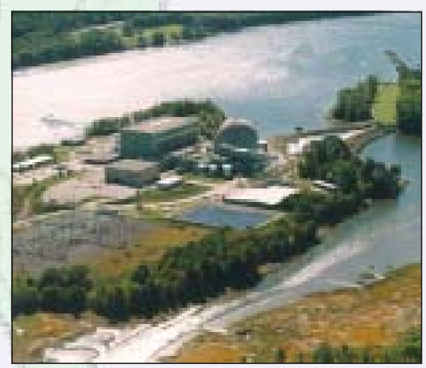
RCRA FACILITY INVESTIGATION REPORT

Bailey Point

Maine Yankee Decommissioning Project

Wiscasset, Maine

August 2004



Bailey Point

PREPARED IN ASSOCIATION WITH:

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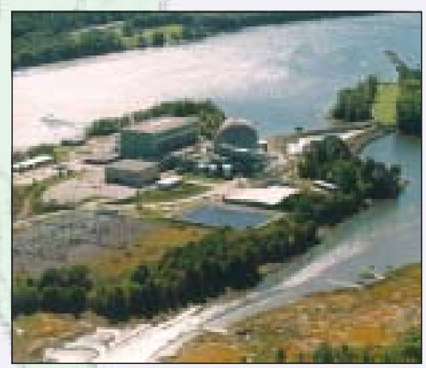

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EXECUTIVE SUMMARY

Maine Yankee is a former nuclear power electrical generating plant that, since ceasing generating electricity in August 1997, is being decommissioned and dismantled. This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report supports closure of the industrial (Bailey Point) portion of the plant site in accordance with RCRA regulations (06-096 Code of Maine Regulations (CMR) Chapter 851, Section 11, and Title 40 Code of Federal Regulations (CFR) Part 265). Radiological closure is addressed in Maine Yankee's License Termination Plan. The goals of this RFI were to collect data to characterize contaminant sources, determine nature and distribution of sources, support fate and transport analysis, conduct risk assessments for human health and the environment, and support future remedial activities, if necessary, to minimize potential risk.

The entire Maine Yankee site is about 820 acres, of which about 150 acres lie within the Bailey Point peninsula, the portion of the site most impacted by construction and operation of the facility. Tidal waters of Montsweag Bay, a part of the Sheepscot River estuary system, surround the Bailey Point area. This RFI Report presents the field investigation within this portion of the site, including an investigation beneath buildings, remaining concrete foundations and along shoreline areas. Risk assessments for human health and the environment were performed and are included as part of this RFI Report. The remaining 670 undeveloped acres were also investigated and the results were documented in a separate Backlands RFI Report to allow Maine Yankee to expedite ownership transfer of the backlands portion of the site.

Prior to construction of the Maine Yankee facility, the Bailey Point area was used for residential and farming activities. During construction and operation of Maine Yankee between 1968 and 1997, this portion of the site was used to support industrial activities associated with nuclear power generation. For a brief period in the early 1980s Maine Yankee held an Interim Hazardous Waste Storage Facility License for the Lube Oil Storage Room issued by the Maine Department of Environmental Protection (MDEP). After terminating that license in 1985, Maine Yankee continued to operate as a hazardous waste generator. A separate MDEP-approved plan was implemented for closure of the Lube Oil Storage Room, which was certified closed in October 2002. Because of detected petroleum hydrocarbons in Lube Oil Storage Room sub slab soils, these results were assessed as part of the RFI.

RFI planning, which consisted of developing project plans and outlining field investigation activities, was initiated in September 1999. Specifically, a Site History Report (SHR), Building Assessment Plan (BAP) and Quality Assurance Project Plan (QAPP) were developed that identified potentially contaminated areas of the site, summarized the environmental and geologic investigations performed at the site, and proposed the investigation plan. The QAPP describes all field, laboratory and validation activities to be completed as part of the RFI to ensure that quality data were collected. The QAPP was granted final approval by MDEP on December 11, 2001.

The site was divided into six study areas to provide additional focus and grouping of similar areas or features of the site. Two study areas (Study Areas 1 and 2) were associated with the non-industrial backlands portion of the Maine Yankee site. The field program was implemented in two major field mobilizations to coordinate with demolition work, decommissioning activities and to allow for work in favorable weather conditions. Phase 1A was performed between September and December 2001, while Phase 1B was completed between April and October 2002.

The RFI activities included collection of soil, concrete, sediment, biota, surface water, and groundwater samples from specific areas of Bailey Point with the highest potential for contamination and from reference locations sited away from the influence of the facility. A total of 278 soil samples were collected from 188 locations on Bailey Point. A total of 118 groundwater samples were collected for analysis from 65 locations, which consisted of 53 newly installed wells, 10 existing wells and two grab locations. Surface water was sampled from five areas downgradient or within areas of suspected contamination. A total of 103 freshwater and marine sediment samples were collected from 83 locations. Twenty samples of concrete were collected from 20 locations. Forty-two (42) tissue samples of soft-shelled clams, blue mussel, lobster, and mummichog were collected and evaluated for risk assessments.

Some RFI sampling activities were deferred as a result of ongoing decommissioning and demolition work, or the inability to access active building sumps and energized transformers. These areas will be sampled as the decommissioning schedule allows and documentation will be included in final closure documents. Confirmatory sampling will be performed in areas where remediation was conducted as part of RCRA closure activities.

Soil contamination identified in the RFI typically included elevated concentrations of polynuclear aromatic hydrocarbons (PAHs) and petroleum hydrocarbons, and detected concentrations of Polychlorinated Biphenyls (PCBs). Constituents identified in groundwater included petroleum hydrocarbons and metals, with one focused area of chlorinated solvents. The RFI evaluated the fate and transport of these and other constituents, including the leaching from soils to groundwater, biodegradation potential, solubility in groundwater, and flow of groundwater and surface water to near-shore areas.

A number of contaminant migration pathways and receptors are present in the Bailey Point area, including a near-shore environment that consists of populations of benthic organisms that are commercially and recreationally harvested and are a source of food for fish and wildlife. Future receptors at the site include office workers, passive recreation seekers and construction workers. The application of institutional controls will restrict future land use to industrial/commercial.

A baseline Human Health Exposure Assessment (HHEA) was performed to evaluate potential human health risks due to exposure to residual contamination in soils, sediment, fish tissue and groundwater within or surrounding the Maine Yankee site. The risk assessment was conducted consistent with the HHEA Work Plan and in accordance with United States Environmental Protection Agency (USEPA) and MDEP guidance.

The calculated risks associated with exposure to soils throughout Bailey Point by an on-site or construction worker were at or below MDEP target risk levels (10^{-5}). The risks associated with residential exposure to soils, an exposure scenario conducted at the request of Maine Bureau of Health (MBOH), were above the MDEP target risk level for Bailey Point. The potential risk associated with exposure to naturally occurring arsenic represents a significant portion of the overall risk. Arsenic is present throughout Bailey Point soils at concentrations similar to soils from reference locations. Arsenic was neither used nor produced as part of plant operations and the observed arsenic distribution in Bailey Point soils is interpreted as background.

The risks associated with exposure to sediments were evaluated for two additional scenarios requested by the BOH: the commercial fisherman harvesting shellfish and/or worms and an area resident wading in the tidal portion of the Back River. All risk estimates were at or below the MDEP target risk level.

The risks associated with the ingestion of shellfish exceeded the MDEP target risk range for all species (i.e., clams, mussels, lobster tissue and tomalley). However, the risks associated with the ingestion of shellfish obtained from reference locations also exceeded the MDEP target risk range. Similar contaminants were detected in shellfish at both locations with the majority of contaminants being present at greater concentrations in the reference samples. As such, the risks from ingestion of biota are the result of background conditions.

The risks associated with the ingestion of groundwater exceeded MDEP target risk range. In addition, eighteen contaminants were detected at concentrations exceeding their respective Maximum Exposure Guidelines (MEGs) or Maximum Contaminant Levels (MCLs).

The results of this risk assessment indicate that exposure to groundwater from Bailey Point may present a health risk. As such, it is recommended that the Corrective Measures Study (CMS) evaluate potential corrective actions to either reduce exposure to groundwater users or to reduce contaminant concentrations in groundwater. No additional corrective actions are necessary to reduce the risks from exposure to soil, sediment or shellfish for future industrial/commercial land use.

An Ecological Risk Assessment (ERA) was prepared to evaluate the potential risk to ecological receptors associated with the marine habitat surrounding the Maine Yankee site in order to make informed risk management decisions. This risk assessment was conducted consistent with the ERA Work Plan outlined in the QAPP, and in accordance with USEPA and MDEP guidance.

Based on the weight of evidence from the various studies and evaluations conducted for the ecological risk assessment, there are potentially moderate risks to fish and benthic invertebrates from site-related chemicals in the sediments at Outfall 009. Although some site-related chemicals were detected in the sediments at some other outfalls, the weight of evidence suggests that the potential ecological risk at the other outfalls is minimal.

An evaluation of fate and transport qualities and assessment of risk to human-health and the environment identified several areas that remain for consideration in the CMS which will identify areas to be remediated, methods of remediation and areas that will require ongoing monitoring. The following areas are recommended for consideration in the CMS:

- Subsurface soils containing Volatile Organic Compounds (VOCs) on the southwest side of Warehouse 2/3 that are degrading groundwater quality;
- Surface and shallow soils containing petroleum hydrocarbons and PCBs near the Construction Transformer;
- Subsurface soils containing petroleum hydrocarbons in the area of the Former Truck Maintenance Garage;
- Subsurface soils adjacent to Monitoring Well (MW) 401B in the Radiological Restricted Area (RA) as a result of petroleum hydrocarbons in groundwater;
- Groundwater associated with solvents and various metals downgradient of Warehouse 2/3; and
- Groundwater for Diesel Range Organics (DRO) and various metals throughout Bailey Point.

The petroleum-contaminated soils beneath the residential fuel oil tank at the Bailey Farm House were removed July 2003. A plan to remove petroleum-contaminated (PAHs) sediments at Outfall 009 was approved by MDEP April 2003 and was implemented fall 2003. A plan to further investigate the petroleum-contaminated subsurface soils in the area of the Former Truck Maintenance Garage was submitted to MDEP July 2003 and the additional soil sampling identified in the plan was completed in October 2003. These sampling results and any remedial activities will be documented in the CMS.

Following MDEP-approval of the CMS, areas that remain to be remediated and/or investigated will be performed as part of Corrective Measures Implementation (CMI), leading to final RCRA site closure of the Maine Yankee site.

APPROVAL PAGE

State of Maine Registered Professional Engineer

I hereby certify that the Maine Yankee Bailey Point RCRA Facility Investigation (RFI) was completed in accordance with the MDEP-approved Quality Assurance Project Plan (QAPP), as amended in correspondence with MDEP. The results of the Bailey Point remedial investigation are presented in the Bailey Point RFI Report.

____ __________

John D. Rendall, P.E. – RCRA Program Manager Date

[Place PE stamp here]

State of Maine Certified Geologist

I hereby certify that I have prepared or reviewed and approved the geological and hydrogeological interpretations reported in the Bailey Point RFI Report, and that I concur with the conclusions of the Bailey Point RFI Report.

____ __________

Robert G. Gerber, P.E./C.G. – RCRA Project Geologist Date

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ACRONYMS

AOC	Areas of Concern
AOI	Analytes of Interest
AWQC	Ambient Water Quality Criteria
BAP	Building Assessment Plan
BCSA	Benthic Community Structure Analysis
BQ	Benchmark Quotients
BSTA	Bulk Sediment Toxicity to Amphipods
BSTS	Bulk Sediment Toxicity to Sandworms
BTEX	Benzene, toluene, ethylbenzene, and xylenes
BWST	Boron Waste Storage Tank
^{o}C	Degrees Celsius
CAG	Carcinogen Assessment Group
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CMR	Code of Maine Regulations
COC	Chain of Custody
COPC	Chemicals of Potential Concern
cPAH	Carcinogenic Polynuclear Aromatic Hydrocarbon
CRA	Cumulative Risk Assessment
CSF	Carcinogenic Slope Factor
CT	Central Tendency
CVCS	Chemical and Volume Control System
CWA	Clean Water Act
CWPH	Circulating Water Pumphouse
cy	cubic yard
DAD	Dermally Absorbed Dose
DO	Dissolved Oxygen
DQI	Data Quality Indicator
DQO	Data Quality Objective
DRO	Diesel Range Organic
DWST	Demineralized Water Storage Tank
EDD	Electronic Data Deliverable
Eh	Redox Potential
EHC	Electrohydraulic Control
EPA	(U.S.) Environmental Protection Agency
EPC	Exposure Point Concentration
EPH	Extractable Petroleum Hydrocarbon
ERA	Ecological Risk Assessment
ER-L	Effects Range-Low
ESA	Environmental Site Assessment
^{o}F	Degrees Fahrenheit
FOB	Fuel Oil Bunker
FTAL	Fish Tissue Action Level
FTC	Flow Through Cell

ACRONYMS

GC/ECD	Gas Chromatography/Electron Capture Detector
GIS	Geographical Information System
GPS	Global Positioning System
GRO	Gasoline Range Organic
HASP	Health and Safety Plan
HEAST	Health Effects Summary Table
HHEA	Human Health Exposure Assessment
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
HSA	Hollow-Stem Auger
HVAC	Heating, Ventilation, Air Conditioning
I&C	Instrument & Controls
ICP/MS	Induced Coupled Plasma/Mass Spectroscopy
ID	Inside Diameter
IDL	Instrument Detection Limit
IRIS	Integrated Risk Information System
ISFSI	Independent Spent Fuel Storage Installation
JWC	Jacques Whitford Company, Inc.
KAS	Katahdin Analytical Services
kg	kilogram
kV	kilovolt
LD	Lethal Dose
LEL	Lower Exposure Limit
LFB	Laboratory Fortified Blanks
LIMS	Laboratory Information Management System
LNAPL	Light Non-Aqueous Phase Liquid
LOAEL	Lowest Observed Adverse Effect Level
LTP	License Termination Plan
MADEP	Massachusetts Department of Environmental Protection
MCC	Motor Control Center
MCL	Maximum Contaminant Level
MDEP	Maine Department of Environmental Protection
MDL	Method Detection Limit
MBOH	Maine Bureau of Health
MEG	Maximum Exposure Guideline
mg/L	milligrams per liter
mg/kg	milligrams per kilogram
mg/kg dry wt	milligrams per kilogram dry weight
MGP	Maximum Gauge Pressure
ml	milliliter
mS/cm	milliSiemans per centimeter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MPC	Measurement Performance Criteria
MPS	Media Protection Standard
MSL	Mean Sea Level

ACRONYMS

MV	millivolts
MY	Maine Yankee
NA	Not Applicable or Not Available
NCEA	National Center of Environmental Assessment
ND	Not Detected
ng/mg^3	nanograms per cubic meter
NOAA	National Oceanographic Atmospheric Administration
NOAEL	No Observed Adverse Effect Level
NRC	(U.S.) Nuclear Regulatory Agency
NRPA	Natural Resources Protection Act
NTU	Nephlometric Turbidity Units
OD	Outside Diameter
OMOE	Ontario Ministry of the Environment
ORP	Oxygen Reduction Potential
OSHA	Occupational Safety and Health Administration
PAB	Primary Auxiliary Building
PAH	Polynuclear Aromatic Hydrocarbon
PAL	Project Action Limit
PCC	Primary Component Cooling
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
ppb	parts per billion
PPE	Personal Protective Equipment
ppm	parts per million
PQL	Project Quantitation Limit
PQO	Project Quality Objective
PRG	Preliminary Remediation Goal
PVC	polyvinyl chloride
PWT	Pore Water Toxicity
QAPP	Quality Assurance Project Plan
QA	Quality Assurance
QC	Quality Control
QL	Quantitation Limit
RA	Radiological Restricted Area
RAG	Remedial Action Guidelines
RBC	Risk-Based Concentration
RCA	Radiation Control Area
RCRA	Resource Conservation and Recovery Act
RCS	Reactor Coolant System
RFA	RCRA Facility Assessment
RfC	Reference Concentration
RfD	Reference Dose
RFI	RCRA Facility Investigation
RGGI	Robert G. Gerber, Inc.
RME	Reasonable Maximum Exposure
RPD	Relative Percent Difference

ACRONYMS

RQD	Rock Quality Designation
RWST	Refueling Water Storage Tank
SCAT	Spray Chemical Addition Tank
SCC	Secondary Component Cooling
SDG	Sample Delivery Group
SHR	Site History Report
SIM	Selected Ion Monitoring
SOP	Standard Operating Procedure
SPCC	Spill, Prevention, Control and Countermeasure
SQL	Sample Quantitation Limit
SRM	Standard Reference Material
SVOC	Semivolatile Organic Compound
S&W	Stone & Webster
TAL	Target Analyte List
TBD	To Be Determined
TCA	Trichloroethane
TCE	Trichloroethene
TCL	Target Compound List
TCR	Tisssue Concentration Ratio
TCLP	Toxicity Characterization Leaching Procedure
TEF	Toxic Equivalence Factor
TIC	Tentatively Identified Compound
TLV	Threshold Limit Value
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TSA	Technical Systems Audit
TSC	Tissue Screening Concentration
TSDF	Treatment Storage and Disposal Facility
UCL	Upper Confidence Level
ug/g	microgram per gram
ug/kg	microgram per kilogram
USCG	United States Coast Guard
UST	Underground Storage Tank
VOC	Volatile Organic Compound
UOR	Unusual Occurrence Report
URF	Unit Risk Factor
VPH	Volatile Petroleum Hydrocarbon
WNT	Waste Neutralization Tank

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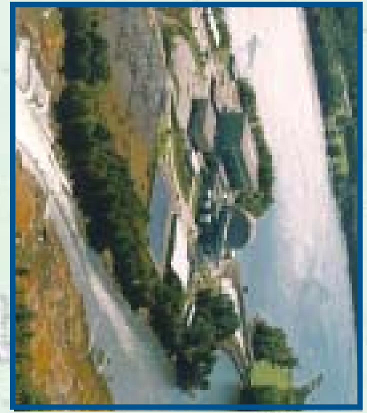

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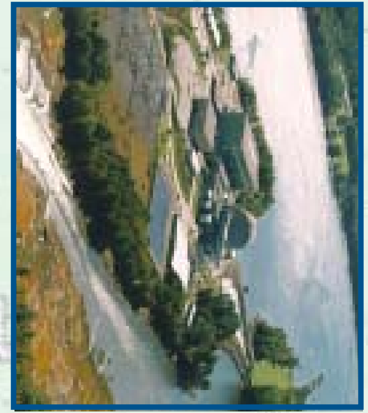

SECTION 1.0 - INTRODUCTION

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1.0 INTRODUCTION

Maine Yankee is a former nuclear power electrical generating plant that, since ceasing generating electricity in August 1997, is being decommissioned and dismantled. This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report supports closure of the industrial (Bailey Point) portion of the plant site in accordance with RCRA regulations (06-096 Code of Maine Regulations (CMR) Chapter 851, Section 11, and Title 40 Code of Federal Regulations (CFR) Part 265). This RFI Report presents the field investigation results and assessments used for decision-making in order to close the Bailey Point area in a manner appropriate for the protection of human health and the environment.

The entire Maine Yankee Site is about 820 acres, of which about 150 acres lies within the Bailey Point area, the portion of the site most impacted by construction and operation of the facility. This RFI Report presents the field investigation within this portion of the site, including an investigation beneath buildings, remaining concrete foundations and along shoreline areas. Risk assessments for human health and the environment were performed and are included as part of this RFI Report. A Backlands RFI Report, based on an investigation of the remaining 670 acres, was prepared separately to allow Maine Yankee the ability to expedite ownership transfer of the backlands portion of the site.

RFI planning, which consisted of developing project plans and outlining field investigation activities, was initiated in September 1999. Specifically, a Site History Report (SHR), Building Assessment Plan (BAP) and Quality Assurance Project Plan (QAPP) were developed that outlined areas of the site potentially contaminated, summarized the environmental and geologic investigations performed at the site, and the investigation plan. The QAPP, which describes all field, laboratory and validation activities to be completed as part of the RFI, was granted final approval by Maine Department of Environmental Protection (MDEP) on December 11, 2001. QAPP Change Orders were processed during the RFI to document changed conditions encountered in the field, additional sampling activities, and/or revised sampling and analytical procedures.

The majority of the RFI sampling program was performed in two major field mobilizations (Phase 1A and 1B) to coordinate investigation activities with ongoing decommissioning and demolition work, and to allow work in favorable weather. The majority of the sampling program was implemented in Phase 1A, which was conducted between September and December 2001. Shoreline sediment sampling was performed early in Phase 1A to support decision making, and consisted of a tiered approach for evaluating the sediment bulk chemistry, toxicity and the benthic community. To support ongoing decommissioning and permitting activities, deep-water sediments were collected prior to the RFI using divers in and around the submerged diffuser pipes, and soil and groundwater samples were collected prior to construction of the spent fuel storage area in the central portion of the Bailey Point area.

The Phase 1B sampling program, conducted from April through November 2002, was enhanced several times to add sampling and analytical scope based on a preliminary assessment of Phase 1A data. The additional sampling scope was discussed with MDEP and the United States Environmental Protection Agency (USEPA) and documented using the QAPP change order process. Some sampling activities outlined in the QAPP were deferred beyond Phase 1B as a result of ongoing decommissioning and demolition work, sub-grade remediation work, or inability to access active building sumps and energized transformer yards. These sampling activities will be performed prior to final site closure as areas become available or as confirmatory samples following removal.

Following completion of the RFI, a Corrective Measures Study (CMS) will be developed to identify potential areas to be remediated and methods of remediation. Several areas were remediated prior to and during the RFI to support decommissioning and demolition work. These remedial activities will be documented in the CMS. Following MDEP-approval of the CMS, areas that remain to be remediated will be performed as part of Corrective Measures Implementation (CMI), leading to final RCRA site closure of the Maine Yankee site.

1.1 Purpose

The purpose of this report is to present the results of the RFI activities conducted in the Bailey Point portion of the Maine Yankee site to support site closure. The RFI was conducted to characterize the Maine Yankee site to support RCRA (non-radiological) closure; radiological closure is addressed in Maine Yankee's License Termination Plan (MY, 2002k). The goals of this RFI were to complete the sampling program and apply the project quality objectives (PQOs) identified in the QAPP (Stratex, 2001d). The PQOs include the generation of data to characterize contaminant sources, determine nature and extent of contamination, support fate and transport analysis, conduct risk assessments for human health and the environment, and support future remedial activities, if necessary, to minimize potential risk.

1.2 Scope of Work

As outlined in the QAPP, the RFI activities included collection of soil, concrete, sediment, biota, surface water, and groundwater samples from specific areas of Bailey Point. The RFI characterizes the potential impacts to site media, and assesses risk to human health and the environment. To ensure that quality data was collected to support PQOs and project decision-making, Quality Assurance/Quality Control (QA/QC) samples were collected and evaluated as outlined in the QAPP. Following sample collection, the locations were surveyed to determine the horizontal and vertical location of the sampling points.

The RFI was implemented in two major field mobilizations, Phase 1A and Phase 1B. The field program was split primarily to coordinate with demolition work in the area of the former Turbine Hall and to allow work in favorable weather conditions. Phase 1A was performed between September and December 2001, while Phase 1B was completed between April and November 2002. Some sampling activities identified in the QAPP have been deferred as a result of ongoing decommissioning and demolition work, sub-grade concrete paint removal, and inability to access active building sumps and transformer yards. These areas will be sampled as the decommissioning and demolition schedule allows and documentation will be included in final closure documents. Later phases of sampling will be relegated to filling identified data gaps and confirmatory sampling in areas where remediation was performed as part of RCRA closure activities.

The Bailey Point RFI included the following activities:

1. Surface soil sampling;
2. Subsurface soil sampling using soil borings, geoprobes, hand augers and test pits;
3. Sub-slab soil sampling;
4. Sub-grade concrete sampling;
5. Subtidal and intertidal sediment sampling;
6. Biota collection for analysis of tissue;
7. Surface water and groundwater-seep sampling;
8. Installation of monitoring wells in soil and bedrock;
9. Sampling of groundwater from monitoring wells;
10. Laboratory analysis of soil, concrete, sediment, tissue, surface water, and groundwater samples; and
11. Data validation of soil, concrete, sediment, tissue, surface water, and groundwater sample results.

Soil, sediment, biota, and groundwater samples were also collected from reference locations sited away from impacted areas for comparison purposes.

Once validated, the data was uploaded to a web-based Geographical Information System (GIS)/Oracle database system and correlated with its location-survey information. The validated data were available to view, to sort and examine spatial variability, and to provide input for assessment of risk to human health and the environment.

1.3 Site Description

The Maine Yankee plant site is located on Montsweag Bay in Wiscasset, Maine **(Figure 1-1)**. The site is located approximately one and one-half miles east of Route 1 and one-half mile west, across Back River, from Westport Island **(Figure 1-2)**. The land owned by Maine Yankee is divided by Old Ferry Road, the closest public road, which terminates on the shore of Back River **(Figure 1-3)**. The main plant facilities are located on Bailey Point, which is surrounded by tidal waters of Montsweag Bay, a part of the Sheepscot River estuary system **(Figure 1-4)**.

The entire Maine Yankee site is about 820 acres, of which approximately 670 undeveloped acres commonly referred to as the Backlands, exist west of Bailey Cove/Young's Brook and north of Old Ferry Road. The remaining approximately 150 acres lie south of Old Ferry Road within the Bailey Point area, which is bounded by

Bailey Cove to the west and Back River on the east (**Figure 1-4**). This RFI Report focuses on the Bailey Point area, which is the portion of the site where most construction, operation and decommissioning activities have taken place.

Notable features within the Bailey Point area (**Figure 1-4**) include Foxbird Island, a 12-acre peninsula within Montsweag Bay south of the plant forebay; the Independent Spent Fuel Storage Installation (ISFSI), an 8-acre area north of the plant area and south of Old Ferry Road; and the industrial area, a 12-acre area within security fencing where the majority of the industrial plant buildings were located. The remaining plant area includes two electrical switchyards and transmission lines, warehouse complexes, administration buildings, and the Bailey Farm House and Barn.

Following decommissioning, most above-grade structures will be demolished. Several structures were demolished during RFI activities, including the Circulating Water Pumphouse, Sewage Treatment Plant, Turbine Hall, Service Building, Information Center, and the Fire Pond and Pumphouse. At the current time, above-grade structures to remain following RFI activities include the ISFSI, the two electrical switchyards (115 kV and 345 kV) and transmission lines, the construction transformer (X-5) and the barge slip and dolphins. The road that travels west of the ISFSI will remain in place, terminating near the 115 kV switchyard. The original plant access road will remain but will terminate between the ISFSI and the former location of the Information Center. The existing railroad that travels the west side of the ISFSI and its two spurs will remain in place. Some below-grade structures and systems will remain following any required surveys and remediation.

During plant operation the site was divided into 15 drainage sub areas, which lead to shoreline areas surrounding Bailey Point via overland or piped storm water systems. There are over 12,000 feet of shoreline around Bailey Point (south of Old Ferry Road), of which approximately 2,500 feet surround the main plant area where industrial activity and licensed industrial discharges occurred. The licensed water discharge pathway during plant operation was the Forebay and the submerged diffuser system extending into Montsweag Bay. The final disposition of stormwater outfalls, including the diffuser forebay and piping, was coordinated with the MDEP through the Site Location and Natural Resources Protection Act (NRPA) regulations (MDEP, 2002a). The diffuser piping will remain in place, both offshore and beneath Foxbird Island. The diffuser forebay was investigated and, as a result of radiological contamination, it will be remediated and restored as a high marsh-wetland (MDEP, 2003a).

1.4 Site History and Basis for RFI Program

Prior to construction of the Maine Yankee facility, the Bailey Point area was used for residential and farming activities. During construction and operation of Maine Yankee, this portion of the site was used to support industrial activities associated with nuclear power generation. The Bailey Point area includes terrestrial, fresh and saltwater wetlands and intertidal environments.

Construction of the Maine Yankee facility began in 1968 and commercial operation commenced in December 1972. The plant generated electricity for approximately 26 years; the plant was taken offline December 1996 and permanently ceased operation in August 1997. The plant is in the process of being decommissioned, with most plant structures scheduled to be demolished and removed.

For a brief period in the early 1980s Maine Yankee held an Interim Hazardous Waste Storage Facility License issued by the MDEP. After terminating that license in 1985, Maine Yankee continued to operate as a hazardous waste generator. Since Maine Yankee was a generator of hazardous waste, the site must be investigated and remediated, if necessary, in accordance with the RCRA (06-096 CMR Chapter 851, Section 11, and CFR 40 CFR Part 265), in order to close the site in a manner appropriate for future use and protection of human health and the environment. The RFI was performed to support an assessment of risk to human health and the environment and to support site closure; the QAPP was prepared as a blueprint for the RFI (Stratex, 2001d). A separate plan was submitted to MDEP for closure of the former Interim Hazardous Waste Storage Facility, the Lube Oil Storage Room (Stratex, 2001a).

1.5 Previous Investigations and Remediations

Numerous environmental and geologic investigations have been conducted at Maine Yankee prior to and since construction of the power generating facility. Section 5 of the QAPP details the assessments and investigations previously performed at the site, which form the basis for the RFI sampling approach (Stratex, 2001d). RCRA-related assessments included a RCRA Facility Assessment (RFA) prepared by MDEP (MDEP, 1992a and 1999), and a Site History Report (SHR), Building Assessment Plan (BAP) and visual site inspection performed by Maine Yankee (S&W, 1999c, Stratex, 2000a, 2001c, and MY, 2001d and 2002m). Several investigations were performed prior to the RFI to support decommissioning and demolition activities, including an assessment prior to enlargement of the barge access road (S&W, 2000a) and construction of the ISFSI (MY, 2000d). An investigation of deep-water sediment in and around the submerged diffuser system was also performed to support NRPA permitting activities (MDEP, 2002a). The Lube Oil Storage Room was evaluated to support closure of Maine Yankee's Interim Hazardous Waste Storage License (Stratex, 2002c). **Table 1-1** summarizes the environmental investigations that have been conducted at Maine Yankee. A summary of geologic investigations is provided in Section 3 of this RFI Report.

Several targeted remediation activities were performed at Maine Yankee prior to the RFI to support decommissioning and demolition work, including removal of kerosene-contaminated soil prior to construction of the ISFSI, removal of petroleum stained soil during excavation work, and removal of paint from the sub-grade concrete surfaces that would remain following demolition. A summary of these remedial activities is also included in **Table 1-1**.

During the RFI, Maine Yankee continued implementation of its MDEP-approved Spill Plan (MY, 2002o). In accordance with the plan, all spills are addressed and remediated, if necessary, in a timely manner. For several larger spills, remedial plans were developed and implemented. **Table 1-1** includes a summary of remedial activities performed as a result of spills reported during the RFI.

Following an assessment of data collected during the RFI, further remedial activity will be planned, evaluated and implemented, as necessary, as part of the Corrective Measures Study (CMS) and Corrective Measures Implementation (CMI) phases. Results of this remedial activity will be documented in final site closure documents.

1.6 Project Organization

RCRA Closure is one of several activities being conducted by Maine Yankee as part of decommissioning, which required support from multiple Maine Yankee groups and contractors as outlined in **Figure 1-5**.

The Maine Yankee Site Restoration/Remediation Group, managed by Mr. Stephen Evans coordinated implementation of the RFI. Mr. Evans was supported by the Nuclear Safety and Regulatory Affairs Group, directed by Mr. Thomas Williamson. Mr. John Rendall of CH2M Hill, the RCRA Program Manager, coordinates the programs leading to RCRA closure of the site: RFI, Risk Assessments, CMS and CMI. Key contributors to implementation of the RFI were Mr. Robert Gerber of Stratex (Project Geologist), Ms. Lauri Gorton of CH2M Hill (QA Officer), Mr. Brian Couture of Sequoia (RFI Manager), Dr. Melville Dickenson of Dickenson & Associates (Project Chemist), and Mr. Nick Sabatine of Jacques Whitford (Field Manager). Jacques Whitford and CH2M Hill provided additional qualified field personnel, such as environmental engineers and geologists, on an as-needed basis throughout the RFI.

The risk assessments performed for this project were managed by Mr. John Lowe of CH2M Hill. The assessment of risk to human health (Section 5) was conducted by Ms. Elizabeth Walter of Dickenson & Associates and the ecological risk assessment (Section 6) was completed by Dr. Jamie Maughan of CH2M Hill.

Data management was the responsibility of Jacques Whitford, which included development of the web-based GIS database and production of graphics to support the RFI.

Several subcontractors supported the RFI organization. Subcontracted services included soil and rock boring, well installation, geoprobes, test pitting, surveying, laboratory analysis, and data validation. The following is a list of primary subcontractors supporting this project:

- Katahdin Analytical Services, Inc.– Prime Laboratory for Sample Analysis
- Southwest Research Institute – Prime Laboratory for Radiological Samples
- EA Engineering, Science, and Technology, Inc. – Sediment Toxicity Analysis
- Aquatec Biological Sciences – Sediment Benthic Community Structure Analysis
- Arthur D. Little – Tissue Analysis

- Research and Productivity Council – Tissue Metal Analysis
- ICF Consulting, Inc. – PCB Congener/Homologue Analysis
- Northeast Test Laboratory – Asbestos Sample Analysis
- Kestrel Environmental Technologies, Inc. – Analytical Data Validation
- Northeast Diamond Drilling Company, Inc. – Soil and Rock Borings and Well Installation
- ESN - Geoprobe Drilling
- Survey and Geodetic Consultants – Surveying

Production of this RFI Report was a collaborative effort of the above-named organizations, as outlined in **Figure 1-5**.

1.7 Project Coordination and Planning

Maine Yankee has been in regular contact with the MDEP and EPA since the beginning of site decommissioning, and with RCRA closure planning since September 1999. As outlined in the QAPP, project personnel have met on numerous occasions to discuss project and data quality objectives, problem delineation, suitability of existing data, data gaps, and data needs to complete the RFI (Stratex, 2001d).

During RFI activities, the core RFI team members communicated daily and met at least weekly to ensure that work was conducted efficiently, in a technically appropriate manner, and in accordance with the QAPP. Communication with MDEP and EPA occurred at least weekly to discuss ongoing RFI work, upcoming activities and issues that arose in the field. Project status reports were prepared monthly and submitted to project personnel to document communication with MDEP, summarize work completed for the previous month, outline anticipated future work, and transmit quality assurance assessments performed during the RFI. A summary of project meetings and monthly project status reports is provided in **Table 1-2**.

As summarized in **Table 1-2**, a coordination meeting was held with MDEP on March 19, 2002, to discuss preliminary results from Phase 1A prior to initiating Phase 1B work. Modifications and enhancements were made to the Phase 1B program based on these initial findings and upon requests made by MDEP. A similar meeting was held on September 12, 2002, following substantial completion of Phase 1B. Data gaps were identified at this stage and were addressed with additional sampling scope to be conducted prior to submitting this RFI Report.

QAPP Change Orders were developed and submitted to MDEP during the RFI program. Change orders were submitted to the appropriate project personnel as outlined in the QAPP, and were implemented following project and/or MDEP approval. The majority of the changes were enhancements to the program, which improved data quality. These changes included the addition of an analytical laboratory to receive radioactive samples, eliminating or relocating sample locations to address conditions encountered in the field, revising field sampling and analytical procedures, and modifying sampling activities based on preliminary findings. A summary of the change orders is provided in **Table 1-3**.

1.8 Report Organization

The remainder of this RFI Report is organized as follows:

- **Section 2** describes the site characterization methods utilized to complete the RFI field program and develop an understanding of current site conditions.

- **Section 3** provides the environmental setting, which presents interpretations of site geology, hydrology, hydrogeology, and ecological areas.

- **Section 4** presents the data generated from the RFI field program, maps of sampling locations and investigative studies and tables of sampling results. The subsequent fate and transport of site-related constituents are addressed at the conclusion of this section.

- **Section 5** presents an assessment of risk to human health by comparing the results to appropriate screening standards.

- **Section 6** presents an assessment of ecological risk by comparing the results to appropriate screening standards.

- **Section 7** includes the summary and conclusions developed from the site investigation and risk assessments.

Table 1-1
Summary of Previous Investigations and Remediations
Bailey Point

Description	Date	Preparer	Summary
Environmental Surveillance and Studies	4/78	Maine Yankee	Final report of surveillance studies performed at Maine Yankee from 1969 through 1977 in order to determine the environmental impact of plant operation.
Evaluation of Ultimate Fate of Chromium	3/89	Robert G. Gerber, Inc.	The report summarizes the evaluation of the potential pathways from a 12,000 gallon underground pipe leak of 700 ppm sodium chromate and estimates maximum possible concentrations reaching various points in the environment based on preliminary modeling. Installation of monitoring wells in bedrock was recommended.
Sodium Chromate Spill Summary Report	6/89	Robert G. Gerber, Inc.	Submission of B-200 series drilling logs and initial water levels, temperature, and conductivity in monitoring wells installed to look for sodium chromate in groundwater.
Sodium Chromate Spill Summary Report	3/90	Robert G. Gerber, Inc.	Summary report of activities done to remediate and evaluate groundwater impacts from spill. Study presents CFS flow calculations, precipitation data, chemical analysis, analysis of saltwater intrusion, water level measurements, and temperature and conductivity measurements from May to December 1989. Chromate had moved out of the groundwater system.
Underground Gasoline Tank Facility Closure Site Assessment	1/92	Robert G. Gerber, Inc.	Site assessment associated with removal of 1,000 gallon underground gas tank northeast of information center. Field headspace on soils and water collected from excavation during tank removal indicated minor leakage of gasoline had occurred.
Underground Gasoline Tank Facility Closure Site Assessment	4/92	Robert G. Gerber, Inc.	A PVC monitoring well was located 10 feet from the former tank location. No gasoline was detected in the groundwater. Contaminated soil was remediated.
Site Assessment for Ferrous Sulfate Tank	2/92	Robert G. Gerber, Inc.	The report summarizes closure activities that included removing liquid remaining in the tank, cleaning the tank, and filling the tank in place.
Groundwater Monitoring Related to Component Cooling Change in Service	10/92	Robert G. Gerber, Inc.	The report summarizes groundwater monitoring completed in 1989 and 1992. The only evidence of significant groundwater impact was associated with seawater intrusion.
Groundwater Monitoring for the Ferrous Sulfate Tank Abandonment	2/92	Robert G. Gerber, Inc.	Site assessment report at time of tank closure. Results of monitoring well installation, water levels and ferrous sulfate chemistry included.
Groundwater Monitoring for the Ferrous Sulfate Tank Abandonment	5/92	Robert G. Gerber, Inc.	Follow-up report on additional chemical sampling of groundwater and nearby seawater. The location appeared to be affected by saltwater intrusion and no further sampling was recommended for ferrous sulfate.
Groundwater Monitoring at Maine Yankee	9/92	Robert G. Gerber, Inc.	Provided a summary of comprehensive groundwater chemistry sampling in B-200 series wells, BK-1, CFS, MW-100, and seawater in March and August 1992. Exceedances of MCL's and MEG's occurred for iron, chloride, bromide, iodide, and TDS, due in part to seawater intrusion in some wells.
Evaluation of Contaminated Soil at Former Low Level Radioactive Waste Storage Area	10/92	Yankee Atomic Electric Co.	Evaluation report on the contaminated soil found in the area of the former low level radioactive waste storage area. The report describes remedial actions and concentrations remaining in soil.
RCRA Facility Assessment (RFA)	8/92	MDEP	The RFA summarized the site setting, geology and spill history of the facility, and identified areas of concern (AOCs).

Table 1-1
Summary of Previous Investigations and Remediations
Bailey Point

Description	Date	Preparer	Summary
Underground Diesel Fuel Storage Facility Site Closure Site Assessment	12/94	Robert G. Gerber, Inc.	Closure report associated with removal of two diesel fuel tanks south of the former Turbine Hall. The report concluded that neither of the tanks nor the associated piping had leaked and oily soil associated with the tank filling station was appropriately removed to Baseline Cleanup Standards. The MDEP concurred with the closure findings January 17, 1995.
Kerosene Leak, Spare Generator Enclosure	7/94	Robert G. Gerber, Inc.	Preliminary report summarizing results of fuel oil analysis of 2 surface water samples, 2 groundwater samples from test pits, and PID headspace readings on soil samples from test pits in the area of the spill. Monitoring well investigation recommended to further delineate groundwater impact.
Site Assessment Report of Kerosene Leak at Spare Generator Enclosure	8/94	Robert G. Gerber, Inc.	Summarized installation of 3 pairs of monitoring wells (soil and bedrock) and one soil boring. Groundwater flow to the west with upward vertical gradients. No kerosene detected below 9.5 feet because of presence of clay-silt. Recommended quarterly groundwater sampling for one year in overburden wells.
Groundwater Summary Report for Kerosene Leak at Spare Generator Enclosure	12/95	Robert G. Gerber, Inc.	Summarized quarterly testing of monitoring wells around kerosene leak site. No detectable concentrations of BTEX, TPH or oil and grease were found in any well during any quarterly sampling event.
Characterization Survey Report for the Maine Yankee Atomic Power Plant	4/98	GTS Duratek	Volume 7 (Hazardous Materials) presents study of soil, groundwater, sediment, and surface water samples collected from locations across the Maine Yankee site for initial, qualitative chemical analysis to support contractor bidding.
Classification and Disposition of Electrical Transformers	9/99	Maine Yankee	Pursuant to Maine Yankee's Site Location of Development order, information was provided to MDEP summarizing PCB information for the six transformers and disposition information.
ISFSI Trench Excavation Sampling and Analysis Plan	11/99	Stone & Webster	Plan to assess the soil excavated from the new storm drain/potable water line trench and the relocated sewer line trench associated with the ISFSI. This plan was required by MDEP Site Location of Development order for ISFSI.
Corrected MDEP RFA	11/99	MDEP	Corrected 1992 RFA presented by MDEP to Maine Yankee November 9, 1999.
Site History Report (SHR)	11/99	Stone & Webster	The report provided a detailed summary of historic releases of hazardous material to the environment and areas of concern initially summarized in the 1992 RFA (MDEP, 1992). It also summarized the field data obtained during the site characterization survey of hazardous materials completed by GTS Duratek in April 1998.
Kerosene Release Investigation	2/00	Stone & Webster	MDEP-approved sampling plan to assess the extent of any soil contamination in the area of the former spare generator storage building as a result of a kerosene leak. Comments received from MDEP 3/2/00 were incorporated into the investigation.
Characterization of Electrical Cables	6/00	Woodard & Curran	Sampling plan to evaluate cable sheathing from various electrical cables at Maine Yankee.
ISFSI Trench Excavation Sampling and Analysis Report	6/00	Stone & Webster	Report summarizing results of soil samples collected pursuant to the sampling and analysis plan submitted to MDEP (11/2/99) as required by MDEP Site Location permit.
Petroleum Contaminated Soils -	6/00	Stone &	Report summarizing remediation of petroleum contaminated soil discovered on March 16, 2000,

Table 1-1
Summary of Previous Investigations and Remediations
Bailey Point

Description	Date	Preparer	Summary
ISFSI Sewer Line Trench		Webster	during installation of the ISFSI sewer line.
Kerosene Spill Report – Spare Generator Storage Enclosure	7/00	Stone & Webster	Presents the results of soil investigation performed in the vicinity of the former spare generator storage building March 6 and 7, 2000, in accordance with the MDEP-approved investigation plan (February 2000).
Barge Slip Access Road Improvements	7/00	Stone & Webster	In accordance with MDEP orders (Site Location and NRPA), soil samples were collected from four locations within the area disturbed by barge slip access road improvements.
Spray Chemical Addition Tank (SCAT) Closure Certification	7/00	Stone & Webster	Closure documentation to support closure of the SCAT, submitted to MDEP July 13, 2000. The closure was conducted in accordance with an MDEP-approved closure plan submitted to MDEP on January 11, 2000.
ISFSI RFI Sampling Results	8/00	Maine Yankee	Summary of RFI sampling performed within the ISFSI area (Study Area 4) prior to construction. A response to MDEP comments was provided to MDEP December 14, 2000.
Kerosene Spill Remediation Plan	8/00	Stratex, LLC	Plan to remediate kerosene-contaminated soil in the area of the former spare generator storage building. The plan was approved by MDEP August 23, 2000.
Kerosene Spill Remediation	9/00	Stratex, LLC	Presents the results of soil remediation performed August 24, 25 and 28, 2000, which resulted in the removal of 1,700 tons of kerosene-contaminated soil from the site of the former spare generator storage building.
ISFSI Soil Remediation Plan	9/00	Stratex, LLC	MDEP-approved plan to remediated petroleum-contaminated soil discovered during construction of ISFSI on August 28, 2000.
Report on August 28, 2000 ISFSI Spill Discovery Remediation	10/00	Jacques Whitford	Results of remediation of petroleum-contaminated soil discovered on August 28, 2000, during construction of ISFSI. Approximately 30 cubic yards of soil was excavated August 30 and September 7, 2000.
Building Assessment Plan (BAP)	10/00	Stratex, LLC	The BAP developed an understanding of the various processes conducted at the Maine Yankee facility, summarized known and documented spill histories and releases, and identified a level of environmental concern for each of the buildings and structures at the facility.
Lube Oil Storage Room Closure Plan	2/01	Stratex, LLC	MDEP-approved plan to close Maine Yankee's Interim Hazardous Waste Facility, the Lube Oil Storage Room, in accordance with CMR Chapter 855. The Plan was approved by MDEP February 26, 2001.
Concrete Waste Characterization Program	3/01	Maine Yankee	Plan that describes the sampling and analysis program to determine the radiological and potential hazardous waste characteristics of the concrete waste that will be shipped off-site for disposal or temporarily stored in on-site storage areas. The plan was approved by MDEP and placed in the Operations Manual for the temporary solid waste storage areas.
Waste Concrete Characterization Report	4/01	Stratex, LLC	Results of extensive concrete sampling performed at Maine Yankee in accordance with MDEP-approved program (3/29/01). The report concludes that concrete at Maine Yankee is non-hazardous.
Building Walkdown Assessment Data Packages	5/01	Stratex, LLC	The data packages document the results of visual site inspections of buildings/structures at the Maine Yankee site performed in accordance with the BAP.

Table 1-1
Summary of Previous Investigations and Remediations
Bailey Point

Description	Date	Preparer	Summary
Certification of Closure-Hazardous Waste Treatment Facility Abbreviated License for Treatment in Tanks	8/01	Stratex, LLC	Closure certification associated with a cable stripping/granulator operated at Maine Yankee from March 2001 through June 2001 within the former Turbine Hall. The certification concluded that the facility was appropriately cleaned prior to removal and that the required test samples did not indicate detectable levels of PCBs.
Additional Building Walkdown Assessment Data Packages	11/01	Stratex, LLC	Additional data packages that document the results of sump/trench inspections performed between 5/9/01 and 10/2/01 in accordance with the BAP.
November 9, 2001 Hydraulic Oil Spill in Restricted Area	12/01	Jacques Whitford	Report documenting remedial activities performed following a crane hydraulic hose leak in the RA area.
ISFSI Form Oil Release Clean-up	12/01	Jacques Whitford	Report documenting removal of soils impacted by form oil, which was applied to wooden concrete forms used to construct ISFSI storage casks.
Ferrous Sulfate Tank Removal Notification	1/02	Maine Yankee	Notification to MDEP of removal of the 9400 gallon ferrous sulfate tank. The tank was removed as part of RFI activities on November 28, 2001. Closure photographs were submitted to MDEP on November 28, 2001, following tank removal as required by Maine Yankee's Site Location/NRPA permit.
April 1, 2002 Hydraulic Oil Spill	5/02	Jacques Whitford	Report documenting remedial activities performed following a crane hydraulic hose leak in the RA area.
Forebay Remediation Plan – Phase 1	6/02	Maine Yankee	As required by Maine Yankee's Site Location/NRPA permit, the first phase of planning for remediation of the forebay was submitted to MDEP. Phase I consisted of further characterization activities to determine the extent of contamination, support remedial alternative analysis, and select dewatering options.
Lube Oil Storage Room Closure Certification	8/02	Stratex, LLC	Final Hazardous Waste Closure Certification of Lube Oil Storage Room, which was prepared in accordance with MDEP-approved Plan. The Closure document was submitted to MDEP August 28, 2002, and a subsequent certification letter was submitted to MDEP October 2, 2002. MDEP concurred that the closure meets the certification requirements of Chapter 855 of the Maine Hazardous Waste Management Rules on 11/28/02.
Removal of PCB Bulk Product Waste from Concrete Blocks	10/02	Maine Yankee	Report submitted to EPA that summarizes removal of PCB Bulk Product Waste paint from concrete removed from the containment building. All the concrete samples collected following paint removal confirmed that the PCB concentrations were below the residual limit of 1 ppm PCBs.
Final Building Walkdown Assessments	11/02	Jacques Whitford	Additional data packages that document the results of the remaining building assessments performed in accordance with the BAP.
Forebay Remediation Plan – Phase 2	12/02	Maine Yankee	As required by Maine Yankee's Site Location/NRPA permit, the second phase of planning for remediation of the forebay was submitted to MDEP. Phase 2 evaluated remedial alternatives, dewatering options, and end-state alternatives.
Removal of PAB Alleyway Soils	4/03	Jacques Whitford	Report documenting remedial activities performed following a discovery of an historic petroleum-contaminated area during excavation in the PAB Alleyway in the RA area.

Table 1-2
Summary of Project Meetings and Status Reports

Description	Date	Summary
RFI Field Training	September 10/11, 2001	Two day field training seminar held at Maine Yankee for all personnel (including MDEP and EPA) involved with RFI work. The training included an overview of sampling procedures for each media and sample screening required by Maine Yankee prior to release from the site to analytical laboratories.
Project Status Report	October 2001	• Began RFI field work September 17, 2001. • Developed response matrix for outstanding QAPP comments. • Integrated additional laboratory (SWRI) to receive radiological samples. • Initiated Field and Laboratory Technical System Audits (TSAs). • Summary of weekly status calls with MDEP July 9th, 16th, 24th, and 30th; August 6th, 13th and 20th; September 24th; and October 1st. • RFI Phase 1 field work over 70 percent complete.
Risk Assessment Meeting	October 9, 2001	Meeting held with MDEP and EPA at Maine Yankee to discuss the methodology for conducting the baseline Human Health Exposure Assessment (HHEA) submitted to the MDEP/EPA (draft) on September 13, 2001.
Project Status Report	November 2001	• Developed technical memorandum (November 21, 2001) summarizing an evaluation of bulk sediment chemical data from the initial round of outfall sediment sample collection and held a conference call with MDEP (see below). • Submitted Field TSA Report to MDEP November 15, 2001. • Developed Field TSA Corrective Action Report. • Distributed revised QAPP pages based on resolution of MDEP/EPA outstanding comments and Field TSA findings. • Held weekly status calls with MDEP the 5th, 13th, 19th, and 26th. • RFI Phase 1 field work over 75 percent complete.
Outfall Toxicity Sediment Sampling	November 8, 2001	Conference call with MDEP to discuss the results of the initial round of outfall bulk sediment chemical data and to decide which locations should be resampled for toxicity analysis.
Project Status Report	December 2001	• MDEP final approval of QAPP on December 11, 2001. • Distributed revised QAPP pages based on changes to the groundwater sampling procedure and to provide laboratory SOPs. • Submitted QAPP Change Order No. 1, which was based primarily on changed field conditions encountered during initial field activities. • Completed Laboratory TSA. • Held weekly status calls with MDEP the 3rd and 10th. • RFI Phase 1 field work about 80 percent complete. • Completed Phase 1A RFI field work December 13, 2001.
Project Status Report	January 2002	• No field work performed. • Completed sample analyses and validation for samples collected from the Backlands (Study Area 1 and 2). • Initiated development of Backlands RFI Report.

Table 1-2
Summary of Project Meetings and Status Reports

Description	Date	Summary
		• Held weekly status calls with MDEP the 7th, 14th and 28th. • Completed Laboratory TSA Report and Corrective Action Report.
RFI Project Meeting	January 31, 2002	Project team meeting held at Maine Yankee to discuss lessons learned during the Phase 1A field program and plan for Phase 1B work.
Project Status Report	February 2002	• No field work performed. • Completed Phase 1A sample analyses. • Held weekly status calls with MDEP the 4th, 11th and 25th. • Submitted Laboratory TSA Report and Corrective Action Report to MDEP February 14, 2002. • Submitted Draft Backlands RFI Report to MDEP February 27, 2002.
Project Status Report	March 2002	• No field work performed. • Completed Phase 1A data validation. • Project coordination meeting held with MDEP March 19th (see below). • Held weekly status calls with MDEP the 4th, 11th and 25th.
MDEP Project Meeting	March 19, 2002	Project coordination meeting held with MDEP and EPA in Portland, Maine, to discuss preliminary Phase 1A results and proposed additions to the Phase 1B program.
Project Status Report	April 2002	• Began Phase 1B field work April 8, 2002. • Submitted QAPP Change Order No. 2, which included an expansion of the investigation in the Backlands (Relic Dump 2) and Bailey Point. • Conducted Data Validation TSA. • Received comments from MDEP on the Draft Backlands RFI Report April 17th. • Held weekly status calls with MDEP the 23rd and 30th.
Project Status Report	May 2002	• Developed technical memorandum (May 15, 2002) for risk characterization results for the stormwater outfalls based on chemical, toxicity and benthic data collected to date. • Held meeting onsite with MDEP on May 29, 2002, to discuss additional sample scope at the 345 kV silt spreading/ball field area and stormwater outfalls (see below). • Submitted Data Validation TSA to MDEP May 30, 2002. • Held weekly status calls with MDEP the 7th, 14th and 28th. • RFI Phase 1 field work nearly 90 percent complete.
MDEP Site Meeting	May 29, 2002	Meeting held at Maine Yankee to discuss additional sampling within the 345 kV silt spreading/ball field area and the preliminary ecological risk assessment performed for the outfall areas based on Phase 1A bulk chemical, toxicity and benthic community analytical results. It was concluded that the sampling program in the 345 kV transmission line/silt spreading/ball field area would be expanded and that no further sediment characterization was necessary to support the offshore ecological risk assessment.
Project Status Report	June 2002	• Submitted QAPP Change Order No. 3, which provided additional analytical protocol and an expanded investigation program in the 345 kV transmission line area.

Table 1-2
Summary of Project Meetings and Status Reports

Description	Date	Summary
		• An additional audit of Katahdin Analytical Services was performed on June 18, 2002, as a result of missing hold times for mercury analysis on soil samples collected from the Turbine Hall area. • Received additional comments on the Draft Backlands RFI Report from the Bureau of Health on June 21st. • Held weekly status calls with MDEP the 4th, 10th, 19th, and 25th. • RFI Phase 1 field work about 98 percent complete.
Project Status Report	July 2002	• Submitted plan to remediate soils at Relic Dump 2 in the Backlands to MDEP July 18, 2002. • Submitted response to MDEP comments on the Draft Backlands RFI Report to MDEP July 31, 2002. • Held weekly status calls with MDEP the 2nd, 9th, 16th, 23rd, and 30th. • Completed Phase 1B field work activities July 17, 2002.
Project Status Report	August 2002	• Submitted plan to remediate soils at Eaton Farm in the Backlands to MDEP August 15, 2002. • Initiated field work associated with data gaps identified in Phase 1. • Installed additional wells in the Relic Dump 2 area of the Backlands. • Held weekly status call with MDEP on the 13th and 20th.
Project Status Report	September 2002	• Performed synoptic water level measurements from installed wells during historic low water period. • Performed groundwater sampling associated with identified Phase 1 data gaps and newly installed wells. • Project coordination meeting held with MDEP September 12th (see below). • Held weekly status calls with MDEP the 3rd, 10th, 17th and 24th.
MDEP Project Meeting	September 12, 2002	Project coordination meeting held with MDEP and EPA in Portland, Maine, to discuss preliminary Phase 1B results and proposed additions to the RFI program.
Project Status Report	October 2002	• Performed groundwater sampling at identified Phase I data gap locations. • Collected additional sediment samples at Outfall 009 for bounding purposes and from a gully west of the 345 kV transmission line/ballfield area at the request of MDEP. • Initiated remedial activities at the Eaton Farm Carriage House and Relic Dump 2 in the Backlands. • Identified additional relic dump in the Backlands (Relic Dump 12). • Submitted well abandonment procedure to MDEP for review. • Held weekly status calls with MDEP the 1st, 8th, 15th, 22nd, and 29th.
MDEP Ecological Risk Conference Call	October 3, 2002	Conference call with MDEP to discuss stormwater outfall sediment sample analytical results and ecological risk approach to support remedial plans for Outfall 009.
Project Status Report	November 2002	• Collected confirmatory samples following remediation of soils at Relic Dump 2 and Eaton Farm Carriage House, and removal of debris from Relic Dump 12. • Completed building assessment activities as required by the BAP. • Held weekly status calls with MDEP on the 5th, 19th and 26th. • Completed RFI Phase I data gap sampling activities on November 14, 2002.

Table 1-2
Summary of Project Meetings and Status Reports

Description	Date	Summary
Project Status Report	December 2002	• Submitted QAPP Change Order No. 4, which was a result of conditions encountered in the field, collection of additional samples based on an evaluation of data collected in Phase I, and comments received from the MDEP. • Submitted SOP 20 to support future abandonment (closure) of site monitoring wells. • Laboratory analysis of Phase I data gap and Relic Dump samples completed. • A plan to remediate radioactively contaminated sediments within the Forebay was submitted to MDEP December 19, 2002. • Held status calls with MDEP on the 10^{th} and 17^{th}.
Project Status Report	January 2003	• Submittal of draft Human Health Exposure Assessment document (Rev. 1) to MDEP January 15, 2003. • Data validation of Phase I data gap and Relic Dump 2 laboratory results complete. • Submitted revised Cumulative Risk Assessment Framework document to MDEP January 22, 2003. • Held weekly status calls with MDEP the 7^{th} and 28^{th}.
Project Status Report	February 2003	• Collected water samples from the PAB Test Pit. • Held weekly status calls with MDEP on the 25^{th}.
Project Status Report	March 2003	• Submitted draft Backlands RFI Report (Rev. 1) to MDEP March 11, 2003. • Received comments from MDEP on the revised draft HHEA document (Rev. 1). • Provided response to MDEP comments on the HHEA. • Held weekly status calls with MDEP on the 25^{th}.
Project Status Report	April 2003	• Groundwater samples and water levels obtained from Relic Dump 2 monitoring wells. • Submitted draft Backlands Closure Report to MDEP April 10, 2003. • MDEP provided comments on Maine Yankee response to HHEA comments on April 11, 2003 and conditional approval of HHEA approach. • MDEP approval of Outfall 009 Remediation Plan April 14, 2003.
Project Status Report	May 2003	• MDEP completed review of Backlands RFI and Closure Reports May15, 2003. • Provided MDEP response to outstanding comments on the revised HHEA May 7, 2003. • Held routine status call with MDEP on the 20^{th}.
MDEP Routine Status Calls	June 2003 – August 2003	Held routine status calls with MDEP/EPA on 6/24, 7/15 and 8/19.
MDEP Project Meeting	August 13, 2003	Project coordination meeting held with MDEP, MBOH and EPA at Maine Yankee, to discuss RFI findings and recommended actions.

Table 1-3
Summary of QAPP Change Orders

<table>
<tr><th>Description</th><th>Date</th><th>Summary</th></tr>
<tr><td>Change Order No. 1</td><td>December 12, 2001</td><td>Study Area 1
• Installed additional monitoring wells to evaluate groundwater conditions beneath rubble piles;
• Constructed additional test pits to evaluate soil within the rubble piles; and
• Reconstructed and/or replaced reference wells as a result of damage and/or field conditions.
Study Area 5
• Installed additional collocated soil boring/monitoring well downgradient of leachfield;
• Adjusted forebay sampling program based on remedial plans and field conditions;
• Adjusted sampling program near the Information Center and the Construction Transformer south of the 115 kV switchyard based on proximity to structures;
• Replaced a damaged monitoring well in Radiological Restricted Area; and
• Constructed additional investigative test pits behind Warehouse 2/3.
Study Area 6
• No sediment available for collection at Outfall 009 intertidal location and Outfall 010 subtidal location;
• Relocated reference sediment and biota sample locations to Brookings Bay in order to achieve more comparable conditions.</td></tr>
<tr><td>Change Order No. 2</td><td>April 8, 2002</td><td>Study Area 2
• Collected additional soil samples and installed additional monitoring wells to evaluate conditions associated with a former homestead dumpsite (Relic Dump 2).
Study Area 4
• Perform a second round of groundwater sampling from existing monitoring wells.
Study Area 5
• Installed additional test pits within area of leachfield;
• Collect additional soil samples in area of Construction Transformer, Former Truck Maintenance Garage, and Warehouse 2/3 based on detections in the Phase 1A sample program;
• Install additional collocated soil borings/monitoring wells in the Warehouse 2/3 area;
• Adjusted soil sampling plan around transformers based on demolition plans;
• Perform a second round of groundwater sampling from wells installed in the Pre-operation Cleaning Basin Area and the Radiological Restricted Area; and
• No soil available beneath several building slab locations in the Turbine Hall and Radiological Restricted Area.
Study Area 6
• Adjusted analytical protocol for the 28-day Leptocheirus plumulosus test based on newly promulgated procedure.

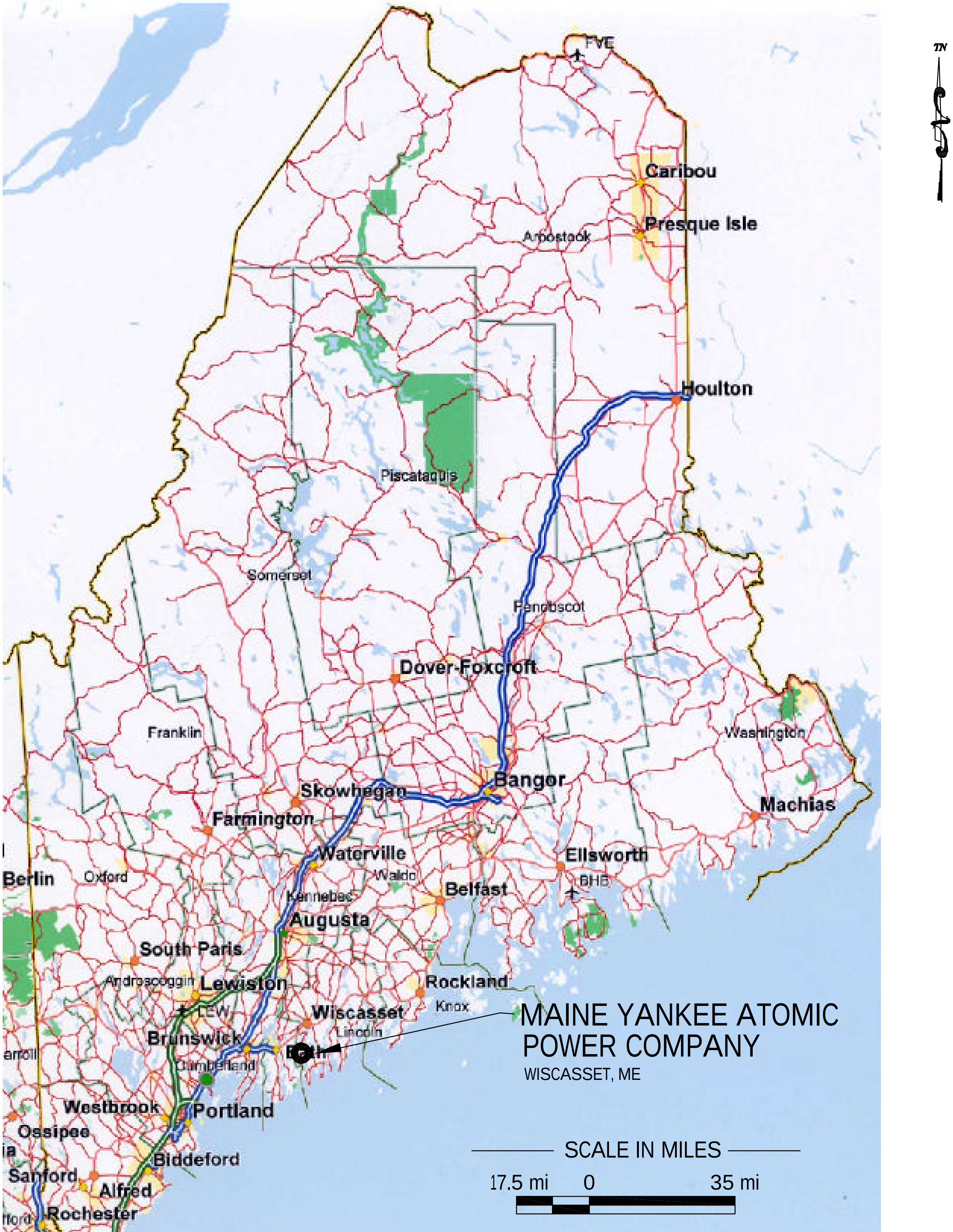
In addition, a second round of water level measurements were obtained from site monitoring wells and a second round of groundwater samples were collected from each reference well.</td></tr>
</table>

Table 1-3
Summary of QAPP Change Orders

Description	Date	Summary
Change Order No. 3	June 20, 2002	*Study Area 5* • Expanded soil and groundwater investigation within the 345 kV transmission line area based on detections in the Phase 1A sampling program; and • Provided additional understanding of historical fill activities within the 345 kV transmission line area. At the request of MDEP, groundwater analysis for petroleum hydrocarbons will be performed using the MDEP Diesel Range Organics (DRO) Method versus EPH. Analytical procedures for the DRO method were provided in the Change Order. To support Maine Yankee's License Termination Plan, additional Anion/Cation analysis was performed on selected Radiological Restricted Area monitoring wells. Analytical procedures to support Anion/Cation analysis were provided in the Change Order.
Change Order No. 4	December 5, 2002	*Study Area 1* • Collected additional surface soil samples from the rubble pile area based on pesticide detection. *Study Area 2* • Installed additional monitoring wells and sampled groundwater to evaluate conditions associated with a former homestead dumpsite (Relic Dump 2); • Collect second round of groundwater samples from the initial monitoring wells installed at Relic Dump 2; and • Collect a surface soil sample following removal of debris from the newly discovered relic dump (Relic Dump 12). *Study Area 4* • Collect a third round of groundwater samples from overburden monitoring wells. *Study Area 5* • Perform a second round of groundwater sampling from selected RA and Turbine Hall area wells; • Collect a second round of groundwater samples from monitoring wells installed in the 345 kV Transmission Lines (Silt Spreading) area; • Install additional monitoring wells, soil borings and geoprobes around the Warehouse 2/3 complex; • Collect an additional round of groundwater samples from existing wells surrounding Warehouse 2/3; • Collect an additional groundwater sample from monitoring well north of ISFSI in the area of the Pre-Operation Cleaning Basin; • Install additional monitoring wells and perform second round of groundwater sampling in area of Former Truck Maintenance Garage; and • No soil available beneath several building slab locations in the Turbine Hall and Radiological Restricted Area and former Fire Pump House.

Table 1-3
Summary of QAPP Change Orders

Description	Date	Summary
Change Order No. 4, continued		*Study Area 6* • Collect additional sediment samples from Outfall 009 to bound detections of petroleum hydrocarbons; and • At the request of MDEP, collect additional sediment samples from Bailey Cove sediments from a gully west of the 345 kV Transmission Lines (Silt Spreading) area. A third round of water level measurements were obtained from site monitoring wells and a third round of groundwater samples were collected from each reference well. A SOP for abandonment of monitoring wells (SOP 20) was also forwarded to the MDEP and appropriate personnel for placement in the QAPP.



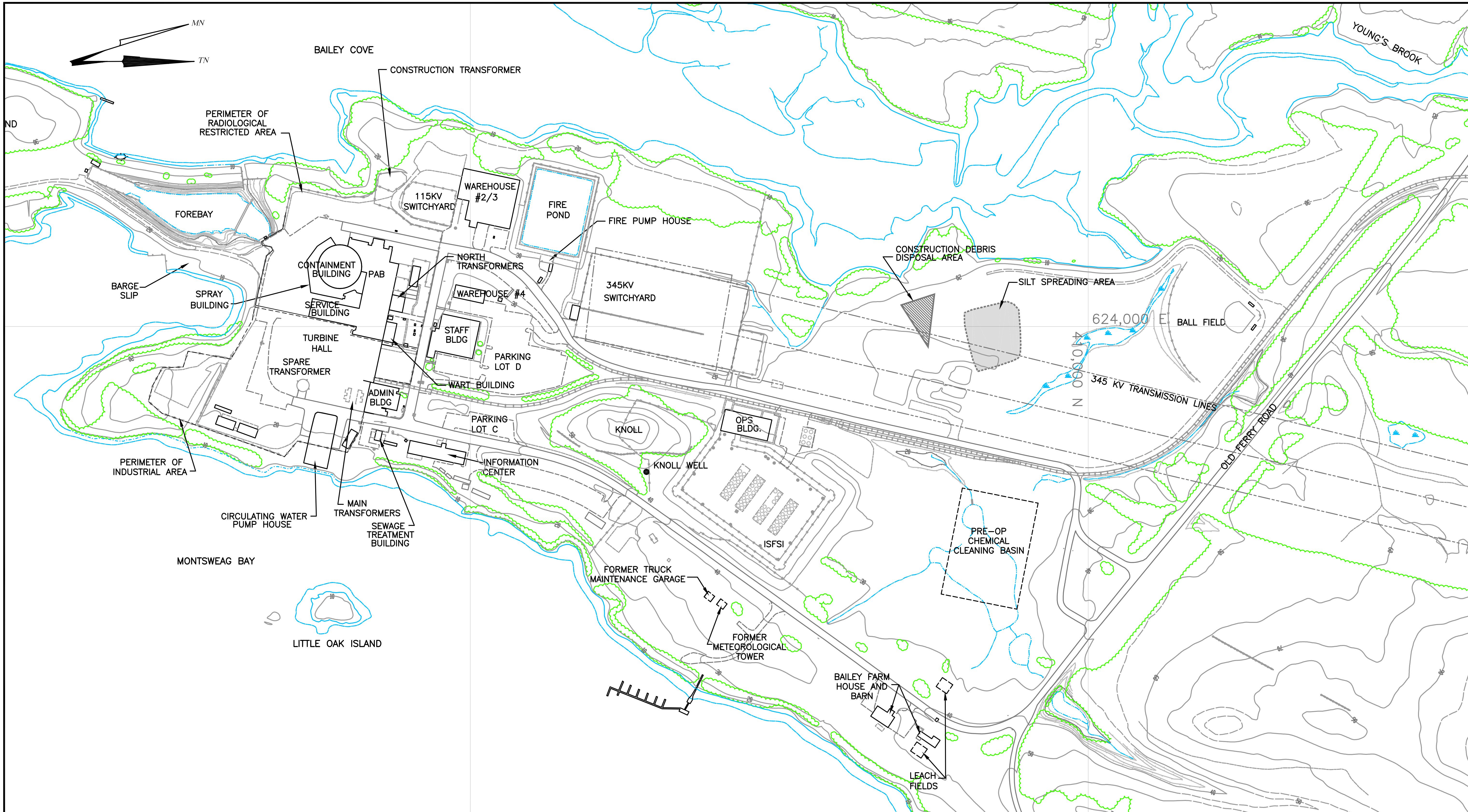
ORIGINAL BASE MAP INFO OBTAINED FROM:
DeLORME STREET ATLAS USA 7.0

Maine Yankee

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY				DRAWING TITLE: **LOCATION MAP**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
PROJECT NAME/FILE NAME: BAILEY/REGIONAL LOC	PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=35mi	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. **1-1**



LEGEND:

- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

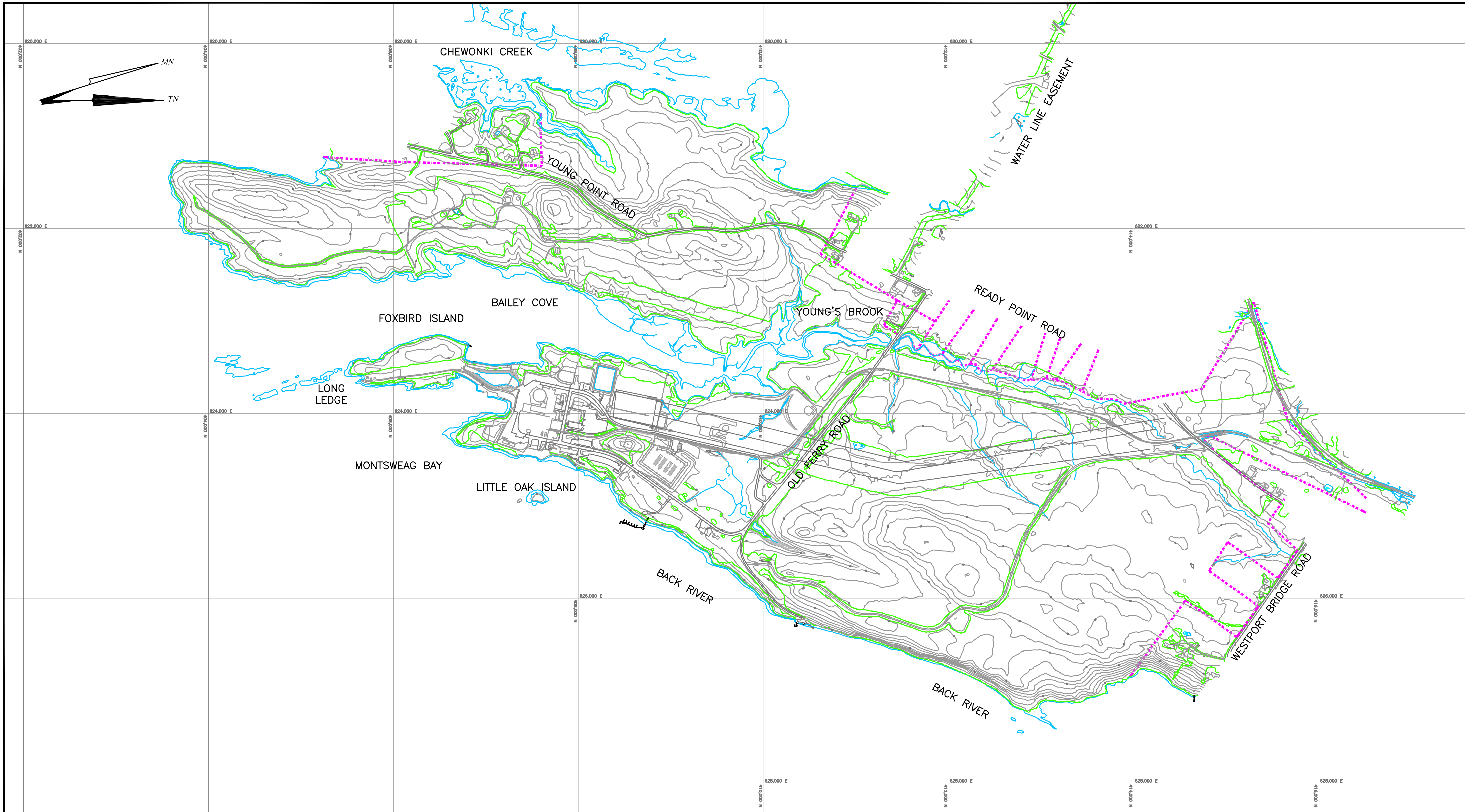
CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: PLANT STRUCTURES
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 1-4


MAINE YANKEE
SITE
WISCASSET
WESTPORT
ISLAND
BACK RIVER
Wiscasset Airport
Powerplant
Little Oak Island
Bailey Pt
Foxbird Island
Long Ledge
Young Pt
Chewonki Neck
Chewonki Creek
Shag Ledge
Halftide Rock
Berry Island
Cowseagan
Colby Cove
Westport Ch
Boat Ramp
Gravel Pit
Knight Cem
Doggett Castle
Rum Cove
Quarry Point
Brook
MAINE



LEGEND:

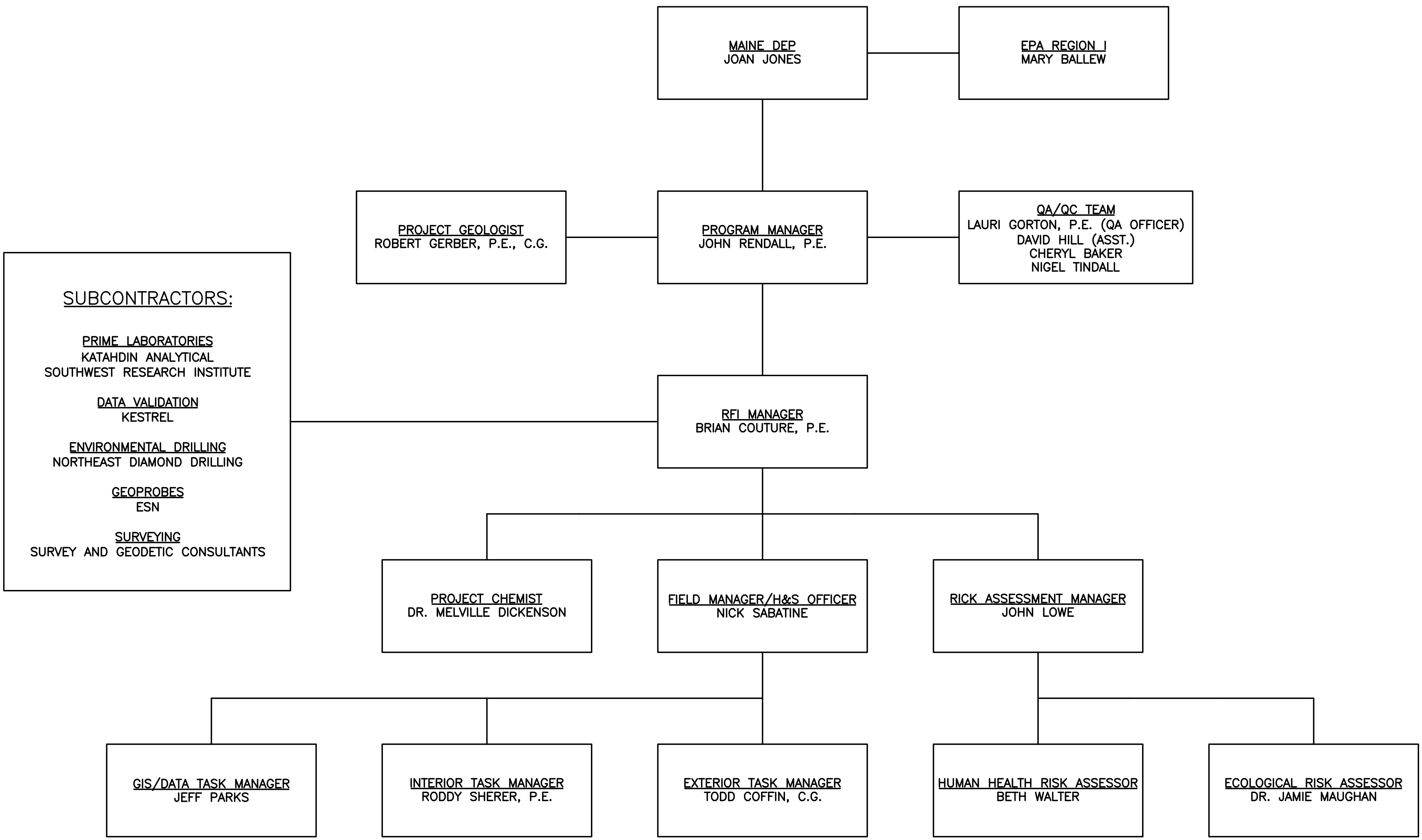
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- PROPERTY LINE

SCALE IN FEET

500 0 1000 2000

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report				
CH2MHILL / WA / STRATEX strategic consulting	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY				DRAWING TITLE: MAINE YANKEE PROPERTY BOUNDARIES
	DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
	PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A	SCALE: 1"=1000'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME
					FIGURE NO. 1-3



Maine Yankee

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: **PROJECT ORGANIZATION**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	FIGURE NO. **1-5**
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: NA	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

SECTION 2.0 – SITE CHARACTERIZATION

LIST OF TABLES

LIST OF FIGURES

2.0 SITE CHARACTERIZATION

The RFI program was based on known or suspected potential sources or releases to various site media, which required further characterization to support closure of the Maine Yankee site in accordance with RCRA requirements. Based on this understanding, analytes of interest, analytical protocol and sampling approaches were developed in the QAPP to support a determination of the nature and extent of contamination and to assess impact to human health and the environment for the Bailey Point area of the site (Stratex, 2001d). This section presents an overview of the site characterization activities required to make project decisions leading to site closure, and summarizes the quality assurance assessments performed during the RFI to ensure that quality data were collected.

2.1 Program Overview

This section provides an overview of the RFI program performed for the Bailey Point portion of the Maine Yankee site. Included is a summary of potentially affected media, pathways and receptors, the sampling and analytical approach used, and the requirements that would trigger a project action.

2.1.1 Environmental Contamination Overview

Minor spills and releases (primarily petroleum) have occurred since the beginning of plant construction. A few significant releases occurred during operation. These spills and releases, detailed in the QAPP, are summarized below and are shown on **Figure 2-1**.

As part of the MDEP RFA study, two solid waste management units (SWMUs) and four areas of concern (AOCs) were identified. The SWMUs included:

- SWMU-1 PCC and SCC Pipelines and
- SWMU-2 Hazardous material and waste storage area (Lube Oil Storage Area).

The four AOCs were identified as:

- AOC-1 Satellite storage area outside Service Building,
- AOC-2 Floor drains in water treatment area,
- AOC-3 Hazardous waste storage buildings, and
- AOC-4 Cooling water discharge to Forebay and diffuser pipe in Montsweag Bay.

Review of these SWMUs and AOCs as part of the Building Assessment Plan and visual site inspection has led to focused studies in SWMUs 1 and 2 and AOCs 2 and 4 (Stratex, 2000a and 2001c and MY 2002m). No specific studies were focused on AOCs 1 and 3 as no historic or visual evidence of spill/releases was observed. As part of decommissioning activities, the hazardous waste storage buildings will be closed in accordance with

Chapter 851 of the MDEP hazardous waste management rules. Additionally, groundwater samples were taken from monitoring wells located downgradient of AOCs 1 and 3.

Three notable features relating to construction of the plant were identified in the QAPP and investigated as part of the RFI: a chemical cleaning basin; a garage used for the maintenance of concrete trucks; and a marine sediment/construction debris disposal area.

The pre-operational chemical cleaning basin was located south of Old Ferry Road and east of the railroad tracks (**Figure 2-1**). The unlined basin, approximately 250 feet by 350 feet with a depth of approximately 10 feet, was used for the disposal of chemical solutions and rinse water from pre-operational cleaning associated with the main steam, condensate and steam generator feed piping. Pipe cleaning was necessary to remove corrosion-inhibiting protective coatings, and reportedly involved the following chemicals: monosodium, disodium and trisodium phosphate; formic acid; hydroxyacetic acid; a high temperature chloride free inhibitor; a nonionic wetting agent; citric acid; and sodium nitrate. After completing the pre-operational cleaning activities, the wastewater in the basin was reportedly released to a drainage area (west of the railroad tracks) that flowed to Bailey Cove. The pre-operational cleaning activity occurred over a limited time period during construction (July 1971) and was terminated prior to start of facility operation (December 1972).

A second pre-operational feature identified was a maintenance garage that was used to service concrete trucks during construction. The garage was located on the east side of the plant access road in the vicinity of the former meteorological tower (**Figure 2-1**). The location of the garage was confirmed by both aerial and project photographs taken during plant construction. The location or presence of floor drains or other specific features was researched; however no detailed drawings of the garage could be located. Based on the use as a vehicle maintenance garage, potential chemicals used at the facility include oils, fuel and degreasing solvents. The garage was removed prior to operation of the Maine Yankee facility.

The final pre-operational feature investigated was located in an approximate 20-acre area west of the railroad tracks and north of the 345 kV switchyard to Old Ferry Road (**Figure 2-1**). Prior to plant construction, this portion of the site included a large tidal drainage that connected a channel extending from Bailey Cove eastward to the area of the pre-operational cleaning basin described above. The tidal drainage was bordered by a significant expanse of saltwater marsh terrain. The initial fill material utilized in this portion of the site included glaciomarine clay-silt soils and blasted bedrock removed from the southern portion of Bailey Point where the main plant buildings were constructed. Various construction debris and wastes including wire rope, wood, and steel were also mixed with this material that was used to fill the central and southern portion of the area including the large tidal drainage. A construction debris area was located in the southwestern portion of the site and was used to sort through the construction debris, most of which was recycled. The construction debris that was not recycled was most likely buried in this area. Based on this understanding, the central and southern portion of the area, west of the railroad tracks, is believed to have had a combination of soil/blast rock fill and construction debris placed within the large drainage and above the natural soils. Most of the construction debris is believed to have been placed in the area west of the 345 kV lines and south of the "ball field". In addition to the fill included in this area, the area west of the railroad and contractor access road, and under the more easterly 345 kV set of lines has occasionally served as a parking area for subcontractors and a laydown area for equipment.

During 1968 and 1969, an estimated 50,000 cubic yards (cy) of marine sediments were removed from the intake channel associated with the construction of the Circulating Water Pump House and material removed from under the original east forebay dike, barge slip and accompanying barge slip channel. These materials were pumped via overland pipes and deposited north of the pre-construction drainage to what is now called the "ball field" area and the area east of the railroad tracks where the pre-operational cleaning basin was constructed in 1971.

During the construction of the Maine Yankee forebay structure and diffuser pipe in 1974, a berm was built along the western edge of the 345 kV transmission line area to retain soft marine sediments that had been excavated for the foundations of the west dike of the forebay and the marine portion of the diffuser pipe. The material for the berm included an estimated 35,000 cy of glaciomarine clay-silt soils and 34,000 cy of blasted rock excavated from the Foxbird Island trench for the diffuser pipe. Following construction of the berm, approximately 90,000 cy of the marine sediments were placed within the berm and to the north into the "ball field" area.

Additionally, a total of approximately 60 cy of marine sediments and silt periodically removed from the intake structure of the Circulating Water Pump House was spread on five separate occasions between September 1992 and September 1997. This material was spread in an approximate one-acre portion of the site that was located adjacent to the contractor parking area, in accordance with a dredge spoils utilization license (MDEP, 1992b). The dredge spoils area was sampled annually as required by the license, and the license was surrendered to MDEP, with its approval, in 1998.

Four notable releases occurred during operation of the facility:

- a release of an unknown amount of chromated water from the Primary Component Cooling (PCC) system to a storm drain in October 1985 (SWMU-1);
- a release of approximately 12,000 gallons of de-mineralized Secondary Component Cooling (SCC) water containing sodium chromate in December 1988 through an underground pipe leak (SWMU-1);
- an accidental release of approximately 200 gallons of low viscosity non-PCB containing transformer oil to the Back River in May 1991 from a fire in the main transformer; and
- a release of kerosene through a slow leak in a fuel line to subsurface soils in the former Spare Generator Storage Building adjacent to the west side of the current ISFSI area in June 1994.

These four releases were addressed in a timely manner to the satisfaction of the MDEP; however additional characterization within these former release areas were conducted as part of the RFI to support an assessment of risk and final site closure.

Several areas of contamination were identified and remediated both prior to and during construction of ISFSI. The release of kerosene to subsurface soils near the former Spare Generator Storage Building was remediated prior to the RFI to MDEP Baseline-2 standards (MDEP, 2000a). Approximately 1,700 tons of petroleum-contaminated soil were removed, and the remediation was completed in accordance with MDEP-approved remediation plan and clean-up criteria (Stratex, 2000c).

Two areas of subsurface historical petroleum contamination were discovered during construction of the ISFSI and were subsequently remediated to MDEP Baseline-2 standards (MDEP, 2000a). The initial discovery was during utility trenching along the west side of the ISFSI Operations Building. Approximately 300 cubic yards of petroleum-contaminated soil was removed, which was completed in accordance with an MDEP-approved remediation plan and clean-up criteria (S&W, 2000f). The second area was in the central portion of the ISFSI area and resulted in the removal of about 30 cubic yards of petroleum-impacted soil. A report summarizing that remedial activities were performed in accordance with the MDEP-approved plan and clean-up criteria was submitted to MDEP (JWC, 2000).

One minor spill of "form oil" was reported during construction of the ISFSI that was remediated in a timely manner to MDEP Baseline-2 standards (MDEP, 2000a). A small amount of impacted surface soil was removed in accordance with MDEP-approved plan and clean-up criteria (JWC, 2001).

Within the RA, several minor surface spills (i.e., hydraulic fluid) and a historic subsurface petroleum-contaminated area were discovered and addressed during the RFI. Two hydraulic oil leaks to surface soils in the RA were cleaned to MDEP-Baseline standards (MDEP, 2000a). The two spills were timely addressed and a small volume of impacted surface soils were removed to MDEP clean-up standards (JWC, 2002). An area of subsurface historical petroleum soil contamination discovered in the alleyway adjacent to the Primary Auxiliary Building (PAB) was remediated to MDEP Baseline-2 standards (MDEP, 2000a). Approximately eight cubic yards of soil was removed from this area down to bedrock and MDEP clean-up standards were achieved (JWC, 2003).

Additional activities having contamination potential during operation of the facility were identified and investigated. In the 1970's and early 1980's, used drums containing residual solvents were staged in front of the loading dock at Warehouse 2/3 prior to shipment back to the vendor to recycle the containers. It was reported that a used drum of degreasing solvent that contained 1,1,1- trichloroethane was likely released to the ground on the east of the loading dock as a result of this practice. It was also believed that paint, painting solvents, and paint removal blasting grit was disposed west of

Warehouse 2/3 and along the boundary of Warehouse 2 and Warehouse 3 prior to joining the two structures.

The forebay, the licensed discharge pathway, was connected to a large, underground pipe system beneath Foxbird Island that lead to diffuser pipes in Montsweag Bay (AOC-4) (**Figure 2-1**). Several sumps located in the industrialized portion of the facility were treated and discharged through the forebay along with stormwater runoff. The forebay was also the discharge point for the non-contact cooling water systems. When the plant was operating, approximately 420,000 gallons per minute of circulating and service water were discharged through the forebay.

In addition to the known spills and releases and documented historical activity, the QAPP outlined additional understanding concerning the distribution of impacted areas at the Maine Yankee facility based on previous investigations and remediations (Stratex, 2001d). The previous studies included investigations of soil, groundwater, sediment, and surface water from areas of potential concern. These investigations showed low concentrations of Volatile Organic Compounds (VOCs), Polynuclear Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), and Diesel Range Organics (DRO) in soils, and low concentrations of VOCs, Semivolatile Organic Compounds (SVOCs) and metals in groundwater. Sediments were impacted primarily by PAHs and DRO, and surface water, collected primarily from catch basins, contained elevated concentrations of DRO.

Air discharges did not appear to be a significant issue at the Maine Yankee facility as no significant or historic releases of airborne material occurred at the facility.

2.1.2 Potentially Affected Media, Pathways and Receptors

Previous studies described in the QAPP and summarized in **Table 1-1** indicate low levels of soil and groundwater contamination in industrial portions of Bailey Point where spills and releases occurred. Detected concentrations of chemicals, primarily PAHs and petroleum hydrocarbons, were also observed in sediments associated with stormwater outfalls. The Bailey Point area includes a near-shore environment that consists of populations of benthic organisms (clams, mussels, and worms) that are commercially harvested and are a source of food for fish and wildlife. Based on these studies, the following is a summary of potentially affected media within the Bailey Point area:

- surface waters and sediment of Montsweag Bay;
- sediments along drainage ways leading from the Maine Yankee property into Back River, Bailey Cove, and Montsweag Bay;
- soils on the site upon which spills occurred or wastes were placed or intermixed with soil;
- concrete left in place below grade upon which spills occurred;
- groundwater in the soil of the site; and
- groundwater in the bedrock of the site.

The potential migration pathways and receptors of these contaminants within the Bailey Point area include:

- contaminants entering the groundwater system traveling the pathways identified by the groundwater modeling discussed in Section 3 of this RFI;
- contaminants being extracted from the groundwater system by plants;
- contaminants entering shallow drainage ditches or wetlands and being returned to the fresh water surface system;
- contaminants potentially extracted through subsurface drains or from groundwater from wells or springs used as human water supplies;
- contaminants discharging to Montsweag Bay, up through or onto the bay sediments;
- surface runoff carrying contaminated sediments or bringing contaminants in contact with sediments that adsorb or precipitate contaminants carried in surface water;
- contaminants being taken out of sediments or soil by plants or by soil-ingesting or water-filtering organisms;
- bioaccumulation of contaminants by soil ingesting or water filtering organisms, followed by food chain transfer to higher trophic level organisms, such as fish, birds, or mammals;
- human contact with contaminated sediment;
- human contact with contaminated soil;
- human contact with the waters of Montsweag Bay;
- human ingestion of benthic organisms like clams or mussels; and
- human ingestion of fish and lobster.

A schematic site conceptual model relating the primary and secondary sources at the site to potential pathways and receptors was developed in the QAPP. Previous studies indicated that the stormwater discharge to sediments in the industrial area outfall areas represents the most significant potential risk at the site. Due to the presence of the near-shore environment, other receptors potentially include commercial and recreational shellfish harvesters, worm diggers, and other recreational receptors. Specific ecological and human health receptors will be evaluated in the risk assessments outlined in Sections 5 and 6 of this RFI Report.

2.1.3 Analytes of Interest

Analytes of Interest (AOI) represent specific compounds that were believed to be present at the site based on previous investigations, scoping meetings with regulators, historic use of materials at the site and pre-operational and operational releases. Initial AOIs were developed in the QAPP, which formed the program outlined in this RFI. Additional AOIs and target analytes were added to the program based on preliminary RFI findings to support assessment of risk to human health and the environment.

Due to the diverse activities across the site, the AOIs include several classes of organic and inorganic compounds that generally resulted in "full suite" analysis at each soil and groundwater sample location. A full suite of organic analytes was considered to be VOCs, SVOCs, pesticides, and PCBs identified on the Target Compound List (TCL) in Appendix D of 06-096 CMR 405. Petroleum hydrocarbons were evaluated by Extractable Petroleum Hydrocarbons (EPH) and Volatile Organic Hydrocarbons (VPH) using Massachusetts DEP methods. Following the initial round of groundwater sampling results, at the request of MDEP, analysis of petroleum hydrocarbons in groundwater was performed using the MDEP Diesel Range Organics (DRO) method (MDEP, 2002d and MY, 2002q). In addition to RCRA metals, inorganic compounds included a full suite analysis of compounds identified in CMR 405 as total inorganic target compounds, and referred to in this report as the Target Analyte List (TAL). Boron, a commonly used element at this site was included in the TAL list. Because of groundwater analytical results from previous sampling on site, nitrate analysis was included with the majority of groundwater samples collected in this program.

Concrete sampling was conducted on potentially impacted foundations, floors and slabs that will remain onsite following demolition. Concrete sample locations and selection of the analytical suite were based on observations and assessments made during the RFA phase and included analysis for PCBs and EPH.

To support an assessment of ecological risk, sediment samples were analyzed for TCL, TAL metals, PAHs using Selected Ion Monitoring (SIM), grain size, PCB homologues and congeners identified on NOAA and World Health Organization lists, and total organic carbon (TOC). Additional testing of sediment occurred in a phased approach based on the results of the bulk-chemistry analysis. The additional testing included bulk sediment toxicity to amphipods (BSTA) and sand worms (BSTS). Following an assessment of the chemical and toxicity analysis, benthic community structure analysis (BCSA) was conducted at selected sites.

Biota samples collected for analysis included the soft-shell clam, blue mussel, mummichog, and lobster. The tissue from these organisms was analyzed for TCL (minus VOCs), TAL, SIM PAHs, and lipids.

2.1.4 Project Action Limits

Project Action Limits (PALs) were developed in the QAPP to support DQOs for the project. The PALs are risk-based and are used to make project decisions. Further investigation and remedial actions will be based on risk-based screening concentrations, the findings of the risk assessments and whether the limits of potential contamination are bounded.

The QAPP defines the basis of the PALs developed for the RFI, which are summarized as follows:

- Soil - USEPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil;
- Concrete - USEPA Region 9 PRGs for industrial soil;

- Groundwater - Maine Maximum Exposure Guideline (MEG) or USEPA Region 9 PRGs for tap water when MEGs are not available;
- Surface Water - Ambient Water Quality Criteria (AWQC), using chronic values when available;
- Sediment - National Oceanographic and Atmospheric Administration (NOAA) Effects Range-Low (ER-L); and
- Tissue - Maine Bureau of Health (MEBOH) Fish Tissue Action Levels (FTALs) or USEPA Region III Risk Based Concentrations (RBCs) for fish tissue when MEBOH FTALs are not available.

The risk-based values utilized for the PALs were not always available for the complete TCL and TAL suite of analytes. Likewise, for a few of the TCL and TAL compounds the PALs were less than laboratory achievable quantitation limits (QLs).

2.1.5 Sampling Approach

The primary purpose of the RFI program was to obtain an understanding of current site conditions to support potential remedial decision-making in order to close the site in a manner appropriate for the protection of human health and the environment. To support this understanding, three separate sampling and analysis strategies were developed in the QAPP:

- a backlands sampling program in non-industrial areas north of Old Ferry Road and west of Bailey Cove;
- an exterior sampling program in the industrial area of Bailey Point south of Old Ferry Road; and
- an interior sampling program within and beneath on-site buildings and structures.

The QAPP also divided the site into study areas to provide additional focus and grouping of similar areas or features of the site. The six study areas and approximate size are defined below and are shown on **Figure 2-2**:

- *Study Area 1 and 2*: 670-acre backland areas north of Old Ferry Road and west of Back River, including the Eaton Farm area;

- *Study Area 3*: 12-acre peninsula (Foxbird Island) within Montsweag Bay south of the plant forebay in the Bailey Point area;

- *Study Area 4*: 8-acre area within the Bailey Point area consisting of the Independent Spent Fuel Storage Installation (ISFSI);

- *Study Area 5*: 130-acre area within Bailey Point containing the majority of the plant structures, two electrical switchyards, a ball field, and the Bailey Farmhouse and barn, but excluding the ISFSI; and

- *Study Area 6*: Shoreline outfall locations and tidal areas around Bailey Point in Back River, Montsweag Bay and Bailey Cove.

A draft Backlands RFI Report, based on the investigation outlined in the QAPP for the non-industrial backland portions of the Maine Yankee site (Study Areas 1 and 2) was submitted to MDEP February 27, 2002 (MY, 2002c). Following additional investigation of several relic dump areas and in response to MDEP comments, a second draft Backlands RFI Report was submitted to MDEP on March 11, 2003 and a final report was submitted on January 14, 2004 (MY, 2004).

The investigation of the industrial area south of Old Ferry Road (Study Areas 3 through 6) within the Bailey Point area is the focus of this RFI Report. This investigation took into account the potential migration pathways discussed above, and focused primarily on the major surface water discharge areas located on the edge of the Back River, Bailey Cove, and Montsweag Bay; soils from within the industrial area; and migration of contaminants from soils to site groundwater.

To support construction of the ISFSI, an investigation of Study Area 4 was conducted in Spring 2000, based on discussion with the MDEP and USEPA at the QAPP planning meetings on February 9 and 10, 2000. The results of the soil and groundwater investigation were communicated to MDEP prior to construction to demonstrate that there was no significant residual environmental contamination in the ISFSI area that would preclude construction (MY, 2000d). The results of this investigation are included in this RFI Report.

The interior sampling program focused on potential migration pathways associated with floor cracks, sumps and trenches located within the on-site buildings, and/or specific historic spills, AOCs, SWMUs, or releases within the buildings that had the potential to migrate into the environment (Stratex, 2000a). The majority of the interior investigations were performed prior to building demolition.

The Lube Oil Storage Room, Maine Yankee's former Interim Hazardous Waste Storage Facility, was closed in accordance with a MDEP-approved closure plan (Stratex, 2001a). The findings are included in this RFI Report (MY, 2002j).

In addition to the six study areas described above, sediment was also collected in and around the submerged portion of the plant's diffuser pipes in the Back River to support decommissioning. The samples were collected using divers in summer 2001 using methods consistent with procedures and protocol outlined in the QAPP. The results of this sampling effort are included in this RFI Report.

2.2 Data Acquisition Methods

Data acquisition activities included surface and subsurface soil sampling, installation of test pits, soil borings, geoprobes, and monitoring wells, bedrock coring, concrete sampling, sediment sampling, biota collection for tissue analysis, surface water sampling, groundwater sampling, QA/QC sampling, and laboratory analysis. Following collection of samples and installation of monitoring wells, locations were surveyed. Following analytical data collection, the results were validated and managed using a web-based database system that geo-referenced the sample results with their surveyed locations.

2.2.1 Soil Sampling and Bedrock Coring

Soil samples were collected using several methods depending on the location to be sampled or the objective of the investigation as dictated by the QAPP. Soil samples were obtained via surface grabs, soil boring, geoprobes, hand auger, test pit, and through core holes from beneath building slabs. Bedrock was cored as specified in the QAPP and was used to support geologic interpretation and selection of monitoring well screen intervals.

Surface Soil Sampling

Surface soil samples were collected in accordance with methods identified in the QAPP, which involved collection from soil boring locations and at discrete locations identified specifically for surface soil sampling. In limited instances, a composite surface soil was collected which consisted of a mixture of equal portions of soil from more than one discrete location. The sampling interval for surface soils was 0 to 6 inches. The surface soil samples (except VOCs) were collected using a stainless-steel spatula and mixing bowl. The soil was placed in a stainless-steel bowl and screened using a photoionization detector (PID). The soil was mixed with a spoon to homogenize the sample and placed in pre-cleaned, glass soil jars for analysis. Discrete VOC surface soil samples were taken using an EnCore™ sampler. All sampling equipment was decontaminated between sampling locations in accordance with protocols specified in the QAPP.

Hand Auger Sampling

A hand auger was used to obtain soil samples up to approximately 5 feet below the ground surface as soil conditions permitted. The hand auger consisted of an auger bucket attached to a drill rod extension and a "T" handle. In accordance with the QAPP, a hand auger soil sample was collected by advancing the auger into the soil by applying downward pressure on the handle while manually rotating it. The soils were logged in the field and observations were recorded in field logbooks. After collecting a sample from the desired sampling depth, the soil was screened using a PID. VOC soil samples were collected first from the auger using an EnCore™ sampler. The remaining soil from the auger was placed in a stainless-steel bowl, mixed with a spoon to homogenize the sample, and placed in pre-cleaned, glass soil jars for analysis. All hand auger sampling equipment was decontaminated between sampling locations in accordance with protocols specified in the QAPP.

Test Pit Sampling

Test pits were installed using a backhoe consistent with QAPP protocols. The soil stratigraphy observed within the test pit was logged in the field. Soil samples from the test pits were screened using a PID at two-foot intervals from the ground surface to the base of the test pit. The completed test pit was photographed to document the excavation. Test pit soil samples required for PID screening and laboratory analysis were taken directly from the backhoe bucket. VOC soil samples were collected first from the bucket using an EnCore™ sampler. Then an appropriate amount of soil was taken from the backhoe bucket and placed in a stainless-steel bowl, mixed with a stainless-steel spoon to homogenize the sample, and placed in pre-cleaned, glass soil jars for other required analysis. All sampling equipment, including the backhoe bucket, was decontaminated between sampling locations in accordance with protocols specified in the QAPP.

Sub-Slab Soil Sampling

Soil samples were collected from potentially impacted areas below concrete foundations and slabs in accordance with QAPP protocols. Sub-slab soil samples were either obtained following foundation or slab removal, in which they were collected as a surface soil sample as described above, or following the installation of a core hole through the concrete slab. Concrete coring was performed using an air-powered drill equipped with a 4 or 6-inch carbide bit. The bit removed a cylinder of concrete that created a void through which to retrieve a sub-slab soil sample for analysis using hand auger or surface soil sampling methods as described above.

Geoprobe Sampling

Geoprobes were installed in accordance with methods outlined in the QAPP. A 1½ -inch open tube sampler was installed to the desired sampling interval and then withdrawn. The soils were logged in the field and all observations were recorded in field logbooks. Upon retrieving and opening the sampler, the soil was screened using a PID. VOC soil samples were collected first from the open split-spoon using an EnCore™ sampler. The remaining soil from the sampler was placed in a stainless-steel bowl, mixed with a spoon to homogenize the sample and placed in pre-cleaned, glass soil jars for analysis. All geoprobe equipment was steam cleaned prior to use and all sampling equipment was decontaminated between sampling locations in accordance with protocols specified in the QAPP.

Soil Boring Sampling

Soil borings were typically installed at the site using a 4.25-inch inside diameter (ID) Hollow Stem Auger (HSA) in accordance with the QAPP. In summary, the HSAs were advanced into the subsurface soils using five-foot auger flights. For borings that were planned to core bedrock, a 4-inch casing was driven in 5-foot sections through the overburden soils. Subsurface soils were continuously sampled using a 3-inch outside diameter (OD) split-spoon sampler. The soils were logged in the field and all observations were recorded in field logbooks. Upon retrieving and opening the split-spoon sampler, the soil was screened using a PID. VOC soil samples were collected first from the open split-spoon using an EnCore™ sampler. The remaining soil from the split-spoon sampler was placed in a stainless-steel bowl, mixed with a spoon to homogenize the sample and placed in pre-cleaned, glass soil jars for analysis. All down-hole drilling equipment was steam cleaned prior to use and all sampling equipment was decontaminated between sampling locations in accordance with protocols specified in the QAPP.

Bedrock Coring

In proposed bedrock monitoring well locations, cores were removed from the bedrock. Once the bedrock was encountered, the casing was driven or spun into the rock to securely seat it, and the borehole was advanced further by coring. A core barrel with a diamond-impregnated bit was advanced through the casing and into the rock. The OD of the bit was usually 4 inches, which permitted the installation of a two-inch well. Coring continued until water-bearing fractures were encountered (minimum 15 feet) as shown by an inspection of the retrieved rock core and borehole water level.

Each core run was 5 feet in length. When retrieved, the core was logged by the field geologist to characterize rock attributes. The rock quantity designation (RQD) was determined by adding the lengths of all sound rock pieces in a core run which are greater than 5 inches (or two times the core diameter) and dividing that total number by the total length of the core run. The resulting percentage gives an indication of rock competency. The length of individual pieces was determined considering only naturally occurring breaks in the core, not mechanically induced fractures resulting from vibration of the core barrel as it was advanced. Naturally occurring and mechanically induced fractures were distinguished based on fracture weathering, coloring, fracture fillings, and other diagnostic features.

2.2.2 Concrete Sampling

Concrete samples were collected as described in the QAPP from potentially impacted floor drains, building floors, and slabs that would remain on site following decommissioning. Concrete was collected at ½ inch depths and was typically collected from stained areas and floor low points following paint removal. Samples were collected using a ¾ or 1 inch diameter carbide drill bit fitted in a rotary impact hammer, which generated a fine concrete powder to support laboratory analysis. The concrete powder was placed in a stainless-steel bowl, mixed with a spoon to homogenize the sample and placed in pre-cleaned, glass jars for analysis. All sampling equipment was decontaminated between sampling locations in accordance with protocols specified in the QAPP.

2.2.3 Surface/Seep Water Sampling

Surface water and seep water samples were collected using similar methods as described in the QAPP. Where conditions allowed, the samples were collected from areas of least to worst potential contamination and working from downstream to upstream, so that any suspended particles would be transported away from the sample point. Surface water samples were taken from the top foot of the water column and seep samples were obtained directly from the point of water seep. Water quality field parameters were obtained prior to collecting the water samples using methods described in the QAPP. Surface water samples were obtained using an adjustable rate peristaltic pump connected to a flow-through cell, in much the same manner as groundwater sample collection described below. Samples were collected following removal of the flow-through cell, filling the appropriate pre-cleaned aqueous sample container directly from dedicated tubing.

2.2.4 Groundwater Sampling

Groundwater samples were collected following installation and development of monitoring wells. The following section outlines the methods for well installation, development and sample collection using methods specified in the QAPP.

<u>Monitoring Well Installation and Development</u>

Monitoring wells were installed in both soil borings and bedrock core holes as required by the QAPP. The monitoring wells were constructed using 2-inch schedule 40 polyvinyl chloride (PVC) risers and 10-foot schedule 40 PVC screens with 0.10-inch wide slot openings. In summary, the wells were assembled within the borehole by adding riser sections to the screen until the screened section was set at the desired depth. The annular space surrounding the well screen was filled with filter sand, while simultaneously measuring the depth of the filter pack and removing the augers or casing. The filter sand was initially added until it extended no more than two feet inside the auger or casing, then the augers or casing were pulled upward allowing the filter sand to flow from the bottom of the borehole, filling the resultant annular space. The augers or casing were not extracted in greater than 2-foot increments, which minimized the potential for native material to cave or slump into the annular space. The filter pack was extended approximately two to three feet above the top of the screen. A bentonite pellet seal was placed directly above the filter pack. If the pellets were above the water table, deionized water was poured over the bentonite pellets to hydrate the bentonite seal. The remaining annular space was filled with bentonite chips/pellets or bentonite slurry to a depth of approximately 1-foot below the ground surface.

Following installation of the PVC riser, either a seven-foot length of 4-inch diameter steel guard pipe or a road-box at the ground surface was placed over the 2-inch diameter monitoring well and seated at least 2 feet below ground surface. Bentonite chips/pellets were added to the remainder of the annular space surrounding the guard pipe. Labeling the outer and inner well cap permanently identified the wells. Locks were placed on all wells protected by guard pipes following installation.

The installed well was developed by pumping the well and monitoring pH, temperature, specific conductivity, and turbidity. Well development was considered complete when a minimum of three well volumes had been removed from the well, and pH, temperature, conductivity, and turbidity had stabilized (three successive measurements vary by less than 10%).

Groundwater Sampling

Upon completion of the installation and development of the monitoring wells, groundwater from the monitoring wells was sampled using low-flow techniques and dedicated sampling equipment as outlined in the QAPP. Flow-through cells were used to measure field parameters and assess groundwater quality stabilization. Prior to collecting the sample, the field parameters were stabilized to levels described in the QAPP. Following removal of the flow-through cell, the appropriate pre-cleaned aqueous sample containers were filled directly from dedicated tubing in the well.

2.2.5 Sediment Sampling

Sediment samples were collected from inland freshwater locations and intertidal and subtidal outfall locations as directed by the QAPP. In general the samples were collected from a depth interval of 0 to 3.5 inches from areas of least to worst potential contamination and working from downstream to upstream, so that any suspended particles will be transported away from the next sample point. Prior to placing the sample in the collection jar, the sediment was de-watered to remove as much standing water as possible without losing the fine particulate matter at the sediment/surface water interface.

Inland freshwater sediment samples were collected using a large stainless-steel spoon. Marine sediment samples were collected using a 3-inch diameter, 18-inch long plastic core tube fitted with end caps. Sediment collected for non-VOC analysis was placed in a stainless-steel mixing bowl, screened with a PID, homogenized, and placed in a pre-cleaned glass jar for chemical analysis. Discrete VOC sediment samples were collected first using a cut-off syringe and placed into a glass vial pre-preserved by the laboratory with 30 ml of methanol. Care was taken to avoid the collection of organic material such as seaweed.

Samples for possible analysis of PCB analysis using a PCB homologue and congener method and benthic community structure analysis (BCSA) were also collected concurrent with the intertidal and subtidal samples for bulk chemistry analysis. A BCSA sample consisted of four petite Ponar grab samples (6 by 6 inches) collected from each sampling location. The samples were sieved (0.5 mm), preserved with formalin, and archived at the laboratory pending the results of the bulk sediment chemical screening.

Based on an evaluation of analytical results from the initial round of outfall sediment sampling, additional samples were collected at selected locations for analysis of bulk sediment toxicity to amphipods (BSTA) and sand worms (BSTS). The second round of sediment samples for toxicity testing included collection of samples for chemical analysis using the same sampling methods described above. The evaluation of initial sample results also dictated the location for which to perform BCSA analysis.

The collection of deep-water sediment samples in and around the underwater diffuser system was consistent with the method described above for collection of intertidal sediment samples; however a diver retrieved the samples. To assist with deep-water sample collection, the plastic core tubes were filled with analyte-free water and marked to orient the diver. During sample collection the diver avoided disturbing the sediment as much as possible, and worked from down-current to up-current locations.

2.2.6 Biota Sampling

Blue mussel, soft-shell clams, mummichog, and lobster were collected for tissue analysis using methods outlined in the QAPP. Lobster was collected at the request of the MDEP to assess risk to humans, and mummichog was sampled to assess the potential risk to intertidal fishes and piscivorous (fish-eating) wildlife. A biota sample consisted of the collection and compositing of approximately 20 organisms (clams, mussels and lobster) and 50 organisms (mummichog).

Typically, soft-shell clams were collected from intertidal locations and blue mussels were collected from subtidal locations. Biota collection was performed by traditional handpick methods in areas where organisms are commonly located. Mummichogs and lobster were collected using minnow traps and lobster traps, respectively, which were deployed from a boat. Whole organisms were collected and placed in zip-top plastic bags, put on ice to cool to 4^0C, and forwarded to the appropriate analytical laboratory for analysis. Enough sample volume was collected and frozen at the laboratory for possible PCB analysis at a later date using a PCB homologue and congener method.

2.2.7 QA/QC Sampling

Field duplicates, Matrix Spikes (MS), Matrix Spike Duplicates (MSD), and equipment/rinsate blanks were collected for QA/QC purposes as outlined in the QAPP. The following is a brief definition and description of the acquisition method used for QA/QC samples required for the RFI.

Field Duplicates

Field duplicates provide a measure of overall sampling and test method precision as well as sample heterogeneity. They were collected immediately adjacent to the sample to be duplicated, at the same time and in the same manner. The field duplicate samples were identified so that the laboratory did not know the samples were duplicates, thereby eliminating potential analytical bias. A duplicate sample was collected at a frequency of 1 for every 10 field samples.

Matrix Spike and Matrix Spike Duplicates

The MS/MSD samples were used to evaluate the potential effect of the matrix of the sample on the laboratory analysis. MS/MSD samples also provide an indication of precision and accuracy. An MS/MSD was collected for organic analysis and an MS for inorganics. Additional sample volume was collected at the designated location to support MS/MSD analysis based on visual or screening results and at a frequency of 1 for every 20 field samples.

Equipment Rinsate Blank

Equipment rinsate blanks were collected to provide information on the efficiency of the decontamination process. They were generated by using HPLC-grade analyte-free water to rinse the field equipment after decontamination and prior to sample collection. The analyte-free water was poured over the field equipment, collected in a stainless steel bowl, agitated, and poured into the appropriate sample container. At least one equipment rinsate blank was collected each day of sampling for each specific sampling activity.

Trip Blanks

Trip blanks accompanied all VOC sample shipments to provide an indication of any contamination source arising from the trip to the laboratory. The primary analytical laboratory (Katahdin) provided the trip blanks (vials containing organic-free water), with one trip blank placed in each outgoing cooler containing samples for volatile analysis.

Temperature Blanks

Temperature blanks are water-filled bottles supplied by the primary analytical laboratory (Katahdin) for use in measuring the temperature of the samples upon arrival at the laboratory. A temperature blank accompanied each cooler shipped from, or picked up, at the site.

2.2.8 Sample Handling and Tracking

Samples were labeled, packaged and shipped off site to the appropriate analytical laboratory in accordance with procedures developed in the QAPP. Following collection in the field, all sample containers were placed on ice to cool to 4^0C, and shipped under appropriate chain of custody protocol within 24 hours of collection to the laboratory.

All sampling points were surveyed in the field to determine the horizontal and vertical location of the sampling point. The survey was conducted as described in the QAPP using Global Positioning Satellite (GPS) techniques whenever possible to establish the vertical and horizontal control and locate the sampling points. Conventional survey techniques were employed in the event that a specific sampling point was not locatable by GPS. Sampling locations within buildings were located by measuring vertical and horizontal distance to the nearest corner of the building and height above known floor elevations, as all building footprints were included as part of the Geographical

Information System (GIS) database for the RFI. The deep-water sediment samples collected in and around the submerged diffuser system were located using a combination of GPS techniques and in relation to nozzles on the diffuser.

2.2.9 Data Handling and Management

Data generated as part of this RFI included information recorded in the field, laboratory analytical reports, and data validation assessments. A central project file is maintained at Maine Yankee, which will archive all essential project documents both in hard copy and electronically. All project documentation is organized and categorized to facilitate ease of project use. Long-term storage will be accomplished in accordance with Maine Yankee's document control program, ensuring that all RFI-related documents are retained for a minimum of 10 years.

Data management for the RFI includes the use of a GIS and Oracle database interfaced with the Internet. This web-based system uses standard GIS platforms including ArcIMS, ArcView, ArcInfo, MapInfo and CARIS, and supports both GIS and database tasks. All field information, analytical data and geographic information is stored and managed using this system. As the system is web-based, it supports external (e.g., regulators and/or public) interface to the system.

2.3 Laboratory Sample Analysis

Soil, sediment, biota, surface water, and groundwater samples collected as part of the RFI were generally analyzed for full suite analysis as defined in Section 2.1.3 above. As documented in the third QAPP Change Order, the MDEP requested that analysis of groundwater for petroleum hydrocarbons be accomplished using the MDEP DRO method in lieu of the MA DEP EPH method. This change took place prior to collection of Phase 1B groundwater samples. Concrete samples required analysis of PCBs and EPH. In addition to TCL and TAL, sediment samples were also analyzed for SIM PAHs, grain size and TOC. Analysis of sediment toxicity (BSTA and BSTS), BCSA and PCB homologues and congeners was performed at specific outfall locations based on the results of the initial round of chemical analysis. Tissue analysis included TCL (minus VOCs), TAL metals, SIM PAHs, and lipids. Additional samples of solid media were collected for analysis of Total Solids to support an adjustment to analytical results for comparison to PALs, which were determined on a dry-weight basis. A summary of the analytical methods utilized in the RFI for each type of media is included in **Table 2-1**. The sample analysis was performed in accordance with Standard Operating Procedures (SOPs) identified in Appendix B of the QAPP.

The QAPP outlined the Project Quantitation Limits (PQLs) for each analyte, which was typically set three to ten times less than the PAL or using the laboratory quantitation limit (QL) when the QL is at least three to ten times below the PAL. The QL is the quantitation limit that the laboratory routinely expects to achieve during the analysis of samples for the RFI. Lower QLs were developed for compounds believed to be site related when the standard method was not able to achieve the PAL or PQL. For example, sediment analysis incorporated SIM 8270 for PAHs, Induced Coupled Plasma/Mass Spectroscopy (ICP/MS) was used for some metals in groundwater and surface water, and SIM 8260 for vinyl chloride was used for surface water and groundwater. Compounds not believed to be site-related may have QLs in excess of the PQL or PAL.

To support a determination of laboratory accuracy and ability to perform the various analytical methods, the primary laboratories analyzed standard reference material (SRM) for each media prior to initiating the analytical program. The results of this analysis were compared to standard values and were evaluated as part of the QA assessments outlined in the QAPP and summarized in this RFI Report.

2.4 Field Parameter Data Collection

Field parameters were monitored as part of the low-flow groundwater sampling activities and screening with a Photoionization Detector (PID) as required by the QAPP. Water quality parameters were monitored as part of low-flow sampling procedures to demonstrate that the water-bearing formation had stabilized and that groundwater samples were representative of ambient groundwater conditions. This information was obtained using a flow-through cell, pH meter and/or a turbidity meter. The field parameters monitored as part of low-flow sampling included:

- turbidity;
- dissolved oxygen (DO);
- specific conductance;
- temperature;
- pH; and
- oxygen reduction potential (ORP).

Water level measurements were recorded from each of the monitoring wells following well development as outlined in the QAPP. At least two sets of water levels were obtained: one during traditional high and one during traditional low groundwater periods. Water level measurements were obtained using an electronic water level indicator, recording levels to the nearest 0.01 foot. Water level measurements were collected from the same location (i.e., on the PVC riser) on each monitoring well and were recorded on field sampling sheets and/or field logbooks.

PID screening was conducted on soil samples collected during the RFI in accordance with procedures outlined in the QAPP. The procedure for headspace screening required obtaining a soil sample immediately following removal from the ground in order to reduce loss of volatile compounds. Approximately 250 to 300 grams of soil was placed into a clear glass jar at least 500 ml in size, or a one quart polyethylene bag. A PID reading was collected from the container at least 10 minutes following sample collection and was recorded on field sampling sheets and/or field logbooks.

PID screening was also conducted to monitor the workspace-breathing zone during field activities. The PID screening results from workspace-breathing zone are included in the project field logbooks and will be maintained in the RFI project files.

2.5 Field Sampling Program

The following section outlines the locations that were investigated as outlined in the QAPP. The investigation of the backland area (Study Areas 1 and 2) was summarized in the Backlands RFI Report, which included an evaluation of reference soil and groundwater samples collected from unaffected portions of this area. Reference sediment and biota samples were collected from an area outside of the influence of Maine Yankee and are summarized in this RFI Report. The reference sampling program and the investigation performed within Study Areas 3, 4, 5, and 6, which comprise the Bailey Point area, are summarized in this section and in **Tables 2-2 and 2-3**, respectively.

2.5.1 Reference Locations

Reference samples for soil, groundwater, sediment and biota were collected to characterize comparable distribution of chemicals for each media. A summary of the reference sampling program described in this section is provided in **Table 2-2**.

Soil and Groundwater

The Backlands RFI Report details the investigation of reference soil and groundwater samples collected for comparison to samples collected as part of this RFI.

A total of five reference soil borings (MYRSSB01 through MYRSSB05) and four reference surface soil samples (MYRSSS01 through MYRSSS04) were completed in Study Areas 1 and 2 (**Figure 2-3**). With the exception of MYRSSB02, which was logged for geological data only since no groundwater was present in the overburden soils, the soil samples were analyzed for VOCs, SVOCs, PCBs, pesticides, EPH, and TAL metals.

As shown in **Figure 2-3**, four of the reference soil borings from the two study areas had monitoring wells installed in the overburden (RW-01 and RW-02) and the bedrock aquifer (RW-03 and RW-04). The two bedrock wells replaced the three existing monitoring wells (BWI-1 through BWI-3) originally proposed in the QAPP, which were vandalized as outlined in QAPP Change Order No. 1. Groundwater samples (MYRSGW01 through MYRSGW04) from these four wells was collected in Phase 1A and analyzed for VOCs, SVOCs, SIM vinyl chloride, PCBs, pesticides, EPH, TAL metals, and nitrate. A second round of groundwater samples (MYRSGW01-1B through MYRSGW04-1B) from these four wells was collected in Phase 1B and analyzed for VOCs, SVOCs, SIM vinyl chloride, PCBs, pesticides, DRO, TAL metals, and nitrate. A third round of groundwater samples (MYRSGW01-1C through MYRSGW04-1C) was collected only for metal analysis.

A summary of the soil boring and monitoring well construction details is provided in **Table 2-4** and the monitoring well water quality parameters are summarized in **Table 2-5**. Groundwater elevations were recorded from each of these wells, which are summarized in **Table 2-6**. Boring logs, well installation diagrams and bedrock core logs are included as **Appendix A and B**.

<u>Sediment and Biota</u>

Reference samples for sediment and biota were collected from Brookings Bay in September 2001, which provided comparable conditions to tidal waters surrounding Bailey Point (**Figure 2-4**). This was a change from the Damariscotta River location originally proposed in the QAPP, which was documented in QAPP Change Order No. 1.

Sediment was collected at 3 intertidal and 3 subtidal locations (MYRSSD01 through MYRSSD06). The sediment samples from each location were analyzed for VOCs, SVOCs, PCBs, pesticides, TAL metals, grain size, SIM PAHs, and TOC. Additional samples (MYRSBI01A-D through MYRSBI06A-D) were collected to support an evaluation of benthic community structure analysis (BCSA) and PCB congener/homologue analysis, if necessary, at a later date. These samples were archived at Katahdin Analytical Services (KAS) of Portland, Maine.

A second round of reference sediment samples was collected in November 2001 for chemistry and toxicity analysis to support an assessment of toxicity at the intertidal location MYRSSD02. The bulk-chemistry sample (MYRSSD02A) was analyzed for VOCs, SVOCs, SIM PAHs, PCBs, pesticides, grain size, TOC, and PCB congeners/homologues, and the sample for toxicity analysis (MYRSTX02) was assessed for bulk sediment toxicity to amphipods (BSTA) and sand worms (BSTS). For comparative purposes, one reference intertidal location (MYRSBI02A-D) and one reference subtidal location (MYRSBI05A-D) collected in the initial round of sampling and archived at KAS, was processed for BCSA.

The biota samples collected include soft-shell clams from the 3 intertidal locations (MYRSBC01 through MYRSBC03) and blue mussel from the 3 subtidal locations (MYRSBM01 though MYRSBM03). At least 20 individuals were collected at each location for analysis of tissue for SVOCs, PCBs, pesticides, TAL metals, SIM PAHs, lipids, and PCB congeners/homologues. In addition, at least 20 individual mummichog (MYRSMM01) were collected and analyzed for the same parameters.

2.5.2 Study Area 3 – Foxbird Island

Foxbird Island is a small, 12 acre island located adjacent to and south of Bailey Point. In the early 1970s the construction of the Forebay linked Foxbird Island to Bailey Point. No industrial activities have occurred on Foxbird Island except those associated with the construction in 1974-1975 of the diffuser pipeline buried beneath Foxbird Island. Due to the lack of historic industrial activity on Foxbird Island, the soil characterization was limited to three surface soil samples (MY03SS01, MY03SS14, and MY03SS15) located along the northern, central, and southern portion of the island where the diffuser pipeline construction occurred (**Figure 2-5**). The surface soil samples were analyzed for TCL and TAL compounds.

2.5.3 Study Area 4 – ISFSI

The ISFSI area comprises the bermed area in the central portion of the Bailey Point area (**Figure 2-2**). During construction, soil and rock from basement excavation for plant area structures was placed in this area, and a concrete batch plant operated in a portion of this area. During plant operation the area was occasionally used as a contractor parking lot, and a Spare Generator Storage Building was located near the railroad tracks on the west side of this area. No significant industrial activities were conducted in the ISFSI area during plant operation. The RFI sampling program within this area was performed in two phases: soil and groundwater sample collection prior to construction and additional monitoring wells installed following construction of ISFSI. The analytical results from the pre-ISFSI construction sampling were submitted to MDEP August 3, 2000, and are further evaluated as part of this RFI Report (MY, 2000d).

Soil and groundwater samples were collected from this area as a part of preliminary RFI sample collection activity conducted during the spring of 2000 to support construction of the ISFSI scheduled for later that summer. The scope of sampling was developed with the MDEP and USEPA during QAPP planning meetings held February 9 and 10, 2000. Groundwater samples were collected from three existing wells (98-1-OW, 98-9-OW, and 98-10-OW) located in the northeast, northwest and southeast corners of the ISFSI area, respectively (**Figure 2-6**). These groundwater samples (MY04GW01 through MY04GW03) were analyzed for TCL, TAL metals, and EPH.

The area of the former contractor parking lot was visually inspected for evidence of spills or other possible contamination on April 27, 2000. One minor area of oil-contaminated soil was identified in the northwest portion of the area during the visual inspection (**Figure 2-6),** and the contaminated soil was removed. A test pit was dug and sampled to verify removal on May 31, 2000. A composite sample from each of the four walls was collected (MY04SS01), and a grab sample was collected from the bottom of the pit (MY04SS02). Both samples were analyzed for SVOCs, PCBs and EPH.

In addition to the samples specifically taken as part of the RFI study, additional soil samples were collected from two utility trenches in the associated with the ISFSI construction (S&W, 2000d). The utility trench samples were taken to support MDEP Site Location of Development Order L-17973-26-Q-M, and were located in the southern and western portions of the ISFSI (**Figure 2-6**). The two samples were analyzed for VOCs, RCRA-8 metals, and DRO. The ISFSI construction activities also included four large excavations for the concrete pads that support the spent fuel containers. The four excavations were monitored for the presence of potential contamination. A small petroleum release was identified in northern-most excavation. The identified release was appropriately remediated and the petroleum-contaminated soils were disposed off-site (MY, 2000e).

To support a more complete understanding of groundwater in the ISFSI, four overburden and four bedrock wells were installed around the perimeter of the area Fall 2001 **(Figure 2-6)**. Three of the well pairs were located along the northeastern (MW-303A/B), southeastern (MW-304A/B) and northern (MW-302A/B) sides of the ISFSI area. A fourth overburden/bedrock well pair (MW-305A/B) was located downgradient of the ISFSI area and the historic kerosene spill area remediated in summer 2000. Groundwater samples (MY04GW04A/B through MY04GW07A/B) from each of the newly installed monitoring wells were sampled for analysis of TCL, TAL metals, SIM vinyl chloride, and EPH. Based on petroleum hydrocarbon detected in these initial groundwater samples, a second round of sampling (MY04GW04A/B-1B through MY04GW07A/B-1B) was performed on the four newly installed well pairs for DRO analysis. To further assess DRO detections in three of the overburden wells (MW-302B, MW-303B and MW-304B), a third round of groundwater samples (MY04GW04B-1C, MY04GW05B-1C, and MY04GW06B-1C) was collected for DRO analysis.

Summaries of the monitoring well construction details and water quality parameters are provided in **Table 2-4** and **Table 2-5**, respectively. Groundwater elevations were also measured in the ISFSI monitoring wells, which are documented in **Table 2-6**. Boring logs, well installation diagrams and bedrock core logs are included as **Appendix A and B**.

2.5.4 Study Area 5 – Southern Plant Area

The southern portion of Study Area 5 is the area south of the ISFSI where the majority of plant operations took place (**Figure 2-7 and 2-8**). The field sampling program for this area is further divided into sub-areas to focus the investigation in accordance with site geometry and like features.

Radiological Restricted Area

The Radiological Restricted Area (RA) is the area within the industrial fence with restricted access (**Figure 1-4**). The investigation within this area included sampling soils, concrete and groundwater (**Figure 2-7 and 2-8**). RA buildings within this area that were investigated as part of the interior program include: Containment Building, Spray Building, Primary Auxiliary Building (PAB), and Fuel Building. Investigation within some buildings was deferred as a result of decommissioning activities.

Exterior Sampling Program

To detect any contaminants moving through the groundwater within the bedrock aquifer, the three existing monitoring wells around the Refueling Water Storage Tank (RWST) (B-202, B-205, and B-206), the Containment Building foundation drain (CS-1), and the existing monitoring well near the yard crane (BK-1) were sampled. A new well was installed (B-203B) to replace existing well B-203A, which could not be located in the field as described in QAPP Change Order No. 1. A new well (B-206A) was installed to replace B-206, however B-206 was subsequently found, repaired and both were sampled in the initial round of sampling. Groundwater samples (MY05GW03, MY05GW05 through MY05GW09, and MY05GW29) from each of these wells were analyzed for TCL, TAL metals, SIM vinyl chloride, and nitrates.

To evaluate historic spills and releases associated with the RWST and Spray Chemical Addition Tank (SCAT), six soil borings (MY05SB04 through MY05SB09) were completed in this area. Five of the soil borings were located around the perimeter of the former RWST and the SCAT, and one soil boring was through the former RWST pad. Analyses included pH, TCL, TAL, and EPH on the groundwater or soil bedrock interface sample from each of the borings. The samples screened and found to have the highest PID reading were tested for EPH.

To provide additional soil characterization within the RA yard, four more soil borings were installed in the western portion of the RA yard. One boring was located south of the yard crane near the "high radiation bunker" (MY05SB10) and a second soil boring was located west of the Equipment Hatch (MY05SB11). Two soil borings were installed in the PAB alleyway between the Service Building and the Containment Building: one near the test tanks (MY05SB12) and the other near the Demineralized Water Storage Tank (DWST) (MY05SB13). Soil from all four borings was continuously sampled and field-screened. Samples were collected at the groundwater or soil/bedrock interface for analyses of pH, TAL, TCL and EPH. In addition, the soil samples from the boring adjacent to the yard crane (MY05SB10) was PID screened, and the segment with the highest reading was tested for EPH. A surface soil sample from the boring west of the Equipment Hatch (MY05SB11) was analyzed for PCBs.

To further support groundwater characterization in this portion of the facility, the soil boring in the PAB alleyway between the Service Building and Containment Building (MY05SB12) was completed as a monitoring well (MW-312) in the shallow bedrock. Groundwater from this monitoring well was sampled (MY05GW14) and analyzed for TCL, TAL metals, SIM vinyl chloride, and EPH.

Three surface soil samples (MY05SS01 through MY05SS03) were collected around the outside of the Containment Building in the vicinity of the Equipment Hatch and analyzed for pesticides and EPH.

A second round of groundwater sampling was performed on the RA wells, which included MW-312, B-202, B-203B, B-205, B-206A, BK-1, and CS-1. The groundwater samples collected from these locations (identified with the suffix "-1B" added to the original sample identifiers outlined above) were analyzed for TCL, TAL metals, SIM vinyl chloride, DRO, anion/cation, and nitrates. Groundwater was also collected during this round from existing monitoring well B-201 (MY05GW04) located just east of the RA area and the PAB test pit (MY05GW100) for the same analytes. A follow-up sample (MY05GW04-1C) was collected from B-201 for analysis of TAL metals and DRO.

The PAB test pit is a covered opening in the PAB basement floor that provides access to the bedrock under the PAB and the adjacent Containment Building outer wall. The dimensions of the pit are approximately four by four feet by three feet deep and the volume of the space is approximately 360 gallons. The initial water sample from the PAB test pit (MY05GW100) was a grab sample retrieved from the pit. To further assess the test pit, filtered and unfiltered samples (MYPAB02U and MYPAB02F, respectively), were collected using a pneumatic pump and tubing from a newly installed standpipe through the cover plate.

Four monitoring wells (MW-401A/B, MW-402 and MW-403) were installed in the RA area and Industrial Area as part of the License Termination Plan (LTP) hydrogeology assessment (Stratex, 2002a and b). As outlined in QAPP Change Order No. 2, groundwater was collected from these four wells (MY05GW101 through MY05GW104) for analysis of TCL, TAL metals, SIM vinyl chloride, DRO, anion/cation, and nitrates. Based on detections in the initial round of sampling, the four wells were sampled a second time (MY05GW101-1C through MY05GW104-1C) for analysis of TAL metals and DRO.

Summaries of the monitoring well construction details and water quality parameters are provided in **Table 2-4** and **Table 2-5**, respectively. Groundwater elevations were also collected from the monitoring wells, which are documented in **Table 2-6**. Boring logs, well installation diagrams and bedrock core logs are included as **Appendix A and B**.

Interior Sampling Program

An interior sampling program was developed for this area, which included collection of sub-slab soil and/or concrete samples. Several sub-slab soil samples proposed in the QAPP could not be obtained from this area since soil did not exist beneath the slab. Collection of sub-slab samples at other locations was deferred to a later date as a result of decommissioning activities during the RFI. The following is a description of the interior sampling program for this area:

Containment Building: Four confirmatory concrete samples will be collected from the minus two-foot elevation of the Containment Building following radiological remediation and interior demolition activities, currently scheduled for late 2003. The samples (MY05CS17 through MY05CS20) will be analyzed for PCBs and EPH.

Spray Building: One soil sample (MY05SS62) will be collected beneath the three-inch wide shaker space in the southwest corner of the 21-foot elevation (HV 7/9 area) following decommissioning work in this area, currently scheduled for late 2003. The sample will be analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH. As described in QAPP Change Order No. 2, samples MY05SS61 and MY05SS63 from the 4 foot elevation were not collected as no soil existed beneath the slab at these locations.

PAB Building: Thirteen confirmatory concrete samples were collected from the 11-foot elevation of the PAB following paint removal. Six concrete samples were collected within the concrete slab of the trenches and drainage system. One concrete sample was collected from the sump in the southeast corner. Three concrete samples were collected within the concrete slab of cubicles FL-34A, FL-34B, and FL-35B in northeast corner. Three concrete samples were collected within the concrete slab where two structural joints intersect. The concrete samples (MY05CS03 through MY05CS14, and MY05CS22) were analyzed for PCBs and EPH (**Figure 2-8**). As described in QAPP Change Order No. 2, samples MY05SS21 through MY05SS23 from the 11-foot elevation were not collected as no soil existed beneath the slab at these locations. The shaker space sample (MY05SS20) was not collected based on field confirmation that no soil exists at this location, as documented in QAPP Change Order No. 4.

Fuel Building: Two confirmatory concrete samples will be collected from the Fuel Building/RCA following removal of spent fuel and radiological remediation, which is currently scheduled for late 2004. One concrete sample will be collected within the sump on the 11-foot elevation (tunnel of the Fuel Building) and the other sample will be collected within the concrete slab of the 6-foot elevation, in the northeast corner of the room where TK 85 is housed. The samples (MY05CS15 and MY05CS16) will be analyzed for PCBs and EPH.

Steam Valve House: As described in QAPP Change Order No. 2, the sample proposed in this space (MY05SS60) was not collected, as no soil exists beneath the slab at this location.

Turbine Hall Area

The Turbine Hall Area encompasses the area within the industrial fence which includes the Service Building, Turbine Hall, Wart Building, Circulating Water Pump House and the Sewage Treatment Plant (**Figure 1-4**). The field sampling for this portion of the site includes collection of soil, concrete and groundwater samples (**Figure 2-7**). The investigation plan for the two transformer pits located in this area is outlined in the Transformer Area program described later in this section.

Exterior Sampling Program

Two new wells were installed to complete the semicircular ring of wells south of plant structures in the RA and Industrial Area. One monitoring well (MW-306) was located off the southeast corner of the Turbine Hall in the area where the Hazardous Waste Storage Shed was once located, downgradient of the Spare Transformer. The second new monitoring well (MW-307) was located in the vicinity of the former underground fuel oil bunker, downgradient from the former Water Treatment loading dock. Groundwater from each of these wells was sampled (MY05GW01 and MY05GW02) and analyzed for TCL, TAL metals, SIM vinyl chloride, anion/cation, and nitrates. In addition, because of their proximity to the fuel oil handling area, the wells were also tested for DRO. Follow-up sampling (MY05GW01-1C and MY05GW02-1C) was performed at these two wells based on initial detections of metals and DRO.

Continuous split-spoon soil samples (MY05SB01 and MY05SB02) were collected during boring advancement for the installation of each new well. Both the surface (0 to 6 inches) and the groundwater interface (or soil/bedrock interface if the water table occurs within the bedrock) samples were analyzed for TCL and TAL. The groundwater or soil/bedrock interface sample was also tested for EPH. The segment screened and found to have the highest PID reading in each boring was analyzed for VOCs and EPH. Where there was no PID reading above background nor evidence of staining in a boring, then a sample was taken from the bottom of the interval that appeared to have the highest permeability based on visual inspection in the field. If there was no evidence of an interval having a high permeability, a soil sample was composited between the bottom of the surface sample and the top of the groundwater or bedrock interface sample and a discrete sample for VOC analysis was collected from the depth interval half-way between the surface sample and the groundwater or bedrock interface. A new soil boring (MY05SB03) was completed in the roadway south of the Turbine Hall between wells MW-306 and MW-307. Split-spoon samples were collected from the groundwater or soil/bedrock interface and analyzed for EPH.

At the request of the MDEP, a monitoring well (MW-318) was drilled in the eastern portion of this area to measure groundwater elevation and to verify groundwater modeling results. During boring advancement the geology was recorded. The well was sampled (MY05GW25) for analysis of TCL, TAL metals, SIM vinyl chloride, DRO, and nitrates. The well was sampled a second time (MY05GW25-1C) for analysis of TAL metals and DRO.

Four surface soil samples (MY05SS05 through MY05SS08) were collected in the high traffic area along the north/south roadway east of the Turbine Hall to evaluate the potential residual contamination from the release of oil during the main transformer fire. These surface soil samples were analyzed for TCL, TAL and EPH.

Summaries of the monitoring well construction details and water quality parameters are provided in **Table 2-4** and **Table 2-5**, respectively. Groundwater elevations were also collected from the monitoring wells, which are documented in **Table 2-6**. Boring logs, well installation diagrams and bedrock core logs are included as **Appendix A and B**.

Interior Sampling Program

An interior sampling program was developed for this area, which included collecting sub-slab soil and/or concrete samples from the Turbine Hall, Service Building, Wart Building, Circulating Water Pump House and the Sewage Treatment Plant. Several sub-slab soil samples proposed in the QAPP in the Turbine Hall area could not be obtained since soil did not exist beneath the slab. Collection of sub-slab soil from beneath the Service and Wart Building were deferred to a later date as a result of decommissioning activities during the RFI. The following is a description of the interior samples collected from this area:

Turbine Hall: Because of the volume, concentration, and corrosive nature of some of the chemicals used in the former Water Treatment Area (AOC-2), eight soil samples were collected beneath the sumps and drainage system (MY05SS37 through MY05SS44). Two soil samples were collected beneath the concrete slab of each sump on the north side, and four samples were collected from areas beneath the extensive drainage system. Two soil samples were collected several feet north and south of the bermed sump. The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Three soil samples were collected beneath the concrete slab on the east side of the former Auxiliary Boiler Room in the northern, central, and southern area of the trench (MY05SS24, MY05SS79, and MY05SS80). The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Four soil samples were collected beneath the concrete slab of the former Emergency Diesel Generator Rooms (MY05SS25 through MY05SS28). Two samples were collected beneath the northern one-inch diameter pipes, and two samples were collected from beneath the corner of the trenches on the east side of each room. The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Four soil samples were collected beneath the concrete slab of each of the former outlet pits supporting the Feedwater Heaters and Pumps (MY05SS29 through MY05SS32). The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Three soil samples were collected beneath the concrete slab of the former Turbine Oil Reservoir and Electrohydraulic Control (EHC) oil pump (MY05SS34 through MY05SS36). One soil sample was collected beneath the sump of the oil reservoir containment in the south-central area. Two soil samples were collected on the west and south side of the EHC oil pump beneath the concrete slab. The samples were analyzed for PCBs and EPH.

Two soil samples were collected beneath the concrete slab of the former Cold Side Machine Shop (MY05SS48 and MY05SS49). One soil sample was collected beneath the concrete slab of the sump, adjacent to the north wall of the machine shop, and the other soil sample was collected beneath the concrete slab, in the northwest corner. The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Three soil samples were collected beneath the concrete slab of the former Primary and Secondary Component Coolant (PCC/SCC) Pump and Heat Exchanger Area (MY05SS50 through MY05SS52). Two of the soil samples were collected beneath the concrete slab of the PCC/SCC area. The final sample was collected beneath the concrete slab of the sump on the south end. The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

One soil sample was collected from beneath the center of the concrete slab of the former Vacuum Priming Sump (MY05SS53). The sample was analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

The Lube Oil Storage Room, Maine Yankee's former Interim Hazardous Waste Storage Facility, was located along the south end of the Turbine Hall. This room was investigated in accordance with an MDEP-approved closure plan, which included an investigation of soils beneath the slab following demolition and removal of the room (Stratex, 2001a). In accordance with the closure plan, since minor detections of petroleum products exist in sub-slab soil above PALs, the results of that investigation were evaluated as part of this RFI (MY, 2002j). The five sub-slab soil samples (MYLOSS01 through MYLOSS05) were analyzed for VOCs, SVOCs, PCBs, DRO, and Gasoline-Range Organics (GRO).

As described in QAPP Change Order No. 2 and 4, several sub-slab soil samples proposed in the QAPP in the northern end of the Turbine Hall area (MY05SS33, and MY05SS45 through MY05SS50) were unable to be collected since the concrete slab was poured over bedrock.

Service Building: One soil sample was collected beneath the concrete slab at the center of the hydraulic lift pit in former Warehouse No. 1 (MY05SS54). The sample was analyzed for PCBs and EPH.

Two soil samples were collected beneath the trench system of the former Chemistry Laboratory, one on the west end of the trench and one on the east-central side (MY05SS58 and MY05SS59). The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Four soil samples (MY05SS55 through MY05SS57, and MY05SS81) will be collected from beneath the concrete slab in this area when decommissioning activities are completed in this area, currently scheduled for late 2003. A sample will be collected in the tool crib beneath a stain, in the central area of the main machine shop beneath a crack, in the seal rebuild room beneath a stain, and beneath the concrete slab of the former Planning Office to determine if the historic leak from the Waste Neutralization Tank to the service water line impacted the soil. The samples will be analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Wart Building: One soil sample (MY05SS66) will be collected from beneath the concrete slab corresponding to the stained area in the Instrument and Controls Shop when decommissioning activities are completed in this area, currently scheduled for late 2003. The sample will be analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Circulating Water Pump House: Two concrete samples were collected following paint removal and prior to building demolition from the former pump area to determine if oils and lubricants may have migrated to the concrete (MY05CS01 and MY05CS02). The samples were analyzed for PCBs and EPH.

Sewage Treatment Plant: One concrete sample was collected prior to demolition from the former sump location in the south central area of the room (MY05CS21). The sample was analyzed for PCBs and EPH.

Transformer Areas

Four transformer areas were investigated as part of the RFI program. Two areas (Spare Transformer and Main Transformer) were located on the east side of the Turbine Hall (**Figure 1-4**). The other two areas (Construction Transformer and North Transformer) will remain active through decommissioning (**Figure 1-4**). The investigation approach in these four areas was enhanced to provide characterization consistent with decommissioning plans (i.e. additional hand augers and test pits in lieu of soil borings), as documented in through the QAPP change order process.

Construction Transformer: Four hand auger locations (MY05HA07, MY05HA08, MY05HA09, and MY05HA11) were initially installed around the transformer and soil samples were collected at two intervals (0 to 0.5 and 2 to 2.5 feet.). These samples were analyzed for VOCs, PCBs and EPH. Following an evaluation of initial sampling results, four additional hand auger locations were installed at a distance of 10 feet from each side of the transformer pad. Soil samples from these additional hand augers (MY05HA101 through MY05HA104) were collected from the surface and a depth interval of 2 to 2.5 feet for analysis of PCBs and EPH.

Spare Transformer: A test pit evaluation (MY05TP105) was performed following removal of the interior gravel and concrete walls of the pit. A composite side sample and a bottom sample were submitted for analysis of PCBs and EPH.

Main Transformers: A test pit evaluation (MY05TP106) will be performed following removal of the interior gravel and a portion of the concrete wall surrounding the pit, currently scheduled for late 2003. A discrete soil sample from each side of the pit will be collected, as well as two bottom samples. The samples will be submitted for PCB and EPH analysis.

North Transformers: A test pit evaluation (MY05TP108) will be performed when the transformer is deenergized and following removal of the interior gravel and a portion of the concrete wall surrounding the pit, currently scheduled for late 2004. A discrete soil sample from each side and two bottom samples will be submitted for analysis of PCBs and EPH.

Additional information from the area around the North Transformers (as well as groundwater flow into the plant industrial complex from the north) was collected by the installation of a new monitoring well (MW-308) north of the Service Building in the vicinity of former monitoring well B-204. A groundwater sample (MY05GW10) was collected and tested for TCL, TAL metals, SIM vinyl chloride, EPH and nitrate. Soils (MY05SB15) were sampled continuously during installation of the well and the surface and groundwater interface soils from the boring were collected and analyzed for TCL and

TAL, as well as EPH for the groundwater or soil/bedrock interface sample. The segment screened with the highest PID reading was analyzed for VOCs and EPH. A second groundwater sample (MY05GW10-1B) was collected from MW-308 during Phase 1B activities for analysis of TCL, TAL metals, SIM vinyl chloride, DRO, anion/cation, and nitrate.

Summaries of the monitoring well construction details and water quality parameters, groundwater elevations, and test pit construction details are provided in **Table 2-4 through Table 2-7**. Boring logs, well installation diagrams, bedrock core logs, and test pit logs are included as **Appendix A, B and C**.

Ferrous Sulfate Tank

Following removal of the Ferrous Sulfate Tank, the excavation was inspected for evidence of leaks or spills (**Figure 2-7**). One soil sample (MY05SS04) was collected from the bottom of the tank grave for iron analysis. A soil boring (MY05SB14) was collocated with monitoring well (MW-317) installed off the southeast corner of the Information Center, as outlined in the first QAPP change order, for comparative evaluation with iron collected from the tank grave. MW-317 was installed at the request of MDEP and is described later as part of the evaluation in the area of the Information Center.

Forebay Area

The forebay was a structure engineered to convey licensed water discharges to the submerged diffuser system in the Back River (**Figure 1-4**). Investigation and remedial plans for the forebay are coordinated with various MDEP departments through the State of Maine Site Law and Natural Resource Protection Act (NRPA) permit process (MDEP, 2002a). A remedial plan for the forebay has been submitted to and approved by the MDEP, which outlined the remedial methods and final restoration plan following removal of interior sediments containing radiological constituents (MY, 2002g and 2002p).

Prior to remedial work, sediment and soil samples from the forebay were obtained for chemical analysis, which were presented in the remedial plan (**Figure 2-7**). Two sediment samples (MY05SD01 and MY05SD03) were obtained from within the forebay from each side of the weir. Additionally, six sediment samples were taken from sediments located outside of the forebay. Three samples were collected on the west side (MY05SD09 through MY05SD11), and three samples were collected from the east side (MY05SD12 through MY05SD14) of the forebay structure. All sediment samples were tested for TCL, SIM PAH, TAL metals, and EPH.

To evaluate potential migration of contaminants into the forebay berm, six hand auger soil samples were taken from soils below the rip-rap on the inside of both berms which, based on the presence of coarse gravel and cobbles beneath the rip rap, were collected at a depth of one foot. Three samples were collected from the east berm (MY05HA01 through MY05HA03) and three samples were collected from the west berm (MY05HA04 through MY05HA06). Each soil sample was analyzed for TCL, TAL metals and EPH.

Two seeps located along the western berm of the forebay were sampled (**Figure 3-1**). To characterize the water flowing from the seeps, a surface water sample (MY05SW04) was taken and analyzed for TCL, TAL metals, SIM vinyl chloride, and EPH.

As outlined in the remedial plan for the forebay, following completion of remedial work the remaining sediment and/or soil was sampled to confirm that remaining TCL, TAL metals and EPH concentrations are acceptable for the protection of human-health and the environment. The results of confirmatory sampling will be presented in closure documentation submitted to the MDEP.

115 kV Switchyard Area

The 115 kV Switchyard provided site power since the beginning of plant operations until October 2003. Thereafter, site power has been and will continue to be provided by the construction transformer (X-5). The 115 kV Switchyard Area was visually inspected for the presence of surface soil staining. No surface soil staining was observed, and three test pits (MY05TP06 through MY05TP08) were installed within this area (**Figure 2-8**). The test pits were excavated to a depth of 6.5 feet and a side wall composite sample and bottom sample was collected from each test pit. The bottom sample was analyzed for TCL, TAL, and EPH. The side wall composite sample was tested for PCBs and EPH. A summary of the test pit construction details is provided in **Table 2-7**.

A surface soil sample (MY05SS10) was collected from a ditch west of this area that runs south from Warehouse 2/3 (**Figure 2-8**). The sample was analyzed for TCL, TAL and EPH.

Fire Pond

The Fire Pond was an earthen structure constructed to impound water for fire protection needs (**Figure 1-4**). The pond was drained and removed as part of decommissioning activities, which was coordinated through various MDEP departments (MY, 2002f). Prior to sediment removal, one bottom sample (MY05SS09) was collected and analyzed for TCL, TAL and SIM PAHs (**Figure 2-8**).

As outlined in QAPP Change Order No. 4, since no soil existed beneath the slab of the former Fire Pump House, concrete samples were obtained from a stain identified during the building inspection program (Stratex, 2000a). Concrete samples were collected from the surface (MY05CS101) and depth (MY05CS103) and assessed for EPH (**Figure 2-8**). Based on the elevated levels of EPH from these initial samples, the impacted concrete was removed, sampled a second time (MY05CS107) for EPH, additional concrete was removed, and a final confirmatory sample (MY05CS109) was collected for analysis of EPH.

In addition, a soil test pit (MY05TP119) was excavated on the west side of the concrete slab adjacent to the stained area (**Figure 2-8**). The soil removed from the pit was PID-screened in 2 foot intervals and a sample was collected from the wall and base of the pit for analysis of EPH. A summary of the test pit construction details is provided in **Table 2-7**.

Lower Bailey Point Area

The lower Bailey Point area is an open area south of the industrial fenced area that extends into Montsweag Bay (**Figure 1-4**). A drainage ditch running along the north side of this area was sampled just beneath the crushed stone bottom (MY05SS11) and analyzed for TCL, TAL metals and EPH (**Figure 2-7**). A soil boring (MY05SB16) was installed and continuously sampled on the north, downhill side of the concrete barrier bounding the storage area (**Figure 2-7**). The surface and groundwater or soil/bedrock interface soils were tested for TCL and TAL. The interface sample was also analyzed for EPH. The sample screened and found to have the highest PID result was analyzed for VOCs and EPH.

A summary of the soil boring construction details is provided in **Table 2-4**.

Personnel Buildings

Three personnel buildings, the Staff Building, Administration Building and Information Center, are located north of the industrial fenced area in the central portion of the Bailey Point area (**Figure 1-4**). No industrial activities were conducted in these areas except for the historic use of the northern end of the Information Center as a garage during the early years of plant operation. The sampling activities were limited to sub-slab soil samples collected beneath each building and in addition, a monitoring well was installed, and surface water was collected, immediately east of the former Information Center (**Figure 2-7**).

Exterior Sampling Program

At the request of the MDEP, a monitoring well (MW-317) was drilled adjacent to the southeast corner of the former Information Center to measure groundwater elevation and verify assumptions on direction of groundwater flow (**Figure 2-7**). The soil boring was continuously sampled and the geology was recorded during the drilling process. The well was sampled (MY05GW24) for analysis of TCL, TAL metals, SIM vinyl chloride, EPH, and nitrates. A soil boring (MY05SB14) was collocated with this monitoring well for comparative iron analysis to support closure of the Ferrous Sulfate Tank, as outlined in QAPP Change Order No. 1. Summaries of the monitoring well construction details and water quality parameters are provided in **Table 2-4 and Table 2-5**, respectively. Groundwater elevations were also collected from the monitoring well, which are documented in **Table 2-6**.

Outfall 011, located east of the Information Center, was found to have surface water flow in excess of flow from storm water discharge. The additional flow was believed to be associated with infiltration to the pedestrian tunnel foundation drain, which is connected to the storm water system associated with this outfall. To assess the potential impact of this flow, a surface water sample (MY05SW05) was collected from the outfall and analyzed for TCL, TAL metals, SIM vinyl chloride, and EPH.

Interior Sampling Program

Staff Building: Three soil samples (MY05SS67 through MY05SS69) were proposed beneath the Staff Building (**Figure 2-7**). One sample (MY05SS67) was collected from beneath the HVAC room. The sump in the HVAC room will remain active until the building is demolished, therefore MY05SS68 will be collected at a later date following removal of the sump, currently scheduled for late 2004. The sample in the HVAC room will be analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH. The third sample (MY05SS69) was collected from beneath the elevator pit and was analyzed for PCBs and EPH.

Administration Building: One soil sample was collected from beneath the most stained portion of the concrete slab of the HVAC room (**Figure 2-7**). The sample (MY05SS70) was analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Information Center: Prior to demolition of the Information Center in fall 2001, a visual inspection was performed on the floor slab as outlined in the QAPP (MY, 2002m). No additional stains were identified, and therefore following removal of the building slab, one soil sample was collected from the area of the former vehicle repair shop (**Figure 2-7**). The sample (MY05SS75) was analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

Based on the Phase 1B sampling results for MY05SS75 where elevated lead (969 mg/kg) was detected, additional sampling and analysis was conducted at the former Information Center. Four Geoprobe sampling locations (MY05GP202 through MY05GP205) were sited 10 feet the east, west, north, and south of MY05SS75, and a fifth sample (MY05GP201) was located at MY05SS75. The five locations were sampled at 0.0-5, 1.8-2, and 3.8-4 feet below ground surface, and each soil sample was analyzed for lead and sulfate.

Parking Lot Areas

Three parking lots exist across the Bailey Point area serving the various personnel buildings (**Figure 1-4**). One lot is located to the north of the former Information Center, and Parking Lot C and D are located north of the Administration and Staff Buildings, respectively. Industrial activities were minimal in theses parking lots and the RFI sampling activities were limited to six soil borings (**Figure 2-7**). A summary of the soil boring construction details is provided in **Table 2-4**.

Parking Lot C: One soil boring (MY05SB17) was installed at a location correlating to a known surface gasoline leak from a vehicle waiting at the security gate formerly at this location. Both surface and groundwater or soil/bedrock interface soil samples were collected from this boring for analysis of TCL, TAL, EPH, and VPH. The highest screened PID interval was tested for VOCs, EPH and VPH.

Parking Lot D: Four soil borings (MY05SB18 through MY05SB21) were installed at equally spaced locations throughout the lot. One sample was collected from each boring at the groundwater or soil/bedrock interface and analyzed for TCL, TAL and EPH.

Information Center Parking Lot: To verify no residuals remain following the previous removal of an underground gasoline storage tank (UST) east of the lot, a soil boring (MY05SB22) was installed in the footprint of that former UST. The soils were sampled continuously and screened with a PID. The soil sample from the groundwater or soil/bedrock interface was analyzed for both EPH and VPH.

Warehouse 2/3 Area

The Warehouse 2/3 area includes an investigation surrounding the exterior and below the slab of the warehouse (**Figure 2-8**). Additional evaluations were performed in this area as sample results were evaluated and conditions became better understood. The investigation included installation of soil borings, geoprobes, monitoring wells, and test pits, the details of which are summarized in **Table 2-4, 2-5 and 2-7**.

Exterior Sampling Program

Historic information indicated that the area adjacent to the loading dock of the main Warehouse 2/3 may have had releases from drums temporarily staged or managed in that area. To evaluate this potential, six soil borings were initially installed to a depth of 20 feet or to the soil/groundwater or soil/bedrock interface in this area (MY05SB36 through MY05SB41). Refusal was encountered at approximately three feet below grade at soil boring location MY05SB38, MY05SB40 and MY05SB41, and therefore a sample at the soil/bedrock interface was collected for TCL, TAL and EPH analysis. The remaining locations were sampled as follows: collect a sample from the highest PID reading for analysis of EPH and VOCs, and collect a soil sample from the groundwater or bedrock interface for analysis of TCL and TAL. Based on field PID screening results, soil boring location MY05SB37 was completed as a monitoring well (MW-311). Groundwater was sampled (MY05GW13) and analyzed for TCL, SIM vinyl chloride, TAL metals, and EPH.

To determine if any residual heavy metals or other contaminants were present behind Warehouse 2/3 in the area where sand blasting grit was disposed, three test pits were installed (MY05TP01 through MY05TP03). Soil samples were taken from both the surface and groundwater or soil/bedrock interface (i.e., base of test pit) and were analyzed for TCL and TAL. The interface samples were also analyzed for EPH. A composite sidewall sample from soils between the surface and interface were taken based on visual indications for the presence of blasting grit and analyzed for TCL and TAL.

The program in the Warehouse 2/3 area was expanded in the first QAPP Change Order based on an evaluation of initial sample results. Nine additional investigative test pits were constructed behind the warehouse in the vicinity of MY05TP01. Geologic and PID-headspace information was recorded at each test pit, and based on the PID headspace screening results; six samples (MY05TP10, MY05TP12, MY05TP13, MY05TP15, MY05TP16, and MY05TP19) were submitted for analysis of VOCs, SVOCs and EPH. The sampling program in this area was expanded in QAPP Change Order No. 2 based on detections of PAHs in the vicinity of MY05TP02. Three additional surface soil samples were collected (MY05SS101 through MY05SS103) for analysis of SVOCs.

QAPP Change Order No. 2 also included an expanded program to address detections in the Phase 1A samples collected on the east side of the warehouse (trichloroethane [TCA] and TCA breakdown products) and to further evaluate the former alleyway between Warehouse 2 and Warehouse 3. Monitoring wells were installed in six locations around the warehouse complex (MW-404 through MW-409). Three of the monitoring wells (MW-406, MW-407 and MW-409) were completed as a pair of wells; one installed at the top of the soft clay-silt zone and one installed below the soft clay-silt zone to a maximum depth of 25 feet into rock. The six monitoring wells were installed in six soil borings (MY05SB101 through MY05SB106) that were sampled at two depths, the highest PID-screened interval and the soil/groundwater or soil/bedrock interface, for analysis of VOCs and SVOCs. The groundwater samples (MY05GW106 through MY05GW114) collected from the installed wells were assessed for VOCs, SVOCs, SIM vinyl chloride, and TAL metals.

The groundwater investigation around the warehouse area was further expanded based on detections in Phase 1A and 1B samples, as outlined in QAPP Change Order No. 4. Six additional monitoring wells (MW-420, 421, 422A/B, and 423A/B) were installed around and downgradient of the warehouse complex and sampled (MY05GW120 through MY05GW125) for analysis of VOCs, SIM vinyl chloride and TAL metals. An additional round of groundwater samples were collected from the ten previously installed monitoring wells (MW-311 and MW-404 through 409A/B) for analysis of VOCs, SIM vinyl chloride and TAL metals. Placing the suffix "-1C" to the original sample identifiers identified these groundwater samples.

QAPP Change Order No. 4 also expanded the soil investigation around the warehouse area. A soil boring (MY05SB110) was installed on the south side of the warehouse to assess the depth to bedrock. Thirteen (13) soil geoprobes (MY05GP101 through MY05GP113) were installed on the east side of the warehouse based on detections of TCA in previous soil borings. These geoprobe soil samples were submitted for analysis of VOCs.

The water levels from the wells were recorded, and are summarized in **Table 2-6**.

Interior Sampling Program

Four soil samples were collected beneath the concrete slab in the warehouse (MY05SS71 through MY05SS74). Three of the soil samples were collected beneath the concrete slab where two structural joints intersect in the later constructed Warehouse 3. One sub-slab soil sample was taken from the northern side of the Warehouse 2 under an area of greatest staining. The samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, and EPH.

2.5.5 Study Area 5 – Northern Plant Area

The northern portion of Study Area 5 is the area north of the ISFSI and 345 kV switchyard, including the ball field and Bailey Farm House area (**Figure 2-9**). The investigation in this area included collection of soil, sediment, groundwater, and surface water samples. Soil borings, monitoring wells and test pits were installed, the details of which are summarized in **Table 2-4, 2-5 and 2-7**. Boring logs, well installation diagrams, bedrock core logs, and test pits are included as **Appendix A, B and C**.

345 kV Transmission Line Area

Prior to plant construction, there was a deep tidal drainage area located in the northwest corner of this study area through which much of the area north of the 345 kV switchyard drained into Bailey Cove (**Figure 1-4**). During construction, fill was placed in this area and a portion of the area was used for silt spreading during operation. Four monitoring wells (MW-309, MW-319, MW-320 and MW-323) were installed in the area and the groundwater samples collected (MY05GW11, MY05GW19, MY05GW20, and MY05GW23) were analyzed for TCL, TAL, SIM vinyl chloride, EPH, and nitrate. Soils from the borings (MY05SB23, MY05SB48, MY05SB49 and MY05SB52) were continuously sampled and analyzed as follows: surface soil, TCL/TAL; highest PID-screened sample, VOCs and EPH; and groundwater interface, TCL, TAL and EPH. Another soil boring (MY05SB24) was installed in the former silt spreading area and analyzed in the same manner. In addition, two surface soil samples (MY05SS12 and MY05SS13) were collected from this area and analyzed for TCL and TAL metals.

To assess the potential impact of the 345 kV switchyard on this portion of the facility, two monitoring wells (MW-321 and MW-322) with soil borings (MY05SB50 and MY05SB51) were located along the northern end of the switchyard. Groundwater samples (MY05GW21 and MY05GW22) from the two monitoring wells were analyzed for TCL, TAL, SIM vinyl chloride, EPH, and nitrate. Soils from the completed borings were continuously sampled and analyzed as follows: surface soil, TCL/TAL; highest PID-screened sample, VOCs and EPH; and groundwater interface, TCL, TAL and EPH. Two sediment sampling locations were identified in the natural drainage that flows northwest from the switchyard towards Bailey Cove. The two sediment samples (MY05SD19 and MY05SD20) were analyzed for TCL, SIM PAHs, TAL metals, and EPH.

Several seeps were identified along the western portion of this area (**Figure 3-1**). The seeps were believed to represent the breakout of groundwater along the original ground surface and fill boundary. The two largest seep locations were sampled (MY05SW01 and MY05SW02) and analyzed for TCL, SIM vinyl chloride, TAL metals, and EPH.

Following an assessment of Phase 1A results, the investigation in this area was expanded to include additional surface soil samples, an investigation trench and additional groundwater monitoring wells. This modification to the RFI program was outlined in QAPP Change Order No. 3.

To further assess the potential for surface soil contamination from the central portion of the area, ten additional surface soil samples were collected. These samples (MY05SS104 through MY05SS113) were analyzed for TCL, TAL and EPH. To further assess the northern portion of this area, including the ball field, six composite surface soil samples (MY05SS114 through MY05SS119) were collected. The composite samples were developed from four grab samples collected within six approximate one-acre sub-areas and were analyzed for SVOCs, pesticides, PCBs, TAL metals, and EPH.

To further assess the potential for sub-surface contamination, an approximate 575-foot long investigation trench was excavated across the central portion of this area (**Figure 2-9**). The investigation trench was excavated in the fill material to a depth of approximately 15 feet. Observations and PID field screening (headspace) results were documented in field logbooks. Field screening was performed about every 25 feet along the trench, collecting samples for visual observation and PID headspace screening from the surface, mid-depth and base. Based on field screening results, nine (9) soil samples (MY05TP107A, 110A, 111A, 113, 115, 116, 118, 125, and 129) were collected for testing of TCL/TAL and EPH.

Four monitoring wells were added to the program to further assess petroleum hydrocarbons and elevated metals observed in groundwater west of the railroad tracks. The four wells (MW-413 through MW-416) were located downgradient of the former truck maintenance garage area, the ISFSI area and the pre-operation cleaning basin, and were installed as phreatic wells through the fill to the original ground surface. Groundwater samples (MY05GW115 through MY05GW118) collected from these wells were analyzed for DRO and TAL metals.

An additional round of groundwater samples was collected from these wells as outlined in QAPP Change Order No. 4. The four previously installed wells in the northern portion of this area (MW-309, MW-319, MW-320, and MW-323) were resampled for TAL metals and DRO to support the expanded investigation. MW-321 and MW-322, located just north of the 345 kV switchyard, were also resampled for analysis of DRO and nitrates. These groundwater samples were identified with the suffix "-1B" added to the original sample identifiers outlined above. In addition, a second round of groundwater samples (MY05GW115-1C through MY05GW118-1C) was collected from the additional monitoring wells installed in this area as part of Phase 1B (MW-413 through MW-416). These groundwater samples were analyzed for TAL metals and DRO.

Water levels from the wells were recorded, and are summarized in **Table 2-6**.

At the request of MDEP as outlined in QAPP Change Order No. 4, three sediment samples (MY06SD50 through MY06SD52) were collected from the gully west of this area. These samples, to be evaluated as part of Study Area 6, were analyzed for SVOCs, PCBs, pesticides, TAL metals, and EPH.

Pre-Operation Cleaning Basin

To assess this portion of Study Area 5, samples were collected from soil borings, monitoring wells, surface water, and sediment (**Figure 2-9**). Summaries of soil boring and monitoring well construction details are provided in **Table 2-4 and Table 2-5**.

A group of five soil borings (MY05SB42 through MY05SB46) was installed in the area of the former cleaning basin. Soils from the completed borings were continuously sampled and analyzed as follows: between elevation 21.0 feet (the bottom of the basin) and 19.0 feet, TCL/TAL; highest PID-screened sample, VOCs and EPH; and groundwater interface, TCL, TAL and EPH. Three of the soil borings (MY05SB44 through MY05SB46) had monitoring wells (MW-313 through MW-315) installed to evaluate potential impacts to groundwater. The monitoring wells were screened in the overburden aquifer, and groundwater from each monitoring well was sampled (MY05GW15 through MY05GW17) and analyzed for TCL, SIM vinyl chloride, TAL metals, EPH, and nitrates.

Based on the results of Phase 1A groundwater results, a second round of groundwater samples were collected from monitoring wells MW-313 through MW-315. This round of groundwater samples (MY05GW15-1B through MY05GW17-1B) was submitted for analysis of DRO and pesticides. A third sample (MY05GW15-1C) was collected from MW-313 for analysis of DRO.

The water levels from the wells were recorded, and are summarized in **Table 2-6**.

The former cleaning basin area includes a small pond. To assess the potential impact of the former cleaning basin on the pond, a surface water sample (MY05SW03) and a sediment sample (MY05SD18) were collected from the pond and analyzed for TCL, TAL, SIM vinyl chloride/PAH, and EPH.

To assess the drainage west of the railroad tracks where wastewater from the cleaning basin was released, three sediment samples from the drainage to Bailey Cove were collected (MY05SD15 through MY05SD17). Each sediment sample was analyzed for TCL, TAL metals, SIM PAHs, and EPH.

Bailey Farm House Area

The Bailey Farm consisted of a house that was an environmental field office and a storage barn. The barn was used to store equipment associated with environmental studies. No significant industrial activities occurred in the Bailey Farm House area. Accordingly, a phased approach was adopted and as part of Phase 1A the features investigated included a septic system/leach field, a gray water leach field and a fuel oil tank in the basement of the Farm House (**Figure 2-9**). One monitoring well was installed in each of the leach fields (MW-310 and MW-324). Soil samples from the completed borings (MY05SB25 and MY05SB54) in which the wells were installed were sampled continuously and tested for TCL and TAL at all three levels: surface, highest PID segment and groundwater interface. The lower two samples were also analyzed for EPH. Groundwater samples (MY05GW12 and MY05GW28) collected from these wells were tested for TCL, TAL, SIM vinyl chloride, EPH, and nitrate.

To provide additional characterization of the former leach field west of the Farm House, based on detections in Phase 1A three test pits (MY05TP101 through MY05TP103) were excavated within the leachfield. As described in QAPP Change Order No. 2, the soil from these test pits was assessed for VOCs, PCBs and EPH.

One soil sample (MY05SS76) was collected beneath the concrete slab of the oil tank in the northeast corner of the house basement. The sample was submitted for analysis of EPH.

Summaries of the monitoring well construction details, water quality parameters and groundwater elevations are provided in **Table 2-4 through Table 2-6**.

Former Truck Maintenance Garage

To assess potential soil and groundwater contamination in the vicinity of a former truck maintenance garage, a soil boring (MY05SB47) was installed (**Figure 2-9**). Soils from the completed boring were continuously sampled and analyzed as follows: surface soil, TCL/TAL; highest PID-screened sample, VOCs and EPH; and groundwater interface, TCL, TAL and EPH. The soil boring was completed as a monitoring well (MW-316), which was screened in the overburden aquifer. A groundwater sample (MY05GW18) was collected from the installed monitoring well and analyzed for TCL, TAL metals, SIM vinyl chloride, EPH, and nitrate.

To evaluate the area for the presence of dry wells or old floor drains, a soil investigation trench was excavated in Phase 1A in a north/south orientation, downgradient of the former maintenance building. Visual observations and PID headspace screening were noted in field logs during installation of the investigation trench.

Based on field observations (stained soil and olfactory evidence) made while excavating the investigation trench and an evaluation of Phase 1A groundwater results, further investigations were proposed in this area as outlined in QAPP Change Order No. 2. A series of test pit trenches (MY05TP104A through MY05TP104Q) were installed in the suspected area of contamination. Two samples were collected from two depths (7 to 9 feet and 9 to 11 feet) within the trench (MY05TP104I) based on visual observation and PID screening results and were submitted for analysis of TCL/TAL and EPH. In addition, a second round of groundwater sampling (MY05GW18-1B) was performed in the downgradient well (MW-316) for analysis of DRO.

QAPP Change Order No. 4 outlined additional characterization performed in this area based on detections in groundwater samples collected in Phase 1B. Three additional monitoring wells (MW-424A/B and MW-425) were installed in the area. The wells were sampled (MY05GW126 through MY05GW128) and the groundwater was analyzed for DRO. In addition, the existing well (MW-316) was sampled a third time (MY05GW18-1C) for SVOC and DRO analysis.

Summaries of the monitoring well construction details, water quality parameters, and test pit construction details are provided in **Table 2-4, Table 2-5 and Table 2-7**, respectively. Groundwater elevations were also collected from the monitoring wells, which are documented in **Table 2-6**.

2.5.6 Study Area 6 – Shoreline (Outfalls)

Study Area 6 comprises the intertidal and subtidal zones surrounding the Bailey Point area where the majority of industrial area stormwater discharges occurred. A gully in the northern reach of Bailey Cove that received runoff from the construction debris/silt spreading area north of the 345 kV Switchyard is also included as part of Study Area 6. Stormwater Outfalls 005 and 006 drain into Bailey Cove to the west of the plant, while Outfalls 008, 009, 010, 011, 012, and N12 drain to the east into the Back River. To support the RFI program, intertidal sediment and biota samples were collected from Outfalls 005/006, 008, 010, 011, and 012/N12, and subtidal sediment and biota samples were collected from Outfalls 008, 009, 011, and 012/N12 (**Figure 2-10 and 11**). Outfall biota samples consisted of the soft-shelled clam (*Mya arenaria*) and blue mussel (*Mytilus edulis*). In addition, mummichog (*Fundulus heteroclitus*) was collected in shallow water off Bailey Point and American lobster (*Homarus americanus*) was collected off Long Ledge. The mummichog and lobster collection areas are shown in **Figure 2-11** and **Figure 2-4**, respectively.

Sediment Sampling Program

The general strategy for collection and analysis of sediment samples (MY06SD01 through MY06SD36) at each of the identified outfalls was as follows:

- With the exception of Outfall 009, 3 intertidal sediment samples were collected and analyzed for TCL, TAL metals, SIM PAHs, grain size, and TOC. Outfall 009 exists within a steep bank and does not have a clearly defined intertidal area.

- With the exception of Outfalls 005/006 and 010, 3 subtidal sediment samples were collected and analyzed for TCL, TAL metals, SIM PAHs, grain size, and TOC. Due to the close proximity of Outfall 005 and Outfall 006, and the extent of mudflats in this area, four intertidal samples were collected from the mudflats, and two subtidal samples were collected in the area of Outfalls 005 and 006. Subtidal sediment could not be collected at Outfall 010 because of hard, scoured substrate in the subtidal region.

Sediment samples for possible PCB analysis using a PCB homologue and congener method and grab samples for BCSA (MY06BI01A-D through MY06BI36A-D) were also collected concurrent with the intertidal and subtidal samples collected for chemical analysis. These samples were forwarded to the off-site laboratory (KAS) to archive for potential analysis at a later date.

Based on the results from the initial round of sediment chemical analysis, additional sediment samples were collected in November 2001 for analysis for bulk sediment toxicity to amphipods (BSTA) and sand worms (BSTS) (CH2M Hill, 2001b). These additional tests were conducted at the sediment sampling locations where the chemical results exceeded applicable screening levels. At sediment sampling locations where sediment-screening criteria was exceeded, samples were taken for both the previously performed chemical analysis for comparison purposes, and the BSTA and BSTS toxicity analysis. Samples were collected at Outfall 005/006 (MY06SD04A and MY06TX04), Outfall 009 (MY06SD16A and MY06TX16) and Outfall 010 (MY06SD20A and MY06TX20).

For comparability of data, BCSA analysis was performed on selected samples collected in the initial round of sediment sample collection. BCSA analysis was performed at Outfall 005/006 (MY06BI01A-D through MY06BI04A-D), Outfall 009 (MY06BI16A-D) and Outfall 010 (MY06BI20A-D).

PCB congener and homologue analysis, which produces lower detection limits, was performed at the sample location nearest to the outfall, since the initial round of sample results did not indicate detection of PCBs using the 8082 methodology. This additional analysis was performed at sediment sample locations MY06SD04A, MY06SD08, MY06SD16A, MY06SD20A, MY06SD26, and MY06SD32.

Additional sediment samples were collected from the Outfall 009 area to bound the extent of PAHs identified in the initial round of sampling. The additional sediment samples from this outfall area (MY06SD101 through MY06SD108 and MY06SD110 through MY06SD114) were collected at three intervals (0 to 3.5 inches, 3.5 to 9 inches and 9 to 15 inches) using a sediment gravity corer. A deep-water sediment sample (MY06SD116) was collected from the intake channel just north of Outfall 009 using a petite ponar dredge. The sediment samples were analyzed for SVOCs/SIM PAHs.

At the request of MDEP as outlined in QAPP Change Order No. 4, three sediment samples were collected from the small intertidal mudflat area west of the ballfield area in the northern reach of Bailey Cove (**Figure 2-10**). These samples (MY06SD50 through MY06SD52) were analyzed for SVOCs, PCBs, pesticides, TAL metals, and EPH.

Biota Sampling Program

The general strategy for collection and analysis of biota samples was as follows:

- With the exception of Outfall 009, collect up to 20 soft-shell clams from three intertidal locations (MY06BC01 through MY06BC18) for analysis of SVOCs, pesticides, PCBs, TAL metals, SIM PAHs, and lipids. Outfall 009 exists within a steep bank and does not have a clearly defined intertidal area.

- With the exception of Outfall 005/006, collect up to 30 blue mussel from three subtidal locations (MY06BM01 through MY06BM15) for analysis of SVOCs, pesticides, PCBs, TAL metals, SIM PAHs, and lipids. Outfall 005/006 is associated with an extensive mud-flat area.

- Twenty (20) lobster specimens were collected from Montsweag Bay in the vicinity of Long Ledge. The lobster were divided into four groups (MY06BL01 through MY06BL04) consisting of up to four lobsters. A composite tomalley (pancreas) sample (MY06BL06) was generated from the 20 lobster. The samples were submitted for analysis of SVOCs, pesticides, PCBs, TAL metals, SIM PAHs, and lipids.

- A total of approximately 400 mummichog were collected from shallow water on the east and west side of Bailey Point. Two composite samples (MY06MM01 and MY06MM02) were submitted for analysis of SVOCs, pesticides, PCBs, TAL metals, and lipids.

2.5.7 Diffuser Sampling Program

Deep-water sediment samples were collected from the Back River in and around the plant submerged diffuser system to support an evaluation of decommissioning options and potential impact of operational releases through the forebay (**Figure 2-12**). A summary of the sampling program in and around the diffuser system is provided in **Table 2-8**.

One sediment sample was collected from inside the approximate middle of each diffuser. The sample from within the north diffuser (MYSDDIF01) was taken adjacent to Nozzle 11N and the sample from within the south diffuser (MYSDDIF02) was taken adjacent to Nozzle 10S. Two additional sediment samples were collected from the immediate vicinity of the outside of each diffuser. The north diffuser was sampled directly outside Nozzle 8N (MYSDDIF03) and Nozzle 19N (MYSDDIF05). The south diffuser was sampled directly outside Nozzle 6S (MYSDDIF06) and Nozzle 19S (MYSDDIF07). All sediment samples from in and around the diffuser system were analyzed for TCL, TAL metals, PCBs (including congener and homologue analysis), EPH, grain size, and TOC.

Two deep-water reference sediment samples were collected from the Back River approximately 2,000 feet north (MYSDDIF09) and south (MYSDDIF10) of the diffuser system to support an evaluation of sediment in and around the plant diffuser system (**Figure 2-4**). The deep-water sediment samples were analyzed for VOCs, SVOCs, SIM PAHs, PCBs, TAL metals, pesticides, EPH, grain size, TOC, and PCB congeners/homologues.

2.6 Analytical Data Validation

Data verification and validation activities were performed to ensure that data collected as part of this RFI were consistent with project quality objectives and measurement performance criteria specified in the QAPP. These activities included a review of laboratory processes and reporting that affect RFI data reporting.

All of the data collected as part of this RFI were validated in accordance with the QAPP and USEPA Region I validation guidelines (USEPA, 1996b). A Tier II data validation was completed for all laboratory results, except the first sample delivery group for each media, which received Tier III data validation. Tier III data validation was also performed for all tissue data. Data validation qualifiers were applied to the data for use as the validated RFI data set. Validation qualifiers were input into the GIS database for use in data interpretive analyses. The following is a summary of specific data qualifiers, which are applied as a result of data validation:

- U - The analyte was not detected above the PQL;
- J - The analyte was detected but the associated reported concentration is approximate and is considered estimated;
- R - The reported analyte concentration is rejected due to serious deficiencies with associated quality control results; and
- UJ - The analyte was not detected above the PQL. However, due to quality control results that did not meet acceptance criteria, the quantitation limit is uncertain and may not accurately represent the actual limit.

All analyte concentrations were reported to the PQL. Sample detections below the PQL were reported with a "J" qualifier.

A data usability assessment was performed to determine if data generated for the project was consistent with project goals as outlined in the QAPP. All data evaluation and validation procedures used on the project were reviewed to compare results with project-specific data quality requirements. The data usability assessment was documented and reassessed if data were found to be inadequate for remedial decision making. Details on the data usability assessments performed for the RFI environmental information and analytical data are included in Sections 3.9 and 4.9, respectively.

2.7 Quality Assurance Assessments

Quality assurance assessments were performed for this RFI in the form of technical system audits (TSAs) in accordance with criteria established in the QAPP. The TSAs reviewed major activities, including field sample collection, the fixed based laboratories, and data validation to determine if procedures completed were consistent with those outlined in the QAPP.

2.7.1 Field Technical Systems Audit

The Field TSA was performed early in the RFI field program (Phase 1A) so that necessary corrective action measures, if warranted, could be implemented. The TSA observed sampling of various media critical to field activities, including low-flow groundwater sampling and drilling programs. The audit consisted of an evaluation of sampling techniques, field parameter measurements, record keeping including logbooks and Chains of Custody (COCs), sample collection and handling, sample design, subcontractor oversight, and health and safety.

Following the field audit, a Field Sampling TSA Report was prepared that presented the audit findings, recommendations and corrective actions that were implemented as a result of the audit (MY, 2001e). The report outlined the activities performed in the audit and attached the checklists used during the audit. The audit noted several positive aspects and did not identify any deficiencies that would have an adverse impact on data quality. A summary of the Field Sampling TSA, including any corrective actions taken, is provided in **Table 2-9**.

2.7.2 Laboratory Technical Systems Audit

The Laboratory TSA was performed prior to shipping samples to the lab with follow-up early during the sample analysis program. A TSA was performed at each laboratory used in the RFI and consisted of a review of sample handling procedures, equipment condition and operation, analytical methods, and overall conformance with SOPs provided in the QAPP. Each audit was performed over a few days so that various types of analytical procedures could be observed.

A Laboratory TSA Report was prepared that presented the findings of the laboratory audits and presented recommendations and corrective actions implemented as a result of the audit (MY, 2002b). The report outlined the activities completed for the audit and presented checklists that were followed during the auditing process. The audit noted several positive aspects and did not identify any deficiencies that would have an adverse impact on data quality. A summary of the Laboratory TSA, including any corrective actions taken, is provided in **Table 2-10**.

2.7.3 Data Validation Technical Systems Audit

The Data Validation TSA was performed following completion of data validation of the first phase of sampling data (Phase 1A). The TSA included a review of the data validation reports and procedures used, data deliverables for completeness, determining if the QC acceptance criteria specified for the project were met by the laboratory, and calculations were checked for completeness and accuracy. The TSA also checked for conformance with data validation procedures outlined in the QAPP.

A Data Validation TSA Report was prepared that presented the findings of the data validation processes and procedures audit (MY, 2002e). Conclusions regarding data quality and conformance with project quality objectives and measurement performance criteria were presented, as well as the activities completed for the audit. The audit noted several positive aspects and did not identify any deficiencies that would have an adverse impact on data quality. A summary of the Data Validation TSA, including any corrective actions taken, is provided in **Table 2-11**.

Table 2-1
Summary of Laboratory Analytical Methods

Media	Parameter	Concentration Level	Analytical Method
Soil	VOCs	Low	SW 5035 and SW 8260B
	SVOCs	Low	SW 3550B and SW 8270C
	Pesticides	Low	SW 3540C and SW 8081A
	PCBs	Low	SW 3540C and SW 8082
	TAL Metals	Low	SW 3050B, SW 6010B, SW 6020, and SW 7471A
	EPH	Low	MA DEP Method
	VPH	Low	MA DEP Method
	pH	Low	9045C
	Asbestos	Low	EPA 600R for Bulk Analysis
	Total Solids	Low	SM2540G / ILM03.0
Concrete	PCBs	Low	SW 3540C and SW 8082
	EPH	Low	MA DEP Method
Sediment	VOCs	Low	SW 5035 and SW 8260B
	SVOCs	Low	SW 3550B and SW 8270C
	Low-level PAHs	Low	SW 3550B and SIM 8270C
	Pesticides	Low	SW 3540C and SW 8081A
	PCBs	Low	SW 3540C and SW 8082
	PCB Congeners and Homologues	Low	M680 and M3541
	TAL Metals	Low	SW 3050B, SW 6010B, SW 6020, and SW 7471A
	EPH	Low	MA DEP Method
	BSTSs	Low	AST-SAI-NA-01
	BSTAs	Low	AST-SAI-LP-02
	BCSA	Low	EPA/600/4-90/030
	Grain Size	Low	ASTM D422
	TOC	Low	Lloyd Kahn Method
	Total Solids	Low	SM2540G / ILM03.0
Groundwater	VOCs	Low	SW 8260B
	Vinyl Chloride	Low	SIM 8260B
	SVOCs	Low	SW 3520C and SW 8270C
	Pesticides	Low	SW 3510C and SW 8081A
	PCBs	Low	SW 3510C and SW 8082
	TAL Metals	Low	SW 3010A, SW 6010B, SW 6020, and SW 7470A
	EPH	Low	MA DEP Method
	DRO	Low	ME DEP Method 4.1.25
	Nitrate	Low	EPA 353.2 and EPA 300A

Table 2-1
Summary of Laboratory Analytical Methods

Media	Parameter	Concentration Level	Analytical Method
	Anion/Alkalinity	Low	SM 4110B EPA 300A EPA 310.1
	Sulfide	Low	EPA 376.1
Surface Water	VOCs	Low	SW 8260B
	Vinyl Chloride	Low	SIM 8260B
	SVOCs	Low	SW 3520B and SW 8270C
	Pesticides	Low	SW 3510C and SW 8081A
	PCBs	Low	SW 3510C and SW 8082
	TAL Metals	Low	SW 3010A, SW 6010B, SW 6020, and SW 7470A
	EPH	Low	MA DEP Method
Tissue	SVOCs	Low	NOAA ORCA71/SW 3610
	SIM PAHs	Low	NOAA ORCA71/SW 3610
	PCBs	Low	NOAA ORCA71/SW 3610 SW8082
	PCB Congeners and Homologues	Low	NOAA ORCA71/SW 3610 M680
	Pesticides	Low	NOAA ORCA71/SW 3610
	TAL Metals	Low	SW M6010B/M6020, M245.6, SW 3051, and SW 3052
	Lipids	Low	NOAA ORCA71

Table 2-2
Summary of Reference Sampling Program

Analytical Parameter	Field Samples	Field Duplicates (Note 1)	Number of MS/MSDs (Note 2)	Total Samples (Note 3)
Groundwater				
VOC	8	3	3	14
Vinyl Chloride	8	3	3	14
SVOC	8	3	3	14
PCB	8	3	3	14
Pesticide	8	3	3	14
TAL Metals	12	3	3	18
EPH	4	1	1	6
DRO	4	2	2	8
Nitrate	8	3	3	14
Subtotal	**68**	**24**	**24**	**116**
Sediment				
VOC	7	0	1	8
SVOC	7	0	1	8
PCB	7	0	1	8
SIM PAH	7	0	1	8
PCB Congeners and Homologues	7	0	1	8
Pesticide	7	0	1	8
TAL Metals	6	0	0	6
Grain Size	7	0	NA[4]	7
TOC	7	0	NA	7
Total Solids	7	0	1	8
Subtotal	**69**	**0**	**7**	**76**
Soil				
VOC	16	1	0	17
SVOC	15	1	0	16
PCB	15	1	0	16
Pesticide	15	1	0	16
TAL Metals	15	1	0	16
EPH	15	1	0	16
Total Solids	15	1	0	16
Subtotal	**106**	**7**	**0**	**113**

Table 2-2
Summary of Reference Sampling Program

Analytical Parameter	Field Samples	Field Duplicates (Note 1)	Number of MS/MSDs (Note 2)	Total Samples (Note 3)
Tissue				
SVOC	7	1	1	9
SIM PAH	7	1	1	9
PCB	7	1	1	9
PCB Congeners and Homologues	7	1	1	9
Pesticides	7	1	1	9
TAL Metals	7	1	1	9
Lipids	7	1	1	9
Subtotal	**49**	**7**	**7**	**63**
TOTAL	**299**	**38**	**38**	**368**

Notes:

1. In accordance with the QAPP, at least one duplicate sample was collected for every 10 field samples.
2. In accordance with the QAPP, at least one MS/MSD for organic and one MS for inorganic samples was collected for every 20 field samples.
3. In accordance with the QAPP, additional samples were forwarded to the laboratory for QA/QC purposes, including an equipment rinsate blank collected each day of field sampling, a trip blank forwarded with all volatile organic samples, and a temperature blank accompanied each cooler.
4. NA – Not Applicable.

Table 2-3
Summary of Bailey Point Sampling Program

Analytical Parameter	Field Samples	Field Duplicates (Note 1)	Number of MS/MSDs (Note 2)	Total Samples (Note 3)
Concrete				
PCB	16	3	2	21
EPH	20	6	5	31
Total Solids	20	6	5	31
Subtotal	**56**	**15**	**12**	**83**
Groundwater				
VOC	77	10	7	94
Vinyl Chloride	74	9	6	89
SVOC	63	8	6	77
PCB	51	6	4	61
Pesticide	55	7	5	67
TAL Metals	96	12	9	117
EPH	28	3	2	33
DRO	61	8	7	76
Nitrate	41	6	4	51
Anion/Alkalinity	16	2	1	19
Sulfide	16	2	1	19
Subtotal	**578**	**73**	**52**	**703**
Sediment				
VOC	48	7	5	60
SVOC	51	10	5	66
PCB	51	10	5	66
SIM PAH	80	15	6	101
PCB Congeners and Homologues	33	5	2	40
Pesticide	51	10	5	66
TAL Metals	51	10	5	66
EPH	14	3	2	19
Grain Size	38	5	NA[4]	43
TOC	38	5	NA	43
Total Solids	80	15	7	102
Subtotal	**535**	**95**	**42**	**672**
Soil				
VOC	204	31	19	254
SVOC	170	30	21	221
PCB	182	26	18	226
Pesticide	115	17	13	145
TAL Metals	147	22	16	185

Table 2-3
Summary of Bailey Point Sampling Program

Analytical Parameter	Field Samples	Field Duplicates (Note 1)	Number of MS/MSDs (Note 2)	Total Samples (Note 3)
Iron	2	1	0	3
EPH	199	28	23	250
VPH	4	1	1	6
Total Solids	267	38	25	330
pH	12	0	0	12
Mercury	3	1	0	4
Subtotal	**1305**	**195**	**136**	**1636**
Surface Water				
VOC	5	1	1	7
Vinyl Chloride	5	1	1	7
SVOC	5	1	1	7
PCB	5	1	1	7
Pesticide	5	1	1	7
TAL Metals	5	1	1	7
EPH	5	1	1	7
Subtotal	**35**	**7**	**7**	**49**
Tissue				
SVOC	39	3	3	45
SIM PAH	39	3	3	45
PCB	39	3	3	45
PCB Congeners and Homologues	39	3	3	45
Pesticides	39	3	3	45
TAL Metals	39	3	3	45
Lipids	39	3	3	45
Subtotal	**273**	**21**	**21**	**315**
TOTAL	**2782**	**406**	**270**	**3458**

<u>Notes:</u>

1. In accordance with the QAPP, at least one duplicate sample was collected for every 10 field samples.
2. In accordance with the QAPP, at least one MS/MSD for organic and one MS for inorganic samples was collected for every 20 field samples.
3. In accordance with the QAPP, additional samples were forwarded to the laboratory for QA/QC purposes, including an equipment rinsate blank collected each day of field sampling, a trip blank forwarded with all volatile organic samples, and a temperature blank accompanied each cooler.
4. NA – Not Applicable.

Table 2-4
Soil Boring, Geoprobe and Monitoring Well Construction Details
Reference and Bailey Point Locations

Boring Number	Well Number	Date Drilled	Northing	Easting	Ground Surface Elevation[1]	Top of PVC Elevation[1]	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Bedrock Depth[2]	Bedrock Elevation[1]	Screened Interval[2]
Reference											
MYRSSB01	RW-01	12/11/01	409606.5	622392.7	57.5	61.0	0.0	NA[3]	17.7	39.8	8.0-16.6
MYRSSB02	NA[3]	9/26/01	411734.2	623977.9	43.0	NA	0.0	NA	6.5	36.5	NA
MYRSSB05	RW-02	9/26/01	411641.3	623727.0	34.3	37.1	0.0	NA	24.5	9.8	13.4-23.4
MYRSSB03	RW-03	9/20/01	412606.5	625351.5	93.4	96.2	0.0	NA	5.7	87.7	13.0-23.0
MYRSSB04	RW-04	9/24/01	410993.9	625959.8	84.6	87.4	0.0	NA	4.0	80.6	6.0-16.0
Bailey Point											
98-1-OW	98-1-OW	12/12/98	408684.9	624569.1	38.1	40.9	2.0	36.1	18.5	19.6	6.5-16.5
98-9-OW	98-9-OW	12/11/98	409081.7	624858.5	31.3	34.0	7.5	23.8	25.0	6.3	12.0-22.0
98-10-OW	98-10-OW	12/11/98	409243.6	624613.2	31.4	34.2	18.0	13.4	48.0	-16.6	4.0-14.0
B-201	B-201	5/18/89[5]	407335.1	623861.1	20.6	20.0	4.0	16.6	10.0	10.2	54.5-59.5
B-202	B-202	5/25/89	407377.9	623834.1	20.4	ND[4]	10.5	9.9	15.4	5.0	7.3-66.4
B-203A	B-203A	5/20/89	407481.8	623666.5	20.8	ND	5.0	15.8	7.5	13.3	19.2-27.5
B-203B	B-203B	10/31/01	407475.9	623665.3	20.5	20.1	4.0	16.5	10.0	10.5	12.0-24.0
B-204A	B-204A	5/20/89	407788.7	623984.0	21.0	ND	9.8	11.2	9.8	11.2	23.1-30.6
B-205	B-205	5/16/89	407390.6	623772.4	20.0	19.9	9.0	11.0	9.0	11.0	2.5-13.7
B-206	B-206	5/16/89	407420.1	623823.8	19.6	19.1	13.5	6.1	13.5	6.1	11.0-23.0
B-206A	B-206A	10/30/01	407426.8	623823.8	19.8	19.5	7.5	12.3	7.5	12.3	9.5-21.0
BK-1	BK-1	6/1/92	407697.2	623734.6	21.0	20.7	16.8	4.2	16.8	4.2	8.5-16.4
MW-302A	MW-302A	10/4/01	409203.0	624679.3	29.5	32.9	15.0	14.5	43.3	-13.8	46.6-51.6
MW-302B	MW-302B	10/4/01	409200.8	624683.5	29.7	32.6	0.0	NA	>14.8	<14.9	3.7-13.7
MW-303A	MW-303A	10/8/01	408879.3	624864.7	39.1	41.4	0.0	NA	12.5	26.6	37.6-47.5
MW-303B	MW-303B	10/9/01	408876.8	624862.8	38.9	41.9	0.0	NA	13.0	25.9	4.5-12.5
MW-304A	MW-304A	10/2/01	408610.9	624504.0	45.5	48.2	0.0	NA	22.2	23.3	46.0-51.0
MW-304B	MW-304B	10/2/01	408610.6	624508.9	45.1	48.0	0.0	NA	>22	<23.1	10.7-20.7
MW-305A	MW-305A	10/4/01	409136.7	624170.9	25.2	28.0	12.0	13.2	60.3	-35.1	65.0-70.0
MW-305B	MW-305B	10/15/01	409131.8	624169.6	25.2	27.9	16.0	9.2	>16.0	<9.2	5.0-15.0

Table 2-4
Soil Boring, Geoprobe and Monitoring Well Construction Details
Reference and Bailey Point Locations

Boring Number	Well Number	Date Drilled	Northing	Easting	Ground Surface Elevation[1]	Top of PVC Elevation[1]	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Bedrock Depth[2]	Bedrock Elevation[1]	Screened Interval[2]
MY05SB01	MW-306	5/16/02	407349.9	624167.6	20.1	19.7	5.9	14.2	5.9	14.2	10.0-20.0
MY05SB02	MW-307	4/24/02	407323.5	623984.0	20.0	NA	6.5	13.6	6.5	13.6	10.0-20.0
MY05SB03	NA	4/25/02	407349.7	624085.3	20.1	NA	2.3	17.8	2.3	17.8	NA
MY05SB04	NA	10/16/01	407444.4	623780.7	20.4	NA	13.2	7.2	13.2	7.2	NA
MY05SB05	NA	10/16/01	407420.4	623789.9	20.1	NA	13.5	6.6	13.5	6.6	NA
MY05SB06	NA	10/17/01	407424.2	623757.0	20.1	NA	5.0	15.1	5.0	15.1	NA
MY05SB07	NA	10/17/01	407441.3	623736.8	19.9	NA	6.3	13.6	6.3	13.6	NA
MY05SB08	NA	10/18/01	407462.1	623732.4	19.7	NA	7.5	12.2	7.5	12.2	NA
MY05SB09	NA	10/18/01	407448.2	623757.0	19.8	NA	6.0	13.8	6.0	13.8	NA
MY05SB10	NA	10/29/01	407653.7	623667.0	20.9	NA	4.0	16.9	16.0	4.9	NA
MY05SB11	NA	10/29/01	407586.6	623659.6	20.6	NA	13.5	7.1	13.5	7.1	NA
MY05SB12	MW-312	10/22/01	407628.3	623899.2	20.4	20.1	10.5	9.9	10.5	9.9	13.0-25.7
MY05SB13	NA	10/22/01	407424.7	623847.5	19.6	NA	5.6	14.0	5.6	14.0	NA
MY05SB14	MW-317	10/29/01	407777.7	624410.0	24.9	27.7	14.0	10.9	14.2	10.7	17.0-27.0
MY05SB15	MW-308	10/30/01	407784.9	623985.9	20.7	24.1	15.4	5.3	15.4	5.3	3.5-16.0
MY05SB16	NA	10/31/01	407110.0	624280.0	19.0	NA	0.0	NA	>4.5	<14.5	NA
MY05SB17	NA	10/18/01	407897.0	624328.6	23.8	NA	5.0	18.8	5.0	18.8	NA
MY05SB18	NA	10/11/01	408006.3	623949.9	31.2	NA	1.2	30.0	>8.0	<23.2	NA
MY05SB19	NA	10/10/01	408132.7	624045.2	32.7	NA	4.0	28.7	>14.0	<18.7	NA
MY05SB20	NA	10/10/01	408216.9	624154.7	31.5	NA	8.7	22.8	8.7	22.8	NA
MY05SB21	NA	10/11/01	407976.2	624146.6	32.5	NA	5.2	27.3	5.2	27.3	NA
MY05SB22	NA	10/25/01	624552.3	408072.8	26.7	NA	NA	NA	8.4	18.3	NA
MY05SB23	MW-309	10/4/01	409749.8	623815.5	23.2	26.3	>21.0	<2.2	>21.0	<2.2	10.0-20.0
MY05SB24	NA	10/8/01	409569.1	623975.7	25.3	NA	10.5	14.84	10.5	14.8	NA
MY05SB25	MW-310	10/2/01	409376.9	625410.2	35.5	38.8	NA	NA	10.0	25.5	7.0-20.0
MY05SB36	NA	10/24/01	407942.0	623665.3	21.0	NA	4.0	17.0	>10.5	<10.5	NA
MY05SB37	MW-311	10/23/01	407999.3	623717.5	21.4	21.3	2.0	19.4	7.5	13.9	8.0-18.2

Table 2-4
Soil Boring, Geoprobe and Monitoring Well Construction Details
Reference and Bailey Point Locations

Boring Number	Well Number	Date Drilled	Northing	Easting	Ground Surface Elevation[1]	Top of PVC Elevation[1]	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Bedrock Depth[2]	Bedrock Elevation[1]	Screened Interval[2]
MY05SB38	NA	10/23/01	408042.2	623686.7	24.7	NA	2.9	21.8	2.9	21.8	NA
MY05SB39	NA	10/25/01	408034.1	623724.9	23.0	NA	6.0	17.0	6.4	16.6	NA
MY05SB40	NA	10/23/01	408067.4	623692.1	24.9	NA	3.0	21.9	3.0	21.9	NA
MY05SB41	NA	10/22/01	408088.1	623695.9	25.4	NA	1.5	23.9	2.4	23.0	NA
MY05SB42	NA	10/1/01	409798.4	624606.0	24.8	NA	>6.0	<18.9	>6.0	<18.9	NA
MY05SB43	NA	10/1/01	409781.5	624821.1	27.2	NA	>8.0	<19.2	>8.0	<19.2	NA
MY05SB44	MW-313	9/27/01	409704.1	624671.4	25.6	28.8	>16.0	<9.6	>16.0	<9.6	2.0-12.0
MY05SB45	MW-314	10/1/01	409649.9	624573.7	25.5	28.6	11.0	14.5	>19.0	<6.5	5.0-15.0
MY05SB46	MW-315	10/2/01	409581.0	624846.3	25.2	28.4	10.0	15.2	>16.0	<9.2	5.0-15.0
MY05SB47	MW-316	10/3/01	408686.7	624954.5	35.9	38.7	NA	NA	9.3	26.6	4.0-9.0
MW-318	MW-318	6/5/02	407495.4	624259.7	20.9	20.5	12.0	8.9	12.0	8.9	16.5-26.5
MY05SB48	MW-319	10/9/01	409290.3	623949.8	23.4	26.4	>16.0	<7.4	>16.0	<7.4	5.0-15.0
MY05SB49	MW-320	10/16/01	409625.7	624033.8	27.6	30.2	24.0	3.6	>32.0	<-4.4	12.3-27.3
MY05SB50	MW-321	11/14/01	408991.5	624057.4	16.1	17.9	>6.5	<9.6	>6.5	<9.6	1.5-6.5
MY05SB51	MW-322	11/14/01	408946.7	624131.8	17.4	18.7	>6.5	<10.9	>6.5	<10.9	1.5-6.5
MY05SB52	MW-323	10/17/01	410178.5	623892.1	23.7	26.7	23.5	0.2	>25.0	<-1.3	8.5-23.5
MY05SB54	MW-324	11/5/01	409584.9	625184.9	24.5	26.8	4.0	20.5	19.0	5.5	4.0-19.0
MY05SB110	NA	9/18/02	407864.6	623642.1	21.0	NA	ND	ND	6.0	15.0	NA
MW-401A	MW-401A	4/10/02	407656.8	623639.3	21.3	20.8	2.0	19.3	23.5	-2.2	29.0-39.0
MW-401B	MW-401B	4/15/02	407652.0	623639.3	21.2	20.7	2.0	19.2	>17.0	<4.2	6.0-16.0
MW-402	MW-402	4/8/02	407418.5	623727.6	20.0	19.4	1.8	18.2	1.8	18.2	9.5-19.5
MW-403	MW-403	4/18/02	407326.8	623917.1	20.2	19.7	2.7	17.6	8.2	12.0	19.0-29.0
MY05SB101	MW-404	4/29/02	408034.6	623448.4	27.1	27.1	2.0	25.1	11.3	15.8	14.7-24.7
MY05SB102	MW-405	4/29/02	407996.7	623468.3	26.5	26.5	0.5	26.0	10.0	16.5	13.3-23.3
MY05SB106A	MW-406A	5/20/02	408060.8	623593.8	26.1	25.8	6.0	20.1	25.3	0.8	30.0-40.0
MY05SB106B	MW-406B	5/28/02	408067.6	623593.9	26.1	25.6	6.0	20.1	16.0	<10.1	5.0-15.0
MY05SB103A	MW-407A	5/2/02	407959.4	623599.5	21.4	21.4	3.5	17.9	28.5	-7.1	35.0-45.0

Table 2-4
Soil Boring, Geoprobe and Monitoring Well Construction Details
Reference and Bailey Point Locations

Boring Number	Well Number	Date Drilled	Northing	Easting	Ground Surface Elevation[1]	Top of PVC Elevation[1]	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Bedrock Depth[2]	Bedrock Elevation[1]	Screened Interval[2]
MY05SB103B	MW-407B	5/8/02	407957.8	623606.1	21.4	21.4	3.6	17.8	14.6	<6.8	4.0-14.0
MY05SB105	MW-408	4/29/02	408077.1	623680.0	25.2	25.2	5.0	20.2	4.5	20.7	12.0-22.0
MY05SB104A	MW-409A	5/7/02	407948.1	623652.8	21.4	21.3	4.0	17.4	24.9	-3.5	35.0-45.0
MY05SB104B	MW-409B	5/8/02	407946.5	623658.1	21.3	20.9	4.0	17.3	15.0	<6.3	4.0-14.0
MW-413	MW-413	5/13/02	409428.3	624249.8	25.4	28.2	10.0	15.4	>22.0	<3.1	5.0-15.0
MW-414	MW-414	5/9/02	409885.9	624253.7	24.1	27.0	14.0	10.1	>20.0	<4.0	5.0-15.0
MW-415	MW-415	5/13/02	410199.7	624179.4	24.4	27.6	22.0	2.4	>28.0	<-3.6	5.0-15.0
MW-416	MW-416	5/14/02	410428.2	624028.3	24.3	27.0	16.8	7.5	>18.0	<6.0	5.0-15.0
MW-420	MW-420	9/23/02	408112.8	623698.9	25.5	25.2	2.1	23.4	2.1	23.4	10.0-25.0
MW-421	MW-421	9/19/02	407911.8	623730.4	20.9	20.7	7.5	13.4	7.5	13.4	11.3-22.3
MW-422A	MW-422A	9/17/02	407739.8	623583.7	21.8	24.6	4.0	17.8	14.0	7.8	17.8-27.8
MW-422B	MW-422B	9/18/02	407743.5	623581.3	21.6	24.4	4.0	17.6	>16.0	<5.6	4.1-14.1
MW-423A	MW-423A	9/10/02	407732.2	623496.0	18.9	21.4	0.0	NA	15.8	3.1	9.4-19.4
MW-423B	MW-423B	9/12/02	407738.1	623495.1	18.8	21.5	0.0	NA	15.8	3.0	4.9-14.9
MW-424A	MW-424A	9/4/02	408508.1	624699.2	39.4	42.2	4.0	35.4	8.0	31.4	50.0-60.0
MW-424B	MW-424B	9/9/02	408504.8	624702.3	39.2	42.0	4.0	35.2	8.0	31.2	12.2-22.2
MW-425	MW-425	9/9/02	408693.0	625045.0	28.4	30.9	0.0	NA	3.5	25.0	8.9-18.9
MW-429	MW-429	7/24/03	407868.0	624030.5	21.07	20.66	2.5	18.6	2.5	18.6	10.6-20.6
MY05GP101	NA	8/26/02	408120.9	623692.7	25.4	NA	4.0	21.4	4.0	21.4	NA
MY05GP102	NA	8/26/02	408098.8	623687.5	25.8	NA	3.3	22.5	3.3	22.5	NA
MY05GP103	NA	8/26/02	408094.8	623705.2	25.4	NA	11.3	14.1	11.3	14.1	NA
MY05GP104	NA	8/26/02	408089.1	623733.1	25.0	NA	7.5	17.5	7.5	17.5	NA
MY05GP105	NA	8/26/02	408074.8	623681.2	25.7	NA	3.2	22.5	3.2	22.5	NA
MY05GP106	NA	8/26/02	408072.8	623700.0	24.5	NA	5.9	18.6	5.9	18.6	NA
MY05GP107	NA	8/26/02	408067.2	623728.2	23.2	NA	2.8	20.4	2.8	20.4	NA
MY05GP108	NA	8/26/02	408058.0	623677.4	25.5	NA	2.4	23.1	2.4	23.1	NA
MY05GP109	NA	8/26/02	408057.5	623695.1	24.7	NA	4.1	20.6	4.1	20.6	NA

Table 2-4
Soil Boring, Geoprobe and Monitoring Well Construction Details
Reference and Bailey Point Locations

Boring Number	Well Number	Date Drilled	Northing	Easting	Ground Surface Elevation[1]	Top of PVC Elevation[1]	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Bedrock Depth[2]	Bedrock Elevation[1]	Screened Interval[2]
MY05GP110	NA	8/27/02	408048.2	623723.7	23.1	NA	2.0	21.1	2.0	21.1	NA
MY05GP111	NA	8/27/02	408031.2	623668.9	24.9	NA	0.0	NA	17.5	7.4	NA
MY05GP112	NA	8/27/02	408027.9	623686.6	24.4	NA	0.0	NA	0.0	24.4	NA
MY05GP113	NA	8/27/02	408021.3	623718.0	23.1	NA	6.2	16.9	6.2	16.9	NA
MY05GP114	NA	8/26/02	408102.5	623737.3	25.1	NA	0.0	NA	13.9	11.2	NA

Notes:

1. All elevations in feet referenced to NGVD
2. All depths in feet below ground surface (bgs)
3. NA – Not Applicable
4. ND – No Data collected
5. Original installation date, this location was re-drilled on 5/1/02

Table 2-5
Monitoring Well Field Water Quality Parameters
Reference and Bailey Point Locations

Well Number	Sample Date	Flow Rate (mL/min)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	Temperature (°C)	Conductivity (mS/cm)	pH	ORP (mV)	Turbidity (NTU)
Reference									
RW-01	10/17/01	898	28.5	3.1	11.1	0.25	6.07	250.1	0.4
	12/6/01	150	34.4	3.9	10.0	0.20	6.02	223.3	0.4
	6/24/02	78	22.4	2.5	10.6	0.18	6.05	263.7	0.0
	9/25/02	176	17.8	2.0	11.0	0.21	5.06	245.5	0.2
RW-02	10/24/01	66	21.9	2.5	10.3	0.31	7.64	200.1	12.0
	6/25/02	18	119.0	11.8	15.4	0.16	7.00	207.6	6.6
	9/26/02	6	65.5	6.9	12.6	0.24	7.27	155.6	32.0
RW-03	10/18/01	190	13.1	1.5	10.0	0.12	6.42	-359.5[3]	1.2
	6/25/02	250	117.1	12.5	12.2	0.07	5.89	254.1	20.1
	9/25/02	188	19.1	2.1	10.9	0.08	5.77	242.5	2.5
RW-04	10/22/01	70	69.1	7.5	11.4	0.21	7.17	249.6	19.0
	6/25/02	10	23.1	2.4	14.0	0.26	7.46	216.6	5.0
	9/25/02	20	28.6	2.8	16.6	0.30	7.25	57.8	17.0
Bailey Point									
98-1-OW	3/15/00	200	5.8[1]	5.8	6.4	0.18	6.51	231.3	65.0
98-9-OW	3/15/00	500	0.5[1]	0.5	8.5	0.13	6.09	301.6	35.0
98-10-OW[2]	6/14/00	B[2]	B	B	B	B	B	B	B
B-201	6/13/02	21	11.3	1.2	13.4	2.80	6.40	198.1	7.3
	10/7/02	22	20.0	1.9	16.4	2.46	6.47	-10.0	4.5
B-202	12/11/01	174	17.9	1.8	13.7	0.90	6.79	185.8	0.4
	6/3/02	250	24.8	2.5	15.1	0.67	7.10	154.7	0.4
B-203B	12/5/01	12	36.4	3.9	12.3	0.51	6.25	200.5	6.3
	6/4/02	80	2.5	0.3	12.7	0.55	6.14	265.6	112
B-205	12/5/01	84	47.9	5.2	11.8	0.56	6.86	168.6	0.8
	6/5/02	930	71.0	7.8	11.1	0.65	6.91	182.6	0.4
B-206	12/10/01	96	11.0	1.2	11.1	0.60	7.96	205.9	24.0
B-206A	12/10/01	96	29.9	3.2	11.7	0.45	6.64	266.1	2.8
	6/4/02	220	64.4	7.1	10.8	0.50	8.65	182.3	1.0

Table 2-5
Monitoring Well Field Water Quality Parameters
Reference and Bailey Point Locations

Well Number	Sample Date	Flow Rate (mL/min)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	Temperature (°C)	Conductivity (mS/cm)	pH	ORP (mV)	Turbidity (NTU)
BK-1	12/6/01	210	17.3	1.8	13.6	0.38	6.97	193.4	0.3
	6/6/02	280	130.8	14.3	11.31	0.72	6.93	193.9	0.08
MW-302A	12/13/01	8	31.0	3.8	6.6	0.30	7.47	184.6	80.0
	6/26/02	30	46.2	4.0	21.5	0.27	7.35	339.3	21.0
MW-302B	11/27/01	8	47.6	5.3	10.6	0.62	5.76	158.9	17.0
	7/1/02	22	117.8	10.0	23.1	0.58	5.69	142.4	5.1
	9/30/02	34	52.9	4.7	20.6	0.68	5.99	70.5	2.3
MW-303A	12/11/01	4	41.8	5.0	7.3	0.31	7.72	154.7	11.0
	6/24/02	6	54.3	4.3	26.4	0.39	7.46	100.5	4.3
MW-303B	12/5/01	60	13.1	1.4	11.4	0.19	6.04	211.3	3.9
	6/24/02	24	31.9	2.7	23.3	0.18	6.09	183.2	0.0
	10/1/02	22	87.9	8.5	16.7	0.18	6.38	168.3	3.4
MW-304A	11/15/01	48	23.7	2.6	11.6	0.13	6.82	158.4	11.0
	6/25/02	8	73.4	6.6	20.1	0.15	6.57	159.0	3.9
MW-304B	11/15/01	55	80.0	8.7	11.6	0.06	5.69	277.5	1.7
	6/25/02	26	66.1	5.9	20.69	0.07	5.25	206.8	2.7
	10/1/02	32	70.2	6.9	16.1	0.07	5.66	210.7	8.1
MW-305A	11/29/01	40	110.6	14.3	4.5	0.24	6.63	174.2	12.0
	6/26/02	20	96.2	7.8	25.6	0.25	7.12	189.3	5.4
MW-305B	11/29/01	10	67.3	7.5	10.7	1.49	6.35	260.1	40.0
	6/26/02	100	69.8	6.0	22.6	1.75	6.09	142.0	28.8
MW-306	6/11/02	240	63.5	6.9	11.8	0.67	6.01	267.7	1.8
	10/7/02	74	81.4	8.0	15.8	0.64	5.87	205.1	10.4
MW-307	6/13/02	210	9.7	1.1	11.23	0.65	8.57	-103.3	3.2
	10/7/02	76	13.9	1.4	16.2	0.73	7.70	-42.2	3.6
MW-308	12/12/01	150	2.7	0.3	9.5	0.44	7.22	62.9	3.0
	6/11/02	184	7.9	0.9	11.6	0.42	7.37	-40.2	3.3
MW-309	11/28/01	10	47.4	5.8	6.8	6.21	6.31	-35.2	4.3
	7/2/02	28	98.9	8.5	22.3	7.99	6.19	-42.6	17.0

Table 2-5
Monitoring Well Field Water Quality Parameters
Reference and Bailey Point Locations

Well Number	Sample Date	Flow Rate (mL/min)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	Temperature (°C)	Conductivity (mS/cm)	pH	ORP (mV)	Turbidity (NTU)
MW-310	11/26/01	8	78.5	8.5	11.6	0.18	6.12	279.8	2.1
MW-311	11/12/01	48	6.2	0.7	10.9	0.26	6.34	-351.0	45.0
	9/30/02	20	21.3	1.9	21.7	0.33	6.10	24.2	1.6
MW-312	12/6/01	80	74.0	7.6	14.2	0.32	10.22	112.3	13.0
	6/11/02	232	4.6	0.5	13.6	0.33	10.02	62.9	9.6
MW-313	12/10/01	4	87.2	9.8	10.0	0.77	6.54	224.7	2.1
	7/3/02	10	277.0[3]	(3)	32.8[3]	1.18	5.97	439.7	18.0
	9/30/02	20	84.2	7.6	19.7	0.98	6.12	139.3	1.6
MW-314	12/3/01	8	33.5	3.7	11.4	0.60	6.28	218.9	0.8
	7/8/02	12	102.8	8.8	22.8	0.88	5.84	68.1	2.8
MW-315	11/19/01	80	13.8	1.5	12.5	1.31	6.05	153.7	0.7
	7/8/02	18	20.8	1.7	23.9	1.69	5.92	67.7	3.0
MW-316	12/6/01	8	87.3	8.4	16.8	0.15	5.90	279.6	2.2
	7/1/02	110	31.7	3.0	17.4	0.13	5.67	243.0	1.2
	9/25/02	24	41.0	3.8	19.3	0.14	5.70	246.6	1.4
MW-317	12/5/01	10	204.1[3]	(3)	14.4	0.43	5.92	203.7	5.1
MW-318	6/13/02	146	25.1	2.6	12.9	0.38	6.43	21.2	6.3
	10/7/02	36	48.4	4.6	17.6	0.47	6.71	-26.8	3.3
MW-319	11/27/01	60	17.4	1.9	11.6	0.87	6.64	-52.6	5.8
	7/2/02	184	27.5	2.8	13.6	0.67	6.46	-30.9	1.1
MW-320	11/28/01	60	20.6	2.4	8.0	2.70	5.82	86.9	1.5
	7/2/02	24	143.6	11.2	27.5	2.84	5.92	166.0	23.0
MW-321	11/27/01	22	68.9	7.6	10.7	0.53	5.97	241.1	11.7
	7/8/02	12	65.8	(3)	31.5[3]	0.31	6.26	418.6	10.0
MW-322	12/4/01	10	41.4	4.6	10.4	1.32	6.23	156.6	10.7
	7/8/02	15	95.9	7.8	25.2	1.75	6.17	37.4	5.9
MW-323	11/20/01	52	12.7	1.5	8.8	21.74	6.26	12.3	6.8
	7/9/02	10	27.5	2.4	21.8	24.80	5.84	-18.2	15.0
MW-324	12/10/01	35	19.9	2.4	7.7	0.27	6.72	-24.8	26.0

Table 2-5
Monitoring Well Field Water Quality Parameters
Reference and Bailey Point Locations

Well Number	Sample Date	Flow Rate (mL/min)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	Temperature (°C)	Conductivity (mS/cm)	pH	ORP (mV)	Turbidity (NTU)
MW-401A	6/10/02	30	153.1[3]	(3)	18.0	0.39	6.21	170.3	15.9
	9/18/02	30	60.9	5.6	19.5	0.51	6.92	-15.5	7.9
MW-401B	6/10/02	50	134.9[3]	11.7	21.9	0.88	11.56	-57.2	14.3
	9/17/02	15	63.5	5.4	23.2	0.84	11.32	-5.1	20.4
MW-402	6/5/02	18	127.3	12.9	14.6	0.51	7.03	178.7	2.51
	9/18/02	10	123.9	10.9	21.1	0.14	8.10	213.8	40.1
MW-403	6/10/02	14	73.0	7.2	16.0	1.50	6.48	165.2	0.1
	10/7/02	62	13.3	1.3	15.5	0.74	6.76	75.6	3.2
MW-404	6/18/02	20	36.9	3.8	14.0	0.32	5.96	43.6	42.5
	10/2/02	24	19.0	1.8	17.9	0.41	6.22	-28.2	16.9
MW-405	6/18/02	10	25.3	2.4	17.2	0.37	6.48	246.6	5.2
	10/2/02	8.3	48.4	4.3	20.9	0.32	6.32	159.0	1.2
MW-406A	6/18/02	8	26.6	2.4	19.1	0.33	6.94	168.7	30.0
	10/3/02	9	39.0	3.5	20.0	0.38	7.03	228.6	5.3
MW-406B	6/18/02	10	39.4	3.5	20.3	0.46	7.04	165.3	15.0
	10/3/02	10	60.8	5.5	19.7	0.40	7.07	22.6	5.9
MW-407A	6/17/02	126	11.7	1.2	12.7	0.29	6.72	-34.1	3.2
	10/2/02	36	113.0	9.9	21.5	0.26	6.76	-48.2	1.9
MW-407B	6/18/02	10	5.9	0.5	18.8	0.40	7.30	231.2	3.0
	10/2/02	6	83.7	6.9	24.4	0.32	6.93	260.5	7.0
MW-408	6/17/02	174	48.2	5.0	13.2	0.67	5.81	180.8	0.0
	10/2/02	104	165.4[3]	(3)	17.7	0.54	5.89	267.8	2.4
MW-409A	6/17/02	5	13.8	1.5	12.6	0.25	6.60	209.6	2.2
	10/2/02	46	38.9	3.6	18.8	0.26	6.55	60.5	2.6
MW-409B	6/17/02	2	51.3	4.9	16.9	0.27	7.02	205.1	0.0
	10/2/02	10	49.2	4.0	25.1	0.32	6.92	284.6	2.9
MW-413	6/19/02	72	15.9	1.6	16.0	1.04	5.90	-6.5	11.0
	9/25/02	90	10.2	1.0	17.0	0.95	5.83	-59.6	11.9
MW-414	6/19/02	10	39.7	3.3	23.9	1.94	5.85	76.9	26.3

Table 2-5
Monitoring Well Field Water Quality Parameters
Reference and Bailey Point Locations

Well Number	Sample Date	Flow Rate (mL/min)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	Temperature (°C)	Conductivity (mS/cm)	pH	ORP (mV)	Turbidity (NTU)
	9/26/02	16	23.8	2.3	16.9	2.50	5.89	32.5	49.1
MW-415	6/24/02	10	48.3	4.0	24.8	20.37	5.61	35.9	28.9
	9/30/02	4	73.4	6.0	25.0	9.25	5.62	70.1	15.4
MW-416	6/20/02	546	46.2	5.1	10.9	1.50	6.31	-43.9	9.2
	9/26/02	26	42.1	3.7	20.7	2.82	6.01	32.6	20.0
MW-420	10/1/02	290	25.8	2.6	14.5	0.40	6.34	152.7	4.1
MW-421	10/1/02	126	8.1	0.8	17.1	0.46	6.58	-27.4	3.8
MW-422A	10/1/02	34	65.9	6.1	18.9	0.32	6.49	191.7	4.4
MW-422B	10/1/02	10	76.6	6.6	22.5	0.19	6.65	210.0	40.0
MW-423A	10/3/02	30	19.6	2.1	12.9	0.31	6.78	-2.4	8.0
MW-423B	10/3/02	30	36.2	3.8	12.7	0.24	6.52	215.8	3.4
MW-424A	9/26/02	30	19.2	1.7	19.8	0.19	7.16	-49.5	45.0
MW-424B	9/25/02	45	63.2	5.7	20.2	0.23	6.47	127.3	8.5
MW-425	9/24/02	200	17.2	1.7	15.7	0.16	5.72	253.7	0.0
MW-429	9/29/03	30	68.2	6.16	19.87	0.213	7.22	241.6	(3)

Notes:
1. Dissolved Oxygen measured in milligrams per liter (mg/L).
2. Water quality parameters not collected, well sampled using a bailer (B).
3. Water quality parameters not representative of in-situ conditions.

Units:
mL/min – milliliters per minute
% - percent
°C – degrees Celsius
mS/cm – milliSiemens per centimeter
mV – millivolts
NTUs – Nephelometric Turbidity Units

Table 2-6
Groundwater Elevations
Reference and Bailey Point Locations

Well Number	Groundwater Elevation[1] 12/11/01	Depth to Groundwater[2] 12/11/01	Groundwater Elevation[1] 4/01/02	Depth to Groundwater[2] 4/01/02	Groundwater Elevation[1] 9/16/02	Depth to Groundwater[2] 9/16/02	Groundwater Elevation[1] 11/13/02	Depth to Groundwater[2] 11/13/02
Reference								
RW-01	61.26	-0.24	62.06	-1.04	57.87	3.15	NM[3]	NM
RW-02	15.09	22.05	24.63	12.51	16.03	21.11	NM	NM
RW-03	89.74	6.45	94.60	1.59	87.99	8.20	NM	NM
RW-04	80.43	6.97	84.61	2.79	79.20	8.20	NM	NM
Bailey Point								
98-1-OW	NM	NM	NM	NM	NM	NM	NM	NM
98-9-OW	NM	NM	NM	NM	NM	NM	NM	NM
98-10-OW	NM	NM	NM	NM	NM	NM	NM	NM
B-201	8.51	11.45	12.14	7.82	9.07	10.89	NM	NM
B-202	NM	NM	NM	NM	8.43	11.95	NM	NM
B-203A	NM	NM	NM	NM	NM	NM	NM	NM
B-203B	9.54	10.57	12.20	7.91	10.83	9.28	NM	NM
B-204A	NM	NM	NM	NM	NM	NM	NM	NM
B-205	8.21	11.67	10.38	9.50	8.54	11.34	NM	NM
B-206	8.25	10.88	10.81	8.32	9.30	9.83	NM	NM
B-206A	8.33	11.19	10.78	8.7	10.21	9.3	NM	NM
BK-1	11.86	8.80	11.95	8.71	11.03	9.63	11.94	8.72
MW-302A	26.37	6.53	27.84	5.06	26.21	6.69	NM	NM
MW-302B	26.17	6.39	26.30	6.26	29.48	3.08	NM	NM
MW-303A	29.79	11.65	34.65	6.79	30.03	11.41	NM	NM
MW-303B	30.48	11.42	35.32	6.58	30.32	11.58	NM	NM
MW-304A	28.95	19.29	34.47	13.77	29.62	18.62	NM	NM
MW-304B	30.03	18.01	36.81	11.23	30.87	17.17	NM	NM
MW-305A	18.10	9.86	18.89	9.07	17.65	10.31	NM	NM
MW-305B	13.20	14.71	17.82	10.09	17.49	10.42	NM	NM
MW-306	NI[4]	NI	NI	NI	11.23	8.43	NM	NM

Table 2-6
Groundwater Elevations
Reference and Bailey Point Locations

Well Number	Groundwater Elevation[1] 12/11/01	Depth to Groundwater[2] 12/11/01	Groundwater Elevation[1] 4/01/02	Depth to Groundwater[2] 4/01/02	Groundwater Elevation[1] 9/16/02	Depth to Groundwater[2] 9/16/02	Groundwater Elevation[1] 11/13/02	Depth to Groundwater[2] 11/13/02
MW-307	NI	NI	NI	NI	11.68	8.37	NM	NM
MW-312	9.10	10.96	10.49[5]	9.57[5]	11.35	8.71	NM	NM
MW-317	9.98	17.73	12.02	15.69	9.08	18.63	NM	NM
MW-308	14.57	9.51	16.15	7.93	14.00	10.08	15.62	8.46
MW-309	7.12	19.14	7.81	18.45	6.36	19.90	NM	NM
MW-310	23.59	15.17	25.92	12.84	24.79	13.97	NM	NM
MW-311	14.00	7.26	15.45	5.81	13.91	7.35	15.22	6.04
MW-313	23.34	5.49	24.49	4.34	22.11	6.72	NM	NM
MW-314	20.23	8.38	22.28	6.33	20.68	7.93	NM	NM
MW-315	23.24	5.14	24.43	3.95	23.08	5.30	NM	NM
MW-316	28.40	10.28	34.52	4.16	29.18	9.50	NM	NM
MW-318	NI	NI	NI	NI	8.08	12.40	NM	NM
MW-319	13.62	12.78	14.51	11.89	13.49	12.91	NM	NM
MW-320	14.91	15.29	17.03	13.17	16.95	13.25	NM	NM
MW-321	15.55	2.32	15.59	2.28	14.83	3.04	NM	NM
MW-322	16.36	2.33	16.50	2.19	15.74	2.95	NM	NM
MW-323	11.57	15.10	14.10	12.57	12.27	14.40	NM	NM
MW-324	22.48	4.32	25.68	1.12	22.05	4.75	NM	NM
MW-401A	NI	NI	NI	NI	8.75	12.05	9.48	11.32
MW-401B	NI	NI	NI	NI	15.72	4.94	16.77	3.89
MW-402	NI	NI	NI	NI	10.80	8.64	NM	NM
MW-403	NI	NI	NI	NI	9.39	10.28	NM	NM
MW-404	NI	NI	NI	NI	8.23	18.90	9.11	18.02
MW-405	NI	NI	NI	NI	9.58	16.89	10.40	16.07
MW-406A	NI	NI	NI	NI	18.83	6.95	17.25	8.53
MW-406B	NI	NI	NI	NI	18.67	6.90	19.31	6.26
MW-407A	NI	NI	NI	NI	NM	NM	14.87	6.56

Table 2-6
Groundwater Elevations
Reference and Bailey Point Locations

Well Number	Groundwater Elevation[1] 12/11/01	Depth to Groundwater[2] 12/11/01	Groundwater Elevation[1] 4/01/02	Depth to Groundwater[2] 4/01/02	Groundwater Elevation[1] 9/16/02	Depth to Groundwater[2] 9/16/02	Groundwater Elevation[1] 11/13/02	Depth to Groundwater[2] 11/13/02
MW-407B	NI	NI	NI	NI	17.49	3.86	18.97	2.38
MW-408	NI	NI	NI	NI	16.17	9.02	18.11	7.08
MW-409A	NI	NI	NI	NI	12.76	8.53	14.13	7.16
MW-409B	NI	NI	NI	NI	16.26	4.60	18.69	2.17
MW-413	NI	NI	NI	NI	17.11	11.14	NM	NM
MW-414	NI	NI	NI	NI	18.43	8.55	NM	NM
MW-415	NI	NI	NI	NI	18.05	9.50	NM	NM
MW-416	NI	NI	NI	NI	18.74	8.25	NM	NM
MW-420	NI	NI	NI	NI	NI	NI	18.16	6.99
MW-421	NI	NI	NI	NI	NI	NI	12.98	7.76
MW-422A	NI	NI	NI	NI	NI	NI	11.08	13.51
MW-422B	NI	NI	NI	NI	NI	NI	13.97	10.48
MW-423A	NI	NI	NI	NI	10.47	10.90	11.74	9.63
MW-423B	NI	NI	NI	NI	12.47	9.02	10.61	10.88
MW-424A	NI	NI	NI	NI	29.08	13.16	NM	NM
MW-424B	NI	NI	NI	NI	29.45	12.50	NM	NM
MW-425	NI	NI	NI	NI	24.05	6.88	NM	NM

Notes:

1. Elevations in feet referenced to NGVD
2. All depths in feet below ground surface (bgs)
3. NM – Water level Not Measured
4. NI – Monitoring well Not Installed by this date
5. Water level collected 4/4/02

Table 2-7
Test Pit Construction Details
Bailey Point

Test Pit Number	Date Excavated	Northing	Easting	Ground Surface Elevation[1]	Depth of Pit[2]	Refusal?	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Depth to Bedrock[2]	Bedrock Elevation[1]	Depth to GW[2]	GW Elevation[1]
MY05TP01	10/23/01	408020.3	623480.2	28.4	10.0	N	0.5	27.9	10.0	18.4	>10.0	<18.4
MY05TP02	10/24/01	408098.4	623479.1	28.7	4.8	Y	2.5	26.2	4.8	23.9	>4.8	<23.9
MY05TP03	10/23/01	408155.7	623511.3	30.0	7.5	Y	0.0	30.0	7.5	22.5	>7.5	<22.5
MY05TP06	10/22/01	407835.7	623577.4	20.6	6.5	N	2.5	18.1	>6.5	<14.1	6.0	14.6
MY05TP07	10/27/01	407869.2	623605.1	20.9	5.5	Y	5.5	15.4	5.5	15.4	>5.5	<15.4
MY05TP08	10/22/01	407904.1	623591.4	20.7	6.5	Y	5.0	15.7	6.5	14.2	>6.5	<14.2
MY05TP09	11/28/01	407949.7	623467.0	26.2	10.7	Y	1.9	24.3	10.7	15.6	8.0	18.2
MY05TP10	11/27/01	407978.2	623472.3	27.0	10.0	Y	2.5	24.5	10.0	17.0	>10.0	<17.0
MY05TP12	11/27/01	408003.8	623459.4	26.6	7.3	Y	0.0	26.6	7.3	19.2	>7.3	<19.2
MY05TP13	11/27/01	408000.3	623436.5	26.2	8.3	Y	0.0	26.2	8.3	17.9	>8.3	<17.9
MY05TP15	11/27/01	408029.3	623456.8	27.0	9.0	Y	0.5	26.5	9.0	18.0	>9.0	<18.0
MY05TP16	11/27/01	408038.0	623440.1	26.7	8.5	Y	1.5	25.2	8.5	18.2	>8.5	<18.2
MY05TP18	11/28/01	408063.8	623447.0	27.3	9.8	Y	1.5	25.8	9.8	17.5	>9.8	<17.5
MY05TP19	11/26/01	408052.1	623482.7	29.6	13.3	Y	0.0	29.6	13.3	16.3	>13.3	<16.3
MY05TP21	11/26/01	408109.1	623458.3	26.8	3.5	Y	0.0	26.8	3.5	23.3	>3.5	<23.3
MY05TP101	6/19/02	409582.5	625206.4	33.5	4.5	N	>4.5	<29.0	>4.5	<29.0	4.5	29.0
MY05TP102	6/19/02	409566.7	625213.0	34.0	5.0	N	2.5	31.6	>5.0	<29.0	2.5	31.6
MY05TP103	6/19/02	409581.4	625196.8	32.7	5.0	N	3.0	29.7	>5.0	<27.7	3.0	29.7
MY05TP104A	6/17/02	408716.9	624972.3	37.6	8.0	N	0.0	37.6	>8.0	<29.6	7.0	30.6
MY05TP104B	6/17/02	408727.3	624987.5	37.4	10.0	N	0.0	37.4	>10.0	<27.4	9.0	28.4
MY05TP104C	6/17/02	408740.6	624999.7	38.6	7.0	N	0.0	38.6	>7.1	<31.5	7.0	31.6
MY05TP104D	6/17/02	408728.8	624981.1	38.2	9.0	N	4.0	34.2	9.0	29.2	>9.0	<29.2
MY05TP104E	6/17/02	408761.8	624948.5	43.2	12.0	N	2.0	41.2	12.0	31.2	9.0	34.2
MY05TP104F	6/17/02	408784.1	624921.2	43.9	12.0	N	2.0	41.9	12.0	31.9	10.0	33.9
MY05TP104G	6/17/02	408764.8	624905.8	43.9	17.5	Y	NA[3]	NA	NA	26.4	10.0	33.9
MY05TP104H	6/17/02	408746.3	624890.9	44.5	17.5	Y	0.0	44.5	17.5	27.0	7.0	37.5

Table 2-7
Test Pit Construction Details
Bailey Point

Test Pit Number	Date Excavated	Northing	Easting	Ground Surface Elevation[1]	Depth of Pit[2]	Refusal?	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Depth to Bedrock[2]	Bedrock Elevation[1]	Depth to GW[2]	GW Elevation[1]
MY05TP104I	6/17/02	408728.8	624981.0	38.2	10.0	N	2.0	36.2	10.0	28.2	8.0	30.2
MY05TP104J	6/17/02	408706.2	625001.8	34.9	6.0	Y	0.0	34.9	6.0	28.9	5.0	29.9
MY05TP104K	6/17/02	408715.1	625011.6	34.5	6.0	Y	0.0	34.5	6.0	28.5	5.0	29.5
MY05TP104L	6/18/02	408806.9	624896.1	44.7	18.0	Y	2.0	42.7	18.0	26.7	10.0	34.7
MY05TP104M	6/18/02	408788.3	624879.0	44.6	15.0	N	2.0	42.6	15.0	29.6	10.0	34.6
MY05TP104N	6/18/02	408770.4	624862.4	44.9	15.0	N	2.0	42.9	15.0	29.9	10.0	34.9
MY05TP104O	6/18/02	408824.8	624912.5	44.6	16.0	Y	2.0	42.6	16.0	28.6	>16.0	<28.6
MY05TP104P	6/18/02	408758.7	624972.7	42.6	21.0	Y	2.5	40.2	21.0	21.6	9.0	33.6
MY05TP104Q	6/18/02	408732.2	624953.7	41.7	18.0	N	2.0	39.7	>18.0	<23.7	9.0	32.7
MY05TP105	5/16/02	407428.5	624165.1	19.7	4.0	N	>4.0	<15.7	>4.0	<15.7	>4.0	<15.7
MY05TP107	6/3/02	409906.1	623991.2	24.6	15.0	N	5.0	19.6	>15.0	<9.6	>15.0	<9.6
MY05TP107A	6/3/02	409891.1	623991.2	24.6	15.0	N	ND[4]	ND	>15.0	<9.6	10.0	14.6
MY05TP108 - 345	6/3/02	409878.4	623986.5	25.0	15.0	N	>15.0	<10.0	>15.0	<10.0	10.0	15.0
MY05TP108 - BH	6/19/02	ND	ND	ND	4.0	N	ND	ND	ND	ND	ND	ND
MY05TP109	6/3/02	409854.0	623981.7	24.9	15.0	N	>15.0	<9.9	>15.0	<9.9	9.5	15.4
MY05TP110	6/3/02	409830.8	623977.6	25.0	15.0	N	>15.0	<10.0	>15.0	<10.0	10.0	15.0
MY05TP110A	6/4/02	409815.8	623977.6	25.0	15.0	N	ND	ND	ND	ND	11.5	13.5
MY05TP111	6/4/02	409806.9	623973.2	25.0	15.0	N	>15.0	<10.0	>15.0	<10.0	>15.0	<10.0
MY05TP111A	6/4/02	409791.9	623973.2	25.0	15.0	N	ND	ND	ND	ND	11.5	13.5
MY05TP112	6/4/02	409781.8	623969.1	24.8	15.0	N	>15.0	<9.8	>14.9	<9.9	11.5	13.4
MY05TP113	6/5/02	409757.0	623964.8	25.2	15.0	N	>15.0	<10.2	>15.0	<10.2	10.3	14.8
MY05TP114	6/5/02	409732.5	623960.3	25.1	15.0	N	>15.0	<10.1	>15.0	<10.1	12.0	13.1
MY05TP115	6/5/02	409707.7	623956.1	25.2	15.0	N	>15.0	<10.2	>15.0	<10.2	>15.0	<10.2
MY05TP116	6/6/02	409683.3	623951.9	25.2	15.0	N	>15.0	<10.2	>15.0	<10.2	>15.0	<10.2
MY05TP117	6/6/02	409658.5	623947.5	25.0	15.0	N	>15.0	<10.0	>15.0	<10.0	>15.0	<10.0
MY05TP118	6/6/02	409634.0	623943.4	24.8	15.0	N	14.0	10.8	>15.0	<9.8	>15.0	<9.8

Table 2-7
Test Pit Construction Details
Bailey Point

Test Pit Number	Date Excavated	Northing	Easting	Ground Surface Elevation[1]	Depth of Pit[2]	Refusal?	Depth to Base of Fill[2]	Base of Fill Elevation[1]	Depth to Bedrock[2]	Bedrock Elevation[1]	Depth to GW[2]	GW Elevation[1]
MY05TP119-345	6/6/02	409609.3	623938.6	25.0	15.0	N	13.6	11.4	>15.0	<10.0	>15.0	<10.0
MY05TP119-FPPH	10/28/02	408242.4	623766.7	20.0	4.0	Y	4.0	16.0	4.0	16.0	3.0	17.0
MY05TP120	6/6/02	409584.8	623934.2	24.6	15.0	N	13.6	11.0	>15.0	<9.6	>15.0	<9.6
MY05TP121	6/6/02	409560.2	623929.9	24.2	15.0	N	14.3	9.9	>15.0	<9.2	>15.0	<9.2
MY05TP122	6/6/02	409535.6	623924.9	24.6	15.0	N	14.0	10.6	>15.0	<9.6	>15.0	<9.6
MY05TP123	6/6/02	409512.1	623920.6	24.3	15.0	N	14.0	10.3	>15.0	<9.3	>15.0	<9.3
MY05TP124	6/10/02	409489.6	623931.4	24.5	15.0	N	14.0	10.5	>15.0	<9.5	>15.0	<9.5
MY05TP125	6/10/02	409467.5	623942.4	24.8	15.0	N	14.0	10.8	>15.0	<9.8	>15.0	<9.8
MY05TP126	6/10/02	409444.6	623953.0	24.6	8.0	N	>8.0	<16.6	>8.0	<16.6	>8.0	<16.6
MY05TP129	6/10/02	409376.7	623985.7	25.9	15.0	N	14.0	11.9	>15.0	<10.9	14.0	11.9
MY05TP130	6/10/02	409354.6	623995.5	26.3	15.0	N	>15.0	<11.3	>15.0	<11.3	>15.0	<11.3

Notes:

1. All elevations in feet referenced to NGVD
2. All depths in feet below ground surface (bgs)
3. NA – Not Applicable
4. ND – No Data collected

Table 2-8
Summary of Diffuser Sampling Program

Analytical Parameter	Field Samples	Field Duplicates	Number of MS/MSDs	Total Samples
Reference				
VOC	2	0	0	2
SVOC	2	0	0	2
PCB	2	0	0	2
SIM PAH	2	0	0	2
PCB Congeners and Homologues	2	0	0	2
Pesticide	2	0	0	2
TAL Metals	2	0	0	2
EPH	2	0	0	2
Grain Size	2	0	NA	2
TOC	2	0	0	2
Total Solids	2	0	0	2
Diffuser				
VOC	6	1	2	9
SVOC	6	1	2	9
PCB	6	1	2	9
SIM PAH	6	1	2	9
PCB Congeners and Homologues	6	1	2	9
Pesticide	6	1	2	9
TAL Metals	6	1	2	9
EPH	6	1	2	9
Grain Size	6	1	NA	7
TOC	6	1	2	9
Total Solids	6	1	2	9
TOTAL	**88**	**11**	**20**	**119**

Table 2-9
Summary of Field TSA

Finding	Category*	Corrective Action
Oxygen/LEL meter not operating correctly.	Neutral	Oxygen/LEL meter replaced. The drilling was being conducted at a reference location where contamination was not anticipated.
Damage to existing monitoring wells.	Neutral	Completed planned soil borings as monitoring wells following communication with MDEP. The change was documented using the QAPP change order process and would be documented in RFI Report.
Collected soil boring surface sample approximately 5 feet from proposed boring location.	Nonconformance (Weakness)	Corrected in field; field crews instructed to collect surface sample prior to setting up soil boring rig.
Analyte-free water not being used to prepare equipment blank.	Nonconformance (Weakness)	Corrected in field; field crews instructed to perform final decontamination rinse using HPLC grade analyte-free water.
Information regarding soil sampling not fully documented.	Nonconformance (Weakness)	Corrected in field; the required information was documented elsewhere, which was transcribed into the field logbook. This modification was documented through QAPP page revisions.
Modified sediment sample location identifiers.	Neutral	Modification properly documented in field logbook and documented through QAPP page revisions.
Modifications to subtidal sample locations.	Positive	Noteworthy modification properly documented in field logbook and communicated to project leads.
Health and safety training for individual involved with collection of sediment and biota samples.	Neutral	Training not necessary based on current level of understanding of chemical contamination.
Collected surface water samples using a peristaltic pump with Teflon tubing.	Positive	Use of the peristaltic pump reduces the potential for cross contamination and eliminates the need for equipment decontamination.
Change in surface water sample location.	Positive	The relocation was required to obtain sufficient volume and representative sample.
Monitoring well not fitted with padlock	Nonconformance (Weakness)	Corrected in field; a padlock was installed.

Notes:
* Category descriptions:

Positive – noteworthy practices or conditions;
Neutral – observations, which are neither positive nor negative; and
Nonconformances – deviations from standards and documented practices, subdivided into deficiencies (adverse impact to data quality) and weaknesses (could result in unacceptable data).

Table 2-10
Summary of Laboratory TSA

Finding	Category*	Corrective Action
Katahdin Analytical Services		
Shipping coolers should be managed in a way to minimize potential exposure to cooler contents.	Neutral	Required coolers with broken samples to be opened in the hood or outside. Additional hood space may be acquired.
The volume and traceability of supplemental preservative for pH adjustment not recorded.	Nonconformance (Weakness)	A procedure for tracking and recording lot numbers for these preservatives was initiated.
Incomplete documentation for storage refrigerator temperatures.	Nonconformance (Weakness)	Laboratory personnel were reminded of the documentation requirements associated with sample storage.
Time delay between removal and return of samples from storage refrigerators.	Nonconformance (Weakness)	Analysts were reminded about the conditions associated with sample storage.
Illegible internal custody records.	Nonconformance (Weakness)	Analysts were reminded of documentation requirements.
Out of date training records.	Nonconformance (Weakness)	Analysts were reminded of documentation requirements.
Have not performed or compiled proficiency demonstrations for all SW-846 methods.	Nonconformance (Weakness)	Analysts were reminded of documentation requirements. Training is ongoing and documented upon completion.
Incomplete implementation of root cause corrective action program.	Nonconformance (Weakness)	Completion and implementation of the root cause corrective action program will be completed in a timely manner.
Client confidentiality not maintained.	Nonconformance (Weakness)	The information reviewed was not related to Maine Yankee and was not considered confidential.
Complete validation of software system.	Positive	Validation will be performed when the new system is put on-line.
Balance not verified with weights that cover the torsion range of object(s) being weighed during organic extraction.	Neutral	Difference is considered minimal.
Improper depth of sonic probe during organic extraction.	Nonconformance (Weakness)	General guidance is followed and the depth is dependent on the level of the soil, the level of the solvent and on the specific manufacturer's instructions.
SVOC spiking solutions not stored as specified in SW-846 methods.	Nonconformance (Weakness)	Policies will be evaluated and corrected if these conditions adversely affect the analyses.
Improper storage of SVOC extracts.	Nonconformance (Weakness)	The materials are stored per Method 3550B and 3520C.
Confirm correct hardware being used for Method 8260B.	Nonconformance (Weakness)	Equivalent performance was demonstrated to allow for an alternative purge device as allowed by Method 5030B.

Table 2-10
Summary of Laboratory TSA

Finding	Category*	Corrective Action
Not using recommended internal standards for 8260B analysis.	Neutral	The compounds are considered acceptable per the 8260B Method and are specified in the QAPP.
Encore extraction log not signed by the analyst.	Nonconformance (Weakness)	Analysts were reminded of documentation requirements.
Using a water laboratory control matrix for soil 8260B analysis.	Nonconformance (Weakness)	Unable to locate a certified soil or solid matrix for volatile organic LCS. An example of a blank soil was provided.
Only spiking for the five control analytes for LCS and MS/MSD for 8260B analysis.	Neutral	The QAPP states that 70-130% recovery criteria will be used and that action will be taken on a short list of compounds. It is understood that in some cases the corrective action does not necessarily change the application of data validation guidelines and resultant flagging of data.
Not spiking for all analytes of interest for LCS and MS/MSD for 8260B analysis.	Nonconformance (Weakness)	Because there is no historical data available, this guidance for spiking levels does not apply.
Illegible entries in the GC/MS VOA injection log.	Nonconformance (Weakness)	Analysts were reminded of documentation requirements.
Only spiking for the control analytes for LCS and MS/MSD for 8270C analysis.	Neutral	The QAPP lists specific recovery criteria for a short list of compounds only and the actions to be taken on those compounds. It is understood that in some cases the corrective action does not necessarily change the application of data validation guidelines and resultant flagging of data.
Not spiking for all analytes of interest for LCS and MS/MSD for 8270C analysis.	Nonconformance (Weakness)	Because there is no historical data available, this guidance for spiking levels does not apply.
Should use the dual-column reporting scenario required by Method 8081A/8082.	Nonconformance (Weakness)	The practice for reporting of dual column methods was revised consistent with the appropriate SW-846 methods.
Should use volumetric lab ware for metals preparation.	Nonconformance (Weakness)	This slight difference is insignificant compared to the tolerances presented in the guidance. The difference is also minimized since the initial and final volumes were measured against the same criteria.
Verify that the reagent water used for metals preparation meets ASTM specifications.	Neutral	The ASTM Type water does not need to be used to meet the project DQOs and is well below the PQLs. Laboratory grade DI water is used for analyses, which is continuously monitored through the use of preparation blanks.
Not adhering to the weighing scenario indicated in Method 7471A.	Nonconformance (Weakness)	The metals supervisor reminded all mercury analysts of this requirement.
Not using a reference blank matrix for soils for Method 6010B preparation.	Nonconformance (Weakness)	Unable to locate a clean sand matrix to use for a metal blank and an equivalent method is used consistent with method requirements.
Should supplement standard criteria with the criteria established in SW-846 for decision-critical parameters.	Nonconformance (Weakness)	The blank criteria specified in the method are not needed to meet the project DQOs and the criteria outlined in the QAPP are being followed.

Table 2-10
Summary of Laboratory TSA

Finding	Category*	Corrective Action
For Methods 8260B and 8270C, should not use the average relative response factor from the initial calibration.	Nonconformance (Weakness)	An option allowed by the method is followed and calculated appropriately. As required, the client is informed by way of the client narrative attached to the analytical results.
Some MDL studies were more than one year old.	Nonconformance (Weakness)	Analysts were reminded of this requirement and a schedule was created for completing outstanding MDL studies.
Should evaluate MDL studies for conformance with method requirements.	Neutral	MDLs are reviewed to ensure that they are consistent with history.
Some laboratory QLs are not always within 5 to 10 times MDL as per SW-846.	Neutral	The QLs used are those specified in the QAPP and are appropriate for meeting the DQOs established for the project.
Arthur D. Little		
Not using one sample log-in checklist for each cooler of samples received and not recording the temperature of each cooler on the checklist.	Neutral	Findings were noted.
Organic extraction log batch sheets not numbered or bound, and do not indicate a place for supervisory review.	Neutral	The extractions supervisor documented a review of the extraction records and is exploring improved methods for providing an audit trail.
The acceptance criteria for the balance used in the extraction laboratory is not indicated in the logbook.	Neutral	Acceptance criteria for balance verification were added to the logbooks.
Expired standards are retained as reference in the same refrigerator as working standards.	Neutral	Findings were noted.
The laboratory criteria used for SVOCs by GC/MS for the initial calibration is less than 25% RSD.	Nonconformance (Weakness)	For compounds whose calibration RSD exceeds 15%, the laboratory will use the alternate calibration models described in SW-846 8000, which will be documented in the case narratives.
Provide the "before" and "after" chromatograms for each manual integration performed.	Nonconformance (Weakness)	The raw "before" data for the GC/MS (and GC/ECD) is archived and available upon request.
Training files did not contain initial demonstrations of capability.	Nonconformance (Weakness)	The training files were updated to include method proficiency documentation as required in SW-846.
Southwest Research Institute		
Laboratory redesign, new buildings and reorganization.	Neutral	The restructure was completed.

Table 2-10
Summary of Laboratory TSA

Finding	Category*	Corrective Action
Laboratory busy.	Neutral	November and December are busy months as field work is completed prior to winter months. Additional staff was obtained and trained during this time period.
Training files did not contain initial demonstrations of precision and accuracy.	Neutral	The documentation was added to the personnel training files.
Training files did not contain initial demonstrations of proficiency.	Neutral	The documentation was added to the personnel training files.
Some records were incomplete and lacked sufficient detail to confirm closure.	Neutral	New categories for the NCR system and program were reviewed and training was conducted. The system was completed for a smoother process to document closure.
A second source standard was not used to verify the instrument calibration for SVOC analysis.	Neutral	The process was reviewed and a procedure was determined to provide documentation for verifying a lot of initial calibration standards.
The expiration date of a working level standard may not be tied to the earliest expiration date of a component standard.	Nonconformance (Weakness)	The process was verified to confirm that working level standards are tied to the earliest expiration dates of a component standard.
A second source standard was not used to verify the instrument calibration for 8081A/8082 analysis.	Neutral	The process was reviewed and a procedure was determined to provide documentation for verifying a lot of initial calibration standards.
Calibrated pipettes not used to prepare standards.	Nonconformance (Weakness)	Calibrated pipettes or Class a pipettes identified with a lot number will be used for standard prep.
Several reagents in wet chemistry had shelf lives in excess of ten years.	Nonconformance (Weakness)	A review was performed on the reagent expiration procedure to evaluate the documentation requirements for this process.
The preparation of working-level standards for nitrate was not documented.	Neutral	A review was performed on the reagent expiration procedure to evaluate the documentation requirements for this process.
Only major instrument maintenance was being documented in the maintenance logbook.	Neutral	Maintenance in wet chemistry was evaluated to provide information similar to the metals maintenance documentation.
The laboratory does not have a manual integration policy.	Nonconformance (Weakness)	A review and evaluation was performed to provide a procedure for the manual integration process.
EA Engineering		
No quality issues noted during review of sample receipt process.	Positive	Finding noted.
Sediment had high temperature upon receipt.	Nonconformance (Weakness)	Finding noted. No affect on data quality was indicated.
Samples received later than expected.	Neutral	Communication with the carrier was initiated to document reasons for the delay.

Table 2-10
Summary of Laboratory TSA

Finding	Category*	Corrective Action
Samples held in refrigerator prior to sieving.	Positive	Finding noted.
Well qualified personnel.	Positive	Finding noted.
Log sheets maintained and accessible, and nonconformance notes taken.	Positive	Finding noted.
Client confidentiality maintained; all samples were labeled as Katahdin.	Neutral	Client confidentiality for this project will be improved as requested.
Measurements of DO and pH, calibration of instruments and logs were in conformance with QAPP.	Positive	Finding noted.
Observed Leto test.	Neutral	Adult organisms are not examined under a dissecting microscope at the end of the test to determine survival. Adults are of sufficient size, and activity level to determine without microscope.
Observed Neanthes test.	Neutral	Adult organisms are not examined under a dissecting microscope at the end of the test to determine survival. Adults are of sufficient size, and activity level to determine without microscope.
A log was maintained on all test organisms.	Positive	Finding noted.
Laboratory has independent QA officer on site.	Positive	Finding noted.
Live organisms were not systematically removed from sediment before the tests were initiated.	Neutral	Standard sediment test protocols recommend not sieving samples unless potentially predatory organisms are present, thus samples were not sieved for the Neanthes arenaceodentata test. The Leptocheirus plumulosus procedure requires that each sample be sieved through a 250 micron sieve prior to testing, and this was accomplished prior to test setup.
Lepto protocols were revised by EPA.	Nonconformance (Weakness)	A Protocol Amendment Form for the Leptocheirus plumulosus test was submitted, documenting the microscopic examination of surviving audults is no longer part of the test termination procedure. The QAPP was revised to reflect the change in protocol.

<u>Notes:</u>

* Category descriptions:

Positive – noteworthy practices or conditions;

Neutral – observations, which are neither positive nor negative; and

Nonconformances – deviations from standards and documented practices, subdivided into deficiencies (adverse impact to data quality) and weaknesses (could result in unacceptable data).

Table 2-11
Summary of Data Validation TSA

Finding	Category*	Corrective Action
The data validation report for SDG 005 incorrectly noted that the equipment blanks did not detect target compounds.	Neutral	The equipment blank for the sediment sampling was included in SDG 006. No contamination was reported in the equipment blank and no data in SDG 005 or SDG 006 were qualified based on the blank results.
Data were not qualified in SDG 005, 007, 009, 015, 016, 020, 021, 023, T001, T002, T003, and T004, since ICP serial dilution results were not reported.	Neutral	The lack of ICP serial dilution samples by the laboratory did not appear to have an adverse impact on data quality for these SDGs and the validation was completed by evaluation of alternative criteria.
Laboratory precision for SDG 006 was evaluated using LCS/LCSD and field duplicates since the SDG did not include MS/MSD samples.	Positive	Due to prior history with SDG 005, the data was adequately qualified.
Individual laboratory preparation blanks were used to separately evaluate the equipment blanks and samples in SDG 010 as multiple equipment rinsate blanks were submitted with the data package.	Positive	The approach utilized to evaluate the equipment blanks supports the DQOs for the project.
A sample and sample duplicate in SDG 016 were not properly discerned in the validation report.	Nonconformance (Weakness)	The QA/QC implications were evaluated and the validation report was revised appropriately. None of the validation qualifiers required updating.
Laboratory precision could not be evaluated using the MS/MSD results for SDG 019.	Positive	No indication of significant matrix effects were noted based on prior history and the data was appropriately validated.
SVOC analysis was requested on the COC for MY05GW18, but was not analyzed or reported.	Nonconformance (Weakness)	This finding was a laboratory omission and was addressed in the second round of groundwater sampling.
TAL metal ICP interference standard solutions (ICSA and ICSAB) were not analyzed in SDG T001, T002, T003, and T004.	Neutral	The data were appropriately validated by evaluation of alternative criteria.
A TAL metal 2X CLP CRDL standard was not analyzed for SDG T001, T002, T003, and T004.	Neutral	This laboratory omission did not appear to have an adverse impact on data quality for these SDGs and the validation was completed by evaluation of alternative criteria.
CCVs and CCBs were not analyzed at the 10% frequency for TAL metals for SDG T001, T002, T003 and T004.	Neutral	The results were consistently within the method requirements and the method deviation did not appear to have an adverse impact on data quality for these SDGs.

Table 2-11
Summary of Data Validation TSA

Finding	Category*	Corrective Action
Internal custody documents were not included for SDG T001, T002, T003, and T004.	Neutral	This laboratory omission did not appear to have an adverse impact on data quality for these SDGs as the laboratory controls access to samples.
The TAL metals standard traceability was not included in SDG T001, T002, T003, and T004.	Neutral	The lack of the source/vendor for the standard solutions did not appear to have an adverse impact on data quality for these SDGs as the concentrations for the laboratory standards and NIST standards were consistently reproduced.

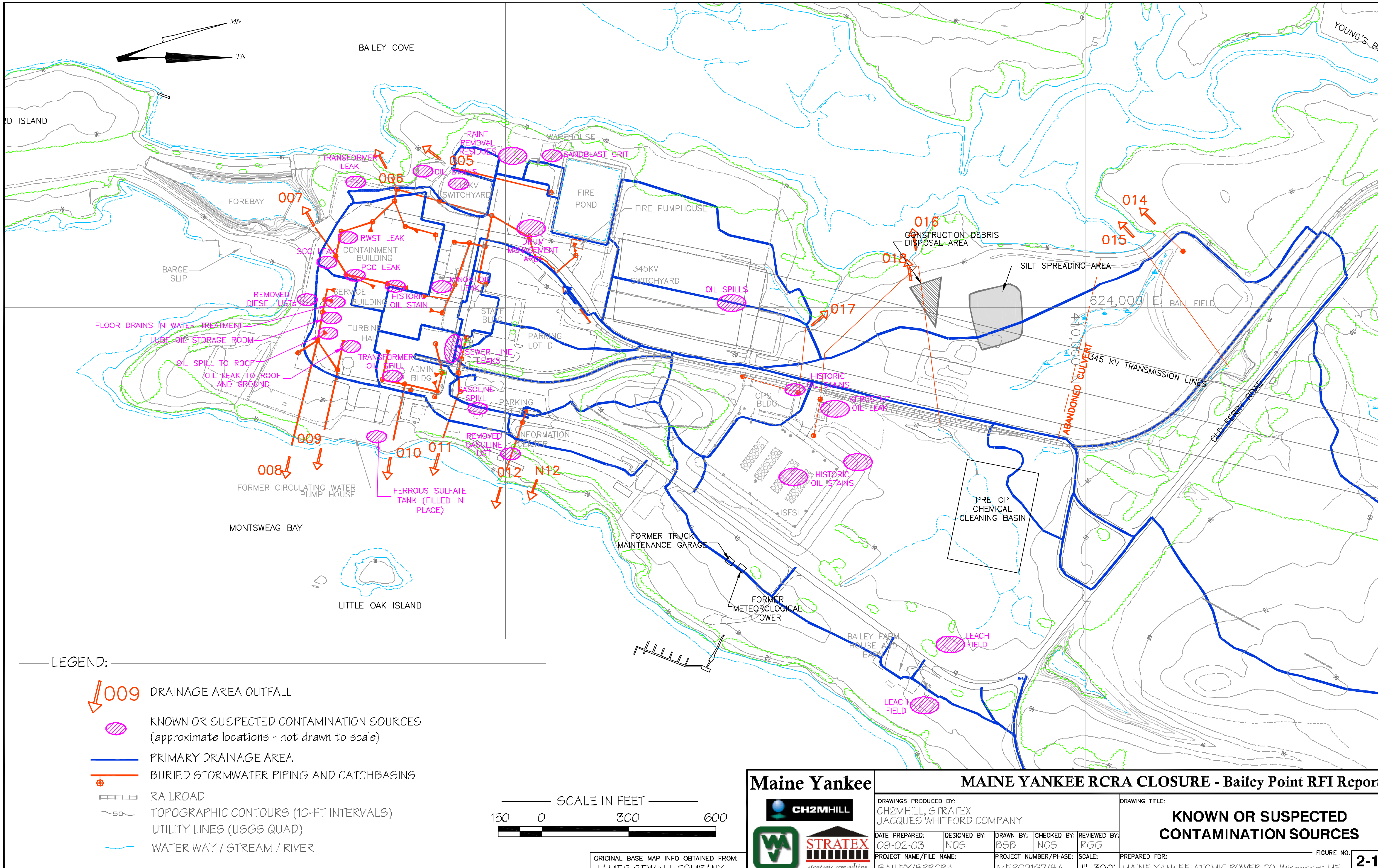
Notes:

* Category descriptions:

Positive – noteworthy practices or conditions;

Neutral – observations, which are neither positive nor negative; and

Nonconformances – deviations from standards and documented practices, subdivided into deficiencies (adverse impact to data quality) and weaknesses (could result in unacceptable data).



Maine Yankee

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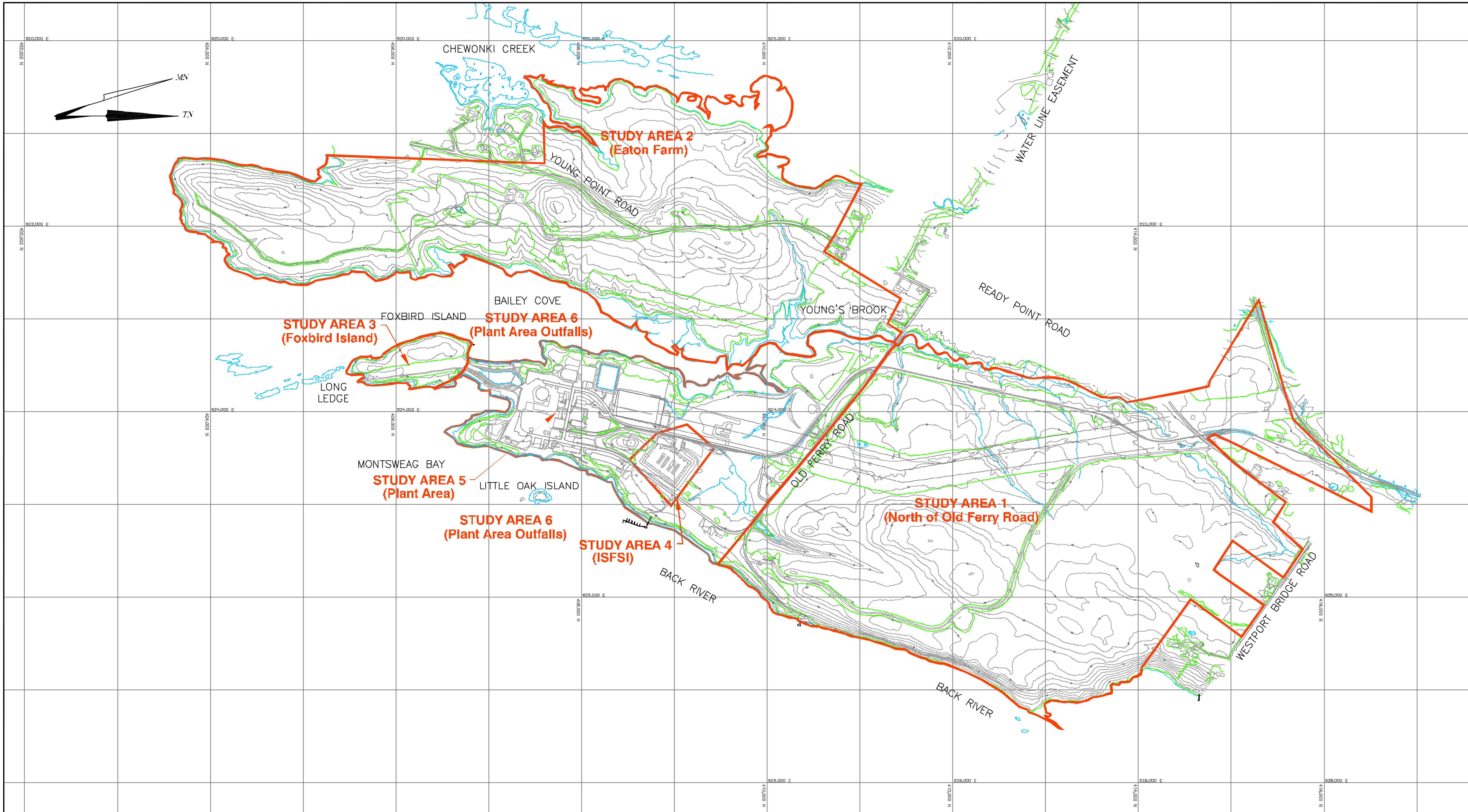
STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					KNOWN OR SUSPECTED CONTAMINATION SOURCES
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: ME?02167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset, ME

FIGURE NO. 2-1



LEGEND:

- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- STUDY AREA DESIGNATIONS

SCALE IN FEET

500 0 1000 2000

ORIGINAL BASE MAP INFO OBTAINED FROM:
JAMES SEWALL COMPANY

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MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:
CH2MHILL, STRATEX
JACQUES WHITFORD COMPANY

DRAWING TITLE:

STUDY AREA DESIGNATIONS

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
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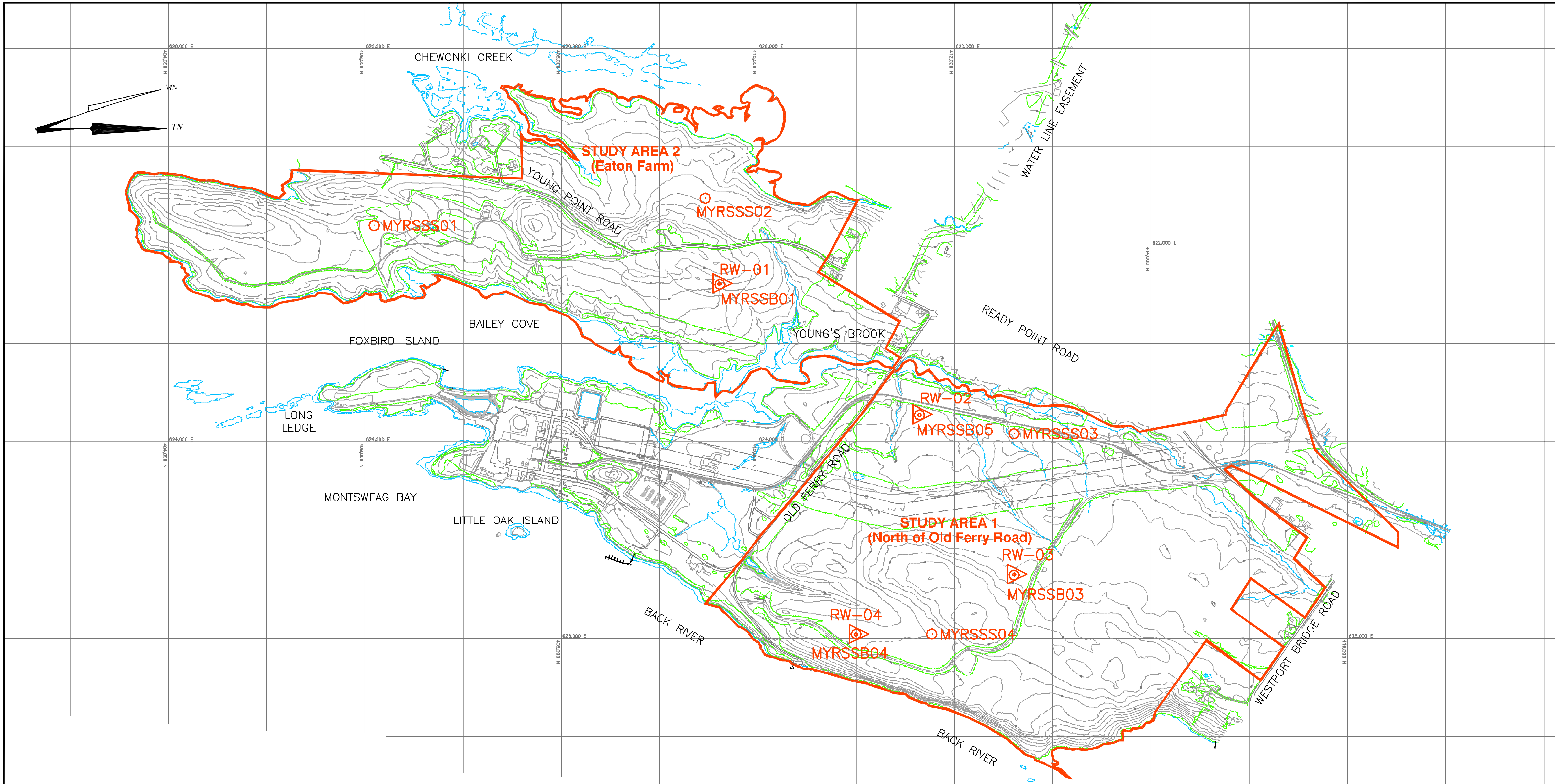

LEGEND:

- MYRSS01 — SURFACE SOIL REFERENCE LOCATION
- MYRSSB03 — CO-LOCATED SOIL BORING/MONITORING WELL LOCATION
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- STUDY AREA DESIGNATIONS

SCALE IN FEET

500 0 1000 2000

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

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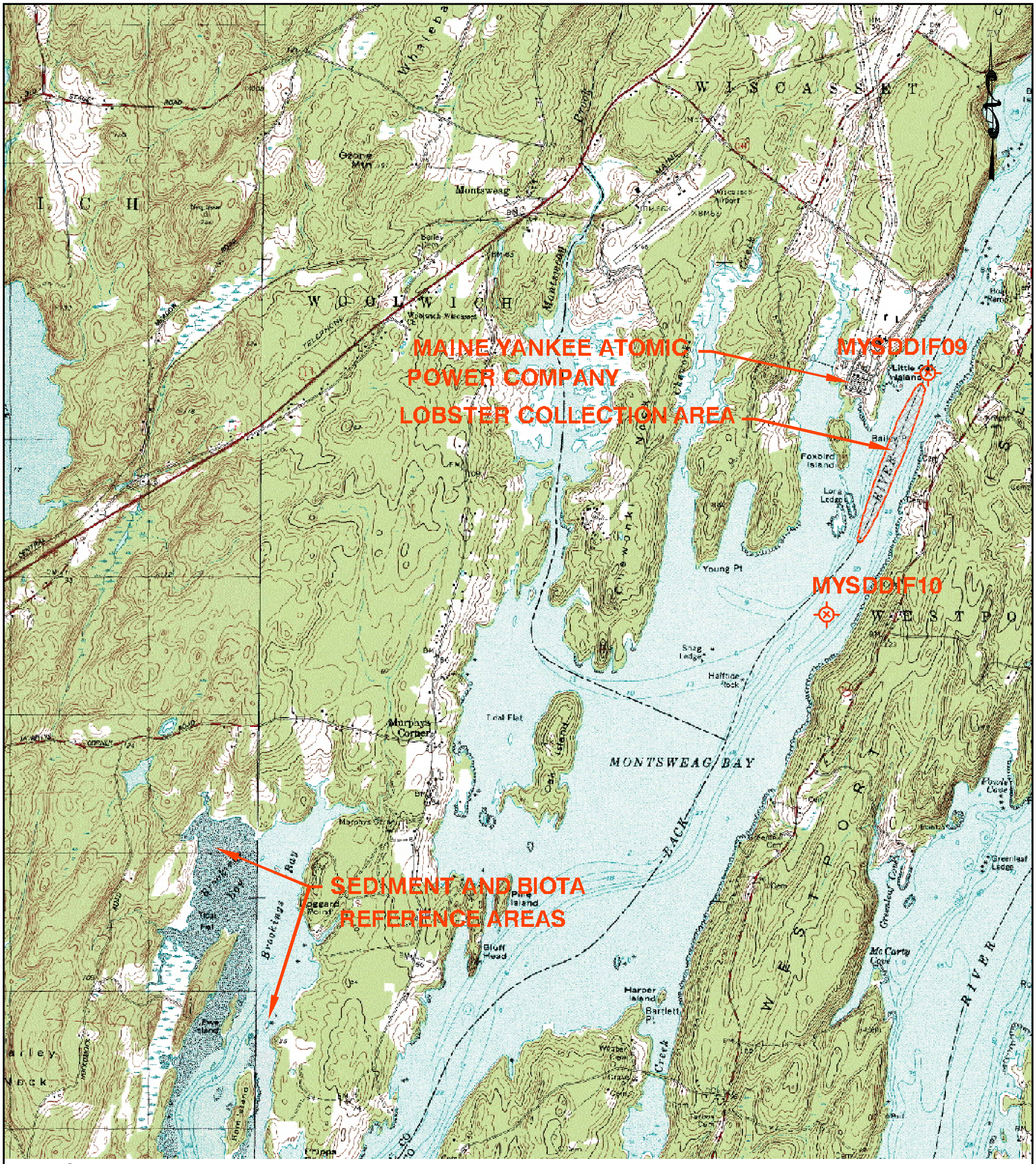
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY

DRAWING TITLE: **REFERENCE LOCATIONS (Soil & Groundwater)**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/BPRCRA	MEP02167/8A	1"=1000'	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME	2-3



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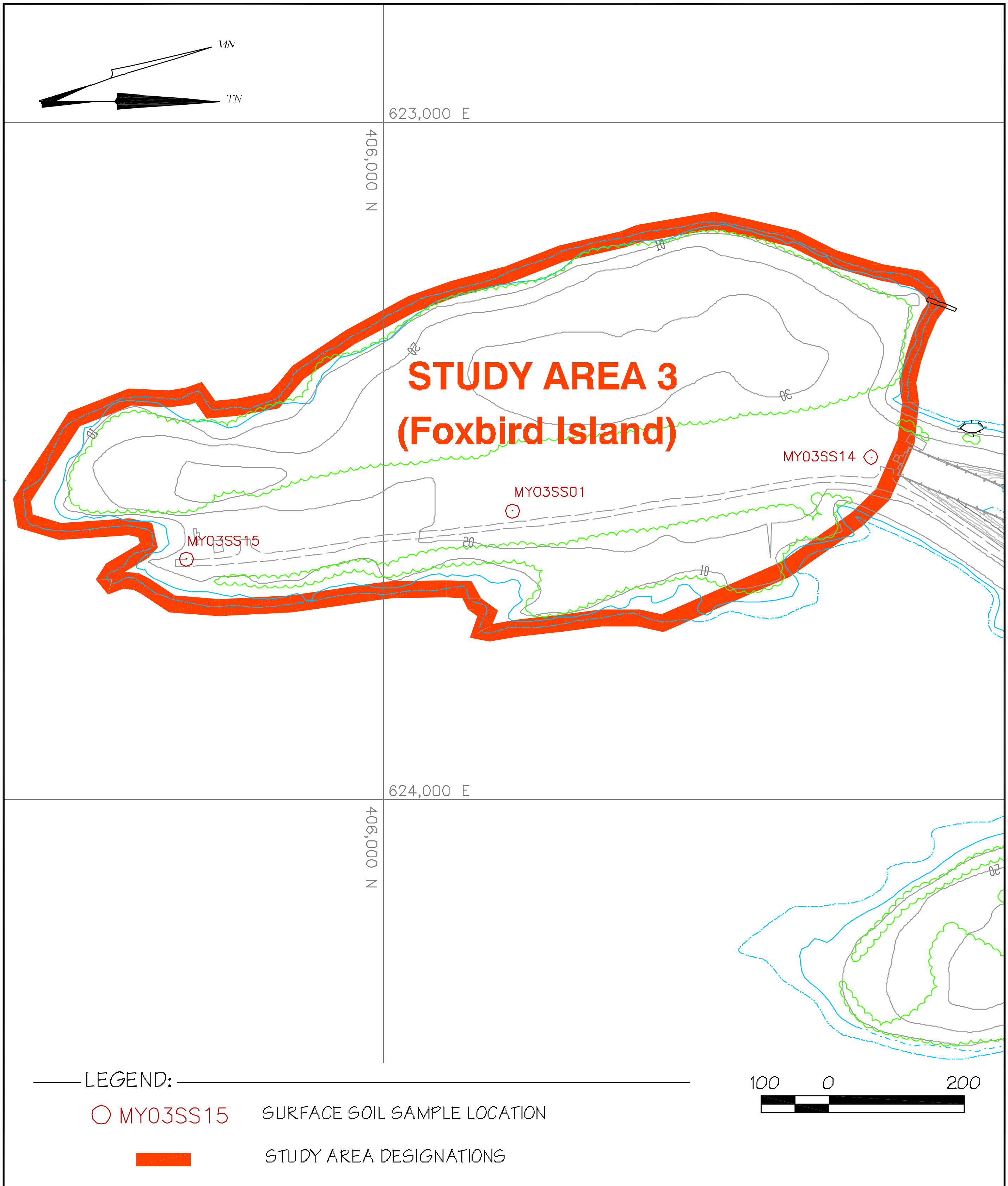
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					REFERENCE LOCATIONS (SEDIMENT AND BIOTA)
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1:40000	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset, ME — FIGURE NO. 2-4



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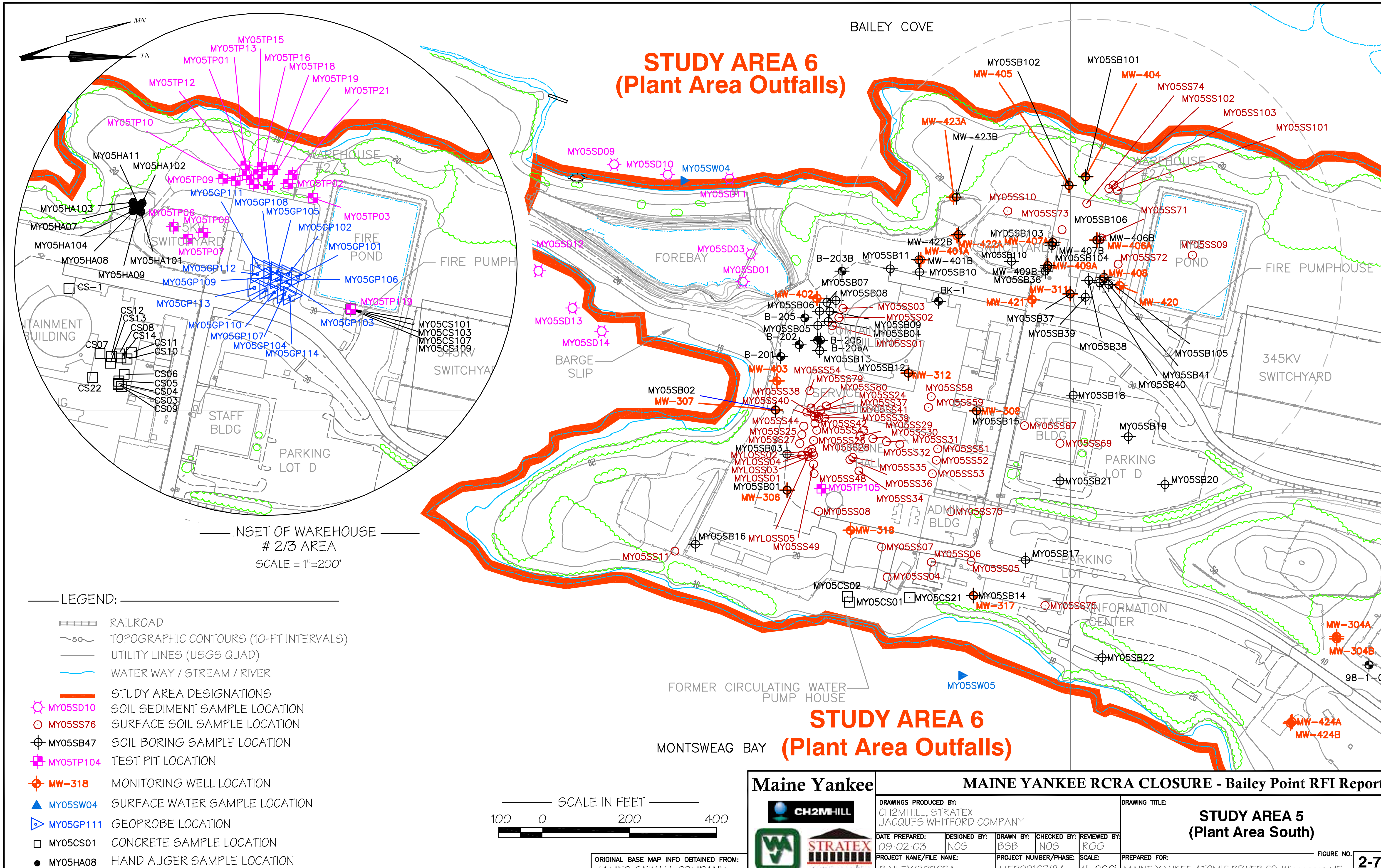
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					**STUDY AREA 3 (Foxbird Island)**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	FIGURE NO. **2-5**
PROJECT NAME/FILE NAME: BAILEY/3PRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=200'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME



ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

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MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

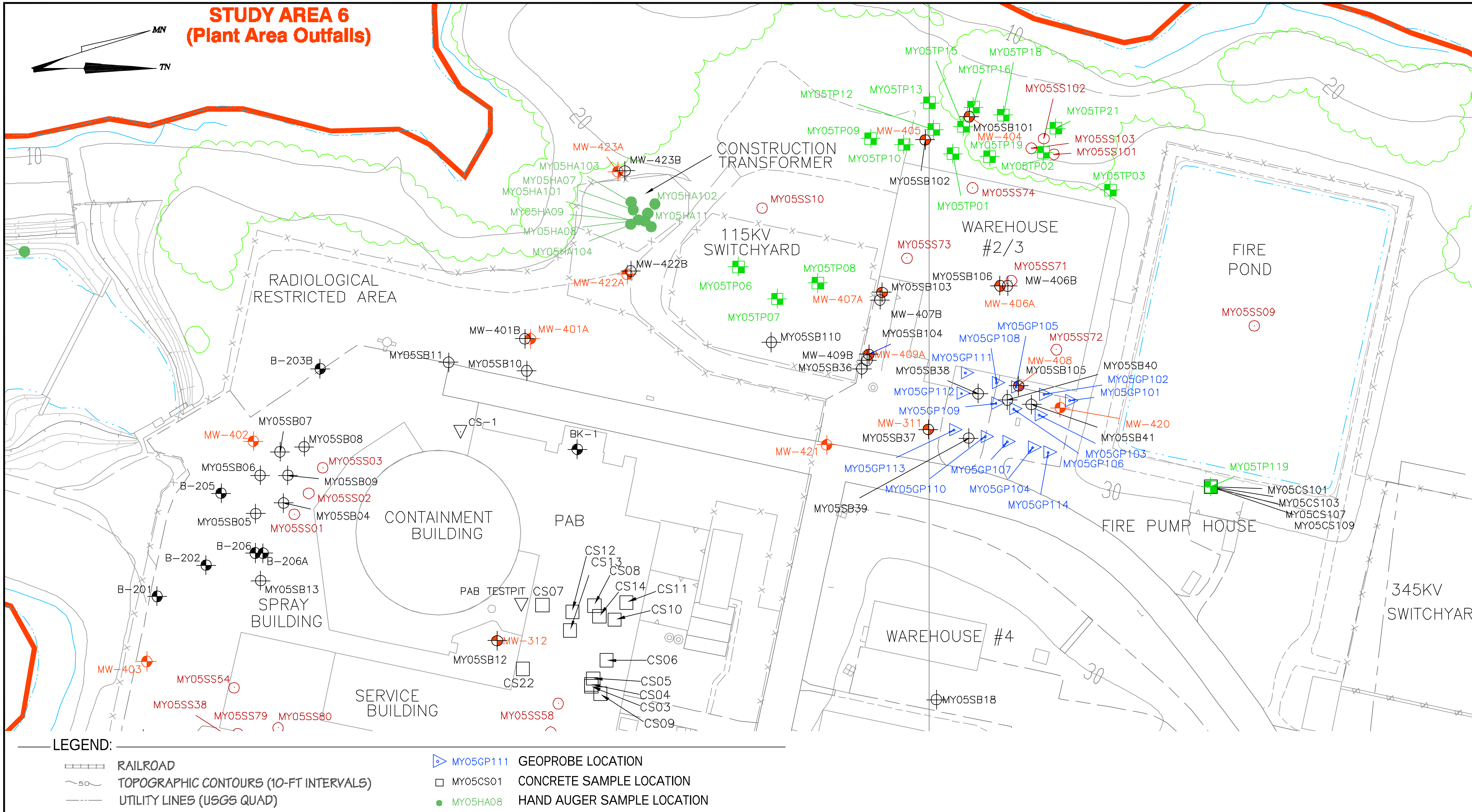
DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY				
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEPO2167/8A	SCALE: 1"=200'	

DRAWING TITLE:

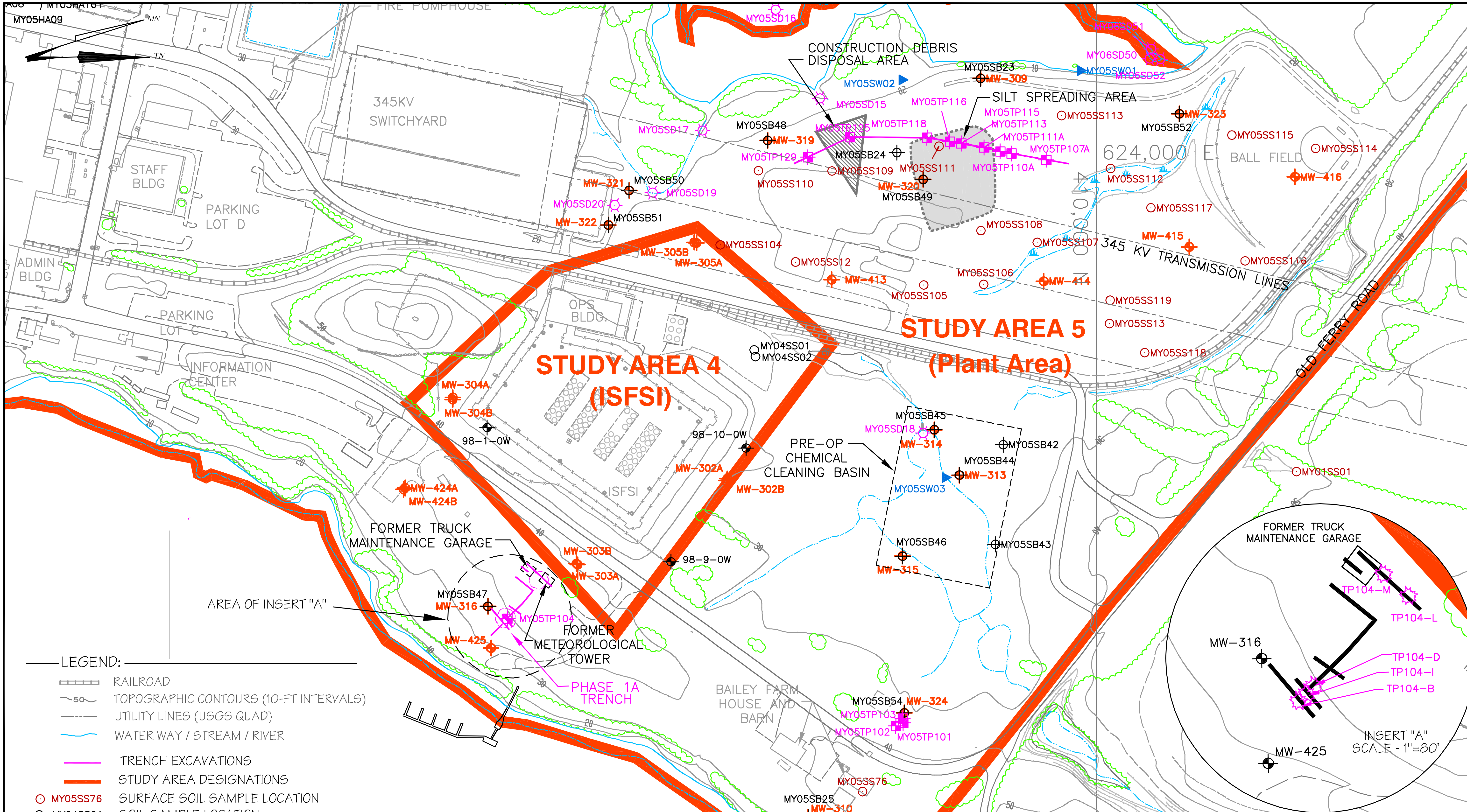
STUDY AREA 5 (Plant Area South)

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. 2-7



Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
CH2MHILL, STRATEX	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: STUDY AREA 5 SOUTHWEST CORNER OF BAILEY POINT
	DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/2-8		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=80'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 2-8



LEGEND:

(railroad)	RAILROAD
50	TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
	UTILITY LINES (USGS QUAD)
	WATER WAY / STREAM / RIVER
	TRENCH EXCAVATIONS
	STUDY AREA DESIGNATIONS
MY05SS76	SURFACE SOIL SAMPLE LOCATION
MY04SS01	SOIL SAMPLE LOCATION
MY05SB47	SOIL BORING SAMPLE LOCATION
MY05SD18	SEDIMENT SAMPLE LOCATION
MY05TP104	TEST PIT LOCATION
MW-324	MONITORING WELL LOCATION
MY05SW02	SURFACE WATER SAMPLE LOCATION
	PROPOSED TESTPIT LOCATION

SCALE IN FEET: 100 0 200 400

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

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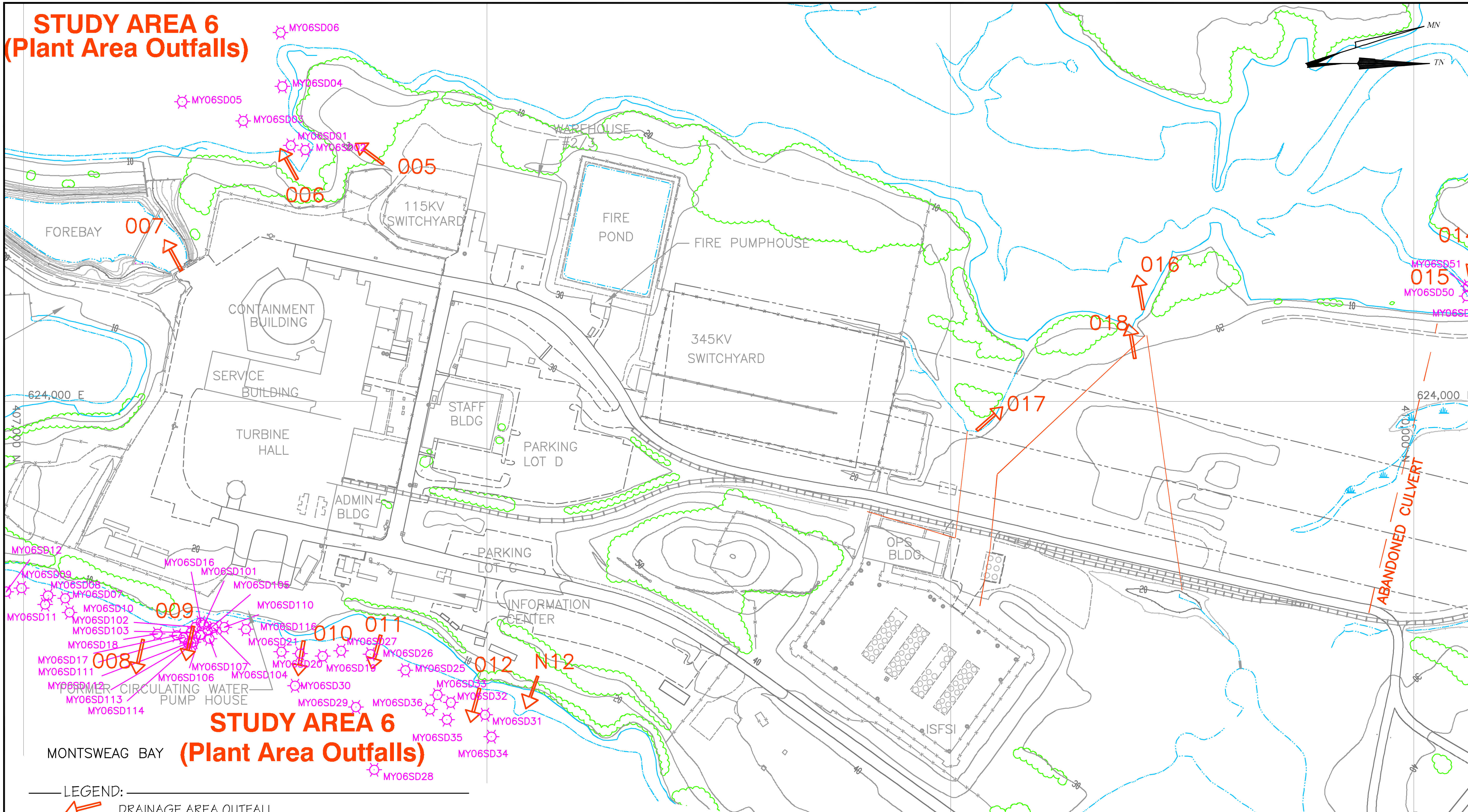
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DRAWING TITLE: **STUDY AREA 5 (Plant Area North)**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/BPRCRA	MEP02167/8A	1"=200'	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME	2-9



LEGEND:

- DRAINAGE AREA OUTFALL
- SEDIMENT SAMPLE LOCATION
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET: 100 0 200 400

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

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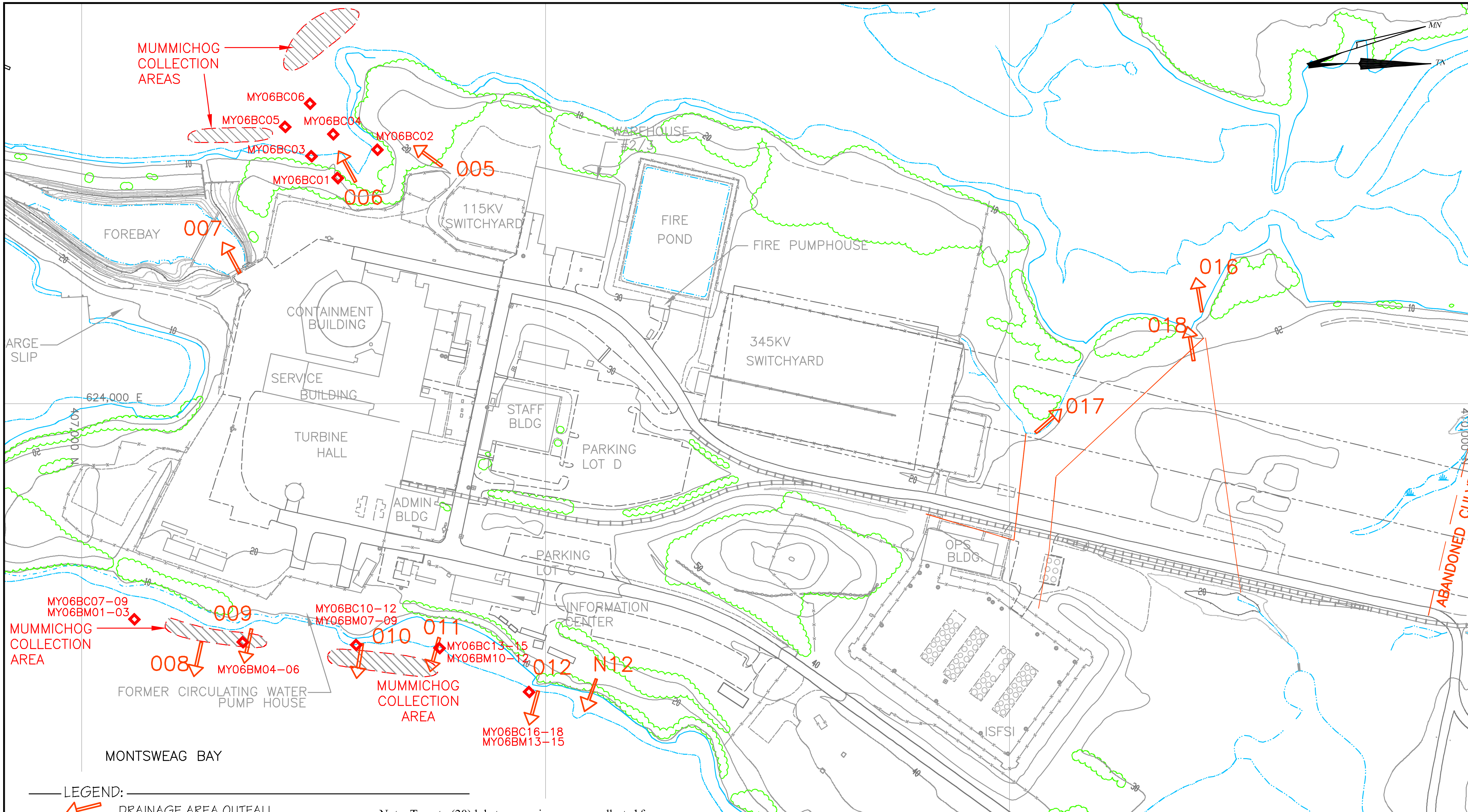
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY					DRAWING TITLE: STUDY AREA 6 (Plant Area Outfalls)
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=200'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 2-10



LEGEND:

- DRAINAGE AREA OUTFALL
- BIOTA SAMPLE LOCATION
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

Note: Twenty (20) lobsters specimens were collected from Montsweag Bay in the vicinity of Long Ledge. (See Figure 2-4)

SCALE IN FEET

100 0 200 400

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

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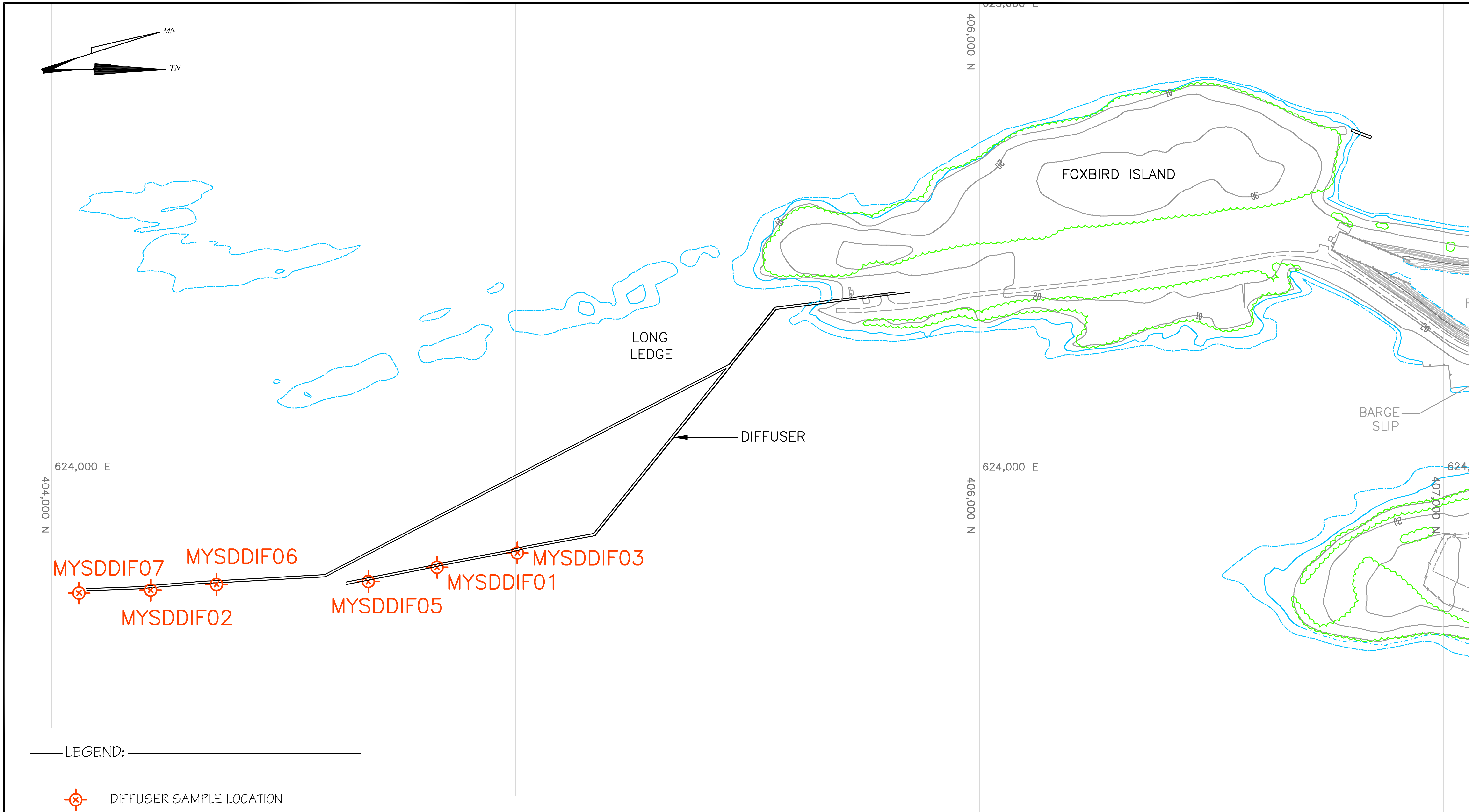
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY					DRAWING TITLE: STUDY AREA 6 (Biota Sampling Locations)
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=200'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 2-11



ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

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MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY

DRAWING TITLE: **DIFFUSER SAMPLING PROGRAM**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/BPRCRA	MEP02167/8A	1"=200'	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME	2-12

SECTION 3.0 – ENVIRONMENTAL SETTING

LIST OF TABLES

LIST OF FIGURES

3.0 ENVIRONMENTAL SETTING

Section 3 outlines the environmental setting for the Bailey Point portion of the Maine Yankee site and a description of the site in relation to its physical surroundings. The section provides a brief outline of site demography, land use, ecology, and meteorology, as well as a description of site surface water, geology, groundwater, and sediment regimes within the Bailey Point area. The physical descriptions are based on historical information, which is supplemented with data collected as part of the RFI. This section concludes with a discussion of uncertainties and limitations of collected environmental data.

3.1 Site Setting

The site is located in the town of Wiscasset, Lincoln County, Maine **(Figure 1-1)**. Site coordinates are approximately 43 degrees 57 minutes 5 seconds north latitude and 69 degrees 41 minutes 45 seconds west longitude. The site is located approximately one and one-half miles east of Route 1 and one-half mile west, across Back River, from Westport Island **(Figure 1-2)**. The land owned by Maine Yankee is divided by Old Ferry Road, the closest public road, which terminates on the shore of Back River **(Figure 1-3)**. The main plant site is located on a peninsula known as Bailey Point, which extends south into Montsweag Bay, which is part of the Sheepscot River estuary system.

The entire site is about 820 acres; of which approximately 670 undeveloped acres (commonly referred to as the Backlands) exist west of Bailey Cove/Young's Brook and north of Old Ferry Road. The remaining 150 acres lie south of Old Ferry Road within the Bailey Point area, which is bounded by Bailey Cove to the west and Back River on the east.

The Back River extends in a northerly direction from a point known as Long Ledge, which is at the northern limit of Montsweag Bay, a distance of about four miles to a confluence with the Sheepscot River at the northern tip of Cushman Point (**Figure 1-2** and Figure 3 in Gerber & Rand, 1980). It varies in width from a maximum of 1,500 feet at Berry Island to a minimum of 500 feet at Cowseagan Narrows. Channel depths vary from 10 to over 60 feet at mean low water, with a maximum depth at the plant site of approximately 36 feet (MY, 1998).

Montsweag Bay extends southward from Back River in the vicinity of Long Ledge a distance of about four miles to Phipps and Hubbard Points, where it connects with Hockomock Bay. Montsweag Bay varies in width from approximately 2,000 feet at its northern and southern limits, to about 8,000 feet midway between these points and has a mean tide level area of about 1,800 acres. Except for a relatively narrow central channel, the bay is quite shallow, with mean low water depths generally less than two feet. Accordingly, extensive intertidal mud flats are exposed at low tide and especially so during spring low tides. The central channel varies in depth from 13 to 50 feet (MY, 1998).

Tidal flows enter and leave the Back River-Montsweag Bay area at the Cowseagan Narrows on the north and through the passage separating Phipps and Hubbard Points to the south. The average tidal range in this area is about nine feet.

The plant site itself is located on a ridge of bedrock running northeast to southwest to form Bailey Point. The maximum elevation of this rock is a knob 75 feet above MSL located about 700 feet northeast of the plant. The general elevation of Bailey Point varies from sea level to 40 feet above mean sea level. The plant industrial area is graded to elevation 21 feet.

3.2 Demography/Land Use

Within five miles of the site, land use consists largely of home sites, small businesses, summer houses, idle farmland and forest. Housing is scattered along principal roads and is concentrated only in the center of Wiscasset. Because of its unique coastal terrain and many bays, the area is a summer recreational center for boating and other water-related activities. This summer recreation and its supportive businesses, motels, restaurants, shops, etc., provide much of the economic base for the area. The resident population density was estimated to average 72 people per square mile in 1990 (MY, 1998).

The waters near the plant site are reported to be relatively low in productivity of fish and shellfish. Some lobstering is carried out in Montsweag Bay and the Back River. The largest commercial marine harvests are marine worms, including two species, the sand worm (*Nereis virens*) and the blood worm (*Glycera dibranchiata*). The worm digging is confined to mudflats in the intertidal areas. The primary boating in the Montsweag Bay-Back River area is done by shallow pleasure crafts (MY, 1998).

The Bailey Point area is bounded to the west and north by the 640-acre undeveloped Backland property. Maine Yankee was granted release of this portion of non-impacted land from their operating license on July 2002 (NRC, 2002). Historically, the Backlands were used for a combination of residential and farming activities. Maine Yankee plans to donate the Eaton Farm portion of the Backland property (approximately 200 acres) to an environmental organization, pursuant to a FERC-approved settlement agreement. The purpose of the donation is to create a nature preserve and an environmental education center and to provide public access to coastal lands in the mid-coast region of Maine (MY, 2002k).

This RFI Report focuses on the approximately 150-acre Bailey Point area, which is the portion of the site where most construction, operation and decommissioning activities have taken place. A separate RFI report discusses the Backlands. Prior to construction of the Maine Yankee facility, the Bailey Point area was used for residential and farming activities.

Notable features within the Bailey Point area include Foxbird Island, a 12-acre peninsula within Montsweag Bay south of the plant forebay; the Independent Spent Fuel Storage

Installation (ISFSI), a 10-acre area north of the plant area and south of Old Ferry Road; and the industrial area, a 12-acre area behind security fencing where the majority of the industrial plant buildings were located. The remaining plant area includes two electrical switchyards and transmission lines, warehouse complexes, administration buildings, and the Bailey Farmhouse. The Bailey Point area includes terrestrial, fresh and salt-water wetlands, and intertidal environments (**Figure 1-3 and Figure 1-4**).

Following decommissioning, most above-grade structures will be demolished. Current plans are to leave the following above-grade structures in place:

- the ISFSI;
- the two electrical switchyards (115 kV and 345 kV) and transmission lines;
- the barge slip and dolphins;
- the road that travels west of the ISFSI, terminating near the 115 kV switchyard;
- the original plant access road, terminating between the ISFSI and the former location of the Information Center;
- the existing railroad that travels the west side of the ISFSI, and its two spurs;
- the Old Ferry Road and public boat landing; and
- some below-grade structures and systems (MY, 2002k).

Two minor archaeological sites have been identified within the Bailey Point area. Both sites are located immediately adjacent to the shoreline, in areas undisturbed during plant construction and decommissioning.

3.3 Meteorology

The Maine Yankee site is located in the mid-coastal region of Maine where the general climatic regime is maritime, with cool air commonly moving in from the North Atlantic. The average annual temperature is about 45^{o}F, with temperatures above 90^{o}F being rare. The highest mean temperature occurs in July and is about 68^{o}F, while the mean low temperature occurs in January and is about 22^{0}F (MY, 1998).

Heavy fog is frequent and sometimes persistent along the coast, and may occur on one day in six during certain portions of the year. When fog is present, the wind speed is ≥ 3 miles per hour (mph) for approximately 60% of the time (MY, 1998).

Precipitation along the Maine coast is influenced by the Atlantic Ocean. Summer thunderstorm activity is somewhat suppressed by the effects of the cool ocean, while winter precipitation is increased by coastal storms such as “Nor’easters”. These combined effects give this area more precipitation in the winter months than in the summer months. Monthly totals average about four inches during winter compared to three inches in summer. Total precipitation averages nearly 46 inches for the Maine Yankee area (MY, 1998).

3.4 Surface Water

The surface water hydrology of the site is dominated by upland runoff processes and by the tidal action of the Sheepscot River estuary system, which surrounds the site **(Figure 1-2).**

3.4.1 Tidal Processes

A tide gage was established at the dock on the east side of Bailey Point in the summer of 2002. Continuous data logger readings of tidal elevation change referenced to 1929 Mean Sea Level (MSL) datum were recorded for a period of about two months (Stratex, 2002d). The semi-diurnal tide cycle is slightly mixed with alternating tides of slightly higher or lower tides than the previous 12 hour and 24 minute cycle. The 100-year and 500-year flood elevations at the site have been determined by the Federal Emergency Management Agency (FEMA) flood mapping program to be 10.6 and 11.4 feet above MSL, respectively. The probable maximum flood elevation at the site is estimated (MY, 1998) at 14.8 feet MSL. Much of Bailey Point is at or above elevation 20 feet MSL, where a steep bank makes an abrupt transition from this elevation down to the upper limit of tidal action.

3.4.2 Upland Surface Water Hydrology

The site consists of a series of ridges and valleys striking north-south that reflect the competency and structural nature of the underlying bedrock. Deep bedrock valleys are filled with glaciomarine clay-silt soil; ridges are characterized by exposed bedrock or thin soil cover over rock. Surface drainage moves both to the north and south along the axes of the topographic valleys and also flows east and west down the flanks of the ridges. **Figure 3-1** shows a simple division of the Site into separate surface watersheds.

In the plant area, where the ground surface is relatively flat, manmade underground storm drains and catch basins were designed to control the surface runoff (**Figure 3-2**). A detailed summary of the storm drain system is provided in **Table 3-1**. As decommissioning proceeds, these underground storm drain systems are being phased out.

The single perennial stream on the Site originates in the formerly-proposed “ash disposal area,” north of Old Ferry Road and directly north of the main access road to Maine Yankee (**Figure 1-3**). The headwaters of this stream occur at the northern end of a deeply incised gully. The gully is supported by bedrock ridges to east and west and relatively shallow bedrock at the northern and upper end of the gully. In this area there are diffuse springs and seeps that gradually coalesce to form the stream that flows into the pond south of Old Ferry Road and north of the ISFSI area. The outlet to this pond is a culvert that is buried beneath the 345 kV transmission lines and discharges on the eastern side of Bailey Cove just above high tide. Other runoff from the Bailey Point peninsula occurs through overland sheet flow and shallow gully or ditch flow.

3.4.3 Groundwater Recharge Capability

The groundwater recharge capability during plant operation was different in the northern half of Bailey Point from the southern half of Bailey Point. This reflects two significant differences in the land cover types that existed during operation. The area north of the Staff Building had much less paving and parking lot area, and generally thicker soils than south of the Staff Building. Overland flow times of concentration were much longer in the north for stormwater runoff, reflecting a less dense drainage network, allowing for more time for precipitation to infiltrate the soil. In the south, a high percentage of the land cover type during plant operation was roof, paving, or dense gravel parking lot surface. In addition, there was a man-made stormwater system with catch basins around the plant area that efficiently moved runoff from the area (**Figure 3-2**). Most infiltration in the southern portion of the site was in grassed strips in and around the paved areas. As discussed in the "Site Groundwater Regime" subsection of Section 5 of the QAPP (Stratex, 2001d), during plant operation approximately 30% of precipitation may have infiltrated the northern half of Bailey Point, but only 10% infiltrated the southern half. Future estimates of recharge potential will be based on values presented in Gerber & Hebson (1996).

3.5 Site Geology

3.5.1 Historical Explorations

The site geology has been studied through a series of site mappings, geophysical explorations, test pits, and borings that have been completed since 1966. Most of the historical data are presented and discussed in RGGI, 1991. The locations of the historical investigations are shown in Figures 5, 6, 7, 8, 9, 10A and 10B of the QAPP and are keyed to the specific reports associated with the various explorations. **Table 3-2** is updated from the QAPP and summarizes basic information on historical data points used to develop the figures in this section. Past studies created over 500 subsurface explorations and provided one of the starting points for planning the RFI. The content of **Figures 3-3** through **3-9** and **Figure 3-13** are based on a combination of both historical and RFI data.

3.5.2 Surficial Geology

The regional surficial geology is shown in Figure 2 of Gerber and Rand, 1980. The surficial geology of Bailey Point is shown in **Figure 3-3**. Construction activities over the years have significantly modified the original surface and probably on the order of 50% of Bailey Point is now covered with fill. About half of this fill is predominantly clay-silt and half is sand and gravel. For those areas not filled, the surface is either exposed bedrock or consists of soils derived from glaciomarine clay-silts or fine sands. There is a thin, discontinuous layer of diamicton (glacial till) overlying bedrock. The different units are described in more detail below. The engineering properties of the site materials are described in detail in RGGI, 1991.

Several figures have been prepared to assist in the interpretation of the major changes on the site due to cut and fill activities. **Figure 3-4** shows the pre-construction ground surface topography of Bailey Point, based on on-the-ground surveys from the late 1960s. Notice that the large lowland in the north-central part of the point has been filled and that the south-central part of the Point has been cut to a lower elevation. **Figure 3-5** shows the pre-construction bedrock surface in the industrial area of the site. Comparing these elevations with existing elevations indicates that as much as 10 to 20 feet of rock was cut to prepare the industrial area base grade which is in the 20 to 21 foot MSL range.

The interpolated contours on the surface of the current day bedrock surface are shown in **Figure 3-6**, which can be compared with the pre-construction bedrock surface shown in **Figure 3-5**. A bedrock contour map and cross sections in the forebay area are shown in Stratex, 2002d. Overburden thickness is illustrated on **Figure 3-7**. The general thickness of fill in each area can be interpreted from the geologic cross sections provided in **Figure 3-13A through 3-13F**. The thickest deposits (up to 60 feet) of glaciomarine clay-silt on Bailey Point can be found north of the ISFSI, as shown on **Figure 3-7 and Figure 3-13B**. There are four depressions in the bedrock surface worthy of note on Bailey Point. The largest depression begins under the ISFSI and extends north under the area of the former pre-operations cleaning basin (see **Figure 1-4** for basin location). There is a second, more elongate, depression under the 345 kV line area that fades off to the south under the former Fire Pond and under the former topographic valley shown on **Figure 3-4**. Two smaller depressions occur: one under Warehouse 2/3 and one under the Staff Building. A small localized valley in the bedrock surface slopes downward to the west, beginning on the south side of the overhead crane, which lies to the northwest of the containment building. We infer that these localized low surfaces in the top of the bedrock represent the effects of glacial erosion on rock surfaces that were softer than the rocks forming the ridges. Zones of soft schist are shown in Figure 13(B) of the Backlands RFI Report (MY, 2004). The schist is most easily eroded and may have formerly occupied these valley areas.

3.5.2.1 Glaciomarine Clay-silt

As shown on **Figure 3-3**, this unit consists predominantly of natural, in-situ clay-silt of glaciomarine origin. Detailed logs from Gerber and Rand, 1980, and **Appendices A through C** describe the stratigraphy in detail. There may be localized fills to support roads or utilities within this unit. Typically the top 10 feet of this unit consists of stiff fissured clay-silt, which has a moderate permeability relative to the underlying soft clay-silt. The stiff clay-silt may have a higher vertical permeability than horizontal permeability, based on detailed work done on other sites in Maine (RGGI, 1994a). The soft clay-silt beneath the stiff clay-silt has thin horizontal sand and silt seams and has a higher horizontal permeability than vertical permeability. The soft clay-silt is a relatively low permeability material and is also moderately compressible. A thin sand zone of higher permeability is common at the bottom of this unit. Less common, but present in places on the site, is a thin layer of silty diamicton (glacial till) lying directly over bedrock. This unit can be seen in several locations in the cross sections provided in **Figures 3-13A through 3-13F**.

3.5.2.2 Glaciomarine Fine Sand

As shown on **Figures 3-3, 3-13C**, and **3-13E** there is a thin zone that is dominated by glaciomarine fine sand along the east side of Bailey Point. Stiff, fissured, clay-silt may lie on top of or be sandwiched within this fine sand unit. Fine sand does occur in abundance in several other sections of the site. This fine sand lies under the eastern portion of the ISFSI and thickens to the south (Cross-section 5-5'—**Figure 3-13C**). Fine sand also lies at the bottom of the glaciomarine unit under the southwestern corner of Warehouse 2/3, and is found overlying rock in MW-407A and MW-401A. The sand has interbedded silt, sandy silt, and silty sand beds and seams and scattered gravel particles.

3.5.2.3 Clay-silt Fill

There is a large surface fill of clay-silt material north of the Knoll (under and to the north and west of ISFSI) and west of the eastern access road into the site from Old Ferry Road. There were three major filling episodes that created this fill: a) upland glaciomarine soils removed from the surface of the rock in the industrial area; b) the original hydraulic dredging of bay sediments from the circulating cooling water intake channel; and c) bay sediments removed from the forebay area during its construction. The upland soils were placed primarily under the current ISFSI area. Some blasted rock and minor amounts of other soil types are intermixed in this fill. The hydraulic dredge spoils from the intake channel were placed in the lowland area north of the ISFSI and under the "ball field" area. These soils have been found to consist primarily of clay-silt texture. South of the ball field area there is a mixture of fill types, including construction debris (see Test Pit descriptions in **Appendix C**), topped by primarily clay-silt fill taken from the area of the forebay and deposited there by truck behind a berm formed of shot rock (blasted bedrock) and other fill along the edge of the current salt marsh.

Miscellaneous surface fills have occurred since construction and most materials have had a clay-silt texture (see discussion in Attachment 2 of Change Order 3 in Appendix C of the QAPP). Silty material has been used to fill the former Fire Pond. Most of the clay-silt fill is very stiff to hard, except at depth. It has a fissured structure allowing the movement of groundwater similar to that in a fractured media. It was generally easy to discern the interface with the original ground surface. Although the cross sections provided in **Figures 3-13A through 3-13F** shows the fills quite well, they may be missing in the section at old boring locations such as B5-66, which was drilled prior to filling activity.

3.5.2.4 Sand and Gravel Fill

Most of the industrial area, all the parking lots, the 345 & 115 kV switchyards, and part of the ridge where the former truck maintenance garage was located have a surface fill of sand or gravelly sand. The fill is quite thick in places around the containment building (see cross sections provided in **Figures 3-13A through 3-13F**). This fill material was placed as structural fill and backfill and the subbase and base materials for roads and parking lots. It has scattered cobbles and areas of shot rock fill. Some sticks, roots, and minor construction debris (usually wood) can be found in the fill. It is free draining.

3.5.2.5 Soil less than 5 feet to Bedrock

This map unit on **Figure 3-3** represents a mixture of different soil textures and includes some fill material but is generally less than 5 feet thick over bedrock. The shoreline areas expose the bottom of the glaciomarine unit and scattered glacial till deposits. The upland soils on the Knoll may have some till-like materials, too. Thin soils in the developed areas such as the industrial area consist of sand and gravel fill.

3.5.3 Bedrock Geology

Three important bedrock units lay beneath Maine Yankee: a) the basic "country" rock of the Cape Elizabeth Formation; b) small, localized granites and migmatized rock; and c) pegmatites (Rand, 1967). Additional background on regional bedrock geology and the detailed geology of portions of the Backlands can be found in Gerber and Rand, 1980. As part of our RFI, we have found that the migmatites occupy a significant volume of the rock under the site and have, therefore, defined the migmatites as a separate rock type, as shown on the bedrock geology map of **Figure 3-8**. The granites, pegmatites, and migmatites seem to be generally interlayered with depth (see **Figure 3-13H**, which contains the simplified core logs of B3-66, MW-303, and MW-409). The schist unit, as we have defined it, is relatively rare on Bailey Point. It apparently occupied those portions of the rock that have been most eroded by glacial action. The ridges are dominated by the pegmatites. There is a broad zone of granite along the western edge of Bailey Point and on the southeastern-most point of land. Near the granite and pegmatite intrusions, the schist has been re-heated, partially melted, and re-crystallized into granite-like migmatites, making the host schist into banded micaceous gneiss.

Accessory minerals of note include pyrite and garnet. Secondary mineralization has been found in fractures in the rock core and consists of calcite, epidote (yellowish alteration products of ferromagnesiums), talc-like weathering products (but probably not true talc), limonite (weathering of iron-bearing minerals), and probable kaolin from localized weathering of feldspars. Our description of the rock types focuses primarily on those features of the rock that will affect contaminant fate and transport.

3.5.3.1 Lithologic Descriptions

The Cape Elizabeth Formation is medium- to fine-grained biotite schist with locally thin, impure quartzite interbeds. The schistose rocks exhibit well-developed foliation and layered fabric defined by the successive alternations of micaceous, quartzitic and feldspathic interbeds. The rock is foliated or separated along thin planar partings (usually along biotite concentrations) like the pages of a book. We have defined “schist” for this report as those rock units exposed on the surface or in drill core that have fairly planar foliation, an absence of granite or pegmatite, a dominance of biotite layers, and an absence of hornfels and other structural and mineralogical features typical of migmatized rock. The prevalence of granite and pegmatite in rock core throughout Bailey Point demonstrates the proximity to high heat and temperature conditions that created the widespread migmatites on the site. Of the 4 major rock types on the site, the schist is the most easily broken and eroded and probably passes the most groundwater per volume of rock. Drill core splits readily along the biotitic foliation planes and calcite deposition and rust staining attest to the movement of water on these planes. Figure 13 of the Backlands, RFI report (MY, 2004) is a picture of an upright biotite schist bed enclosed in much more competent quartzitic and feldspathic strata. At the Relic Dump 2 area, boudinage structures show the effects of differential strain that was related to the last major folding event. **Figure 3-13G** (from MW-417 at Relic Dump 2) shows xenoliths of the original schist enclosed within the migmatite.

The granites and pegmatites are distinct rock types but are juxtaposed directly in places. The pegmatites represent late stage, fluid-rich granitic melt that form dikes or veins that intrude the granite rock. The major difference between the two is that the pegmatites have larger feldspar and quartz crystals that formed in the late stage water-rich melt. The pegmatites are generally quite competent in both outcrop and rock core (see **Figure 3-13G**, a photo of MW-306 rock core). However, several drill cores showed moderate weathering where the pegmatite is disaggregated to gravel-sized particles (see **Figure 3-13G**, a photo of MW-311 rock core). Granite also shows weathered zones (see **Figure 3-13H**, a photo of MW-420 rock core, and **Figure 3-13G**, a photo of a piece of weathered granite from MW-409). The detailed core logs of the RCRA borings are contained in **Appendix B** of this report. The granite and pegmatite have steep contacts with the schist and appear to have been injected along foliation planes. The major structural features of granite and pegmatite are steeply inclined joints and horizontal or gently inclined sheet jointing, both of which show rust-stained surfaces.

The migmatites have a non-planar schistosity and are generally harder and more competent than the schist. **Figure 3-13H** is a photo of a particularly biotite-rich migmatite in MW-424. The average dip of the schistosity is steep, as in the schist, and the migmatites also separate in drill core along biotite-rich zones.

3.5.3.2 Bedrock Structural Features and Influence on Groundwater Movement

The original geologic map of Bailey Point produced by John Rand (1967) (also reproduced in RGGI, 1991, and Figure 13 of Stratex, 2002a) contains the structural mapping of the bedrock. The schist and migmatites exhibit well-developed foliation and layered fabric defined by the successive alternations of micaceous, quartzitic and feldspathic interbeds. The dip and strike information on the joints and foliation has been grouped and summarized in rose diagrams and lower hemisphere stereonet plots in several different ways for this report on **Figures 3-8 and 3-9A and B**.

The partings or foliation planes in the schist and migmatites are nearly vertical in orientation and the line formed by the intersection of a horizontal plane with the foliation or a joint is called the "strike". A “joint” is a planar fracture in the rock with no differential movement across the fracture. The angle which the joint or foliation makes with a horizontal plane, as measured in the plane normal to the strike, is called the “dip”.

The rose diagrams reflect the predominant direction (relative to true north) of the strike. The dip and strike can be inferred from the stereonet plots, which are contour plots of the locations of the intersections of a pole perpendicular to the joint or foliation plane with the lower half of a sphere. The system of north-south ridges and valleys reflects the doubly plunging (both to north and to the south) folds in the country rock. Non-foliated, massive fabric characterizes the intrusive granites and pegmatites, although joints (brittle fractures) do penetrate these rocks.

The rose diagram on **Figure 3-9A** shows the strike of all foliation measurements (in both schist and migmatite) on Bailey Point, as taken by Jack Rand prior to the start of construction of the plant. Notice that there is a tight band between N10W to N10E with 50% of the measurements in the N0E to N10E band and 28% in the N0E to N10W band. Only a very few measurements strayed outside of this group and probably reflect distortion due to nearby granite or pegmatite intrusion. The stereonet plot on **Figure 3-9A** shows that most of the foliation dips are in the range of 75 to 85 degrees from the horizontal. Comparing the dips measured in the bedrock cores with those measured on outcrop in the field suggests that foliation dips in the cores might average slightly less than those measured in outcrop. **Figure 3-8** contains additional summary bedrock structural data, from which one can see the differences between rocks on the east and west halves of Bailey Point. Notice that the rose diagrams for foliation on the east side of Bailey Point show a slight east-of-north bias in strike, compared with the foliation strike on the west side of Bailey Point.

Joints occur in all the rock types on the site. **Figure 3-9B** shows rose diagrams for joints in schist (and migmatite) and for granite (and pegmatite). Although the trends are very similar, the schist (and migmatite) has a somewhat higher percentage striking east-west and the granite (and pegmatite) has a slightly higher percentage striking N75W. **Figure 3-9B** shows the stereonet plots of the same data. In the schist and migmatite the joint dips are all greater than 50°. The high-angle granite and pegmatite joints have similar dips, but the granitic rock also has sheet joints, resulting in some flatter dips. Because sheet joints are difficult to measure in outcrop, they may be under-represented in the stereonet. In fact, review of the rock core suggests that sheet joints are more common than high-angle joints in the granite and pegmatite. Sheet joints are much more common in the top 20 feet of the core than at greater depth.

Comparing joint distribution between the east and west sides of Bailey Point as shown on **Figure 3-8**, there is a similarity in the N70E steeply-dipping joints, but the east side also has a N75W steep southerly dipping set that is all but missing on the west side of the point. Finally, the rose diagram of all fractures in all rock on all of Bailey Point on **Figure 3-9A** shows that the fracture sets are basically orthogonal due to the joint sets lying more or less normal to the foliation strike. In Gerber and Rand, 1980, it was concluded that the foliation was about 5 to 10 times more transmissive than the extensional cross jointing. This was because most of the cross-joints were short and discontinuous. The important water-bearing cross-joints are the N70E set, but they are spaced about 10 feet apart on average. The foliation plane spacing is much smaller by a factor of 10 to 100, thus implying a much greater transmissivity along foliation than in the cross joints. In the granitic rock, where there is an absence of foliation, transmissivity may have an equivalent isotropic character due to the intersection of the sheet joints and the N70W high-angle joints.

Estimates of the average effective porosity of the bedrock can be taken from numbers back-calculated from previous contaminant migration studies on the Maine Yankee site following a leak from the Secondary Component Cooling (SCC) system, and modeling done to track the fate of sodium chromate in the bedrock (Robert G. Gerber, Inc., 1989a). Stratex, LLC, 2002a, made an estimate of fracture surface area per unit volume of rock from an analysis of the average spacing of fractures in rock core logged on the site between 1967 and June of 2002. Seventy-five discrete high angle fractures in 786.9 feet of drill core have been identified for an average spacing of 10.5 feet between high angle fractures. Sheet joints in the granitic rock were typically spaced from 0.2 to 1 foot apart. Foliation partings in the schist were typically 0.1 to 1 foot apart. Overall, maximum fracture spacing of all types was 1 foot; minimum spacing of all types was 0.1 foot. Therefore the range in fracture area per unit volume is 1 square foot per cubic foot to 10 square feet per cubic foot. Average aperture spacing is taken from the literature and considered to be in the range from 1 to 100 microns with foliation plane apertures being in the low end of the range and sheet and high angle joints being about 10 microns at depth and wider in the upper 20 feet of rock.

The bedrock is a generally a very competent rock and foundation material. Of 61 bedrock cores taken on Bailey Point, only 14 show broken rock zones or more than slight weathering. Of 9 RCRA bedrock monitoring wells installed in core holes with moderate weathering or broken rock zones, only 3 had low flow pumping capacities of over 100 mL/minute (**Table 2-5**). The Wiscasset area, as a whole, has an average bedrock well yield that is significantly lower than that of the coast of Maine. There are very few high yield bedrock wells in the Wiscasset area (Gerber and Rand, 1980). In fact, four bedrock wells classified as "dry" have been drilled on the Maine Yankee property south of Old Ferry Road (Table 1 of Gerber and Rand, 1980).

The only major fault of regional significance is one postulated by Arthur Hussey (WGC, 1981) to extend under and parallel to the Back River (the Georgetown-Edgecomb Fault). Extensive geophysical investigations in the Back River by Maine Yankee have failed to find any evidence of disrupted sediments. No post-glacial faulting is either known or inferred for the area. The postulated fault does not affect the hydrogeology of the site. Two very localized small faults are exposed on the eastern shore of Bailey Point (Rand, 1967). One fault lies about 100 feet east of MW-425 and strikes N7E and dips 85°E. MW-425 has a high yield and slickensides were noted in the bedrock core. The other fault lies about 400 feet northeast of MW-425 and strikes N52E and dips 68° to the northwest. The N7E fault is coincident with foliation, but the N52E fault does not parallel other measured features on the site to any significant degree. Photolinear analysis summarized in Robert G. Gerber, Inc. (1994b) shows only 3 weak photolinears on the southern half of Bailey Point, all oriented at N75E. There is one strong photolinear north of Old Ferry Road that has the N52E orientation.

Other than MW-425, slickensides were only noted in 3 other of the 61 cores taken from the site: B101-67; B102-67; and B108-67. B101-67 and B102-67 lie on a north trending depression in the original bedrock surface (**Figure 3-4**), beginning on the shore just east of the east dike of the forebay and trending north, passing just east of the containment building. B101-67 and B109-67 (which are also on the bedrock low trending north from the shore) both showed weathering and/or broken rock zones. B108-67 was located very close to MW-401A. There is a zone of rock in the general vicinity of the Warehouse 2/3 and extending to the south that shows significant weathering effects. Nine of the 14 borings on the site showing moderate weathering and/or broken rock zones are in this area and include: MW-311 (see photo in **Figure 3-13G**); MW-401A; MW-402; MW-408; MW-409 (see photo in **Figure 3-13G**); MW-420 (see photo in **Figure 3-13H**); MW-421: MW-422A; and B12-66. B9A-66 lies to the north, but directly on strike, of this area and also shows moderate weathering. Of these wells, MW-408, MW-420, and MW-421 have higher than 100 mL/minute well capacities (**Table 2-5**). This area also shows irregular bedrock surface topography with steep-sided depressions (**Figure 3-6**). B111-67 and MW-424A are the only two borings showing moderate weathering or broken rock that cannot be linked to a possible bedrock structural feature at this time.

3.6 Site Groundwater Regime

The groundwater regime at the Maine Yankee facility is comprised of two aquifers: (1) a discontinuous surficial aquifer in the unconsolidated glaciomarine soils and fill material and (2) a bedrock aquifer. The surficial aquifer is not present continuously across the site, as the overburden soils are thin to non-existent in some portions of the site. This is especially true in the southern portion of Bailey Point. The bedrock aquifer is present below the entire site and vicinity. Much historical groundwater data and detailed discussions of those data are included in the QAPP and in Stratex, LLC, 2002a. Because both documents have been presented to the MDEP and EPA, that information will not be repeated here. This document will focus on the presentation and interpretation of the water level data gathered on Bailey Point since the start of the RCRA program. Because of the sequential installation of monitoring wells throughout Phase 1A and Phase 1B of the RCRA studies, not all wells have had water level readings more than one time. However, many wells have been measured 3 times. Synoptic water level readings at the site were taken on December 11, 2001, April 1, 2002, and September 16, 2002. On November 13, 2002, a special synoptic round of water levels was recorded for wells in the area west of containment and in the Warehouse 2/3 area. Measured RCRA water elevations on Bailey Point are summarized in **Table 2-6**. Figures 5-24, 5-25, and 5-26 of the QAPP contain selected historical water level data for the Site. Appendix F of Stratex, LLC, 2002a, contains historical data for the industrial area.

3.6.1 Overburden Water Levels

Contour maps of the measured water elevations in RCRA monitoring wells in soil are given in **Figures 3-10A**, **3-11A**, and **3-12A**. Graphs of groundwater elevation fluctuations are given in **Figure 3-12C** for all RCRA wells on the southern half of Bailey Point, and on **Figure 3-12D** for all RCRA wells on the northern half of Bailey Point. In general, most groundwater elevations were near all time low points at the end of the 2001 drought in December. The water levels rose during the spring of 2002, but then declined again to end-of-summer lows in September 2002 (it was a wet spring, but a hot, dry summer). MW-303B was the only aberrant overburden well, rising between April and September 2002, instead of declining.

There were a total of 30 RCRA wells capable of measuring water levels in the overburden. Several wells actually spanned the bedrock interface where the highest water table was very close to this interface, but most were sealed above the bedrock surface. The water table maps for three synoptic measurements show a similar pattern with a high in the middle of the site at the knoll and contours generally parallel to existing ground surface contours. From December 2001 to April 2002 typical water level rises were about 2 feet. However, MW-316 showed about a 6-foot rise and MW-304B showed a 7-foot rise. The area near the groundwater divide—near the ISFSI—had the largest change in groundwater elevation as would be predicted by theory. The maximum decline over the summer of 2002 was about 5 feet with most water levels dropping only 1 to 2 feet.

Of possible importance to this study is a seasonal shift in the position of the groundwater divide in the area of the former concrete truck maintenance garage, east of the ISFSI. The groundwater divide is somewhere in this area and probably moves seasonally. The location of this divide could determine whether the area of the former maintenance garage is the source of petroleum observed in groundwater in the area north of the ISFSI.

Overburden is generally thin north of Old Ferry Road, except in the stream valley that lies about 500 feet northwest of the Bailey Farm House. Figure 12 of Gerber and Rand, 1980, shows a water table map of the stream under the formerly proposed "Ash Disposal Area" in the Backlands. This map was developed from actual measurements of groundwater levels in 13 borings placed in that valley. The lowest elevation, on the south end of the valley, just north of Old Ferry Road, is elevation 30 feet above MSL. None of the groundwater levels on the north side of Old Ferry Road are more than 15 feet below ground surface. The lowest ground elevations north of Old Ferry Road and immediately northeast of the Ballfield are elevation 40 feet MSL, located in drainages where groundwater is discharging to the surface. The highest groundwater elevation measured in the RFI under the 345 kV transmission lines was near elevation 20 feet. This suggests that groundwater to the north of Old Ferry Road is elevated well above the groundwater levels under the 345 kV transmission lines and flowing toward it.

3.6.2 Bedrock Water Levels

Contour maps of the measured water elevations in RCRA monitoring wells in bedrock are given in **Figures 3-10B**, **3-11B**, and **3-12B**. Graphs of groundwater elevation fluctuations are given in **Figure 3-12C** for all RCRA wells on the southern half of Bailey Point, and on **Figure 3-12D** for all RCRA wells on the northern half of Bailey Point. In general, most groundwater elevations were near all time low points at the end of the 2001 drought in December. There are 31 RCRA wells sealed in bedrock and several more that span the bedrock/soil interface. Bedrock wells do not extend so far north of the ISFSI as do soil wells; however, there are more bedrock wells in the industrial area than soil wells since the water table in that area has historically been predominantly below the top of rock. All wells except MW-303A, MW-304A, MW-409A, MW-424A, B-201, and B-202 are sealed within 20' of the bedrock surface. The other wells may be sealed at deeper depths, up to 50 feet into rock.

The water level in the bedrock wells generally only rose a few feet from December 2001 to April 2002. The maximum rise of 5 feet was in MW-303A, in a groundwater divide area near the ISFSI. With the exception of MW-312, all other bedrock water levels were lower in September 2002 than in April 2002. For those wells measured in both September and November 2002, all bedrock water levels except those in MW-406A rose. Only wells MW-308 and MW-311 had water level measurements on all four different synoptic rounds. The levels in these two wells in November 2002 were not quite so high as in April 2002.

Although the 5-foot groundwater elevation contour map, **Figure 3-10B**, suggests no north-south groundwater divide as do the figures representing April and September 2002, the MW-302A level was actually lower by 2.5 feet than the MW-304A level, indicating that some type of divide did exist near the ISFSI. Groundwater modeling results shown in Figure 5-23 of the QAPP suggest that in the deep bedrock (several hundred feet below top of rock), there may be no north-south groundwater divide on Bailey Point.

As with the overburden regime on the north side of Old Ferry Road, all previously measured or inferred bedrock levels to the north of the road are no more than 15 feet below ground surface. Since the ground surface of the land on the north side of the road is at least 15 feet higher than the average ground surface under the 345 kV transmission lines, we can expect that groundwater is higher to the north of the road and flowing across the road to the south in the length of road from the Bailey Farm House to the Ballfield.

We have attempted to reflect the effects of the containment foundation sump drain and the deep rock cuts for the circulating water discharge pipe and pedestrian access tunnel (between Staff Building and Administration Building) in some of the groundwater contour maps.

In bedrock composed mostly of schist or migmatite, we would expect that there would be an anisotropy in the bedrock transmissivity that is about 5 to 10 times greater in a north-south direction than in the east-west direction. Thus the groundwater flow lines in the bedrock of the site will be primarily north-south, except near the east and west sides of the peninsula. As with the overburden water level data, it is difficult to determine the location of the east-west groundwater divide in the vicinity of the ISFSI. For the area of the former truck maintenance garage, see the more detailed discussions in **Section 4.8**.

3.6.3 Groundwater Vertical Gradients

The only known groundwater vertical gradient data for the site has been gathered from the RCRA RFI in 11 locations on Bailey Point. These data are summarized in **Table 3-3**.

Well pairs MW-302, -303, -304, and -305 surround the ISFSI. Based on groundwater contours drawn from RCRA data (**Figures 3-10, 3-11, and 3-12**) MW-303 and -304 appear to be located on or near a major groundwater divide on the site. This is confirmed by the vertical gradient calculations in **Table 3-3**, which indicate downward movement during all three episodes of measurement. The MW-305 well pair showed upward movement in all three episodes and it is only about 200 feet from a discharge location. The MW-302 well pair is on the north side of the ISFSI and indicated upward groundwater movement in December 2001 (very low time for most wells) and April 2002 (typical spring level), but downward in September 2002 (another low period for wells). Since this well is not far from the wetland and pond north of the ISFSI, upward gradients would be expected. The downward gradient observed in September 2002 may be related to a recent precipitation event.

Well pair MW-401 is located west of containment, about halfway to the shoreline at its closest point. The bedrock well is located in a small depression in the bedrock, below sea level, and exhibits saltwater intrusion. The bedrock is overlain by a permeable glaciomarine sand unit, which is in turn overlain by low permeability clay-silt, in which the upper well is located. The sharp increase in permeability with depth below the upper well is probably responsible for the strong downward gradient seen in this well in two different monitoring episodes.

Well pairs MW-406, -407, and -409 are located under and just to the southeast of Warehouse 2/3. Given the distance from discharge areas, a downward gradient would be normal as seen in MW-407 and -409. During the dry period of September 2002, there was a very slight upward gradient in MW-406, under the warehouse, but this was reversed to a strong downward gradient later that fall in November. The top of bedrock is just about at sea level and both the soil well and bedrock well had low specific capacity as shown in **Table 2-5**.

Well pairs MW-422 and -423 are just north of Outfalls 005 and 006. With locations very near a discharge point, upward gradients might be expected. In November 2002, MW-422 had a strong downward gradient and MW-423 had a somewhat weaker upward gradient. In September of 2002, MW-423 had a strong downward gradient. Both overburden wells are located in low permeability glaciomarine clay-silt. At MW-423, a 1.2-foot rise in the bedrock well, but a 1.9-foot decrease in the overburden well relative to the September values resulted in a reversal of gradient direction in MW-423. The implied specific capacity of all 4 wells at this location is low, based on **Table 2-5**.

The MW-424 well pair is located at the south end of the area of interest that includes the former concrete truck maintenance garage. Both wells in this pair are sealed within bedrock, as bedrock was shallow. This location is near the mapped groundwater divide based on contouring of groundwater measurements. In the single set of measurements taken in the low period of September 2002, there was a slight downward groundwater gradient in a rock mass of relatively low implied transmissivity.

In summary, although well pairs near groundwater divides and near discharge areas had somewhat predictable vertical groundwater gradient directions, localized non-homogeneities in the geologic stratigraphy and the differential response of these different stratigraphic units to seasonal and short-term responses to recharge caused groundwater gradient reversals to be observed.

3.6.4 Springs and Seeps

Small seeps and springs associated with spring and late fall high groundwater events can be found throughout the Maine Yankee property. Most of these occur as a result of shallow interflow discharge in small gullies and intermittent streams in the dense drainage network of the site. The flow from these springs is very slight and often diffuse and originates relatively close (normally within a 100 feet or so) to the seep. On Bailey Point, these intermittent springs and seeps are limited to the area of the stream and pond north of the ISFSI, the drainage ditch on the northwest edge of the "ball field," the wetland north of the 345 kV switchyard, a small gully south of the 115 kV switchyard, and very short small gullies along the east side of Bailey Point.

Another class of seeps is groundwater flow seen in the spring of the year at the soil/bedrock interface along the shoreline of Bailey Point where bedrock is present. This type of flow was seen to be very low and generally not sufficient flow for sampling. The origin of groundwater from these springs is less certain and could come from as far away as the groundwater divides on the site.

A third class of seeps and springs are those that occur within or just above the intertidal zone around Bailey Point. Of interest is the fact that no natural springs or seeps have been found in the intertidal or "top-of-tide" zone along the east side of Bailey Point.

On the west side of Bailey Point, **Figure 3-1** shows the locations of identifiable seeps in intertidal or supra-tidal locations. Seeps 1 and 2 may be representative of groundwater passing through the fill under the 345 kV line. Seeps 3 and 4, also west of the 345 kV line fill, are small areas of cat-o-nine tails and localized seeps whose origin may be from beneath the 345 kV yard fill. No other significant seeps are found except on the northern half of the western edge of the western forebay dike. Here there are three concentrated springs observed during a falling tide that appear to represent seepage through or under the forebay dike at rates of several tens of gallons per minute. Seepage paths within the forebay dikes and other hydrogeologic information relating to the forebay is given in Stratex, 2002d.

3.7 Sediment

The sediments of potential concern are in the intertidal (i.e., the area between high and low tide) and shallow subtidal areas surrounding Bailey Point. In these areas there is a layer dominated by fine silt and clay from approximately two to six inches thick. The surface of this layer is subject to resuspension, homogenization and redeposition with the daily tidal currents. The surface layer of sediment is underlain by coarser material (e.g., sand) and fragments of marine mollusk shells. The lack of a constant unidirectional current in the area results in deposition and build up of fine particles, which are a productive habitat for sediment dwelling estuarine organisms.

3.8 Ecological Setting

Maine Yankee is located on a peninsula that is bounded by the Back River to the east, mainland to the north, Montsweag Bay to the south, and Bailey Cove to the west. The site is approximately 13 miles inland from the open ocean. The coastline around the site varies between salt marsh and mudflat, with some rocky areas where the surface gradient is steepest. The eastern and southern sides of the site are characterized predominantly by a rocky shoreline with a moderately steep gradient; small patches of salt marsh are found along the immediate shoreline and mud flats are found in the intertidal zone. Bailey Cove is characterized by extensive mud flats.

3.8.1 Wetlands

As indicated in **Figure 3-14** there are only limited freshwater wetlands on Bailey Point. There is a small permanently flooded palustrine wetland system located along Old Ferry Road near the main entrance to the facility (**Figure 3-15**). The wetland is comprised of two small ponds that are hydrologically connected to one slightly larger pond. The vegetation is typical of a shallow open water system, with emergent aquatic vegetation such as pickerel weed and water lily in the shallow flooded areas, and cattails bordering the perimeter in areas with saturated soils. In addition to this area, there are two small scrub-shrub, deciduous wetlands that are seasonally flooded located in the Backlands. One of the wetlands is located north of Old Ferry Road along the western edge of the Maine Yankee property, and the other is located along Young Point Road and forms the headwater of a small tributary of Young's Brook. The small size and adjacent human activity limit the value of these wetlands as significant wildlife habitat. Similarly, the management of runoff on the site influences the hydrologic importance of the wetlands.

The majority of the wetlands found at the Maine Yankee facility are intertidal, estuarine wetlands that are flooded on a regular basis by tidal action (**Figure 3-15**). Along the shoreline of the peninsula where the main facility is located the bulk of the estuarine wetlands are comprised of mudflats, with bordering intertidal, rocky shore wetlands that are flooded irregularly. In the upper reaches of Bailey Cove near Young's Brook, there is an extensive area of emergent, estuarine wetland dominated by salt-marsh grasses. Similar areas of emergent estuarine wetland are found along the western shore of the backlands area in Chewonki Creek. Common plant species in these areas may include smooth cordgrass, salt hay cordgrass, salt grass, salt marsh bulrush, salt marsh sedge, and others.

3.8.2 Marine Habitat

The benthic invertebrate community of Montsweag Bay and Back River is both abundant and diverse. The invertebrate species of commercial or food value includes the American lobster (*Homarus americanus*), the soft-shelled clam (*Mya arenaria*), the blue mussel (*Mytilus edulis*), the blood worm (*Glycera dibranchiata*), and the sand worm (*Nereis virens*). In summer, the most abundant finfish species in the area include the migratory alewives (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and menhaden (*Brevoorita tyrannus*). Smaller but appreciable numbers of smelt (*Osmerus mordax*), mackerel (*Scomber scombrus*), and striped bass (*Morone saxatilis*) are also found in the area in summer. In winter, all of the above finfish species leave the area except for smelt, which remain widely distributed throughout the estuary and are found at all depths. In spring and fall, large numbers of juvenile sea herring (*Clupea harengus harengus*) appear, but this species is completely absent in summer and winter.

The most abundant demersal (bottom-living) fish is the tomcod (*Microgadus tomcod*), which occurs in large numbers in lower Montsweag Bay in summer, but does not extend into the northern end of the Bay or in to the Back River during that time of year. Of secondary importance in abundance are winter flounder (*Psuedopleuronectes americanus*) and smooth flounder (*Liopsetta putnami*). The grubby sculpin (*Myoxocephalus aenaeus*) is a weak fourth in numerical importance. The last three species are more evenly distributed throughout the area than are the tomcod.

Most of the adult fish are concentrated in the central channel areas of the Bay and Back River. Juvenile flounder, alewives, and bluefish (*Pomatomus saltatrix*) are found in flooded flats and a few species, such as mummichogs (*Fundulus heteroclitus*), silversides (*Menidia menidia*), and sticklebacks (*Family Gasterosteidae*) are restricted to the shallow areas.

There are many aquatic birds that use the marine habitat surrounding the site and the Montsweag Bay area, including several nesting osprey (*Pandion haleaetus*) at the site. In addition, Montsweag Bay, the Back River, and the surrounding areas provide abundant waterfowl habitat. Previous baseline surveys of migratory waterfowl in the area identified American black duck (*Anas rubripes*), bufflehead (*Bucephala albeola*), and goldeneye (*Bucephala clangula*) as the three most abundant waterfowl species using the area (Maine Department of Inland Fisheries and Game, 1971). Other migratory waterfowl known to use the area include mallard (*Anas platyrhynchos*), teal (*Anas spp.*), scaup (*Aythya spp.*), scoters (*Melanitta spp.*), common merganser (*Mergus merganser*), Canada geese (*Branta canadensis*), and old squaw (*Clangula hyemalis*). The area also provides plentiful habitat for shorebirds, such as great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and various sandpipers (*Tringa spp.*). In addition to osprey, other piscivorous birds, such as the belted kingfisher (*Ceryle alcyon*) frequently use the area, and it is also likely that bald eagles occasionally forage there as well. Finally, herring gulls (*Larus argentatus*) and other gulls are common in this area.

3.8.3 Terrestrial Habitat

The terrestrial habitat surrounding the facility and including Foxbird Island is comprised of a mixture of mature, mixed deciduous-coniferous forest, intermingled with old field habitat and shrub/brush land. Coniferous species include primarily a mixture of spruce, balsam fir, hemlock, and white pine. Hardwood species include primarily a mixture of beech, sugar and red maple, paper and yellow birch, white and red oak, quaking and bigtooth aspen, and black cherry. Some portions of the facility are maintained as mowed grass areas. A variety of birds and mammals likely use the site, as portions of the site, such as Foxbird Island, provide quality habitat.

Some of the mammals known to use the site include: white-tail deer, red fox, raccoon, red and gray squirrels, striped skunk, muskrat, and woodchuck. A variety of small mammals, such as snowshoe hare, mice, moles, shrews, weasels, and similar mammals are also likely to use the site.

Many species of migratory songbirds are likely to use the terrestrial portions of the site, including warblers, finches, sparrows, and similar species. Resident species also include black-capped chickadee, white-breasted and red-breasted nuthatch, tufted titmouse, blue jay, ruffed grouse, and others. Terrestrial birds of prey, such as red-tailed hawk, broad-winged hawk, American kestrel, Eastern screech owl, great horned owl, and barred owl are also likely visitors to the site.

In addition to birds and mammals, there are likely a variety of reptiles and amphibians found throughout the site. These might include species such as the eastern garter snake, northern redbelly snake, eastern milk snake, northern spring peeper, green frog, wood frog, spotted salamander, and redback salamander, among others.

3.9 Uncertainties and Data Limitations

Uncertainties and data limitations are discussed in this section of the report in the context of the ability to model contaminant fate and transport in the geologic environment.

The RFI field investigation was undertaken following the approved QAPP procedures. Those procedures focused primarily on the choice of sampling locations and methods of sampling and testing for chemical constituents. Sample acquisition and testing were subjected to a high degree of QA/QC and should, therefore, have few uncertainties or limitations other than those defined in the data validation reports. Uncertainties in the representativeness of the data are managed in the risk assessment process through statistical approaches as described in Sections 5 and 6 of this RFI Report.

Interpretation of geologic information cannot be specified so completely as the reporting of laboratory analytical results. Although soil sample and rock core logging procedures were standardized to the extent possible, multiple field personnel were engaged in the collection and logging of geologic media. We attempted to minimize the variability of having different personnel logging the samples by having one person review and edit for uniformity all RFI geologic media descriptions, and one person compare all rock core with the rock core logs and edit the final core logs.

Because there has been such widespread filling activity on Bailey Point, it was not possible with certainty to delineate the boundary between fill and native in-situ material at all locations. Furthermore, there may be isolated incidences where a notation of "refusal" in a soil log may not represent the actual top of bedrock, but rather may represent a boulder in glacial till or large diameter rocks at the bottom of fill.

Historical and RFI investigations have found steep-sided depressions in the bedrock surface and ubiquitous and rather irregular distributions of softer schistose rock juxtaposed with harder granites and pegmatites. The density of explorations is not uniform over the site; therefore, the standard error of estimate in defining the elevation of the bedrock surface and the thickness of overburden is quite variable across the Bailey Point site. Similarly, widely-spaced groundwater monitoring wells and widely-spaced readings of water levels in time create a large variability in the standard error of estimate in the water level contour maps. The location of the east-west groundwater divide in both soil and bedrock fluctuates seasonally. Groundwater gradients between surface and deep (several hundred feet deep) bedrock have not been measured. Groundwater elevations and flow directions have not been measured in deep bedrock. Nevertheless, refinements in the geologic database are not likely to significantly change the conclusions of the risk assessment or improve the discussion of contaminant fate and transport. To the extent that lack of geologic data affect the Corrective Measures Study (CMS), these limitations can be covered with the appropriate sensitivity analyses.

There are no insitu hydraulic conductivity test results for the site; however, low flow sampling yields can be used as surrogates to estimate insitu hydraulic conductivity. The percentage of precipitation that contributes to groundwater recharge can only be estimated and used as a calibration parameter in groundwater modeling. Since there are no tracer studies on the site, bedrock porosity and fracture aperture width has been estimated from literature values and estimates of bedrock fracture spacing are based on analysis of fracture frequency in cores (Stratex, 2002a). Bedrock transmissivity anisotropy can only be estimated based on qualitative considerations and must be treated as a sensitivity parameter in modeling. There are no site-specific data on specific yield and storativity in soil and bedrock, so transient groundwater simulations, if needed, would estimate these parameters from the literature.

Annual and seasonal variation in recharge to the groundwater system may result in fluctuations in contaminant concentrations detected in groundwater, surface water seeps, and springs. Sufficient information on seasonal contaminant variability was collected to support risk characterization; however, comprehensive seasonal variability characterization was not part of the scope of work for the RFI. Assessment of the bedrock flow system is subject to the inherent limitation of having to use a finite number of monitoring wells. There is a general internal consistency of distribution of most of the chemicals of concern in site groundwater. With the possible exception of molybdenum, which has an irregular distribution most likely related to an unknown mineral distribution in site bedrock, groundwater contaminant distributions conform to our current understanding of the nature of the strength and distributions of the sources. Since the conclusions of the risk assessment are conservative because the highest recorded concentrations on the site for each contaminant of concern were used, the average groundwater exposure is unlikely to exceed our current estimates, even with the addition of more sampling points and sampling episodes.

The type and strength of contaminants on the site have been well bounded by the biased sampling program. It is unlikely that any substantial sources or those of different character than those already encountered will be found. The RFI has been designed consistent with the potential sources and source risks known or inferred for this site and with a similar density of sampling points as other RCRA closure sites with comparable risks. The ubiquitous nature of hydrocarbons in groundwater suggests that the site had a history of multiple small petroleum spills. During the course of the RCRA program, a number of previously unidentified spills were encountered. There may be additional residual petroleum sources that have not been found on the site due to the finite nature of the sampling program. Similarly, construction fill material has been found in explorations widely dispersed about the site. There may be additional buried waste materials that have not been found on the site, also due to the finite nature of the sampling program. The groundwater investigation adequately characterizes the site, regardless of whether all sources have been identified.

We have attempted to overcome uncertainties of the types described above by taking soil samples at known or suspected locations of spills (biased sampling) and also by randomly choosing a large number of soil and groundwater sampling locations over a wide distribution throughout Bailey Point. The uncertainty in the spatial distribution of contaminant concentrations can be evaluated with geo-statistical methods. We have also taken as many samples as possible in zones where large areas of groundwater flow are focused, such as in identified springs and seeps and in bedrock surface troughs. The containment foundation sump was sampled, as it is a collector of groundwater over a significant portion of the RA. Based on historical data, we also attempted to place groundwater monitoring wells in zones of inferred high transmissivity bedrock in order to maximize the possibilities of capturing a large contributory area of groundwater flow. Finally, sediment samples were taken from locations of surface water discharge and expected groundwater discharge areas.

At the planning stage of the QAPP, there was uncertainty over the possible depth to which site-related impacts could penetrate intertidal and subtidal sediments. One of the objectives of the QAPP was to verify that the sediment samples were collected from the appropriate depth in order to evaluate historical site releases. Prior to sediment sample collection, the sediment was cored at various locations around Bailey Point with clear plastic core tubes that allowed a visual examination of the sediment column. Visual observation of the sediment column did suggest that sediment generated since the start of construction of Maine Yankee is discernable and that effects of both plant construction and operation did not extend much deeper than about 6 inches from the surface. This observation was confirmed following sediment chemistry analysis performed at several depths around Bailey Point as summarized in Sections 4 and 6 of this RFI Report.

Localized feasibility studies for the remediation of specific contaminant plumes may require that more data be gathered for parameters that sensitivity modeling shows to be important to fate and transport studies. All parameters would be subjected to sensitivity analysis in conjunction with any contaminant fate and transport analysis.

Table 3-1
Summary of Storm Drain Outfalls

Outfall Number	Description
005	The drainage area associated with Outfall 005 is to the west of the plant adjacent to and north of Warehouse 2/3, and includes a solid waste storage area and the 115 kV switchyard. Drainage is through a grassed swale that receives runoff collected by a culvert and a catch basin prior to being discharged to Bailey Cove. The area is unpaved. This outfall will be removed following decommissioning.
006	The drainage area associated with Outfall 006 receives storm water from material handling, shipping and receiving, and storage areas. It is associated with the loading area of Warehouse 2/3, a portion of the Staff Building parking area, Service Building roof drains, yard drainage in the vicinity of the cooling fans north of the Fuel Building and the north (reserve) transformers. In October 2002 the Outfall 007 drainage area was tied into this system. The subarea includes both paved and unpaved areas and is drained through catch basins and a drainage culvert to a point discharge west of the plant and adjacent to Bailey Cove. This outfall will be removed following decommissioning.
007	The drainage area associated with Outfall 007 receives storm water from the immediate vicinity of the Containment Building. It is comprised of discharges from paved and unpaved areas as well as building roof runoff and groundwater from the vicinity of the Containment Building foundation. The drainage is collected by numerous catch basins and, since October 2002, discharges to Bailey Cove via Outfall 006. Prior to this date, discharges were into the diffuser forebay, which subsequently discharged offshore through a multi-port diffuser into Montsweag Bay. Several of the catch basins and the outfall were abandoned during decommissioning activities.
008	The area associated with Outfall 008 captures drainage from Bailey Point and the area of the plant along the southeastern fence line. Drainage is to a swale and ditch which empties to Montsweag Bay just south of the fence line.
009	The area associated with Outfall 009 captures drainage from the southeast portion of facility paved areas and roof runoff. The area includes a solid waste storage area (not used to date), the former spare transformer, and was an area used for unloading fuel and chemicals during plant operation. Drainage is to catch basins that discharge to a single outfall located south of the former Circulating Water Pumphouse on the shoreline of Montsweag Bay. All but a single catch basin was abandoned during decommissioning activities and, following decommissioning, remaining catch basins will be abandoned and the outfall will be removed.
010	The drainage area associated with Outfall 010 receives storm water from paved and unpaved areas along the east side of the Plant in addition to the former Turbine Hall and the Administrative Building roof drains. Drainage is to catch basins that discharge to a single outfall located north of the former Circulating Water Pumphouse on the shoreline of Montsweag Bay. Located in this area were the main transformers and the security gate, where transport vehicles are held for clearance prior to plant entry. This outfall will be removed following decommissioning.
011	The drainage area associated with Outfall 011 captures drainage from paved roadways leading to the facility northeast of the former Turbine Hall behind the former Information Center. Other drainage includes a groundwater foundation drain and a Staff Building tunnel floor drain. Drainage is to catch basins that discharge to a single outfall located on the shoreline of the Back River. This outfall will be removed following decommissioning.
012	The drainage area associated with Outfall 012 receives storm water from the former Information Center paved parking lot and main access road. Drainage is to catch basins that discharge to a single outfall located on the shoreline of the Back River.
N12	Outfall N12 is an earthen swale that receives runoff from a portion of Parking Lot C and the Information Center Parking Lot.
013	The drainage area associated with Outfall 013 captures runoff from the gravel parking lot associated with the public boat launch in the northeast corner of the Bailey Point area. The drainage swale leads to the Back River.
014	Outfall 014 receives drainage water from the ball field area in the northwest corner of the Bailey Point area and drains to Bailey Cove.

Table 3-1
Summary of Storm Drain Outfalls

Outfall Number	Description
015	Outfall 015 captures drainage water from the area around the ball field and access road near the railroad tracks in the northwest corner of the Bailey Point area and drains to Bailey Cove.
016	Outfall 016 receives drainage water from the wetlands and pond north of the ISFSI and drains to an intertidal area of Bailey Cove west of ISFSI.
017	The drainage area associated with Outfall 017 captures runoff froman area around the ISFSI SOB. Drainage is by a catch basin to a single outfall adjacent to an unnamed drainage swale. The 345 kV Switchyard is located in this area, but its drainage is sheet flow overland to the adjacent environment.
018	The drainage area associated with Outfall 018 receives storm water from the ISFSI. Specifically, draining the area surrounded by the ISFSI berm and future SOB parking area. This area discharges to the intertidal area of Bailey Cove.

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
98-10-OW	409243.6	624613.2	0	18	Clay Fill	31.4	13.4
98-10-OW	409243.6	624613.2	18	44	Clay-Silt	13.4	-12.6
98-10-OW	409243.6	624613.2	44	48	Sand	-12.6	-16.6
98-10-OW	409243.6	624613.2	48	49.5	Rock	-16.6	-18.1
98-1-OW	408684.9	624569.1	0	2	Fill	38.1	36.1
98-1-OW	408684.9	624569.1	2	9	Clay-Silt	36.1	29.1
98-1-OW	408684.9	624569.1	9	18.4	Sand	29.1	19.7
98-1-OW	408684.9	624569.1	18.4	22.5	Rock	19.7	15.6
98-2	408822.2	624534.8	0	2	Fill	35.8	33.8
98-2	408822.2	624534.8	2	8	Clay Fill	33.8	27.8
98-2	408822.2	624534.8	8	29	Clay-Silt	27.8	6.8
98-2	408822.2	624534.8	29	48	Sand	6.8	-12.2
98-2	408822.2	624534.8	48	68	Rock	-12.2	-32.2
98-3	408919.4	624605.2	0	6.5	Fill	35.1	28.6
98-3	408919.4	624605.2	6.5	13	Clay Fill	28.6	22.1
98-3	408919.4	624605.2	13	49	Clay-Silt	22.1	-13.9
98-3	408919.4	624605.2	49	57.4	Sand	-13.9	-22.3
98-3	408919.4	624605.2	57.4	57.5	Rock	-22.3	-22.4
98-4	408900.4	624726.8	0	19.3	Clay-Silt	34.7	15.4
98-4	408900.4	624726.8	19.3	30.4	Sand	15.4	4.3
98-4	408900.4	624726.8	30.4	30.5	Rock	4.3	4.2
98-5	409032.2	624569.5	0	2	Fill	33.4	31.4
98-5	409032.2	624569.5	2	13	Shot Rock Fill	31.4	20.4
98-5	409032.2	624569.5	14	23	Clay Fill	19.4	10.4
98-5	409032.2	624569.5	23	27	Clay-Silt	10.4	6.4
98-5	409032.2	624569.5	27	28.5	Sand	6.4	4.9
98-5	409032.2	624569.5	28.5	57.4	Clay-Silt	4.9	-24
98-5	409032.2	624569.5	57.4	57.5	Rock	-24	-24.1
98-6	409010.5	624659.8	0	2	Fill	34.3	32.3
98-6	409010.5	624659.8	2	9	Shot Rock Fill	32.3	25.3
98-6	409010.5	624659.8	9	18	Clay Fill	25.3	16.3
98-6	409010.5	624659.8	18	38	Clay-Silt	16.3	-3.7
98-6	409010.5	624659.8	38	41.4	Sand	-3.7	-7.1
98-6	409010.5	624659.8	41.4	41.5	Rock	-7.1	-7.2
98-7	409010.4	624643.8	0	2	Fill	34.4	32.4
98-7	409010.4	624643.8	2	6	Shot Rock Fill	32.4	28.4
98-7	409010.4	624643.8	9	17	Clay Fill	25.4	17.4
98-7	409010.4	624643.8	17	39.4	Clay-Silt	17.4	-5
98-7	409010.4	624643.8	39.4	39.5	Rock	-5	-5.1
98-8	409010.0	624628.5	0	8	Fill	34.1	26.1

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
98-8	409010.0	624628.5	8	15	Clay Fill	26.1	19.1
98-8	409010.0	624628.5	15	39.5	Clay-Silt	19.1	-5.4
98-8	409010.0	624628.5	39.5	40	Sand	-5.4	-5.9
98-8	409010.0	624628.5	40	50	Rock	-5.9	-15.9
98-9-OW	409081.7	624858.5	0	2.5	Fill	31.3	28.8
98-9-OW	409081.7	624858.5	2.5	4	Clay Fill	28.8	27.3
98-9-OW	409081.7	624858.5	4	7.5	Fill	27.3	23.8
98-9-OW	409081.7	624858.5	7.5	23	Clay-Silt	23.8	8.3
98-9-OW	409081.7	624858.5	23	25	Sand	8.3	6.3
98-9-OW	409081.7	624858.5	25	35.6	Rock	6.3	-4.3
B101	407725.2	624148.8	0	9.7	Fill	21	11.3
B101	407725.2	624148.8	9.7	9.8	Rock	11.3	11.2
B101-67	407423.0	623820.9	0	14.5	Fill	27.7	13.2
B101-67	407423.0	623820.9	14.5	72.6	Rock	13.2	-44.9
B102	407759.6	624154.2	0	6.1	Fill	21	14.9
B102	407759.6	624154.2	6.1	6.2	Rock	14.9	14.8
B-102-67	407726.3	623889.8	0	20.6	Fill	31.3	10.7
B-102-67	407726.3	623889.8	20.6	77.7	Rock	10.7	-46.4
B103	407773.8	624117.5	0	8.9	Fill	21	12.1
B103	407773.8	624117.5	8.9	9	Rock	12.1	12
B-103-67	408109.1	624002.4	0	19.6	Clay-Silt	33.5	13.9
B-103-67	408109.1	624002.4	19.6	80	Rock	13.9	-46.5
B104	407745.8	624111.5	0	8.9	Fill	20	11.1
B104	407745.8	624111.5	8.9	9	Rock	11.1	11
B-104-67	407610.6	624270.6	0	15.2	Sand	24.3	9.1
B-104-67	407610.6	624270.6	15.2	70.2	Rock	9.1	-45.9
B105	407717.8	624105.3	0	10.4	Fill	21	10.6
B105	407717.8	624105.3	10.4	10.5	Rock	10.6	10.5
B-105-67	408197.8	623617.0	0	15.1	Clay-Silt	25.5	10.4
B-105-67	408197.8	623617.0	15.1	71	Rock	10.4	-45.5
B10-66	408078.7	624417.1	0	10	Clay-Silt	33	23
B10-66	408078.7	624417.1	10	12	Sand	23	21
B10-66	408078.7	624417.1	12	32	Rock	21	1
B-106-67	407916.0	623744.6	0	12.5	Clay-Silt	31.4	18.9
B-106-67	407916.0	623744.6	12.5	22.5	Rock	18.9	8.9
B-107-67	407766.7	623702.6	0	14	Clay-Silt	29.2	15.2
B-107-67	407766.7	623702.6	14	14	Rock	15.2	15.2
B-108-67	407627.4	623658.5	0	13	Fill	26.2	13.2
B-108-67	407627.4	623658.5	13	23	Rock	13.2	3.2
B10-89	407678.8	624434.1	0	11.4	Clay-Silt	19.2	7.8

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
B10-89	407678.8	624434.1	11.4	11.5	Rock	7.8	7.7
B109-67	407567.1	623850.0	0	17.3	Clay-Silt	30.4	13.1
B109-67	407567.1	623850.0	17.3	27.3	Rock	13.1	3.1
B110-67	407525.8	624047.2	0	16.3	Clay-Silt	29.7	13.4
B110-67	407525.8	624047.2	16.3	26.3	Rock	13.4	3.4
B111-67	407669.1	624088.2	0	10	Clay-Silt	31.4	21.4
B111-67	407669.1	624088.2	10	20	Rock	21.4	11.4
B-112-67	407813.3	624131.1	0	5.4	Sand	32.3	26.9
B-112-67	407813.3	624131.1	5.4	15.4	Rock	26.9	16.9
B11-66	407374.5	624081.2	0	6	Fill	30.3	24.3
B11-66	407374.5	624081.2	6	26	Rock	24.3	4.3
B12-66	407825.1	623517.1	0	18	Clay-Silt	23	5
B12-66	407825.1	623517.1	18	38	Rock	5	-15
B1-66	409184.6	625153.9	0	15	Clay-Silt	35.4	20.4
B1-66	409184.6	625153.9	15	19.5	Till	20.4	15.9
B1-66	409184.6	625153.9	19.5	43.5	Rock	15.9	-8.1
B1-89	407815.8	624333.8	0	2.3	Fill	21.6	19.3
B1-89	407815.8	624333.8	2.3	2.4	Rock	19.3	19.2
B1-99	408902.6	624077.3	0	41	Clay-Silt	16.5	-24.5
B1-99	408902.6	624077.3	41	41.1	Rock	-24.5	-24.6
B-1E	408480.3	624134.6	0	6.5	Fill	24	17.5
B-1E	408480.3	624134.6	6.5	6.6	Rock	17.5	17.4
B-201	407335.1	623861.1	0	4	Fill	20.6	16.6
B-201	407335.1	623861.1	4	10	Clay-Silt	16.6	10.6
B-201	407335.1	623861.1	10	61	Rock	10.6	-40.4
B201-69	408120.8	624355.6	0	1.3	Clay-Silt	31	29.7
B201-69	408120.8	624355.6	1.3	1.4	Rock	29.7	29.6
B-202	407377.9	623834.1	0	10.5	Fill	20.4	9.9
B-202	407377.9	623834.1	10.5	15.4	Clay-Silt	9.9	5
B-202	407377.9	623834.1	15.4	66.4	Rock	5	-46
B202-69	408247.7	623840.9	0	0.8	Clay-Silt	29	28.2
B202-69	408247.7	623840.9	0.8	0.9	Rock	28.2	28.1
B203-69	408413.1	623892.5	0	3.5	Clay-Silt	26.8	23.3
B203-69	408413.1	623892.5	3.5	3.6	Rock	23.3	23.2
B-203A	407481.8	623666.5	0	5	Fill	20.8	15.8
B-203A	407481.8	623666.5	5	7.5	Clay-Silt	15.8	13.3
B-203A	407481.8	623666.5	7.5	27.5	Rock	13.3	-6.7
B204-69	408567.3	623854.6	0	21.5	Clay-Silt	20	-1.5
B204-69	408567.3	623854.6	21.5	21.6	Rock	-1.5	-1.6
B-204A	407788.7	623984.0	0	9.8	Fill	21	11.2

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
B-204A	407788.7	623984.0	9.8	30.6	Rock	11.2	-9.6
B-205	407390.6	623772.4	0	9	Fill	20	11
B-205	407390.6	623772.4	9	13.7	Rock	11	6.3
B205-69	408547.4	623937.7	0	13.8	Clay-Silt	26	12.2
B205-69	408547.4	623937.7	13.8	13.9	Rock	12.2	12.1
B-206	407420.1	623823.8	0	13.5	Fill	19.6	6.1
B-206	407420.1	623823.8	13.5	23	Rock	6.1	-3.4
B206-69	408532.4	624008.8	0	3	Clay-Silt	27	24
B206-69	408532.4	624008.8	3	3.1	Rock	24	23.9
B207-69	408705.6	623974.5	0	23	Clay-Silt	18	-5
B207-69	408705.6	623974.5	23	23.1	Rock	-5	-5.1
B208-69	408828.9	624013.7	0	21	Clay-Silt	18	-3
B208-69	408828.9	624013.7	21	21.1	Rock	-3	-3.1
B209-69	408615.8	623677.2	0	15.5	Clay-Silt	28	12.5
B209-69	408615.8	623677.2	15.5	15.6	Rock	12.5	12.4
B2-66	408763.5	624867.1	0	16	Clay-Silt	42.2	26.2
B2-66	408763.5	624867.1	16	36	Rock	26.2	6.2
B3-66	409344.0	624981.1	0	19	Clay-Silt	25.9	6.9
B3-66	409344.0	624981.1	19	40	Rock	6.9	-14.1
B3-89	408164.3	624404.0	0	3.3	Fill	29.9	26.6
B3-89	408164.3	624404.0	3.3	3.4	Rock	26.6	26.5
B4-66	408980.1	624714.5	0	23	Clay-Silt	25.7	2.7
B4-66	408980.1	624714.5	23	43	Rock	2.7	-17.3
B4-89	408357.4	624443.1	0	7	Clay-Silt	35.3	28.3
B4-89	408357.4	624443.1	7	7.1	Rock	28.3	28.2
B5-66	409511.2	624797.2	0	34	Clay-Silt	18.7	-15.3
B5-66	409511.2	624797.2	34	51	Sand	-15.3	-32.3
B5-66	409511.2	624797.2	51	63	Clay-Silt	-32.3	-44.3
B5-66	409511.2	624797.2	63	83	Rock	-44.3	-64.3
B5-89	408484.6	624511.4	0	5.7	Clay-Silt	39	33.3
B5-89	408484.6	624511.4	5.7	5.8	Rock	33.3	33.2
B6-66	409114.6	624472.1	0	45.5	Clay-Silt	16.7	-28.8
B6-66	409114.6	624472.1	45.5	66.5	Rock	-28.8	-49.8
B7-66	409399.9	624241.7	0	13.5	Clay-Silt	12.5	-1
B7-66	409399.9	624241.7	13.5	33.5	Rock	-1	-21
B9-66	409327.0	623924.0	0	28	Clay-Silt	11.4	-16.6
B9-66	409327.0	623924.0	28	28.1	Rock	-16.6	-16.7
B9A-66	409327.3	623884.3	0	15	Clay-Silt	11.4	-3.6
B9A-66	409327.3	623884.3	15	35	Rock	-3.6	-23.6
BK-1	407697.2	623734.6	0	16.85	Fill	21	4.15

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
BK-1	407697.2	623734.6	16.85	16.9	Rock	4.15	4.1
BK-2	407669.4	623701.3	0	9	Fill	21	12
BK-2	407669.4	623701.3	9	20	Clay-Silt	12	1
BK-2	407669.4	623701.3	20	23.7	Sand	1	-2.7
BK-2	407669.4	623701.3	23.7	23.8	Rock	-2.7	-2.8
BK-3	407712.6	623724.2	0	14.3	Fill	21	6.7
BK-3	407712.6	623724.2	14.3	18.6	Sand	6.7	2.4
BK-3	407712.6	623724.2	18.6	18.7	Rock	2.4	2.3
BK-4	407676.7	623717.2	0	17	Fill	21	4
BK-4	407676.7	623717.2	17	19.2	Sand	4	1.8
BK-4	407676.7	623717.2	19.2	19.3	Rock	1.8	1.7
BP-GPO1	407034.2	624268.3	0	12	Clay-Silt	30	18
BP-GPO1	407034.2	624268.3	12	12.1	Rock	18	17.9
BP-GPO2	407051.6	624175.4	0	16	Clay-Silt	30	14
BP-GPO2	407051.6	624175.4	16	16.1	Rock	14	13.9
HB4	410707.6	623810.3	0	6	Clay-Silt	27.5	21.5
HB4	410707.6	623810.3	6	6.1	Rock	21.5	21.4
K-1	409253.9	624342.9	0	9.5	Fill	23	13.5
K-1	409253.9	624342.9	9.5	27.5	Clay-Silt	13.5	-4.5
K-1	409253.9	624342.9	27.5	27.6	Rock	-4.5	-4.6
K-2D	409289.4	624384.3	0	6	Fill	23	17
K-2D	409289.4	624384.3	6	30	Clay-Silt	17	-7
K-2D	409289.4	624384.3	30	31	Sand	-7	-8
K-2D	409289.4	624384.3	31	41	Rock	-8	-18
K-3D	409198.3	624362.0	0	5.8	Fill	24	18.2
K-3D	409198.3	624362.0	5.8	34	Clay-Silt	18.2	-10
K-3D	409198.3	624362.0	34	34.3	Sand	-10	-10.3
K-3D	409198.3	624362.0	34.3	44.4	Rock	-10.3	-20.4
K-4D	409274.6	624320.2	0	10	Fill	24	14
K-4D	409274.6	624320.2	10	25	Clay-Silt	14	-1
K-4D	409274.6	624320.2	25	26	Sand	-1	-2
K-4D	409274.6	624320.2	26	36	Rock	-2	-12
P1	407688.6	623679.5	0	24.5	Clay-Silt	21	-3.5
P1	407688.6	623679.5	24.5	24.6	Rock	-3.5	-3.6
P10A	407822.1	623897.4	0	8.3	Clay-Silt	21	12.7
P10A	407822.1	623897.4	8.3	8.4	Rock	12.7	12.6
P10B	407780.3	623988.9	0	2.6	Clay-Silt	20.3	17.7
P10B	407780.3	623988.9	2.6	2.7	Rock	17.7	17.6
P-10D	408863.6	624481.9	0	37	Clay-Silt	35	-2
P-10D	408863.6	624481.9	37	37.1	Rock	-2	-2.1

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
P11B	407776.2	624062.5	0	3.8	Clay-Silt	20.3	16.5
P11B	407776.2	624062.5	3.8	3.9	Rock	16.5	16.4
P-11D	408653.5	624571.9	0	23.5	Clay-Silt	38	14.5
P-11D	408653.5	624571.9	23.5	23.6	Rock	14.5	14.4
P12B	407735.9	624074.8	0	3.3	Clay-Silt	20.3	17
P12B	407735.9	624074.8	3.3	3.4	Rock	17	16.9
P-12D	408778.8	624629.4	0	18	Clay-Silt	36	18
P-12D	408778.8	624629.4	18	18.1	Rock	18	17.9
P-13D	409184.1	624403.7	0	32	Clay-Silt	26	-6
P-13D	409184.1	624403.7	32	32.1	Rock	-6	-6.1
P-14D	409036.0	624397.4	0	4	Clay-Silt	27	23
P15B	407921.5	623955.5	0	8.3	Clay-Silt	29.9	21.6
P15B	407921.5	623955.5	8.3	8.4	Rock	21.6	21.5
P-15D	408939.9	624373.2	0	5	Clay-Silt	30	25
P16B	407916.0	624055.1	0	23.5	Clay-Silt	31.2	7.7
P16B	407916.0	624055.1	23.5	23.6	Rock	7.7	7.6
P-16D	408990.0	624384.3	0	5	Clay-Silt	28	23
P17B	407907.1	624154.6	0	3.6	Clay-Silt	28.7	25.1
P17B	407907.1	624154.6	3.6	3.7	Rock	25.1	25
P18B	407986.8	624008.4	0	2	Fill	31.5	29.5
P18B	407986.8	624008.4	2	5	Clay Fill	29.5	26.5
P18B	407986.8	624008.4	5	15.5	Fill	26.5	16
P-18D	409055.9	624530.0	0	4	Fill	33	29
P-18D	409055.9	624530.0	4	25	Clay Fill	29	8
P-18D	409055.9	624530.0	25	50	Clay-Silt	8	-17
P-18D	409055.9	624530.0	50	57	Sand	-17	-24
P-18D	409055.9	624530.0	57	57.1	Rock	-24	-24.1
P1-99	408896.8	624052.4	0	38.5	Clay-Silt	17.3	-21.2
P1-99	408896.8	624052.4	38.5	38.6	Rock	-21.2	-21.3
P19B	407968.0	624110.1	0	11	Clay-Silt	31.5	20.5
P19B	407968.0	624110.1	11	11.1	Rock	20.5	20.4
P1A	407520.9	623616.2	0	7.8	Clay-Silt	21	13.2
P1A	407520.9	623616.2	7.8	7.9	Rock	13.2	13.1
P1B	407612.4	623735.8	0	10.8	Clay-Silt	20.3	9.5
P1B	407612.4	623735.8	10.8	10.9	Rock	9.5	9.4
P-1D	408623.5	624199.0	0	4.5	Clay-Silt	23	18.5
P-1D	408623.5	624199.0	4.5	4.6	Rock	18.5	18.4
P2	407658.4	623673.0	0	27	Clay-Silt	21	-6
P2	407658.4	623673.0	27	27.1	Rock	-6	-6.1
P20B	408045.0	623981.3	0	7.5	Clay-Silt	31.2	23.7

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
P20B	408045.0	623981.3	7.5	7.6	Rock	23.7	23.6
P21B	408083.2	624041.7	0	17.5	Clay-Silt	31.2	13.7
P21B	408083.2	624041.7	17.5	17.6	Rock	13.7	13.6
P22B	408053.6	624135.8	0	1.2	Clay-Silt	31.3	30.1
P22B	408053.6	624135.8	1.2	1.3	Rock	30.1	30
P23B	408120.2	624098.8	0	13.8	Clay-Silt	31.4	17.6
P23B	408120.2	624098.8	13.8	13.9	Rock	17.6	17.5
P2-99	408892.7	624075.5	0	44.1	Clay-Silt	17	-27.1
P2-99	408892.7	624075.5	44.1	44.2	Rock	-27.1	-27.2
P2A	407584.1	623629.8	0	9.2	Clay-Silt	21	11.8
P2A	407584.1	623629.8	9.2	9.3	Rock	11.8	11.7
P2B	407636.9	623735.3	0	4.2	Clay-Silt	20.1	15.9
P2B	407636.9	623735.3	4.2	4.3	Rock	15.9	15.8
P2C	408146.2	623558.3	0	20	Clay-Silt	26	6
P2C	408146.2	623558.3	20	20.1	Rock	6	5.9
P-2D	408721.6	624218.3	0	7	Clay-Silt	24	17
P-2D	408721.6	624218.3	7	7.1	Rock	17	16.9
P3	407627.7	623667.0	1	16.1	Clay-Silt	20	4.9
P3	407627.7	623667.0	16.1	16.2	Rock	4.9	4.8
P3-99	408913.9	624068.1	0	22.1	Clay-Silt	16.5	-5.6
P3-99	408913.9	624068.1	22.1	22.2	Rock	-5.6	-5.7
P3A	407515.2	623642.9	0	13.1	Clay-Silt	21	7.9
P3A	407515.2	623642.9	13.1	13.2	Rock	7.9	7.8
P3C	408065.8	623587.5	0	22	Clay-Silt	23	1
P3C	408065.8	623587.5	22	22.1	Rock	1	0.9
P-3D	408820.5	624270.0	0	19	Clay-Silt	28	9
P-3D	408820.5	624270.0	19	19.1	Rock	9	8.9
P4	407633.1	623638.8	0	16.5	Clay-Silt	21	4.5
P4	407633.1	623638.8	16.5	16.6	Rock	4.5	4.4
P4-99	408909.2	624090.3	0	40.5	Clay-Silt	16.8	-23.7
P4-99	408909.2	624090.3	40.5	40.6	Rock	-23.7	-23.8
P4A	407578.3	623656.5	0	11.2	Clay-Silt	21	9.8
P4A	407578.3	623656.5	11.2	11.3	Rock	9.8	9.7
P4B	407661.0	623740.5	0	3.1	Clay-Silt	20.4	17.3
P4B	407661.0	623740.5	3.1	3.2	Rock	17.3	17.2
P4C	408148.9	623545.5	0	13.5	Clay-Silt	27	13.5
P4C	408148.9	623545.5	13.5	13.6	Rock	13.5	13.4
P-4D	408908.4	624293.6	0	23	Clay-Silt	25	2
P-4D	408908.4	624293.6	23	23.1	Rock	2	1.9
P5	407664.3	623645.6	0	26.5	Clay-Silt	21	-5.5

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
P5	407664.3	623645.6	26.5	26.6	Rock	-5.5	-5.6
P5-99	408869.5	624052.8	0	36.3	Clay-Silt	18.5	-17.8
P5-99	408869.5	624052.8	36.3	36.4	Rock	-17.8	-17.9
P5A	407621.3	623727.5	0	12	Clay-Silt	21	9
P5A	407621.3	623727.5	12	12.1	Rock	9	8.9
P5C	407975.1	623532.5	0	9	Clay-Silt	25	16
P5C	407975.1	623532.5	9	9.1	Rock	16	15.9
P-5D	409100.3	624335	0	29	Clay-Silt	24	-5
P-5D	409100.3	624335	29	29.1	Rock	-5	-5.1
P6	407694.3	623653.1	0	21.5	Clay-Silt	21	-0.5
P6	407694.3	623653.1	21.5	21.6	Rock	-0.5	-0.6
P62	410337.3	624291.9	0	3	Fill	23.8	20.8
P62	410337.3	624291.9	3	3.1	Rock	20.8	20.7
P63	410374.9	624245.1	0	6.5	Clay-Silt	23.9	17.4
P63	410374.9	624245.1	6.5	6.6	Rock	17.4	17.3
P68	408415.7	624471.8	0	5	Clay-Silt	37	32
P68	408415.7	624471.8	5	5.1	Rock	32	31.9
P69	408319.0	624431.8	0	8.5	Clay-Silt	34.4	25.9
P69	408319.0	624431.8	8.5	8.6	Rock	25.9	25.8
P6-99	408862.5	624087.8	0	8.8	Clay-Silt	18.5	9.7
P6-99	408862.5	624087.8	8.8	8.9	Rock	9.7	9.6
P6B	407351.8	624151.6	0	2.8	Clay-Silt	20.1	17.3
P6B	407351.8	624151.6	2.8	2.9	Rock	17.3	17.2
P-6D	408810.3	624318.9	0	14.5	Clay-Silt	30	15.5
P-6D	408810.3	624318.9	14.5	14.6	Rock	15.5	15.4
P70	408280.5	624416.4	0	7.5	Clay-Silt	33.2	25.7
P70	408280.5	624416.4	7.5	7.6	Rock	25.7	25.6
P71	408234.0	624405.3	0	7	Clay-Silt	32.2	25.2
P71	408234.0	624405.3	7	7.1	Rock	25.2	25.1
P77	407845.3	624339.0	0	5	Clay-Silt	22.4	17.4
P77	407845.3	624339.0	5	5.1	Rock	17.4	17.3
P78	407739.3	624336.5	0	10	Clay-Silt	20.2	10.2
P78	407739.3	624336.5	10	10.1	Rock	10.2	10.1
P7A	407808.8	623829.0	0	4.4	Clay-Silt	21	16.6
P7A	407808.8	623829.0	4.4	4.5	Rock	16.6	16.5
P7B	407339.2	624210.1	0	3.2	Clay-Silt	20.5	17.3
P7B	407339.2	624210.1	3.2	3.3	Rock	17.3	17.2
P-7D	408886.8	624385.6	0	20.8	Clay-Silt	30	9.2
P-7D	408886.8	624385.6	20.8	20.9	Rock	9.2	9.1
P8A	407836.1	623835.6	0	5.3	Clay-Silt	21	15.7

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
P8A	407836.1	623835.6	5.3	5.4	Rock	15.7	15.6
P8B	407411.0	624164.3	0	2.3	Clay-Silt	20.5	18.2
P8B	407411.0	624164.3	2.3	2.4	Rock	18.2	18.1
P-8D	409079.1	624431.1	0	28	Clay-Silt	27	-1
P-8D	409079.1	624431.1	28	28.1	Rock	-1	-1.1
P9	407803.8	623689.4	0	16	Clay-Silt	21	5
P9	407803.8	623689.4	16	16.1	Rock	5	4.9
P9A	407795.4	623890.9	0	5.5	Clay-Silt	21	15.5
P9A	407795.4	623890.9	5.5	5.6	Rock	15.5	15.4
P9B	407394.3	624241.8	0	1.7	Clay-Silt	20.6	18.9
P9B	407394.3	624241.8	1.7	1.8	Rock	18.9	18.8
P-9D	408766.4	624458.8	0	23.5	Clay-Silt	36	12.5
P-9D	408766.4	624458.8	23.5	23.6	Rock	12.5	12.4
T-28U	409804.6	624103.1	0	35	Clay-Silt	15	-20
T-28U	409804.6	624103.1	35	35.1	Rock	-20	-20.1
T-29C	409160.5	623940.3	0	23	Clay-Silt	13	-10
T-29C	409160.5	623940.3	23	23.1	Rock	-10	-10.1
T-45A	409866.5	624305.1	0	11	Clay-Silt	18	7
T-45C	409871.3	624246.5	0	30	Clay-Silt	18	-12
T-45C	409871.3	624246.5	30	30.1	Rock	-12	-12.1
T-46C	409140.7	624060.4	0	26	Clay-Silt	15	-11
T-46C	409140.7	624060.4	26	26.1	Rock	-11	-11.1
TB-1	407703.3	623669.1	0	12	Clay-Silt	21	9
TB-1	407703.3	623669.1	12	12.1	Rock	9	8.9
TB10B	408098.7	624427.8	0	14.7	Clay-Silt	36.6	21.9
TB10B	408098.7	624427.8	14.7	14.8	Rock	21.9	21.8
TB11A	407839.6	623555.6	0	16	Clay-Silt	20.7	4.7
TB11A	407839.6	623555.6	16	16.1	Rock	4.7	4.6
TB11B	408093.2	624464.8	0	16.5	Clay-Silt	35.6	19.1
TB11B	408093.2	624464.8	16.5	16.6	Rock	19.1	19
TB12A	407907.8	623570.3	0	14.6	Clay-Silt	20.5	5.9
TB12A	407907.8	623570.3	14.6	14.7	Rock	5.9	5.8
TB12B	408001.2	623941.2	0	12.2	Clay-Silt	31.1	18.9
TB12B	408001.2	623941.2	12.2	12.3	Rock	18.9	18.8
TB13A	407891.9	623644	0	3.6	Clay-Silt	20.7	17.1
TB13A	407891.9	623644	3.6	3.7	Rock	17.1	17
TB13B	408023.6	624079.9	0	13	Clay-Silt	31.2	18.2
TB13B	408023.6	624079.9	13	13.1	Rock	18.2	18.1
TB14A	407823.7	623629.4	0	4.6	Clay-Silt	20.9	16.3
TB14A	407823.7	623629.4	4.6	4.7	Rock	16.3	16.2

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
TB14B	408002.0	624175.7	0	4.8	Clay-Silt	31.2	26.4
TB14B	408002.0	624175.7	4.8	4.9	Rock	26.4	26.3
TB1B	407906.7	624029.6	0	25	Clay-Silt	30.8	5.8
TB1B	407906.7	624029.6	25	25.1	Rock	5.8	5.7
TB1C	407949.8	623587.8	0	18.4	Clay-Silt	22	3.6
TB1C	407949.8	623587.8	18.4	18.5	Rock	3.6	3.5
TB-1D	409109.8	624386.1	0	27.8	Clay-Silt	26	-1.8
TB-1D	409109.8	624386.1	27.8	27.9	Rock	-1.8	-1.9
TB-2	407725.5	623674.6	0	8.3	Clay-Silt	21	12.7
TB-2	407725.5	623674.6	8.3	8.4	Rock	12.7	12.6
TB2B	407886.1	624125.6	0	12.3	Clay-Silt	31	18.7
TB2B	407886.1	624125.6	12.3	12.4	Rock	18.7	18.6
TB2C	408140.0	623586.9	0	28.8	Clay-Silt	26.5	-2.3
TB2C	408140.0	623586.9	28.8	28.9	Rock	-2.3	-2.4
TB-2D	408993.2	624360.1	0	25.9	Clay-Silt	21	-4.9
TB-2D	408993.2	624360.1	25.9	26	Rock	-4.9	-5
TB-3	407714.7	623663.0	0	12.2	Clay-Silt	21	8.8
TB-3	407714.7	623663.0	12.2	12.3	Rock	8.8	8.7
TB3B	407941.3	624455.4	0	25.6	Clay-Silt	26.2	0.6
TB3B	407941.3	624455.4	25.6	25.7	Rock	0.6	0.5
TB3C	408086.1	623555.6	0	26	Clay-Silt	26.5	0.5
TB3C	408086.1	623555.6	26	26.1	Rock	0.5	0.4
TB-3D	408915.4	624293.9	0	24	Clay-Silt	21	-3
TB-3D	408915.4	624293.9	24	24.1	Rock	-3	-3.1
TB-4	407728.8	623655.9	0	8	Clay-Silt	21	13
TB-4	407728.8	623655.9	8	8.1	Rock	13	12.9
TB4B	408002.2	624407	0	15.2	Clay-Silt	26.5	11.3
TB4B	408002.2	624407	15.2	15.3	Rock	11.3	11.2
TB4C	408151.7	623526.4	0	6.1	Clay-Silt	28.5	22.4
TB4C	408151.7	623526.4	6.1	6.2	Rock	22.4	22.3
TB-4D	408835.3	624274.1	0	23	Clay-Silt	26	3
TB-4D	408835.3	624274.1	23	23.1	Rock	3	2.9
TB-5	407705.9	623653.3	0	14.5	Clay-Silt	21	6.5
TB-5	407705.9	623653.3	14.5	14.6	Rock	6.5	6.4
TB5B	407993.8	624445.9	0	14.7	Clay-Silt	26	11.3
TB5B	407993.8	624445.9	14.7	14.8	Rock	11.3	11.2
TB5C	407971.3	623487.6	0	8.4	Clay-Silt	28	19.6
TB5C	407971.3	623487.6	8.4	8.5	Rock	19.6	19.5
TB-5D	408825.4	624322.4	0	14.6	Clay-Silt	29.5	14.9
TB-5D	408825.4	624322.4	14.6	14.7	Rock	14.9	14.8

Table 3-2
Pre-RFI Selected Geologic Explorations
Bailey Point

Boring Number[1]	Northing[2]	Easting[2]	Depth to Top of Geologic Unit[3]	Depth to Bottom of Geologic Unit[3]	Stratigraphy[4]	Elevation of Top of Geologic Unit[5]	Elevation of Bottom of Geologic Unit[5]
TB6B	407985.7	624483.4	0	15.1	Clay-Silt	25.7	10.6
TB6B	407985.7	624483.4	15.1	15.2	Rock	10.6	10.5
TB-6D	409052.4	624323.0	0	26.7	Clay-Silt	25	-1.7
TB-6D	409052.4	624323.0	26.7	26.8	Rock	-1.7	-1.8
TB7B	408050.4	624417.4	0	18.5	Clay-Silt	34.4	15.9
TB7B	408050.4	624417.4	18.5	18.6	Rock	15.9	15.8
TB8B	408042.3	624455.0	0	10	Clay-Silt	29.8	19.8
TB8B	408042.3	624455.0	10	10.1	Rock	19.8	19.7
TB9B	408032.0	624503.3	0	12.6	Clay-Silt	25.6	13
TB9B	408032.0	624503.3	12.6	12.7	Rock	13	12.9
TP-1E-92	408330.3	624058.6	0	5	Fill	24	19
TP-1E-92	408330.3	624058.6	5	5.1	Rock	19	18.9
TP-2E-92	408748.8	624189.1	0	4.5	Fill	24	19.5
TP-2E-92	408748.8	624189.1	4.5	4.6	Rock	19.5	19.4

Notes:

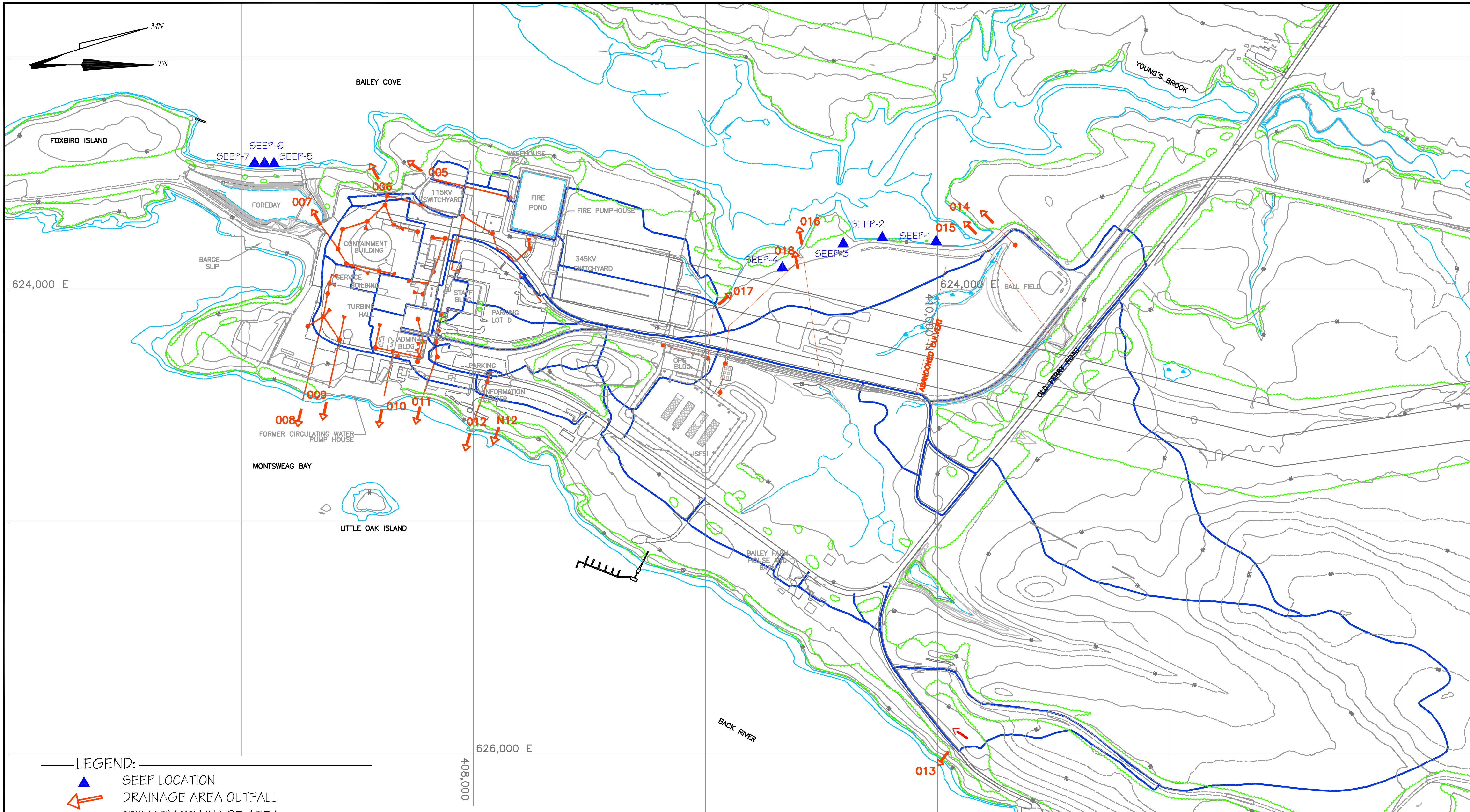
1. See Table 5-2 in QAPP (Stratex, 2001d) for installation date. Some data from Table 5-2 is corrected here.
2. Northings and Eastings are Maine State Grid Coordinates, East Zone, NAD 1927, in feet. Not all locations were surveyed and coordinates were obtained from scale drawings.
3. All depths in feet below ground surface (bgs). Where rock thickness is defined as 0.1 foot, the original boring log indicated "Refusal".
4. Simplified Stratigraphic Descriptions by Robert G. Gerber, C.G.
5. All elevations in feet referenced to NGVD, 1929 Mean Sea Level.

Table 3-3
Vertical Gradient Direction in Paired Wells
Bailey Point

Well Number	Measured Groundwater Elevation[1] 12/11/01	Direction Groundwater Movement 12/11/01	Measured Groundwater Elevation[1] 4/01/02	Direction Groundwater Movement 4/01/02	Measured Groundwater Elevation[1] 9/16/02	Direction Groundwater Movement 9/16/02	Measured Groundwater Elevation[1] 11/13/02	Direction Groundwater Movement 11/13/02
302A	26.4	upward	27.8	upward	26.2	downward	11.9	
302B	26.2		26.3		29.5		NM[2]	
303A	29.8	downward	34.7	downward	30.0	downward	NM	
303B	30.5		35.3		30.3		NM	
304A	29.0	downward	34.5	downward	29.6	downward	NM	
304B	30.0		36.8		30.9		NM	
305A	18.1	upward	18.9	upward	17.7	upward	NM	
305B	13.2		17.8		17.5		NM	
401A	NI[3]		NI		8.8	downward	9.5	downward
401B	NI		NI		15.7		16.8	
406A	NI		NI		18.8	upward	17.3	downward
406B	NI		NI		18.7		19.3	
407A	NI		NI		NM		14.9	downward
407B	NI		NI		17.5		19.0	
409A	NI		NI		12.8	downward	14.1	downward
409B	NI		NI		16.3		18.7	
422A	NI		NI		NI		11.1	downward
422B	NI		NI		NI		14.0	
423A	NI		NI		10.5	downward	11.7	upward
423B	NI		NI		12.5		10.6	
424A	NI		NI		29.1	downward	NM	
424B	NI		NI		29.5		NM	

Notes:

1. Elevations in feet referenced to NGVD
2. NM – Water level Not Measured
3. NI – Monitoring well Not Installed



LEGEND:

- ▲ SEEP LOCATION
- DRAINAGE AREA OUTFALL
- PRIMARY DRAINAGE AREA
- BURIED STORMWATER PIPING AND CATCH BASINS
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

200 0 400 800

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

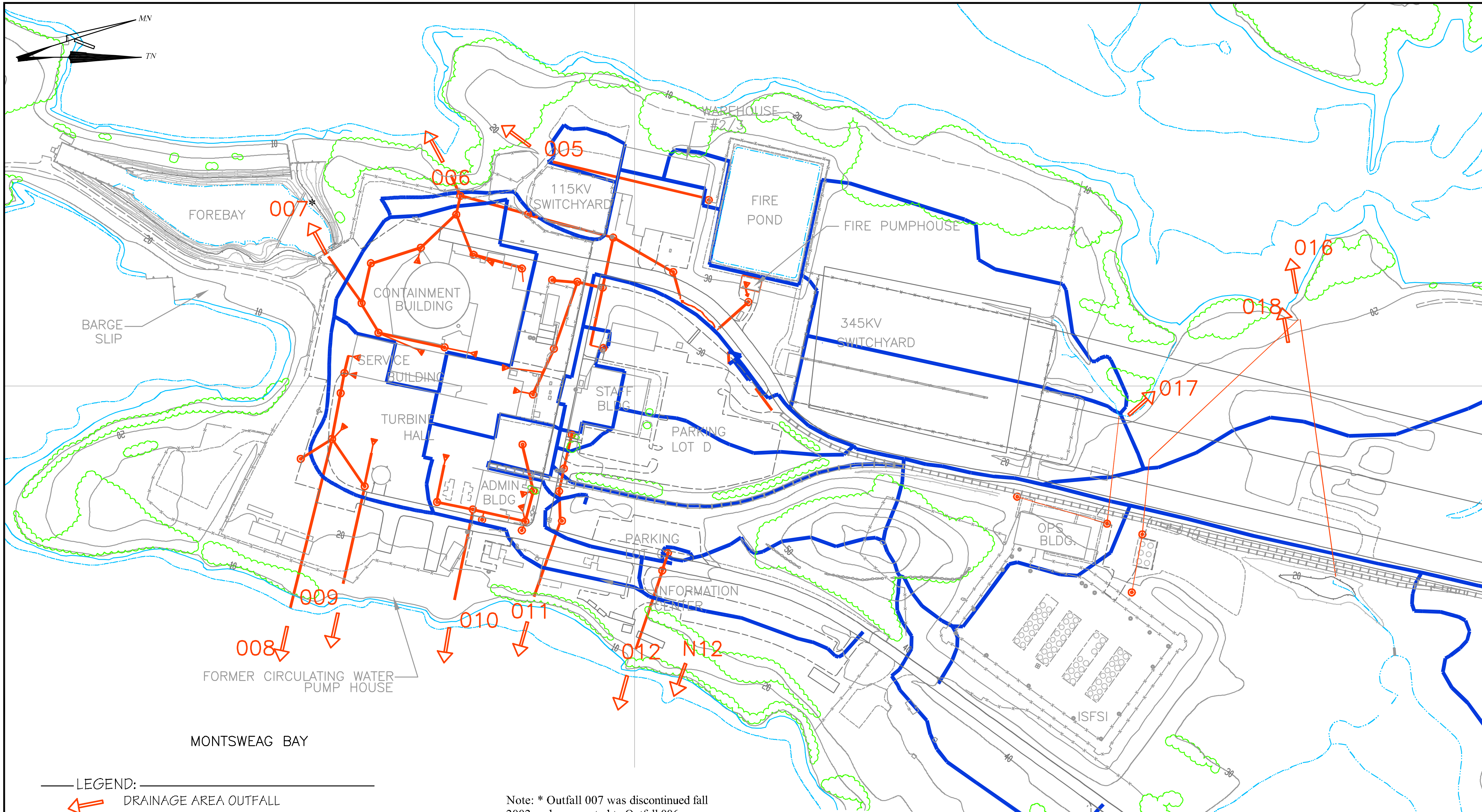
CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: **MAP OF SITE WATERSHEDS (Surface Drainage Patterns)**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=400'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. 3-1



LEGEND:

- DRAINAGE AREA OUTFALL
- PRIMARY DRAINAGE AREA
- BURIED STORMWATER PIPING AND CATCHBASINS
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

Note: * Outfall 007 was discontinued fall 2002 and was routed to Outfall 006.

SCALE IN FEET: 100 0 200 400

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

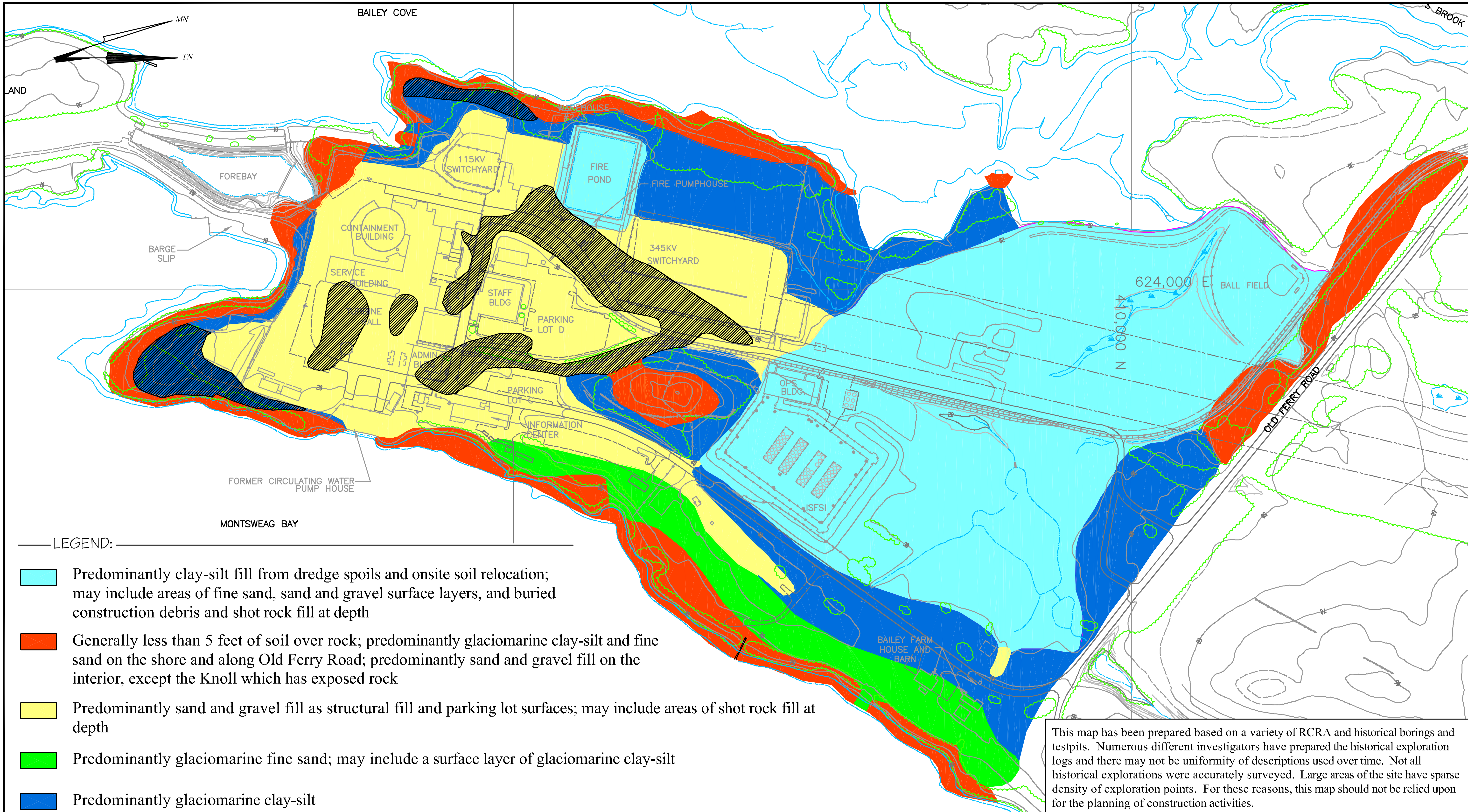
PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:
BAILEY/BPRCRA	MEP02167/8A	1"=200'

DRAWING TITLE:

MAP OF PLANT AREA WATERSHEDS (Surface Drainage Patterns)

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. 3-2



LEGEND:

- Predominantly clay-silt fill from dredge spoils and onsite soil relocation; may include areas of fine sand, sand and gravel surface layers, and buried construction debris and shot rock fill at depth
- Generally less than 5 feet of soil over rock; predominantly glaciomarine clay-silt and fine sand on the shore and along Old Ferry Road; predominantly sand and gravel fill on the interior, except the Knoll which has exposed rock
- Predominantly sand and gravel fill as structural fill and parking lot surfaces; may include areas of shot rock fill at depth
- Predominantly glaciomarine fine sand; may include a surface layer of glaciomarine clay-silt
- Predominantly glaciomarine clay-silt
- Generally less than 5 feet to bedrock
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

150 0 300 600

This map has been prepared based on a variety of RCRA and historical borings and testpits. Numerous different investigators have prepared the historical exploration logs and there may not be uniformity of descriptions used over time. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. For these reasons, this map should not be relied upon for the planning of construction activities.

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

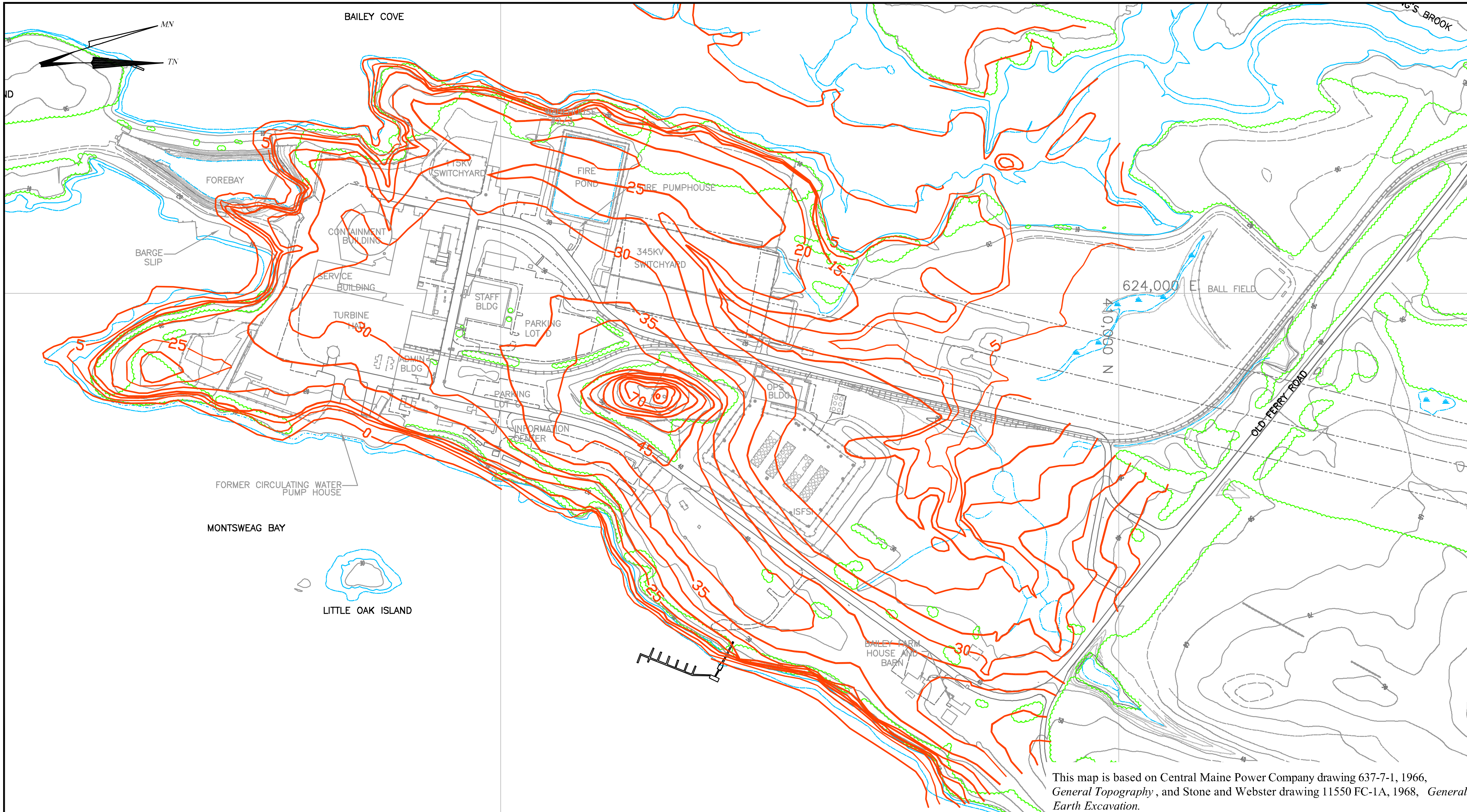
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					SURFICIAL GEOLOGY OF BAILEY POINT
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A	SCALE: 1"=300'		PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 3-3



This map is based on Central Maine Power Company drawing 637-7-1, 1966, *General Topography* , and Stone and Webster drawing 11550 FC-1A, 1968, *General Earth Excavation.*

LEGEND:

- PRE-CONSTRUCTION GROUND SURFACE TOPOGRAPHY CONTOUR (FT. NGVD)
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

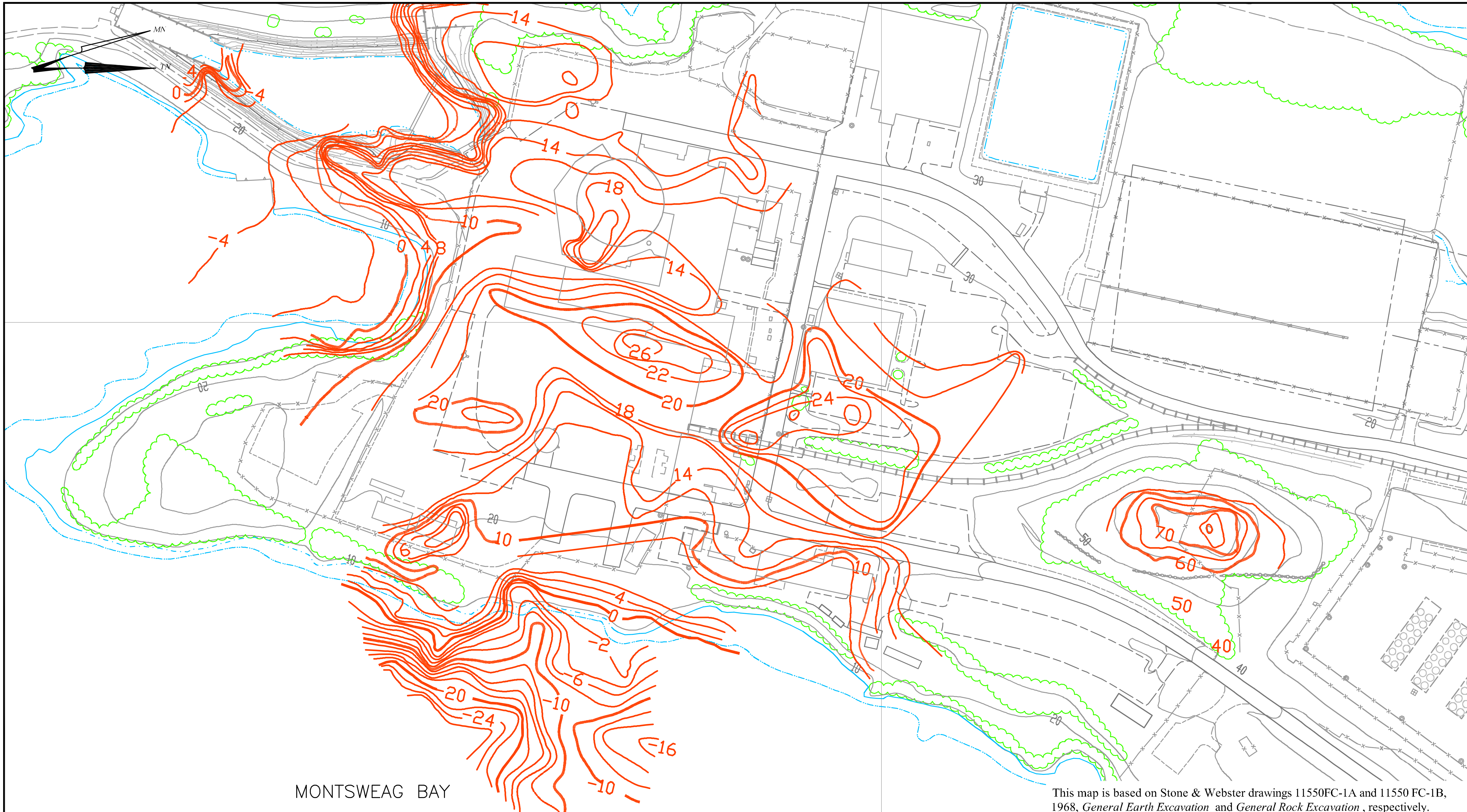
SCALE IN FEET
150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY					DRAWING TITLE: PRE-CONSTRUCTION GROUND SURFACE TOPOGRAPHY OF BAILEY POINT
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 3-4



LEGEND:

- PRE-CONSTRUCTION BEDROCK SURFACE TOPOGRAPHY CONTOUR (FT. NGVD)
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

75 0 150 300

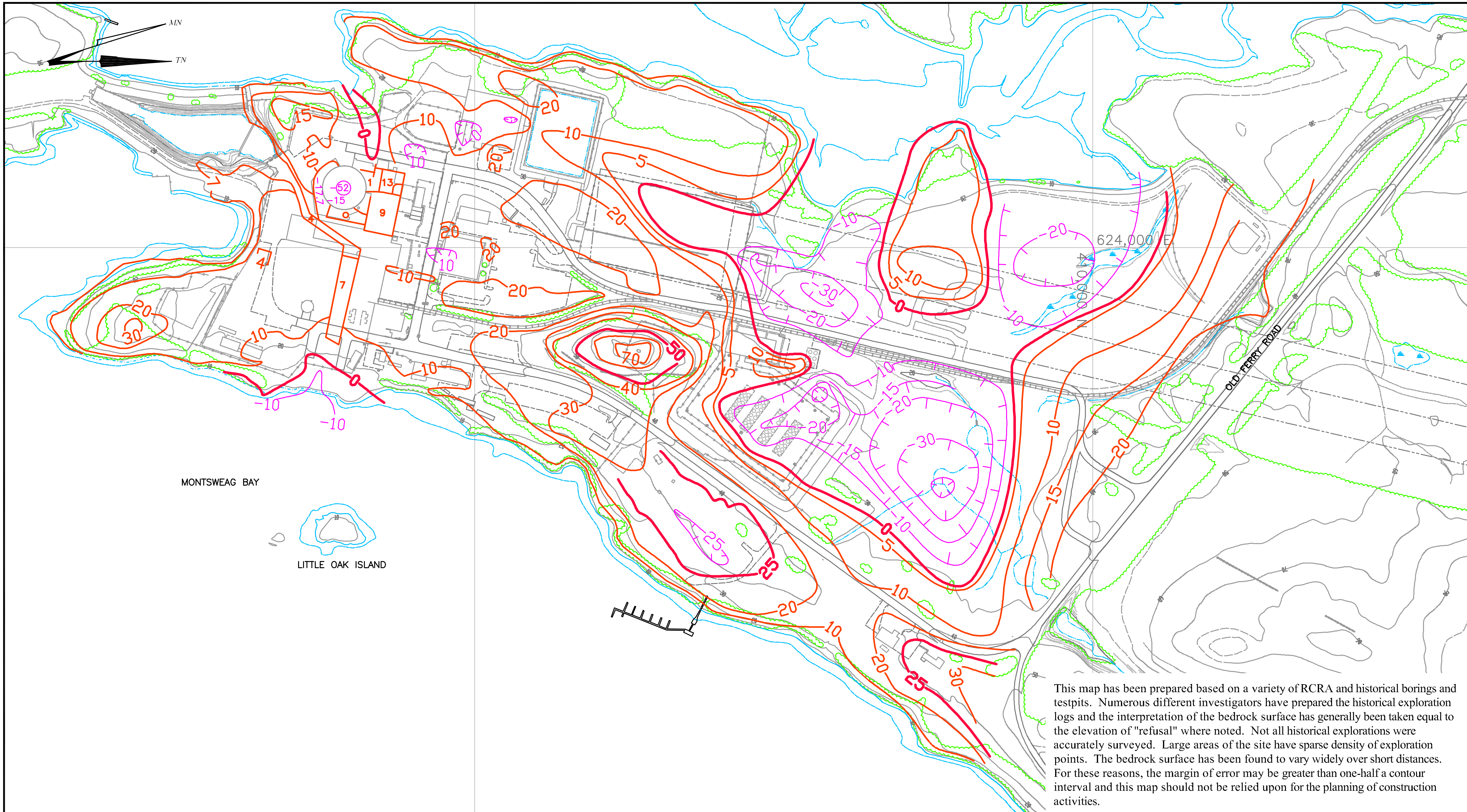
ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					**PRE-CONSTRUCTION BEDROCK SURFACE TOPOGRAPHY OF BAILEY POINT**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=150'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. **3-5**



This map has been prepared based on a variety of RCRA and historical borings and testpits. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. For these reasons, the margin of error may be greater than one-half a contour interval and this map should not be relied upon for the planning of construction activities.

LEGEND:

- BEDROCK SURFACE TOPOGRAPHY CONTOUR (FT NGVD)
- NEGATIVE BEDROCK SURFACE TOPOGRAPHY CONTOUR (FT NGVD)
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

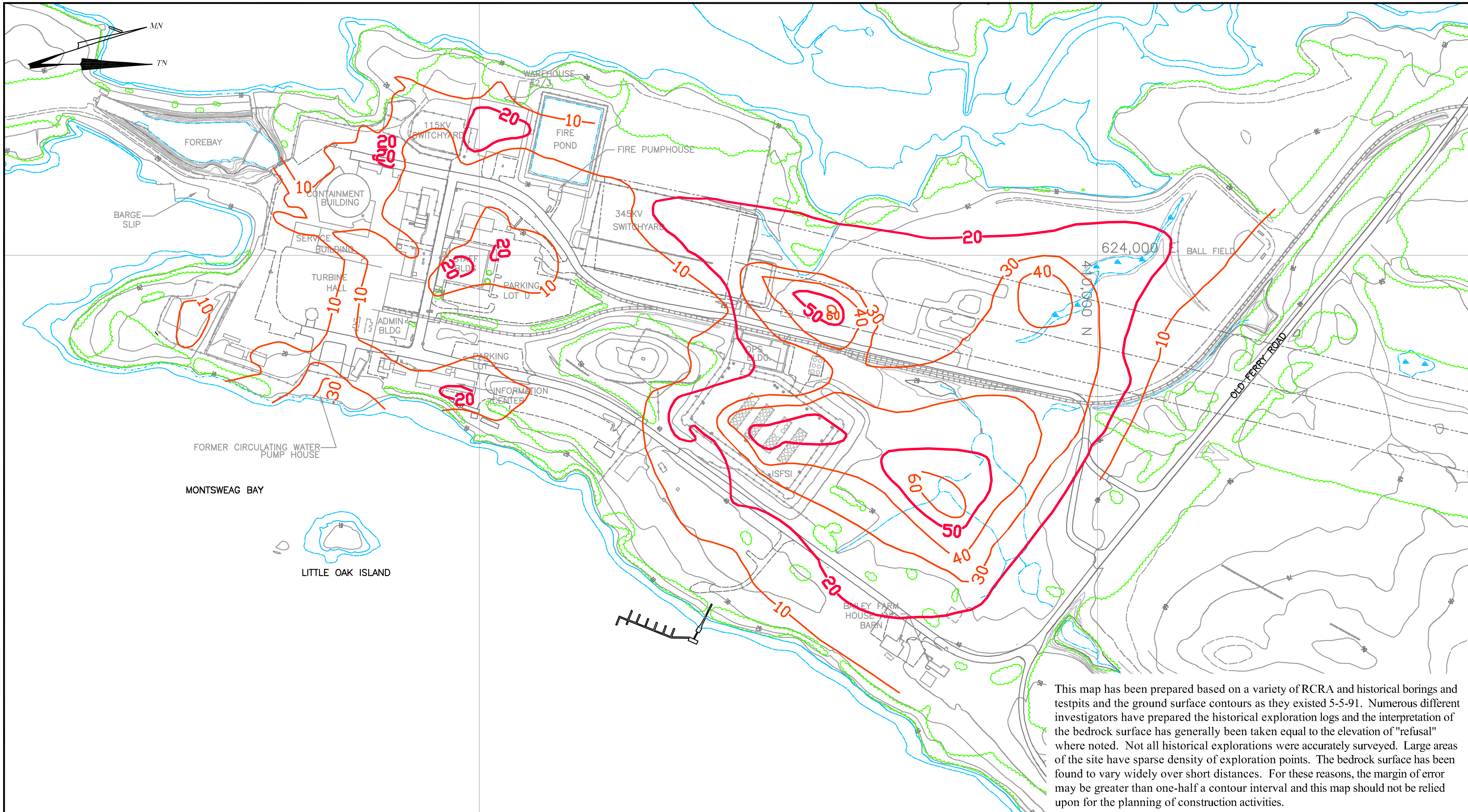
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: BEDROCK CONTOUR MAP OF BAILEY POINT
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 3-6



This map has been prepared based on a variety of RCRA and historical borings and testpits and the ground surface contours as they existed 5-5-91. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. For these reasons, the margin of error may be greater than one-half a contour interval and this map should not be relied upon for the planning of construction activities.

LEGEND:

- OVERBURDEN THICKNESS CONTOUR (FT)
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

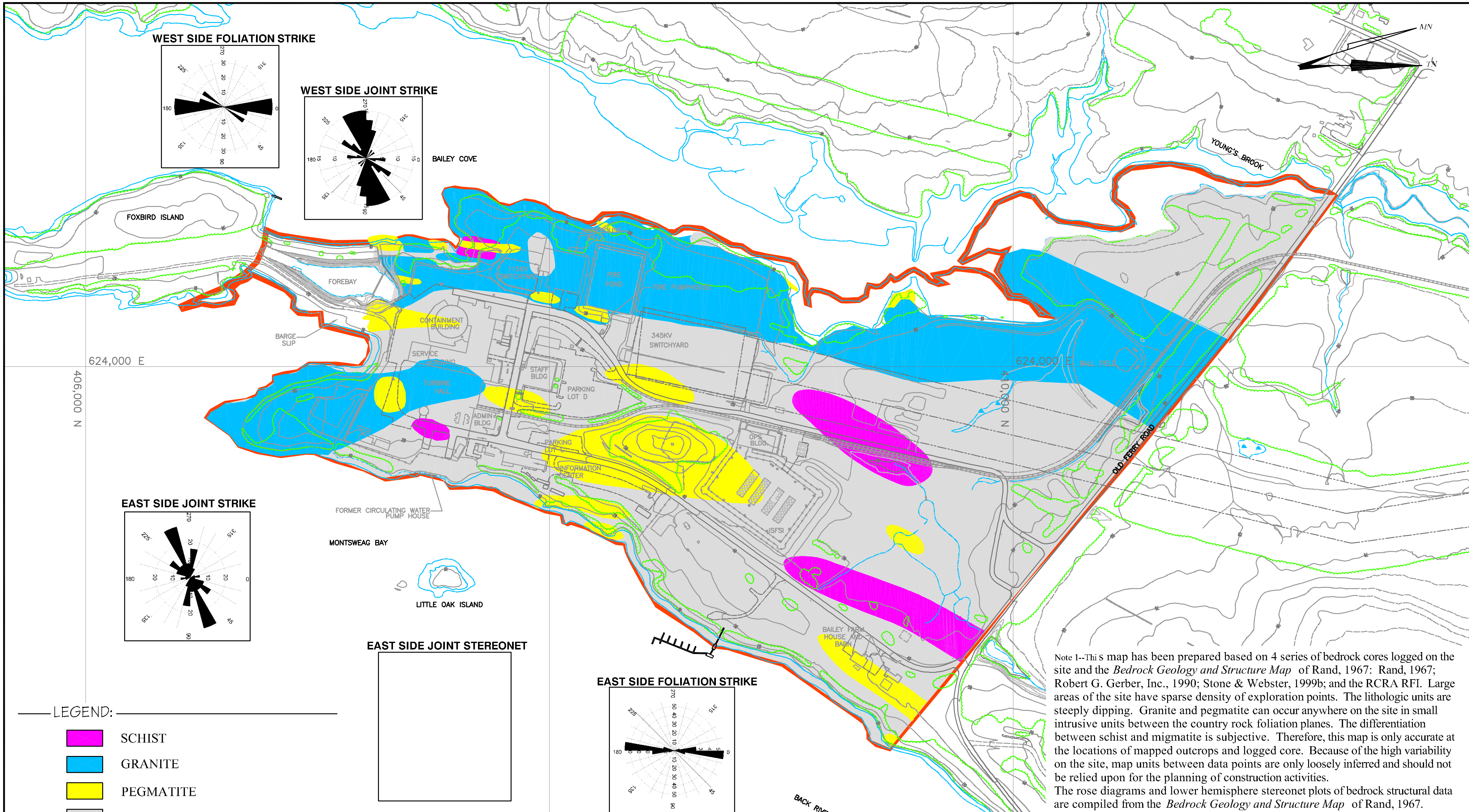
PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:
BAILEY/BPRCRA	MEP02167/8A	1"=300'

DRAWING TITLE:

OVERBURDEN THICKNESS OF BAILEY POINT AND SURROUNDING LAND

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. 3-7



Note 1--Thi s map has been prepared based on 4 series of bedrock cores logged on the site and the *Bedrock Geology and Structure Map* of Rand, 1967: Rand, 1967; Robert G. Gerber, Inc., 1990; Stone & Webster, 1999b; and the RCRA RFI. Large areas of the site have sparse density of exploration points. The lithologic units are steeply dipping. Granite and pegmatite can occur anywhere on the site in small intrusive units between the country rock foliation planes. The differentiation between schist and migmatite is subjective. Therefore, this map is only accurate at the locations of mapped outcrops and logged core. Because of the high variability on the site, map units between data points are only loosely inferred and should not be relied upon for the planning of construction activities.
The rose diagrams and lower hemisphere stereonet plots of bedrock structural data are compiled from the *Bedrock Geology and Structure Map* of Rand, 1967.

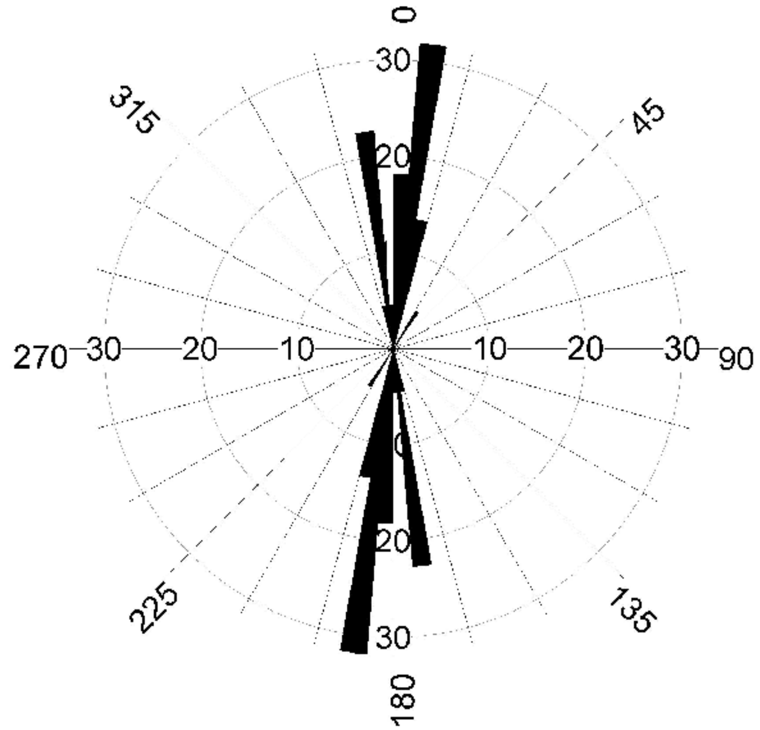
ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY	Maine Yankee / CH2MHILL / STRATEX strategic consulting	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:	DRAWING TITLE:
CH2MHILL, STRATEX; JACQUES WHITFORD COMPANY	BEDROCK GEOLOGY OF BAILEY POINT

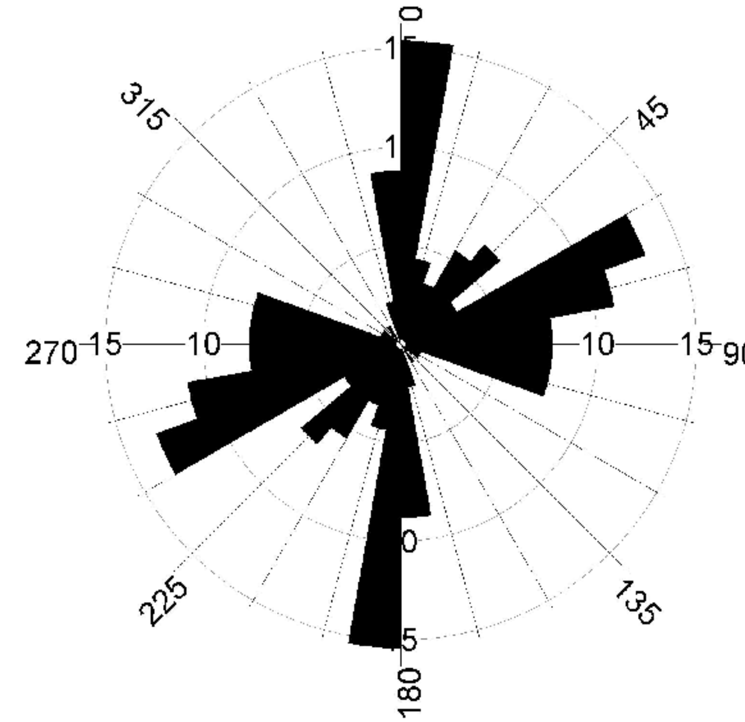
DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/BPRCRA	MEP02167/8A	1"=400'	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME	3-8

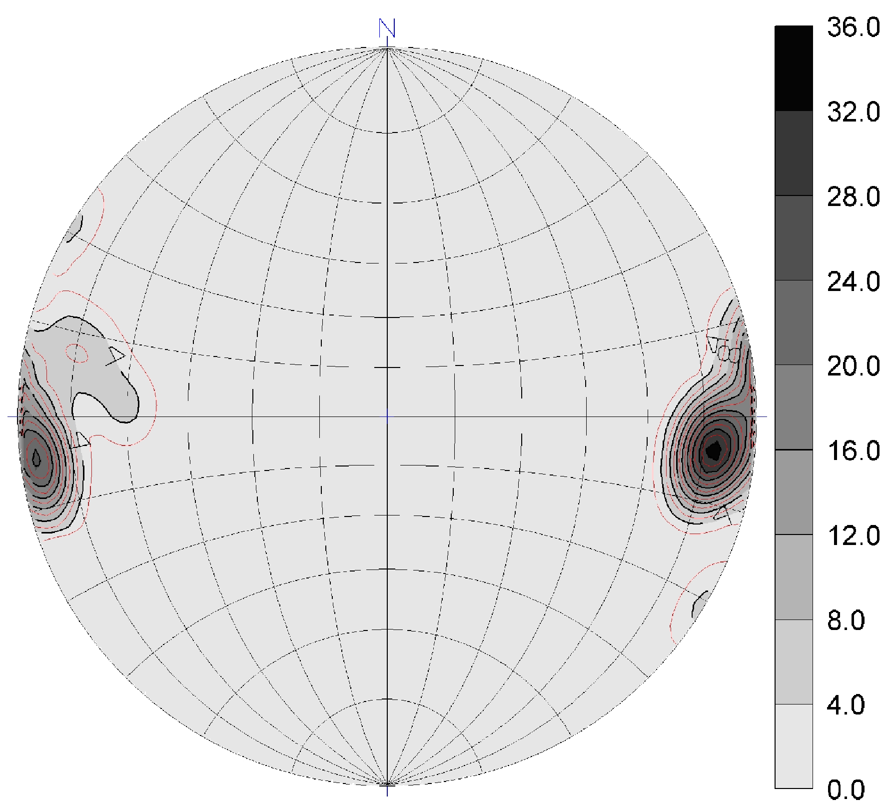
Foliation Strike



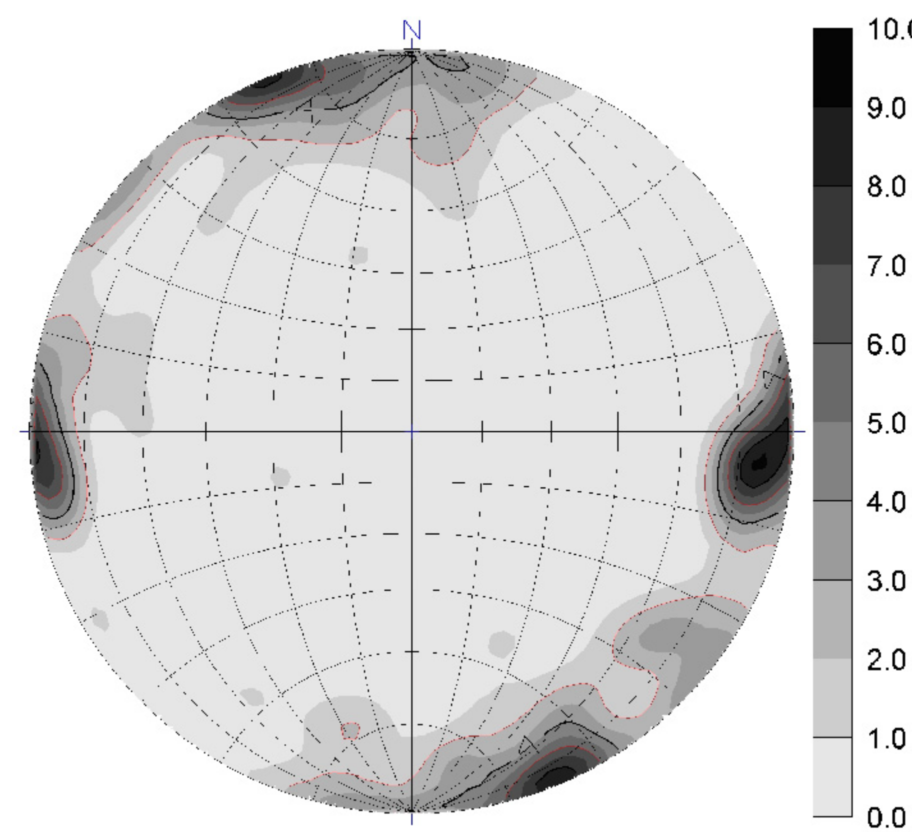
Strike of All Fractures



All Foliation



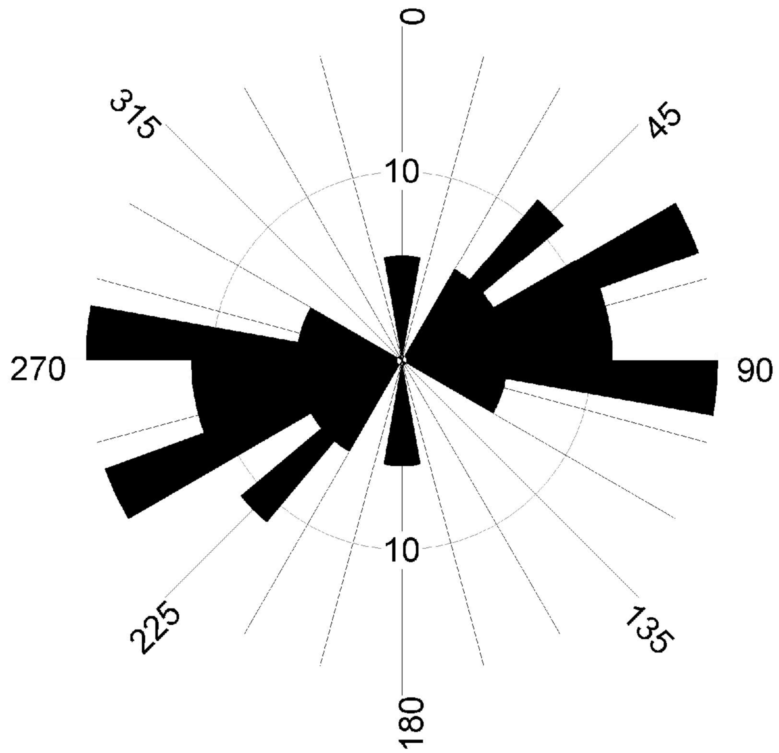
All Fractures



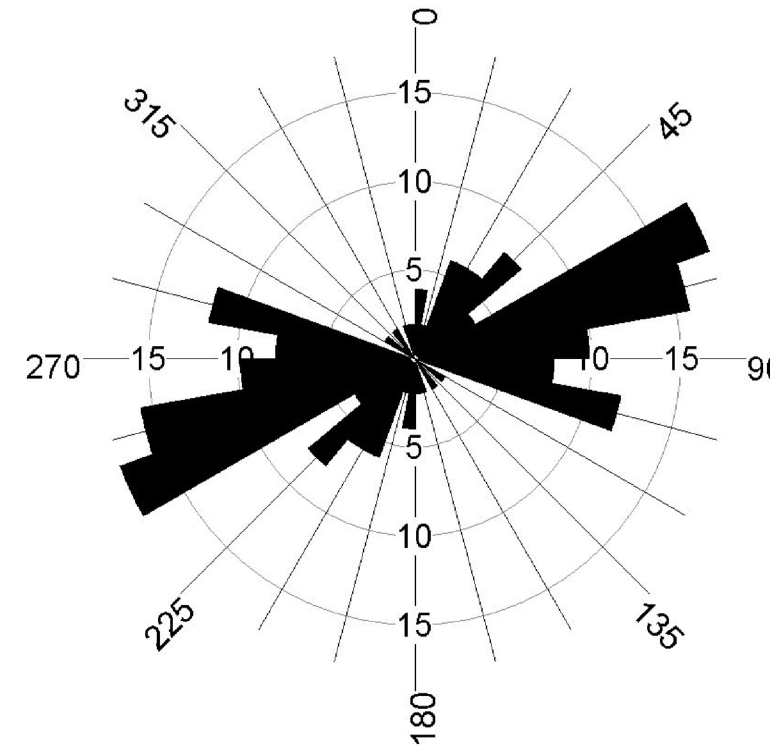
The rose diagrams and lower hemisphere stereonet plots of bedrock structural data are compiled from the *Bedrock Geology and Structure Map* of Rand, 1967.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
CH2MHILL	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: BEDROCK STRUCTURAL DATA FOR BAILEY POINT
STRATEX strategic consulting	DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 3-9A

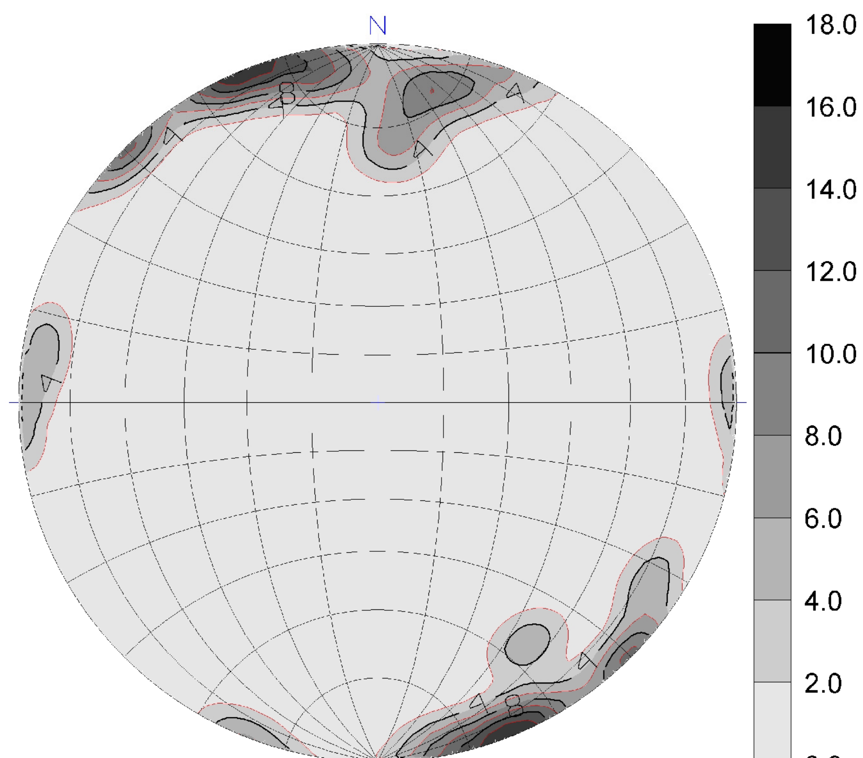
Schist Joint Strike



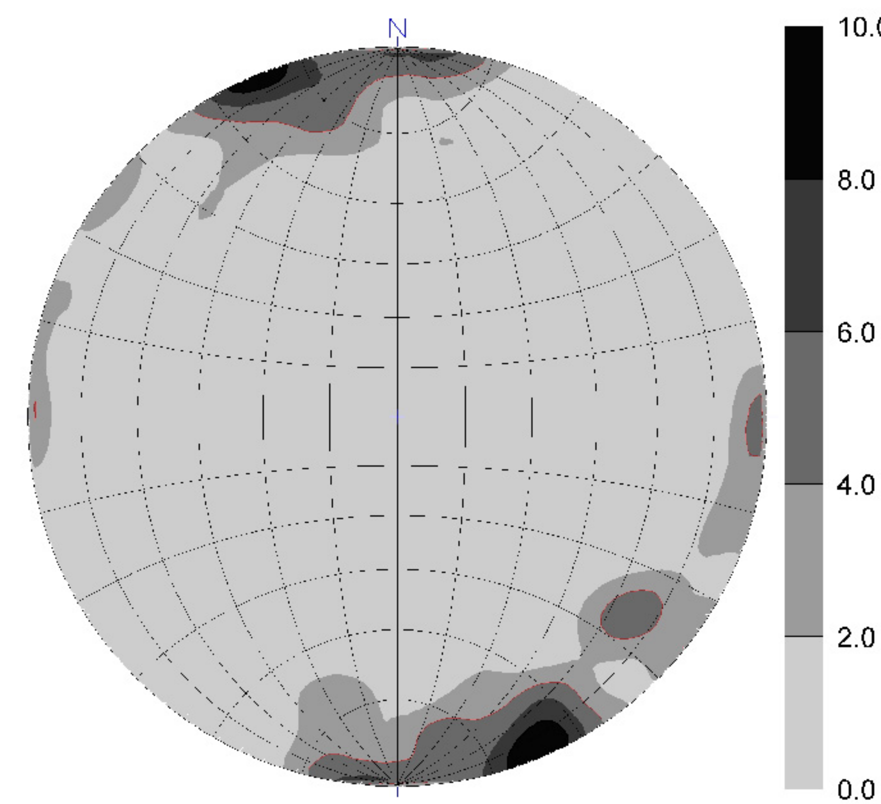
Joints in Granite



Schist Joints

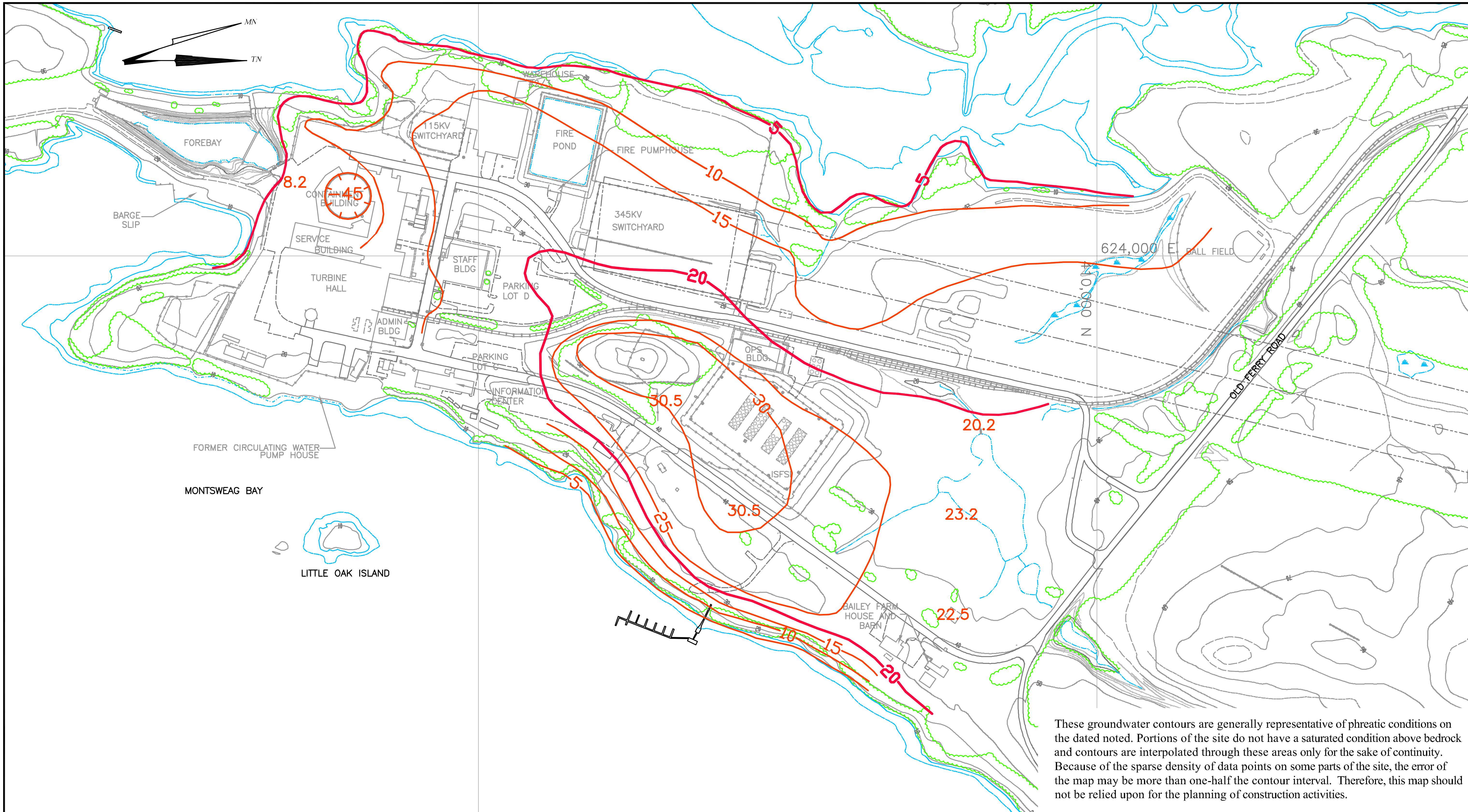


Granite Joints



The rose diagrams and lower hemisphere stereonet plots of bedrock structural data are compiled from the *Bedrock Geology and Structure Map* of Rand, 1967.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
CH2MHILL, STRATEX (strategic consulting)	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: BEDROCK STRUCTURAL DATA FOR BAILEY POINT
	DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 3-9B



These groundwater contours are generally representative of phreatic conditions on the dated noted. Portions of the site do not have a saturated condition above bedrock and contours are interpolated through these areas only for the sake of continuity. Because of the sparse density of data points on some parts of the site, the error of the map may be more than one-half the contour interval. Therefore, this map should not be relied upon for the planning of construction activities.

LEGEND:

- SOIL GROUNDWATER WATERTABLE SURFACE CONTOUR (FT. NGVD)
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

30.5 SPOT ELEVATION

SCALE IN FEET: 150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

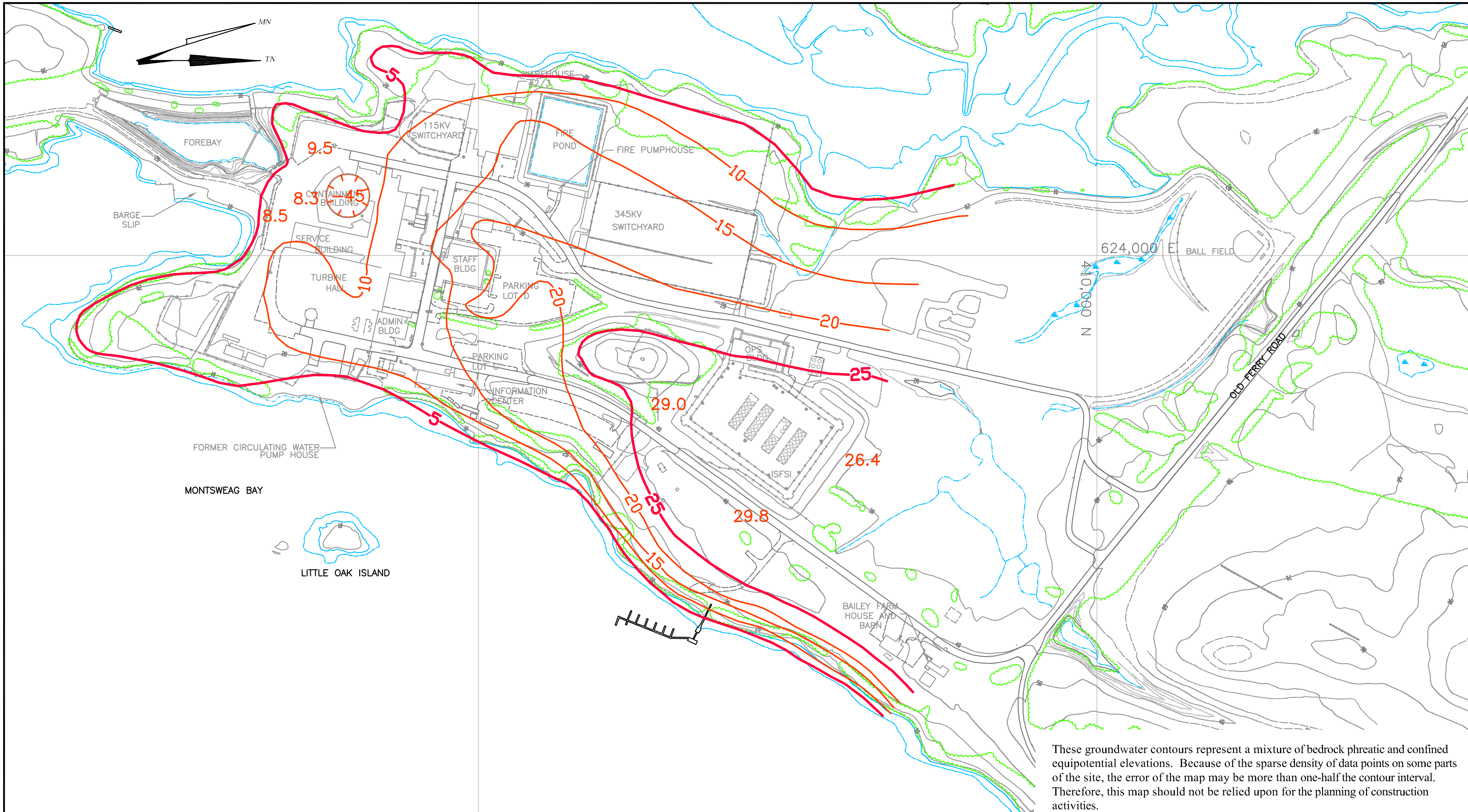
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: MEASURED SOIL GROUNDWATER LEVELS - 12/11/01
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 3-10A



These groundwater contours represent a mixture of bedrock phreatic and confined equipotential elevations. Because of the sparse density of data points on some parts of the site, the error of the map may be more than one-half the contour interval. Therefore, this map should not be relied upon for the planning of construction activities.

LEGEND:

- BEDROCK GROUNDWATER WATERTABLE SURFACE CONTOUR (FT. NGVD)
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- 29.5 SPOT ELEVATION

SCALE IN FEET: 150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

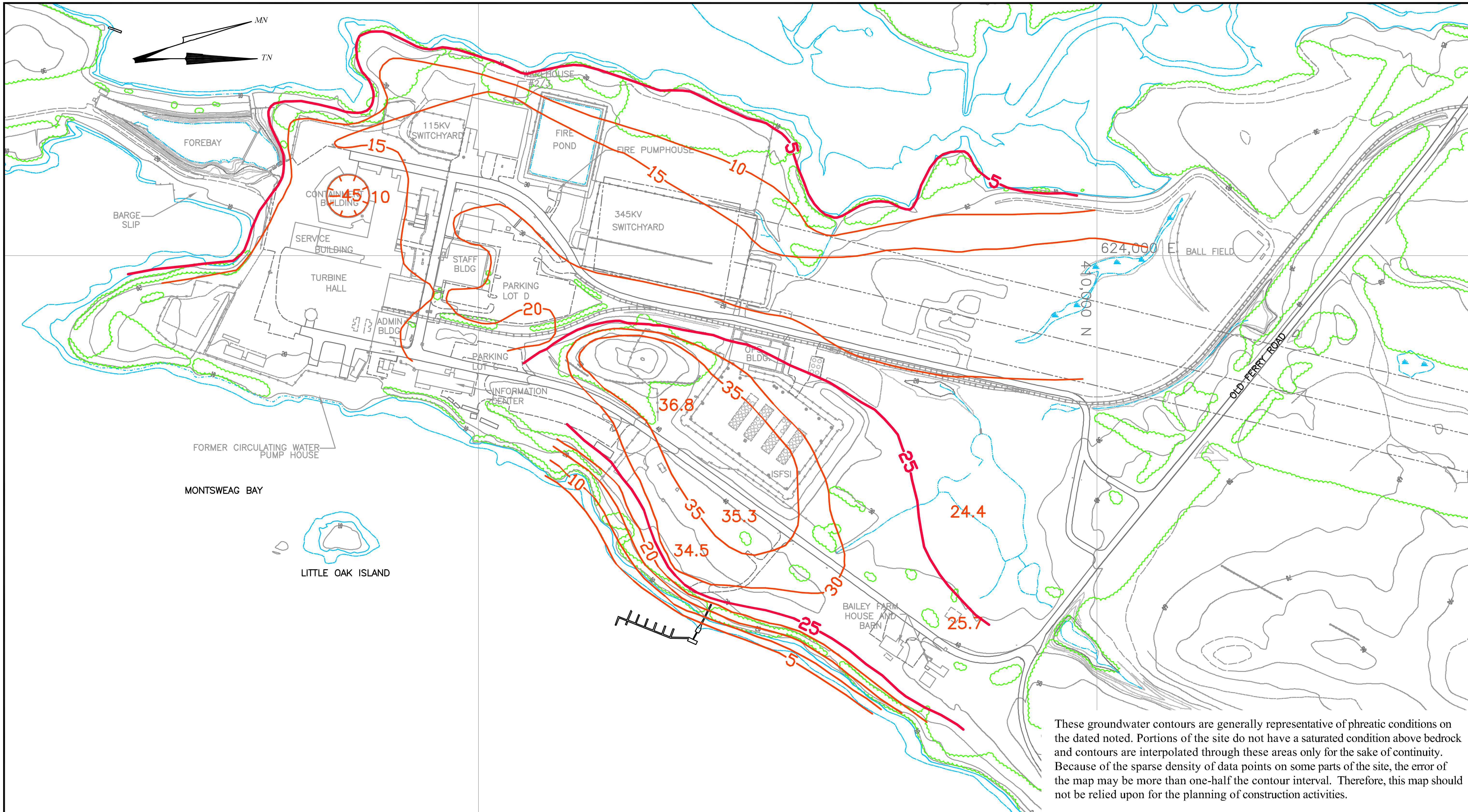
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					**MEASURED BEDROCK GROUNDWATER LEVELS - 12/11/01**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEPO2167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 3-10B



These groundwater contours are generally representative of phreatic conditions on the dated noted. Portions of the site do not have a saturated condition above bedrock and contours are interpolated through these areas only for the sake of continuity. Because of the sparse density of data points on some parts of the site, the error of the map may be more than one-half the contour interval. Therefore, this map should not be relied upon for the planning of construction activities.

LEGEND:

- SOIL GROUNDWATER WATERTABLE SURFACE CONTOUR (FT. NGVD)
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- 36.8 SPOT ELEVATION

SCALE IN FEET

150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

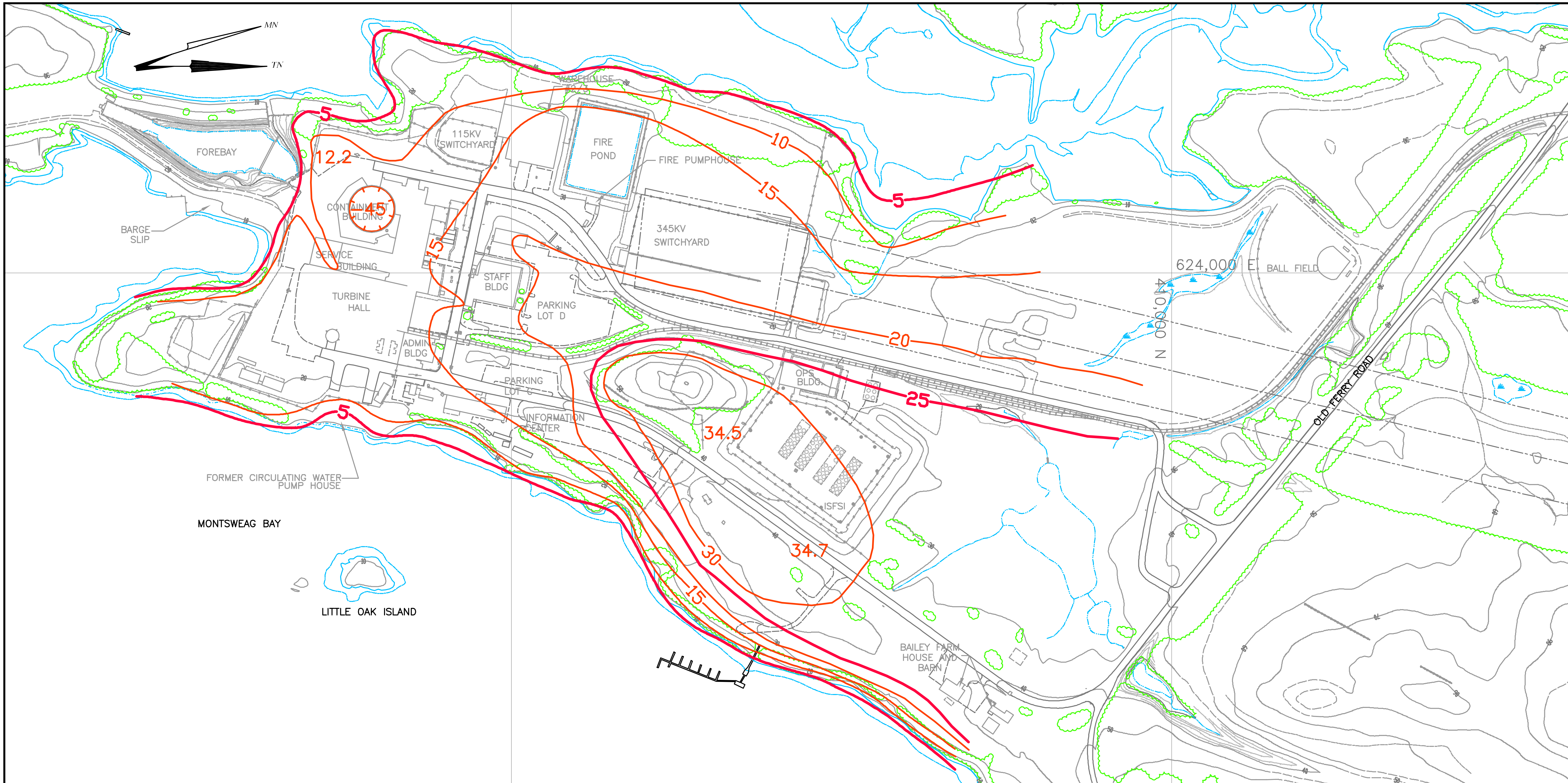
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: **MEASURED SOIL GROUNDWATER LEVELS - 04/01/02**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 3-11A



These groundwater contours represent a mixture of bedrock phreatic and confined equipotential elevations. Because of the sparse density of data points on some parts of the site, the error of the map may be more than one-half the contour interval. Therefore, this map should not be relied upon for the planning of construction activities.

LEGEND:

- BEDROCK GROUNDWATER WATERTABLE SURFACE CONTOUR (FT. NGVD)
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- 34.5 SPOT ELEVATION

SCALE IN FEET: 150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX strategic consulting

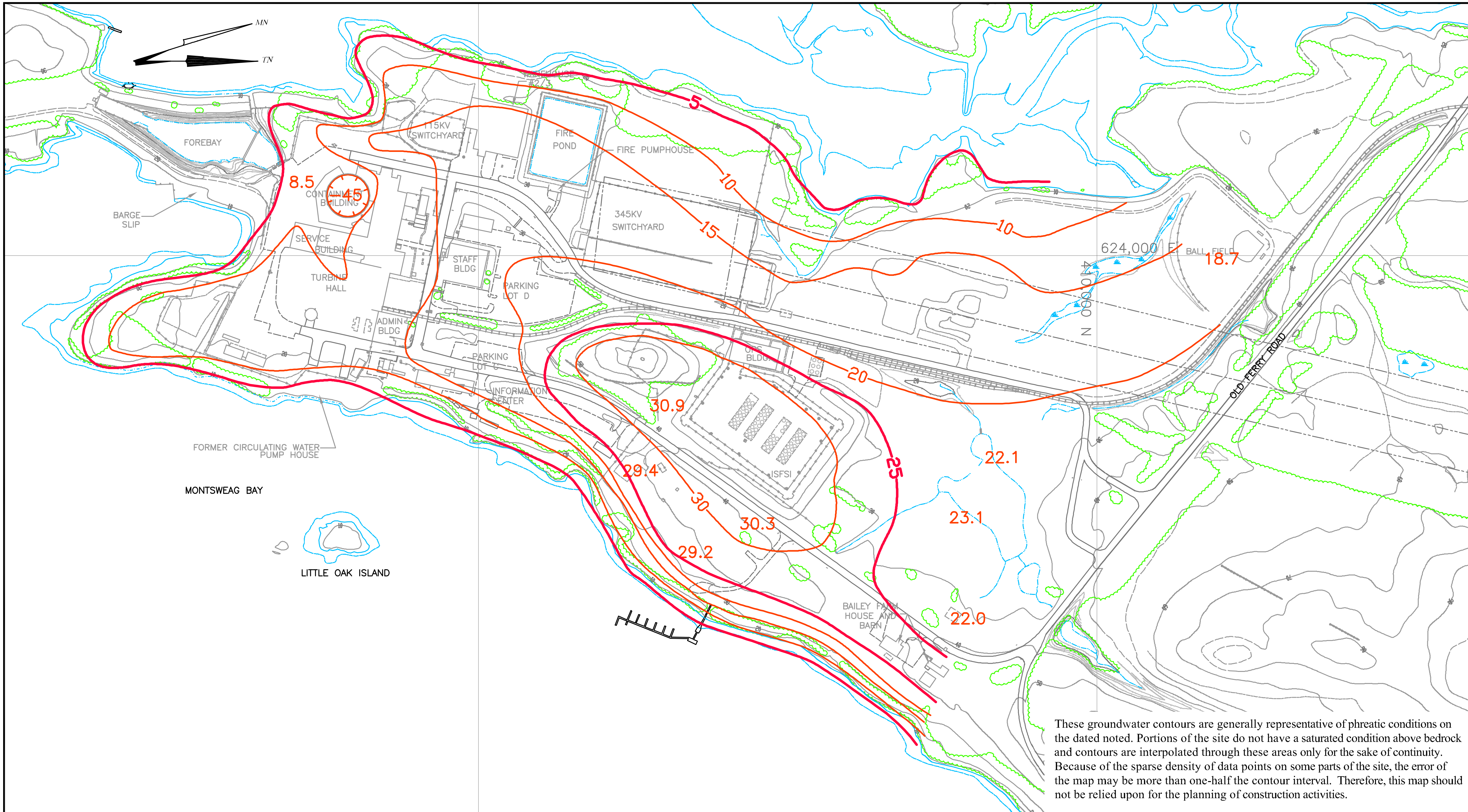
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DRAWING TITLE: **MEASURED BEDROCK GROUNDWATER LEVELS - 04/01/02**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/BPRCRA	MEP02167/8A	1"=300'	MAINE YANKEE ATOMIC POWER CO.	3-11B



These groundwater contours are generally representative of phreatic conditions on the dated noted. Portions of the site do not have a saturated condition above bedrock and contours are interpolated through these areas only for the sake of continuity. Because of the sparse density of data points on some parts of the site, the error of the map may be more than one-half the contour interval. Therefore, this map should not be relied upon for the planning of construction activities.

LEGEND:

- SOIL GROUNDWATER WATERTABLE SURFACE CONTOUR (FT. NGVD)
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- 30.9 SPOT ELEVATION

SCALE IN FEET: 150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX strategic consulting

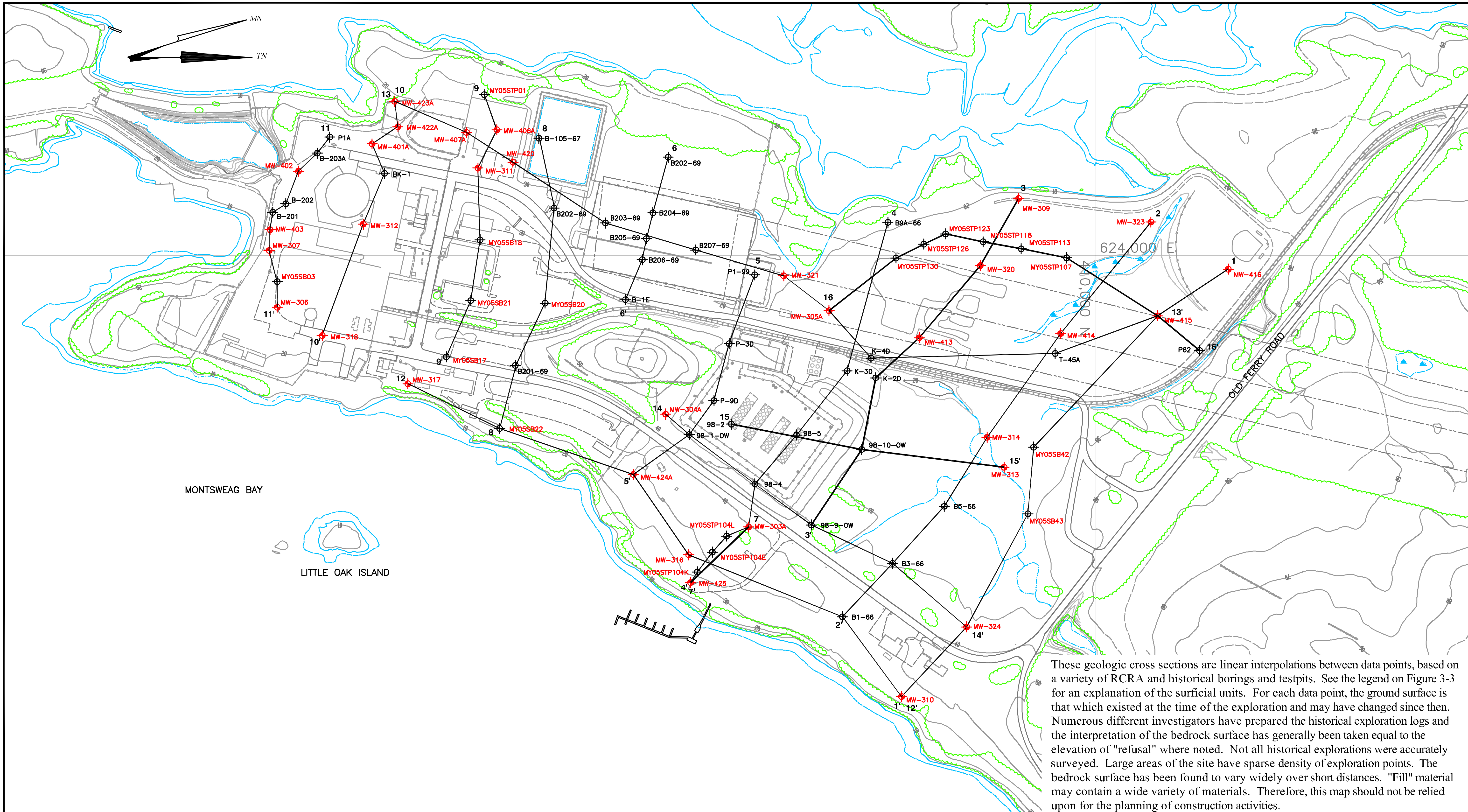
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DRAWING TITLE: **MEASURED SOIL GROUNDWATER LEVELS - 09/16/02**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/BPRCRA	MEP02167/8A	1"=300'	MAINE YANKEE ATOMIC POWER CO.	3-12A



These geologic cross sections are linear interpolations between data points, based on a variety of RCRA and historical borings and testpits. See the legend on Figure 3-3 for an explanation of the surficial units. For each data point, the ground surface is that which existed at the time of the exploration and may have changed since then. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. "Fill" material may contain a wide variety of materials. Therefore, this map should not be relied upon for the planning of construction activities.

LEGEND:
- GEOLOGIC CROSS-SECTION LINE LOCATION
- RAILROAD
- 50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- MW-414 / MY05SB43 RCRA DATA POINT
- T-45A HISTORICAL DATA POINT

SCALE IN FEET: 150 0 300 600

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee | CH2MHILL | STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY					DRAWING TITLE: GEOLOGIC CROSS-SECTION LOCATION MAP
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A	SCALE: 1"=300'		PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 3-13A

These geologic cross sections are linear interpolations between data points, based on a variety of RCRA and historical borings and testpits. See the legend on Figure 3-3 for an explanation of the surficial units. For each data point, the ground surface is that which existed at the time of the exploration and may have changed since then. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. "Fill" material may contain a wide variety of materials. Therefore, this map should not be relied upon for the planning of construction activities.

CROSS-SECTION 1-1'
EAST - WEST
AT NORTH END

HORIZONTAL SCALE = 1"=300'
VERTICAL SCALE = 1"=20'

CROSS-SECTION 2-2'
EAST - WEST
THROUGH PRE-OP CLEANING BASIN

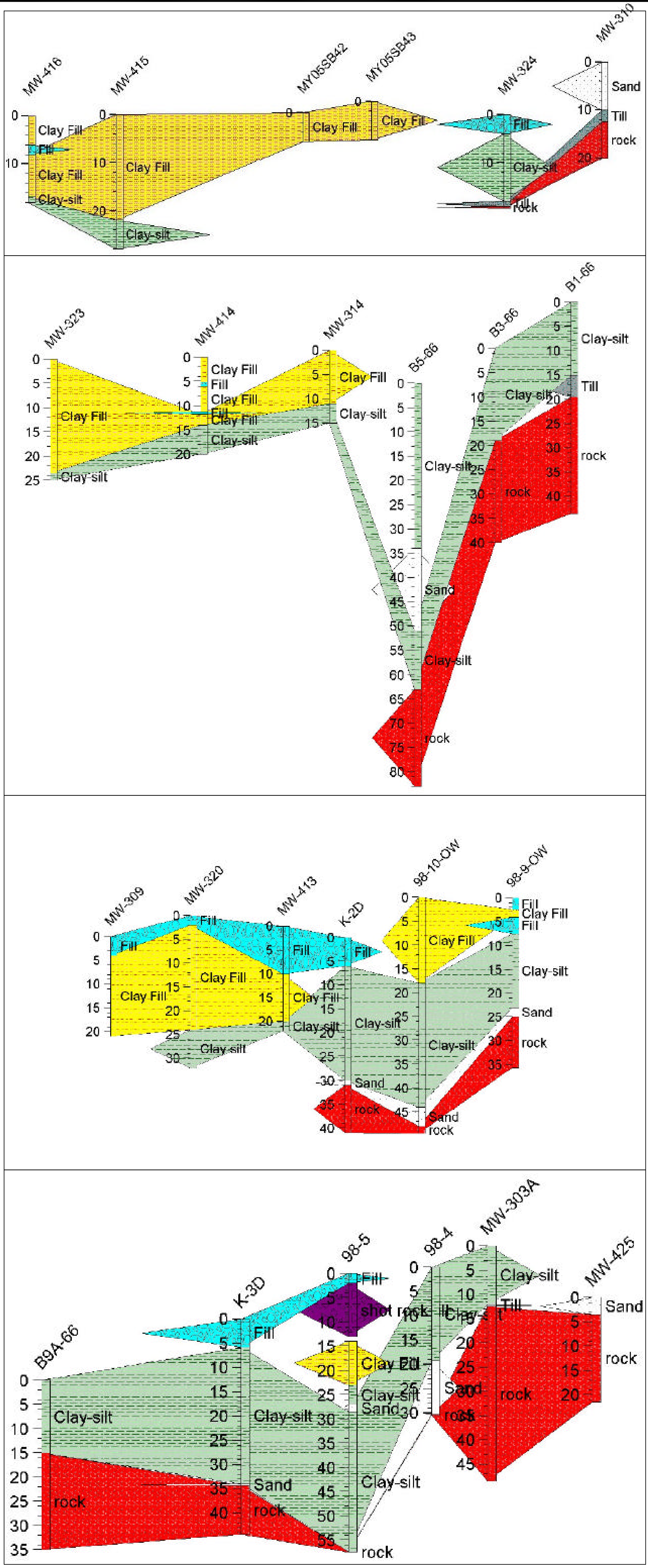
HORIZONTAL SCALE = 1"=300'
VERTICAL SCALE = 1"=20'

CROSS-SECTION 3-3'
EAST - WEST
NORTH END ISFSI

HORIZONTAL SCALE = 1"=300'
VERTICAL SCALE = 1"=20'

CROSS-SECTION 4-4'
EAST - WEST
MIDDLE ISFSI

HORIZONTAL SCALE = 1"=375'
VERTICAL SCALE = 1"=20'



Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

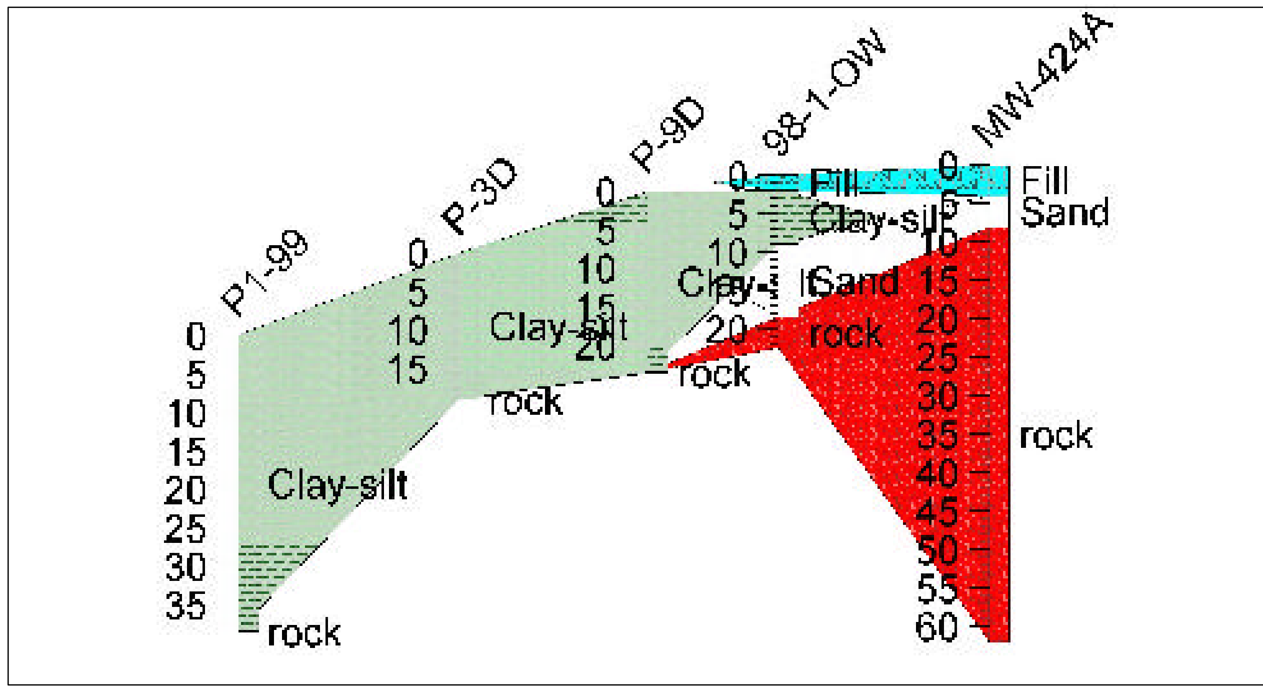
DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					**GEOLOGIC CROSS-SECTIONS**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/CROSS-SECTION		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=1000'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. **3-13B**

These geologic cross sections are linear interpolations between data points, based on a variety of RCRA and historical borings and testpits. See the legend on Figure 3-3 for an explanation of the surficial units. For each data point, the ground surface is that which existed at the time of the exploration and may have changed since then. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. "Fill" material may contain a wide variety of materials. Therefore, this map should not be relied upon for the planning of construction activities.

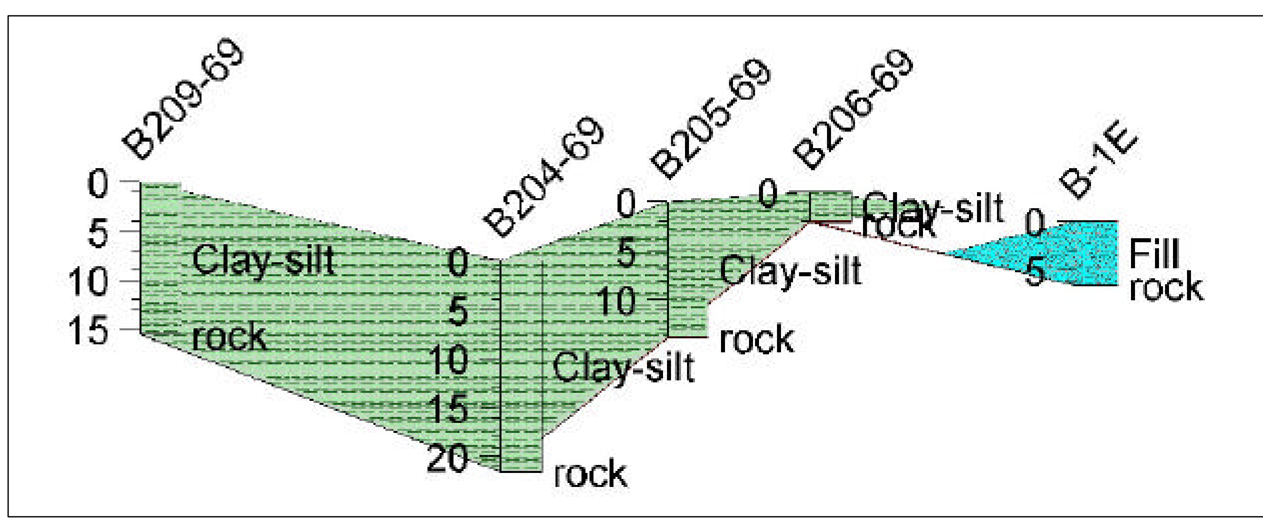
CROSS-SECTION 5-5'
EAST - WEST
SOUTH END ISFSI

HORIZONTAL SCALE = 1"=200'
VERTICAL SCALE = 1"=25'



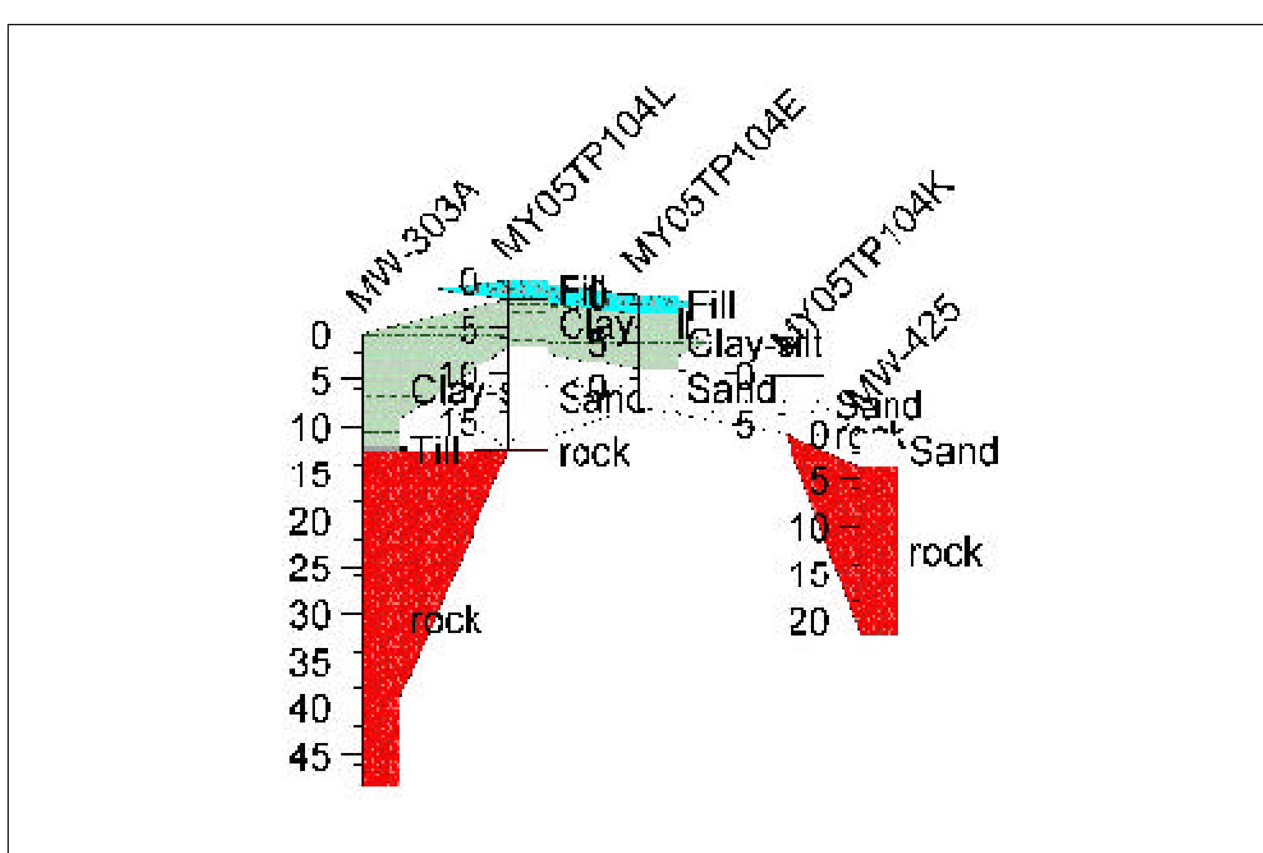
CROSS-SECTION 6-6'
EAST - WEST
THROUGH 345 kv SWITCHYARD

HORIZONTAL SCALE = 1"=100'
VERTICAL SCALE = 1"=20'



CROSS-SECTION 7-7'
THROUGH CORE TRENCH MAINTENANCE GARAGE

HORIZONTAL SCALE = 1"=100'
VERTICAL SCALE = 1"=20'



Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

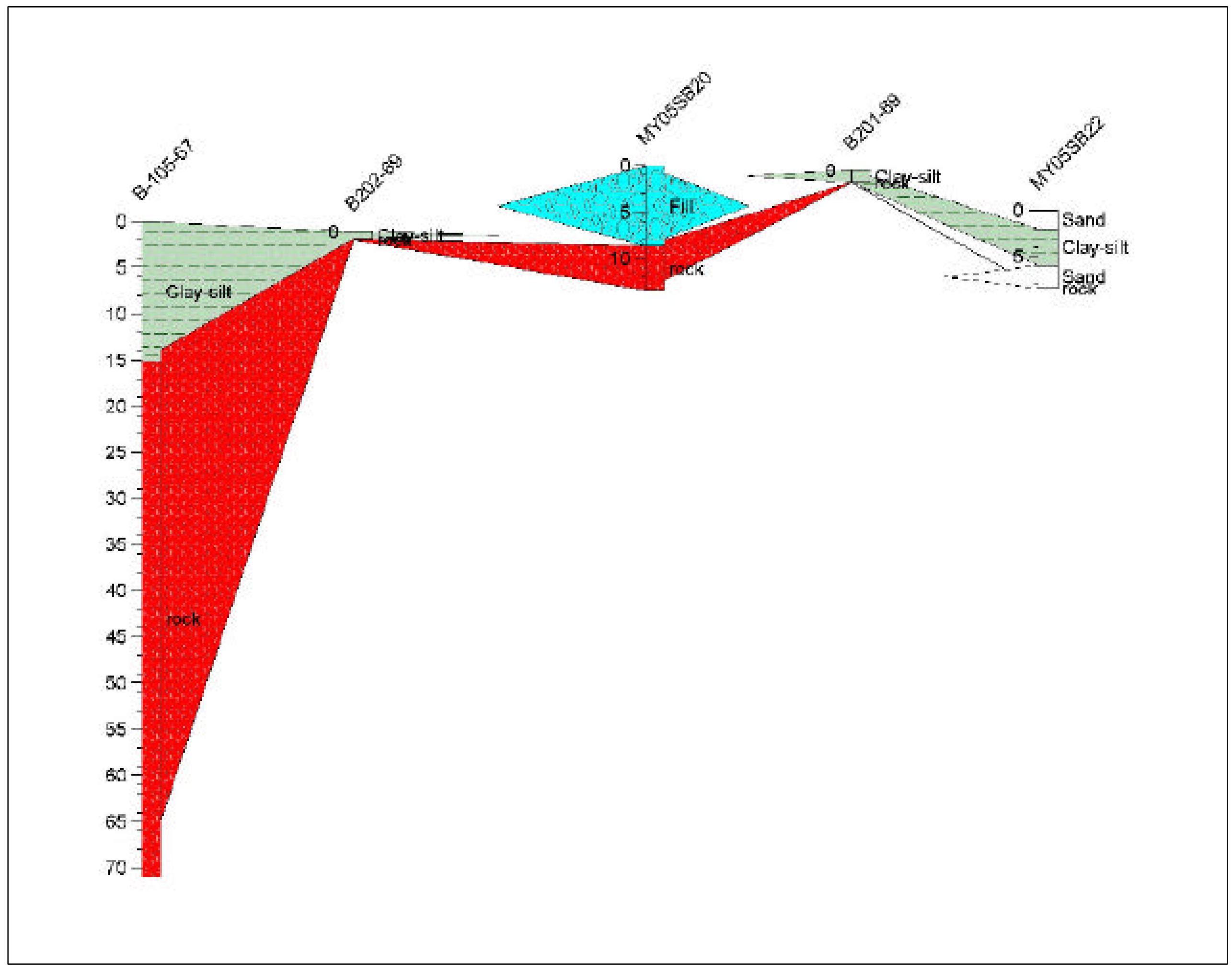
DRAWINGS PRODUCED BY:				
CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY				
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
PROJECT NAME/FILE NAME: BAILEY/CROSS-SECTION		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN

DRAWING TITLE: **GEOLOGIC CROSS-SECTIONS**

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. **3-13C**

These geologic cross sections are linear interpolations between data points, based on a variety of RCRA and historical borings and testpits. See the legend on Figure 3-3 for an explanation of the surficial units. For each data point, the ground surface is that which existed at the time of the exploration and may have changed since then. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. "Fill" material may contain a wide variety of materials. Therefore, this map should not be relied upon for the planning of construction activities.



CROSS-SECTION 8-8' EAST - WEST THROUGH STAFF PARKING LOT

HORIZONTAL SCALE = 1"=200'
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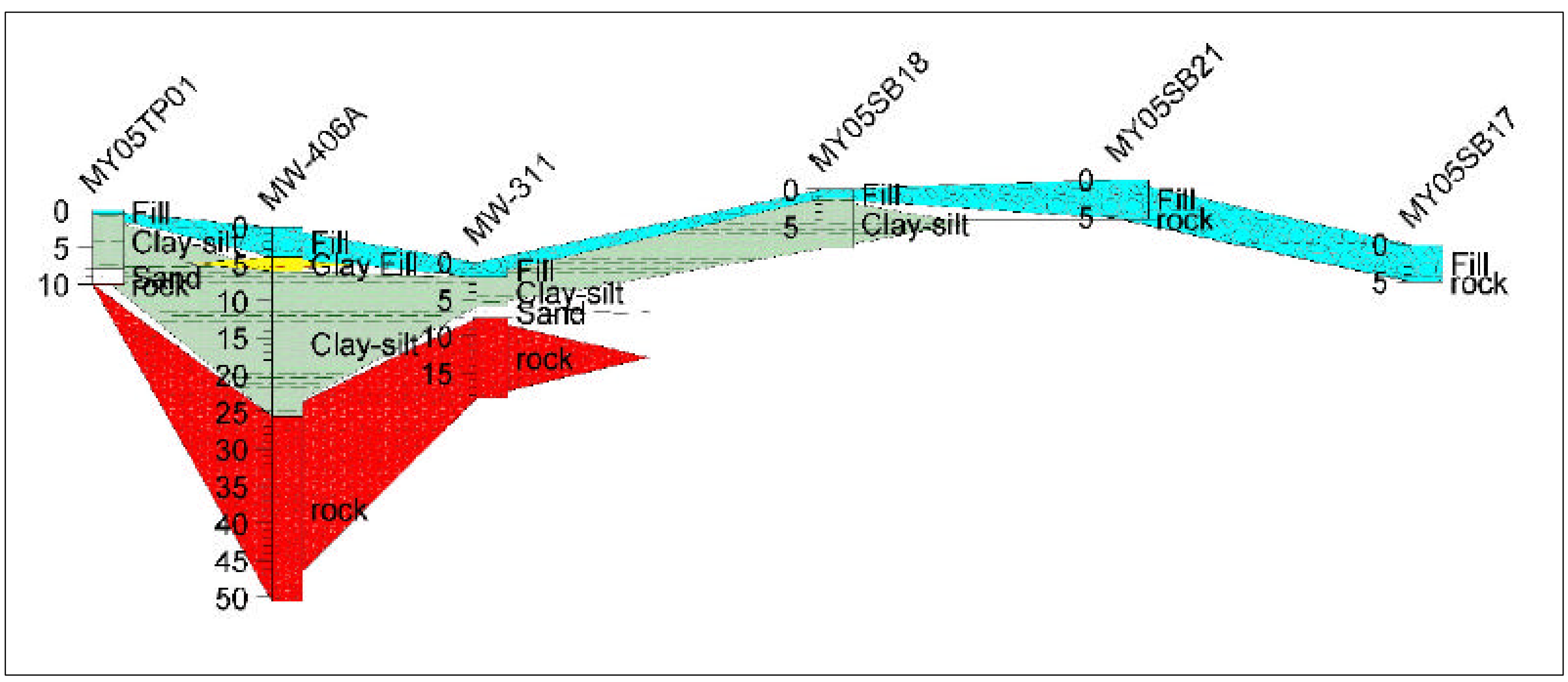

CROSS-SECTION 9-9' EAST - WEST THROUGH STAFF PARKING LOT

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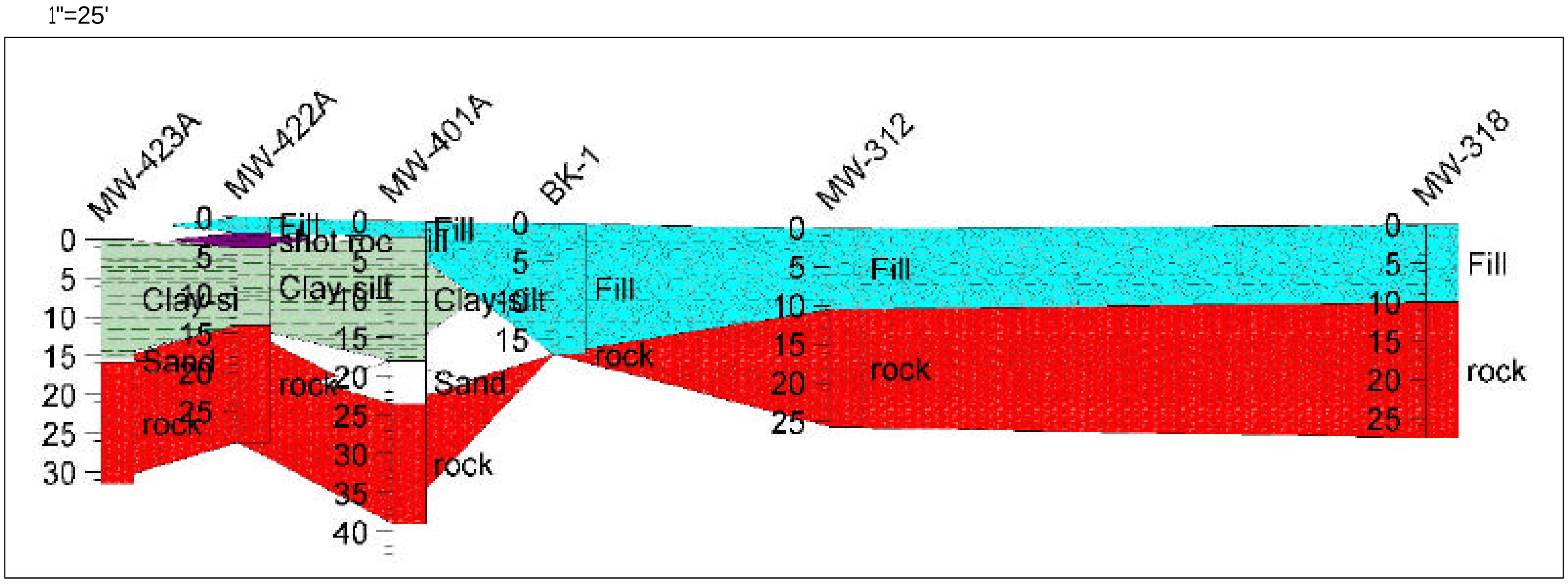
VERTICAL SCALE = 1"=25'



CROSS-SECTION 10-10' THROUGH CONTAINMENT

HORIZONTAL SCALE = 1"=100'
VERTICAL SCALE = 1"=25'

Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

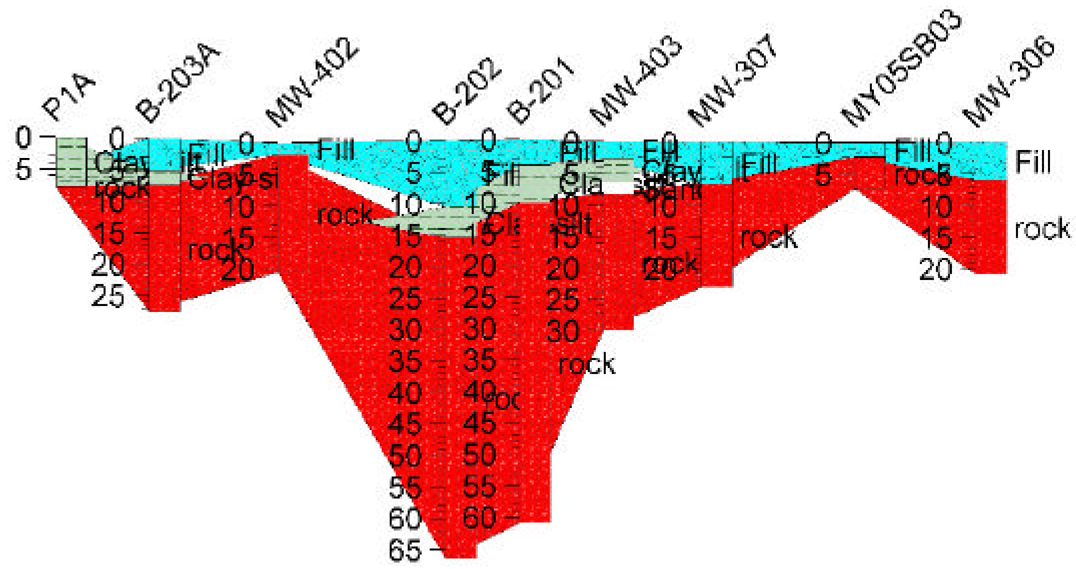
DRAWING TITLE: GEOLOGIC CROSS-SECTIONS

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/CROSS-SECTION	MEP02167/8A	SHOWN	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME	3-13D

CROSS-SECTION 11-11' EAST - WEST THROUGH SOUTH END OF SITE

HORIZONTAL SCALE = 1"=100'
VERTICAL SCALE = 1"=30'



CROSS-SECTION 12-12' ALONG EAST SIDE OF SITE

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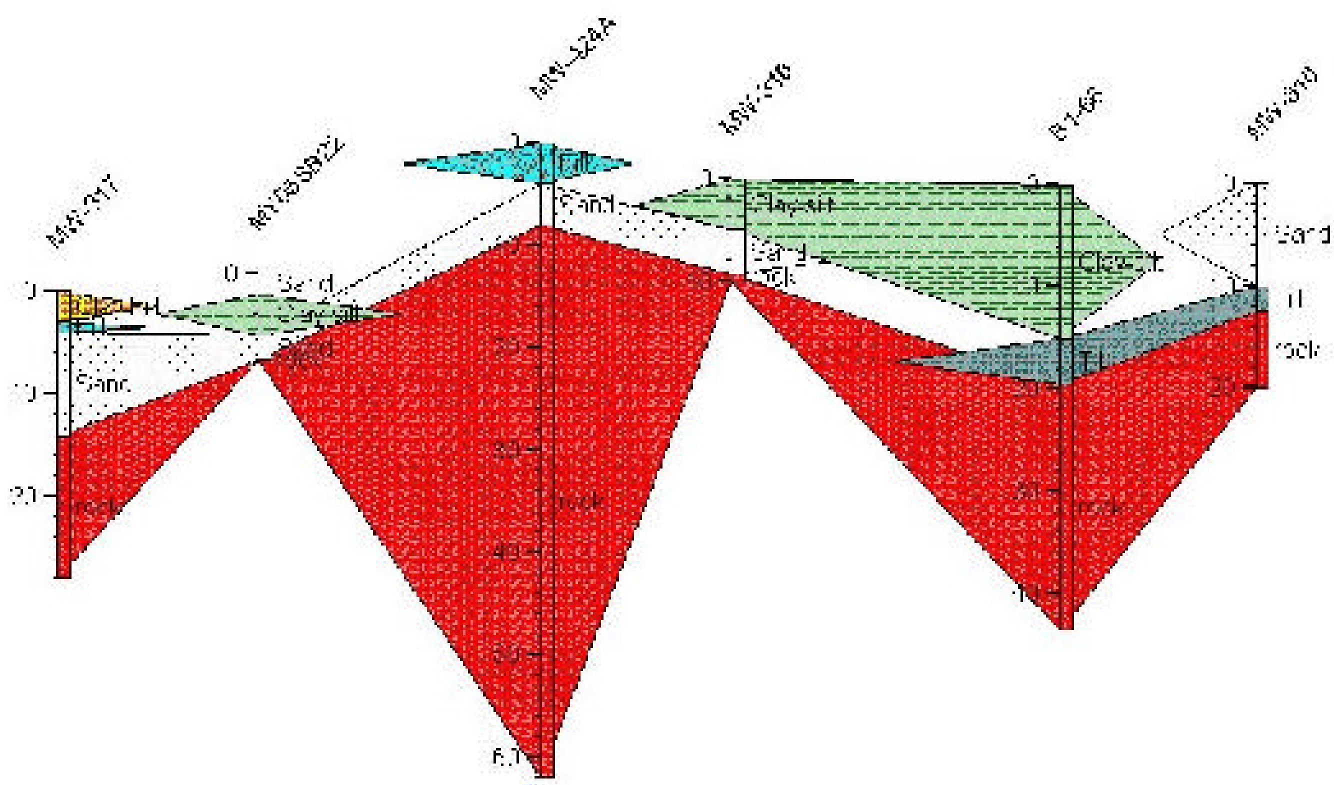
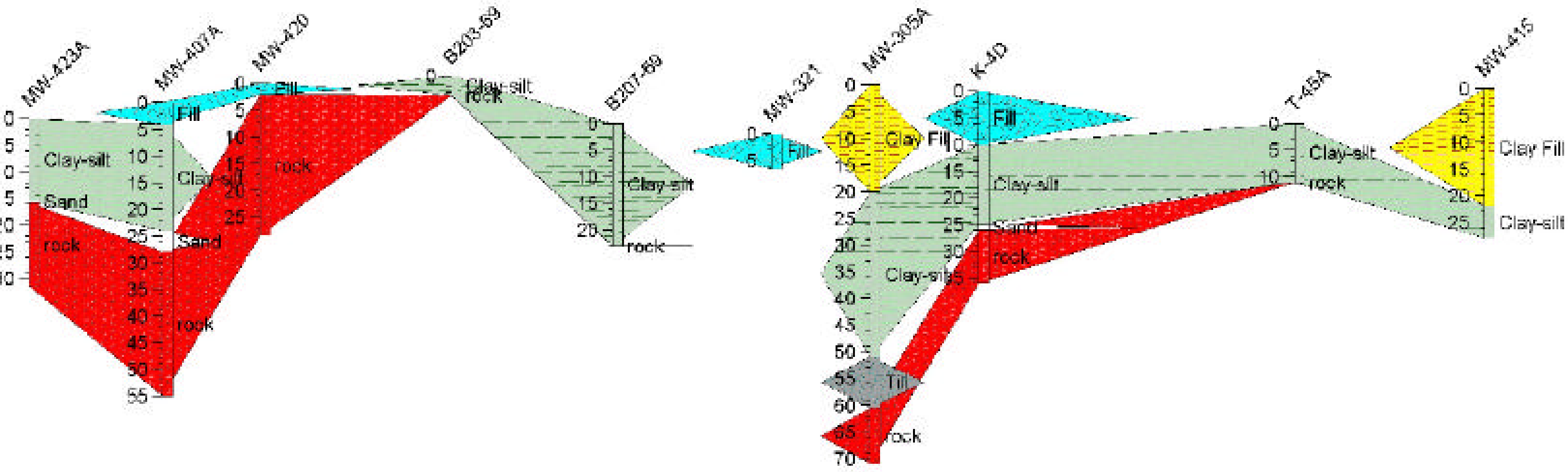
VERTICAL SCALE = 1"=20'



CROSS-SECTION 13-13' THROUGH WEST SIDE OF SIDE

HORIZONTAL SCALE = 1"=300'
VERTICAL SCALE = 1"=35'



These geologic cross sections are linear interpolations between data points, based on a variety of RCRA and historical borings and testpits. See the legend on Figure 3-3 for an explanation of the surficial units. For each data point, the ground surface is that which existed at the time of the exploration and may have changed since then. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. "Fill" material may contain a wide variety of materials. Therefore, this map should not be relied upon for the planning of construction activities.

Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DRAWING TITLE: GEOLOGIC CROSS-SECTIONS

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:
BAILEY/CROSS-SECTION	MEP02167/8A	SHOWN	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. 3-13E

These geologic cross sections are linear interpolations between data points, based on a variety of RCRA and historical borings and testpits. See the legend on Figure 3-3 for an explanation of the surficial units. For each data point, the ground surface is that which existed at the time of the exploration and may have changed since then. Numerous different investigators have prepared the historical exploration logs and the interpretation of the bedrock surface has generally been taken equal to the elevation of "refusal" where noted. Not all historical explorations were accurately surveyed. Large areas of the site have sparse density of exploration points. The bedrock surface has been found to vary widely over short distances. "Fill" material may contain a wide variety of materials. Therefore, this map should not be relied upon for the planning of construction activities.

CROSS-SECTION 14-14'
NORTH - SOUTH THROUGH EAST SIDE OF ISFSI

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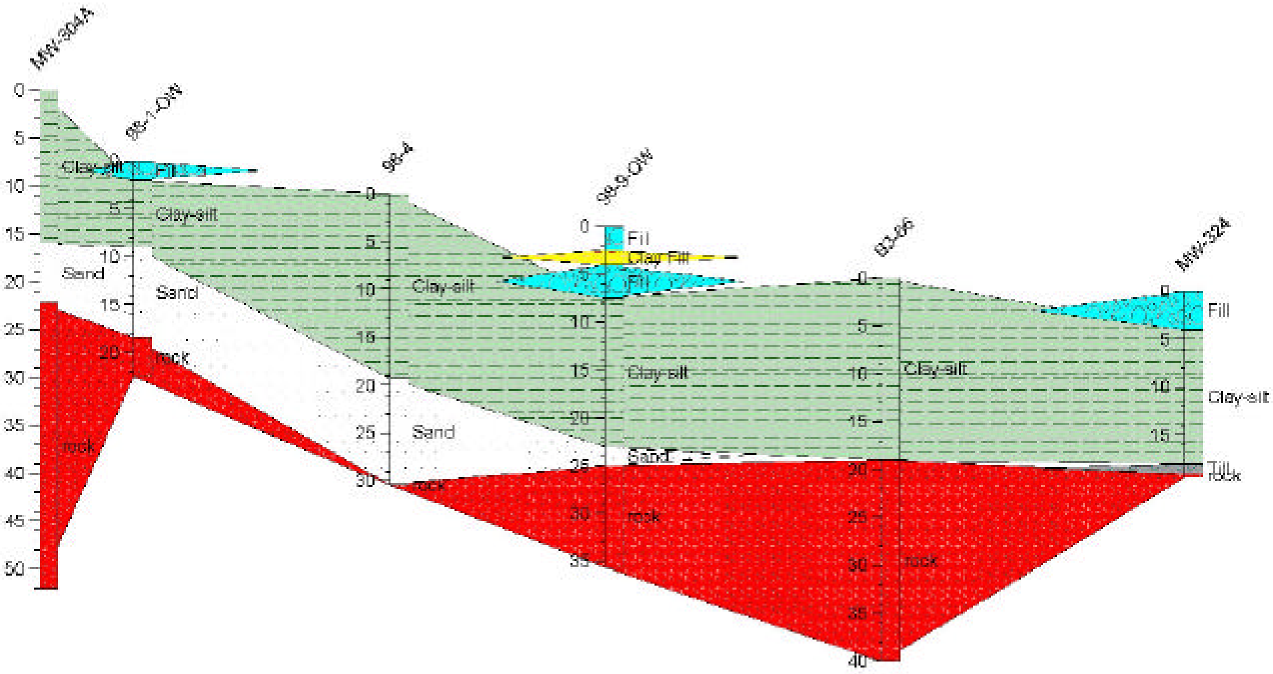
VERTICAL SCALE = 1"=20'



CROSS-SECTION 15-15'
NORTH - SOUTH THROUGH CENTER OF ISFSI

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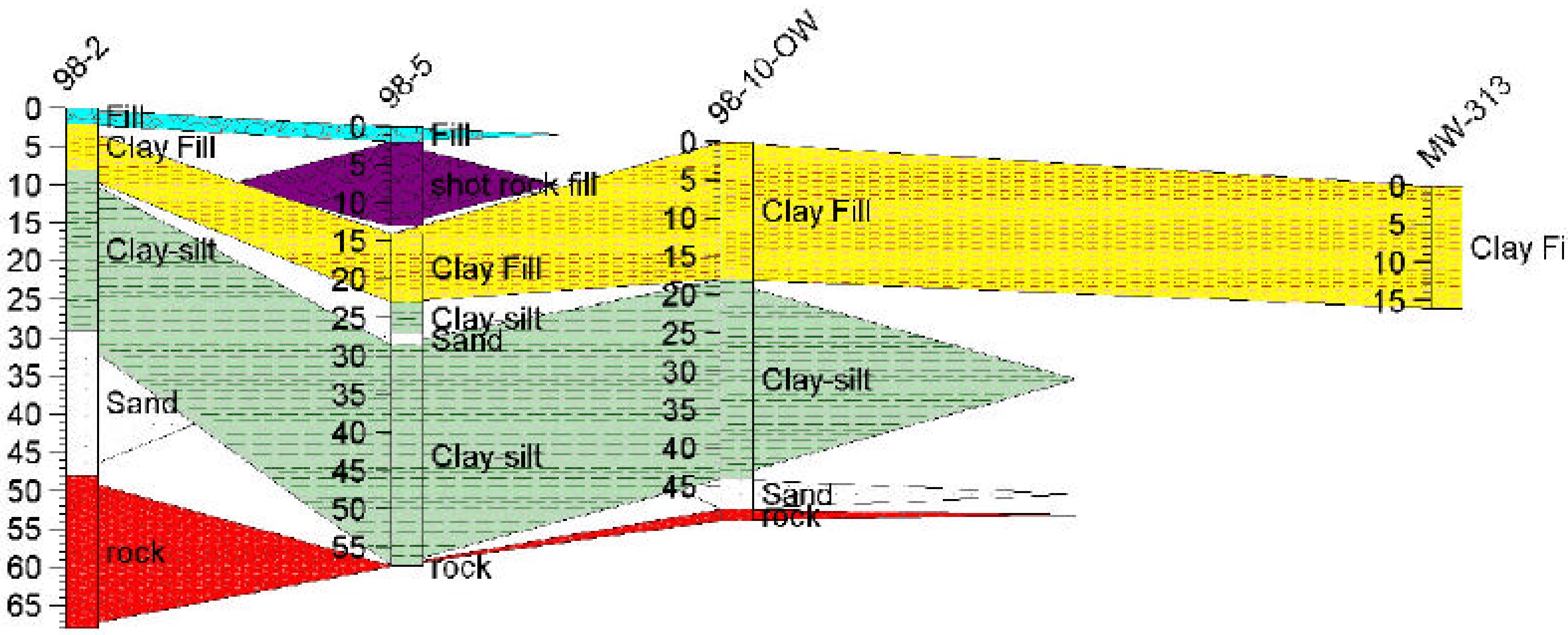
VERTICAL SCALE = 1"=25'



CROSS-SECTION 16-16'
NORTH - SOUTH THROUGH 345 Kv AREA

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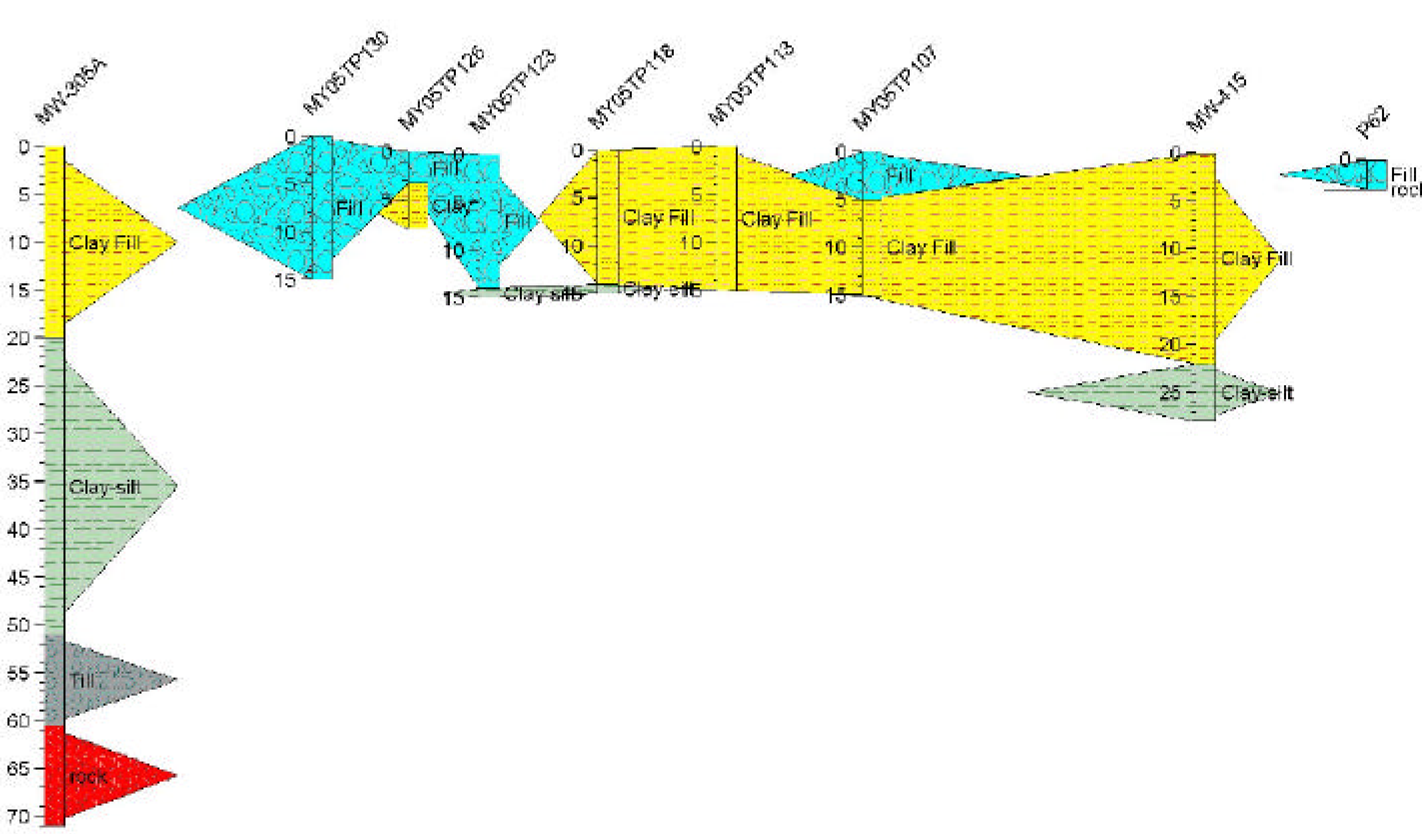


Maine Yankee

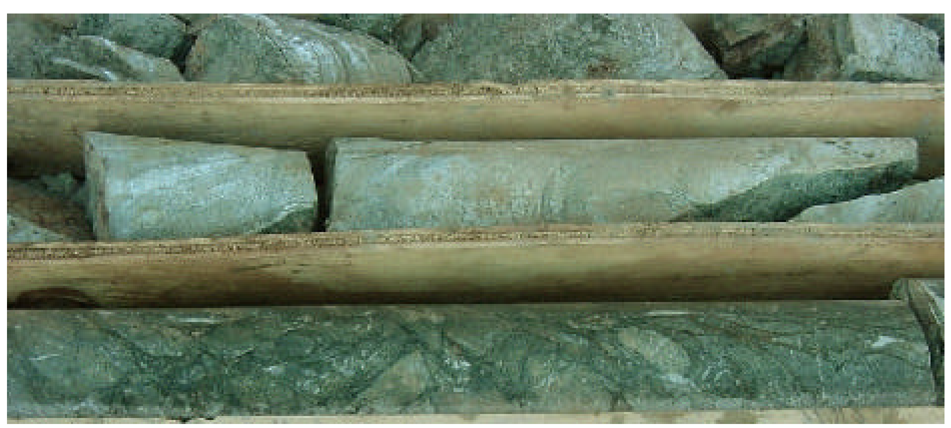
CH2MHILL STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:	CH2MHILL, STRATEX JACQUES WHITFORD COMPANY
DATE PREPARED:	09-02-03
DESIGNED BY:	NOS
DRAWN BY:	BSB
CHECKED BY:	NOS
REVIEWED BY:	RGG
PROJECT NAME/FILE NAME:	BAILEY/CROSS-SECTION
PROJECT NUMBER/PHASE:	MEP02167/8A
SCALE:	SHOWN
DRAWING TITLE:	GEOLOGIC CROSS-SECTIONS
PREPARED FOR:	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME
FIGURE NO.	3-13F

MW-306

MW-409

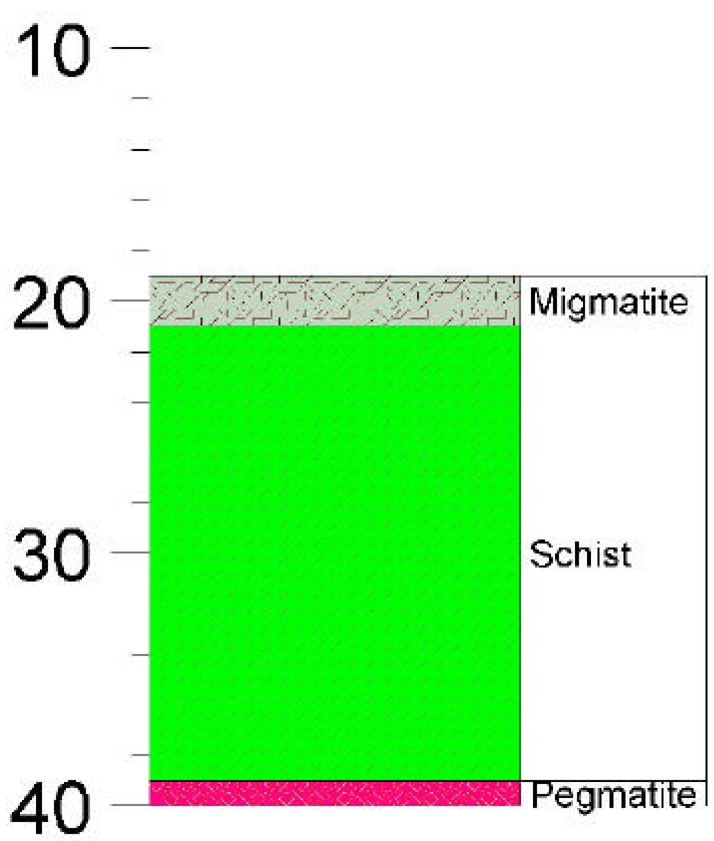


MW-417

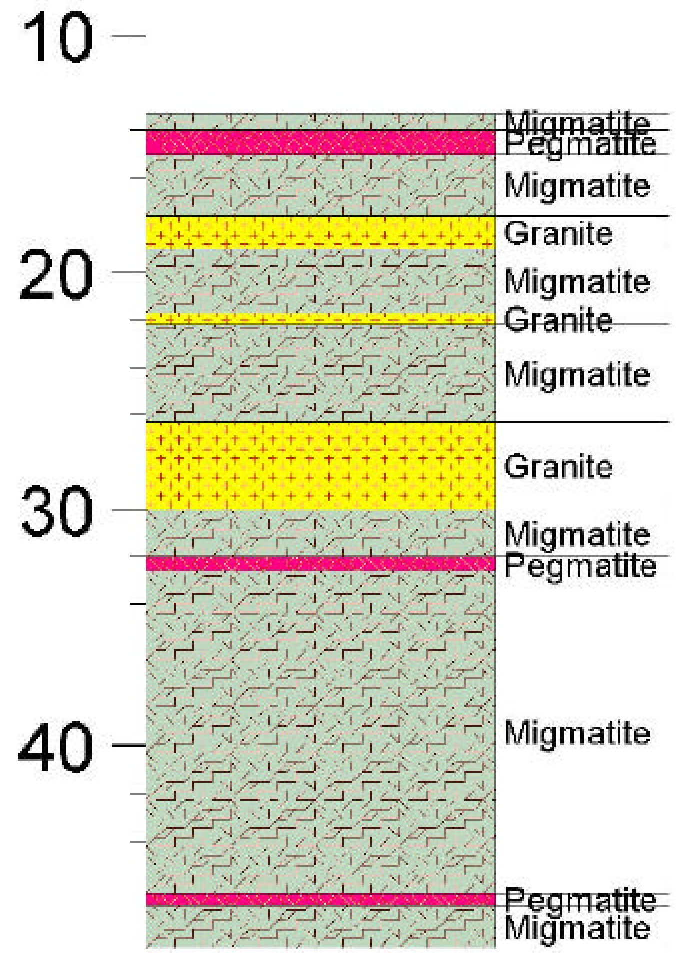
MW-311

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report						
	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: PHOTOS OF ROCK CORE	
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG		
	PROJECT NAME/FILE NAME: BAILEY/3-13_PHOTOS		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: ME YANKEE ATOMIC POWER CO, Wiscasset ME	FIGURE NO. 3-13G

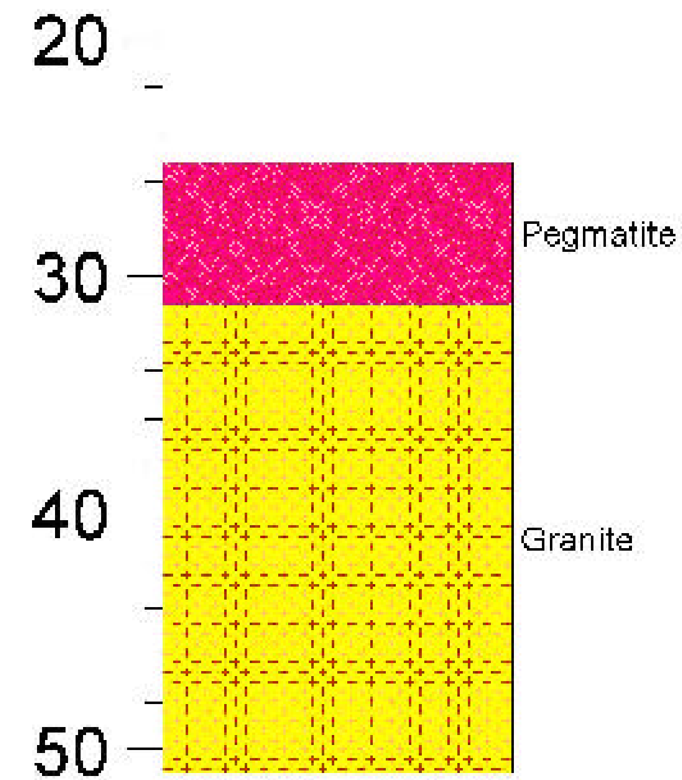
B3-66



MW-303



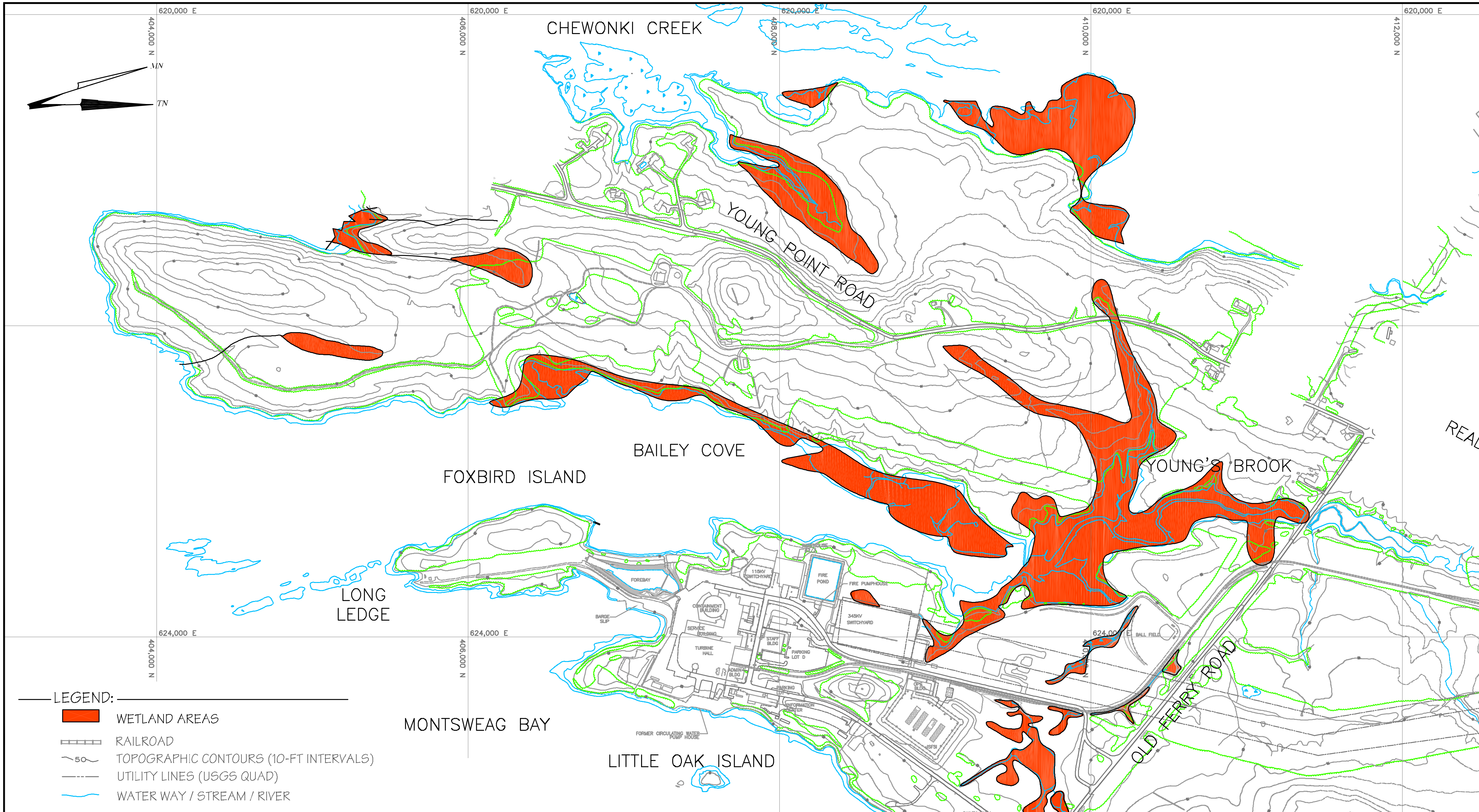
MW-409



MW-420

MW-424

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
CH2MHILL, STRATEX	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: PHOTOS AND LOGS OF ROCK CORE
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/3-13_PHOTOS		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: ME YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 3-13H



NOTES:

1. DATA COMPILED FROM RECONNAISSANCE LEVEL WETLAND MAP, NORMANDEAU ASSOCIATES, INC., 1991, FIGURE 75, WISCASSET SITE MAP, STONE & WEBSTER, 1993, AND WORK BY BOYLE ASSOCIATES, 1996. WORK PERFORMED FOR LOW LEVEL RADIOACTIVE WASTE DOES NOT APPEAR TO MATCH THE TOPOGRAPHY IN ALL LOCATIONS. FIELD VERIFICATION IS RECOMMENDED.

2. SEVERAL WETLAND AREAS IN THE VICINITY OF THE DECOMMISSIONING WORK WERE FIELD VERIFIED BY E/PRO ENGINEERING AND ENVIRONMENTAL CONSULTANTS, LLC. TWO MAPPED AREAS WERE CORRECTED TO REFLECT ACTUAL GROUND CONDITIONS.

SCALE IN FEET

300 0 600 1200

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

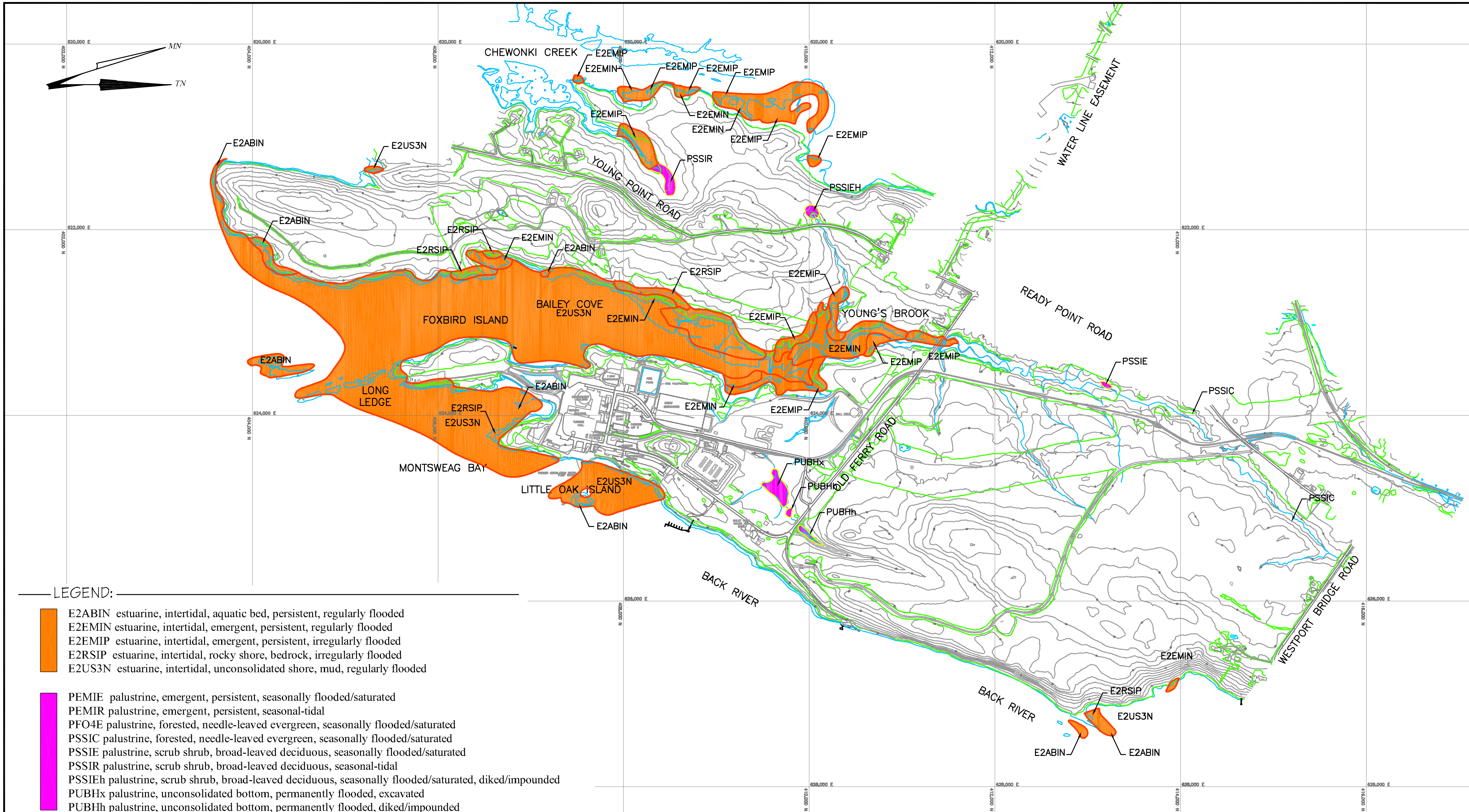
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					**SITE WETLANDS**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=300'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 3-14



LEGEND:

E2ABIN estuarine, intertidal, aquatic bed, persistent, regularly flooded
E2EMIN estuarine, intertidal, emergent, persistent, regularly flooded
E2EMIP estuarine, intertidal, emergent, persistent, irregularly flooded
E2RSIP estuarine, intertidal, rocky shore, bedrock, irregularly flooded
E2US3N estuarine, intertidal, unconsolidated shore, mud, regularly flooded

PEMIE palustrine, emergent, persistent, seasonally flooded/saturated
PEMIR palustrine, emergent, persistent, seasonal-tidal
PFO4E palustrine, forested, needle-leaved evergreen, seasonally flooded/saturated
PSSIC palustrine, forested, needle-leaved evergreen, seasonally flooded/saturated
PSSIE palustrine, scrub shrub, broad-leaved deciduous, seasonally flooded/saturated
PSSIR palustrine, scrub shrub, broad-leaved deciduous, seasonal-tidal
PSSIEh palustrine, scrub shrub, broad-leaved deciduous, seasonally flooded/saturated, diked/impounded
PUBHx palustrine, unconsolidated bottom, permanently flooded, excavated
PUBHh palustrine, unconsolidated bottom, permanently flooded, diked/impounded

Note: Data compiled from National Wetlands Inventory, USDA Department of the Interior, Westport, Maine, 1992.

RAILROAD
50 TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
UTILITY LINES (USGS QUAD)
WATER WAY / STREAM / RIVER

SCALE IN FEET
500 0 1000 2000

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL · STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY

DRAWING TITLE: **NWI WETLANDS**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/BPRCRA	MEP02167/8A	1"=1000'	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME	3-15

SECTION 4.0 – RESULTS

LIST OF TABLES

LIST OF FIGURES

4.0 RESULTS

The RFI program was based on known or suspected releases to various site media, which required further characterization to support RCRA closure of the site. The investigation within the Bailey Point area consisted of the collection of soil, sediment, concrete, groundwater, surface water, and biota at locations identified in the QAPP. The following section describes the results of this investigation, including the results of reference samples collected outside the influence of Maine Yankee industrial activities. **Table 4-1** provides a summary of PID screening results for site locations investigated as part of the RFI program.

Maine Yankee completed the RFI sampling program in two major field mobilizations (Phase 1A and 1B). The first phase of work (Phase 1A) was initiated following conditional approval of the QAPP in September 2001. The second phase of fieldwork (Phase 1B) was initiated spring of 2002 and extended into fall 2002 as enhancements were made to the program. Sample locations referenced in this section have been designated the suffix “1B” to indicate the Phase 1B program, and “1C” refers to additional samples collected following Phase 1B as enhancements were made to the program.

4.1 Reference Locations

Reference samples for soil, groundwater, sediment and biota were collected to compare concentrations of chemicals detected to reference areas outside the influence of Maine Yankee operations for each medium. The Maine Yankee Backlands RFI Report (MY, 2004) details the investigation results for reference soil and groundwater samples collected as part of the RFI.

4.1.1 Soil

A total of five reference soil borings (MYRSSB01 through MYRSSB05) and four reference surface soil samples (MYRSSS01 through MYRSSS04) were completed in Study Areas 1 and 2, the Backlands (**Figure 2-3**). With the exception of MYRSSB02, which was logged for geological characterization data only, the soil samples were analyzed for VOCs, SVOCs, PCBs, pesticides, EPH, and TAL metals. A summary of the reference soil statistical results is provided in **Table 4-2**.

The results of the reference soil investigation were detailed in the Backlands RFI Report (MY, 2004). In general, the reference surface and subsurface soil results indicate non-detect concentrations of target organic compounds and that TAL metal concentrations are consistent with published background data (Shacklette and Boerngen, 1984). The average iron concentration is very near the PAL of 23,000 mg/kg, and had a maximum reference concentration of 44,900 mg/kg.

Several of the reference soil samples have low EPH concentrations very near the quantitation limit. These low EPH detections were interpreted to represent false positives or the decay of natural humic material present in the soils.

4.1.2 Groundwater

As shown in **Figure 2-3**, four of the reference soil borings from the two study areas had monitoring wells installed in the overburden (RW-01 and RW-02) and the bedrock aquifer (RW-03 and RW-04). Groundwater samples (MYRSGW01 though MYRSGW04) from these four wells were collected in Phase 1A and analyzed for VOCs, SVOCs, SIM vinyl chloride, PCBs, pesticides, EPH, TAL metals, and nitrate. A second round of groundwater samples (MYRSGW01-1B through MYRSGW04-1B) was collected in Phase 1B and analyzed for VOCs, SVOCs, SIM vinyl chloride, PCBs, pesticides, DRO, TAL metals, and nitrate. A third round of groundwater samples (MYRSGW01-1C through MYRSGW04-1C) was collected and tested for TAL metals. A summary of the reference groundwater statistical results are provided in **Table 4-3**.

The results of the reference groundwater investigation were detailed in the Backlands RFI Report (MY, 2004). Groundwater in the reference wells was interpreted as having no target organic compounds reported above the project quantitation limits and having metal concentrations generally consistent with a background distribution (Prescott, 1968 and Hem, 1985).

4.1.3 Marine Sediment

Reference marine sediment samples were collected from Brookings Bay (**Figure 2-4**). Sediment was collected at 3 intertidal and 3 subtidal locations (MYRSSD01 through MYRSSD06). The sediment samples from each location were analyzed for VOCs, SVOCs, PCBs, pesticides, TAL metals, grain size, SIM PAHs, and TOC. Additional sediment samples were collected (MYRSBI01A-D through MYRSBI06A-D) to support an evaluation of benthic community structure analysis (BCSA) and PCB congener/homologue analysis at a later date. A summary of the reference sediment analytical results is provided in **Table 4-4**.

The results and conclusions of the initial sediment screening were presented in a technical memorandum to the MDEP in November 2001 (CH2M Hill, 2001b). In general, reference sediment results indicate non-detect concentrations of target organic compounds, with the exception of several low-level detections of SVOCs. PALs were exceeded for three TAL metals: arsenic, mercury and nickel. The intertidal and subtidal reference sediment results showed similar concentrations for each of the detected analytes.

A second round of reference sediment samples was collected from the intertidal location MYRSSD02 for chemistry and toxicity analysis to aid in interpreting the results of the outfall areas. The bulk-chemistry sample (MYRSSD02A) was analyzed for VOCs, SVOCs, SIM PAHs, PCBs, pesticides, grain size, TOC, and PCB congeners/homologues.

The sample for toxicity analysis (MYRSTX02) was assessed for BSTA and BSTS. For comparative purposes, one reference intertidal location (MYRSBI02A-D) and one reference subtidal location (MYRSBI05A-D) collected in the initial round of sampling were processed for BCSA.

The analytical results for the second sample (MYRSSD02A) collected at the intertidal location MYRSSD02 showed comparable concentrations to the initial sample and is summarized in **Table 4-4**. Several PCB Congeners were detected below PALs. The results of this phase of the investigation were summarized in a technical memorandum to the MDEP in May 2002 (CH2M Hill, 2002a).

4.1.4 Biota

To support an assessment of bioaccumulative chemicals in the sediment, reference biota samples were collected from Brookings Bay (**Figure 2-4**). The biota samples included soft-shell clams from the 3 intertidal locations (MYRSBC01 through MYRSBC03) and blue mussel from the 3 subtidal locations (MYRSBM01 though MYRSBM03). At least 20 individuals were collected at each location for analysis of tissue for SVOCs, PCBs, pesticides, TAL metals, SIM PAHs, and percent lipids. In addition, approximately 50 individual mummichogs (MYRSMM01) were collected and analyzed for the same parameters.

The results of this assessment phase were presented in a technical memorandum to the MDEP in July 2002 (CH2M Hill, 2002b), and are summarized in **Table 4-5**. All of the tissue samples detected inorganic and organic analytes, with the exception of the mussel samples that were non-detect for PCBs. The clam samples exceeded PALs for arsenic, iron, PCBs (Aroclor 1254 and 1260), several PAHs (benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(a,h)anthracene), and the SVOC pentachlorophenol. The mussel samples exceeded PALs for arsenic, benzo(a)pyrene, and benzo(b)fluoranthene. Mummichogs exceeded PALs for arsenic, PCBs (Aroclor 1254 and 1260) and pentachlorophenol. All pesticides detected were less than their respective PALs.

4.2 Study Area 3 – Foxbird Island

Three surface soil samples (MY03SS01, MY03SS14, and MY03SS15) were collected from the northern, central, and southern portion of the island to evaluate the complete length of the pipeline construction (**Figure 2-5**). The surface soil samples (0 to 0.5 feet) were analyzed for TAL metals and TCL compounds.

Analytical test results are shown in **Table 4-6**. Iron is the only metal that exceeds its PAL (30,200 mg/kg versus 23,000 mg/kg), however it is within the range of observed background concentrations (**Table 4-2**). Organic compounds are non-detect. These results indicate that no RCRA issues are present on Foxbird Island and that no additional characterization is necessary.

4.3 Study Area 4 – ISFSI

The RFI sampling program within this area was performed in two phases: soil and groundwater sample collection (from existing wells) prior to plant construction, and additional groundwater sample collection from monitoring wells installed following construction of the ISFSI. In addition to the samples specifically taken as part of the RFI study, additional soil samples were collected from two utility trenches in the associated with the ISFSI construction.

4.3.1 Soil

The area of the former contractor parking lot was visually inspected for evidence of spills or possible contamination prior to ISFSI construction. One minor area of oil-contaminated soil was identified in the northwest portion of the parking lot during the visual inspection. The soil was removed, and a test pit was dug to verify contaminant removal (**Figure 2-6**). A composite sample from each of the four test pit walls was collected (MY04SS01), and a grab sample was collected from the bottom of the pit (MY04SS02). Both samples were analyzed for SVOCs, PCBs and EPH.

With the exception of benzo(a)pyrene (210J ug/kg), all SVOCs were below the PALs as shown in **Table 4-7**. EPH was detected in samples MY04SS01 and MY04SS02. The C11-C22 aromatics were reported at 96 mg/kg at MY04SS01 and were non-detect in the MY04SS02 and the duplicate sample MY04SS02DUP. The C19-C36 aliphatics and the C9-C18 aliphatics were reported at 470J and 450J mg/kg, respectively, in the MY04SS01 sample. The MY04SS02 C19-C36 aliphatics had a concentration of 54 mg/kg. Analyses did not contain detectable concentrations of EPH in MY04SS02DUP. The sum of the EPH fractions exceeds the EPH PAL of 100 mg/kg. PCBs were not detected in either sample.

Additional soil samples for the ISFSI included two subsurface soil samples taken from utility trenches on the southern and eastern portions of Study Area 4 (**Figure 2-6**). The soil samples were taken to support MDEP Site Location of Development Order L-17973-26-Q-M associated with the ISFSI construction activities. The two soil samples were analyzed for VOCs, RCRA-8 metals, and DRO, and the analytical results are included in **Table 4-7**. VOCs in both of the trench samples were non-detect, and the metal results were consistent with reference soils. DRO was non-detect in Trench sample 3 and 32 mg/kg DRO was reported in Trench Sample 2.

The ISFSI construction activities also included the excavation of four areas for the concrete pads that support the spent fuel containers. The four excavations were monitored for the presence of potential contamination, and a small petroleum release was identified in one of the excavations. The identified release was appropriately remediated, and approximately 30 cubic yards of petroleum-contaminated soils were disposed off-site (MY, 2000e). None of the other excavations had indications (visual or olfactory) of potential contamination, consistent with the analytical results from the nearby trench samples.

4.3.2 Groundwater

Prior to construction of ISFSI, groundwater samples were collected from three existing monitoring wells (98-1-OW, 98-9-OW, and 98-10-OW) located in the southeast, northeast and northwest corners of the area, respectively (**Figure 2-6**). Groundwater samples (MY04GW01 through MY04GW03) were analyzed for TAL metals, TCL, and EPH.

The TAL metals results from monitoring wells (98-1-OW, 98-9-OW, and 98-10-OW) were generally consistent with concentrations exhibited by the reference groundwater samples (**Table 4-3**). Aluminum exceeded the PAL of 1,430 ug/l in three of the four groundwater samples excluding the duplicate of 98-1-OW (MY04GWD01) (**Table 4-8**). Aluminum was detected at a concentration of 2,200J ug/l at 98-1-OW, 6,900J ug/l at 98-9-OW and 30,000J ug/l at 98-10-OW. Sodium exceeded the 20,000 ug/l PAL in 98-1-OW (and the duplicate) and 98-10-OW at concentrations of 26,000 and 41,000J ug/l, respectively. Iron (PAL 11,000 ug/l), manganese (PAL 500 ug/l), chromium (PAL 40 ug/l), and lead (PAL 10 ug/l) exceeded their PALs in 98-10-OW, with results of 52,000 ug/l, 6,300 ug/l, 70 ug/l, and 35 J ug/l, respectively. Antimony (PAL 3 ug/l) exceeded the PAL at 98-9-OW (11 J ug/l) and 98-10-OW (33 J ug/l). The arsenic concentration (42 J ug/l) at 98-10-OW exceeded the PAL of 10 ug/l.

EPH was detected at 98-9-OW (20 ug/l) and 98-10-OW (110 J ug/l). The PAL for EPH is 50 ug/l.

TAL metal PAL exceedences are attributed to the fill material placed in this area during plant construction. In addition, the elevated metal concentrations in 98-10-OW may be attributed to suspended solids and not dissolved phase metals based on the fact that the sample was retrieved via bailer (in lieu of the "low-flow" method) as a result of a low well yield. The groundwater samples were non-detect for SVOCs and VOCs.

To support a more complete understanding of groundwater in the ISFSI, four overburden and four bedrock wells were installed around the perimeter of the area (**Figure 2-6**). Three of the overburden/bedrock well pairs were located along the northeastern (MW-303A/B), southeastern (MW-304A/B) and northern (MW-302A/B) sides of the ISFSI area. A fourth overburden/bedrock well pair (MW-305A/B) was installed downgradient and west of the ISFSI area and the historic kerosene spill remediation area (**Figure 2-1**). Groundwater samples (MY04GW04A/B through MY04GW07A/B) from each of the monitoring wells were sampled for analysis of TAL metals, TCL, SIM vinyl chloride, and EPH. In all well pairs installed during the RFI program, the "A" well represents the bedrock well and the "B" well is installed in the overburden soils.

TAL metals concentrations in MW-302A/B through MW-305A/B were generally consistent with concentrations seen in reference groundwater samples (**Table 4-3**).

Aluminum, manganese, molybdenum, and sodium frequently exceeded their PALs (**Table 4-8**). These exceedences are detailed below:

- Aluminum (PAL of 1,430 ug/l) exceedences were detected at 3,240 ug/l at MW-302A and 2,470 ug/l at MW-302B.
- Manganese concentrations exceeded the PAL (500 ug/l) in groundwater samples collected at MW-302B (5,120 ug/l), MW-305A (512 ug/l) and MW-305B (12,800 ug/l).
- Molybdenum (PAL 35 ug/l) exceedences were detected at MW-302A (176 ug/), MW-304A (181 ug/l) and MW-305A (128 ug/l).
- Sodium exceeded the PAL (20,000 ug/l) at MW-302A (50,600 ug/l), MW-302B (27,900 ug/l), MW-303A (32,500 ug/l), MW-305A (24,600 ug/l), and 305B (106,000 ug/l).
- Lead (PAL 10 ug/l) exceeded the PAL at MW-305A (18.6 ug/l).

PCBs and pesticides were not detected in any of the groundwater samples collected from MW-302A/B through MW-305A/B. The majority of the SVOC and VOC results were either estimated values or rejected. One exception was chloroform (PAL of 57 ug/l) detected at MW-305A and MW-305B with respective concentrations of 7 and 15 ug/l.

EPH exceeded the PAL of 50 ug/l in MW-302A, MW-302B, MW-303B, MW-305A and MW-305B. EPH exceedences ranged from 51 (MW-305A) to 490 ug/l (MW-305B).

Based on detections in the first round of sampling, a second round of sampling (MY04GW04A/B-1B through MY04GW07A/B-1B) was conducted spring 2002 on the four well pairs for DRO analysis. To further assess DRO concentrations in three of the overburden wells (MW-302B, MW-303B and MW-304B), a third round of groundwater samples (MY04GW04B-1C, MY04GW05B-1C, and MY04GW06B-1C) was collected in fall 2002 for DRO analysis (**Table 4-8**).

DRO results exceeded the 50 ug/l PAL with 54 ug/l in the groundwater collected from the bedrock well, MW-302A. DRO exceeded the PAL of 50 ug/l in MW-302B with a concentration of 140 ug/l during both the spring and fall 2002 sampling rounds.

MW-303A and MW-303B, located in the northeastern portion of Study Area 4, exceeded the DRO PAL with results of 220J and 650J ug/l, respectively, during the spring groundwater sampling event. MW-303B was also sampled during the fall 2002 sampling round and exceeded the DRO PAL with a 460 ug/l result.

MW-304B was sampled during the spring and fall 2002 sampling rounds. During the spring 2002 sampling event, DRO exceeded the PAL and was reported at 83J ug/l while a 90 ug/l DRO result was reported in the fall 2002 data. A duplicate sample (MY04GW10) of MW-304B was collected during the fall 2002 sampling event and exceeded the DRO PAL with a result of 60 ug/l.

MW-305A and MW-305B were sampled during the spring 2002 sampling events for DRO. MW-305A and MW-305B exceeded the DRO PAL with results of 60 and 190 ug/l, respectively.

The groundwater chemistry test results of the ISFSI monitoring wells indicate several elevated TAL metals and DRO concentrations associated with the previous land use activities and petroleum spills that occurred in this portion of the site.

4.4 Study Area 5 – Plant Area

The field sampling program for this area was divided into two primary areas – a southern area and a northern area. The southern portion of Study Area 5 is the area south of the ISFSI where the majority of plant operations took place (**Figures 2-7 and 2-8**). The northern portion of Study Area 5 is the area north of the Knoll and includes the 345 kV switchyard, the ball field, and Bailey Farm House area (**Figure 2-9**). Each of these areas was subdivided further to focus the investigation in accordance with historic land use and like features.

4.4.1 Radiological Restricted Area

The Radiological Restricted Area (RA) is the area within the industrial fence with restricted access and is located in the southern portion of Study Area 5 (**Figure 2-7 and 2-8**). The investigation within this area included sampling soils, concrete and groundwater. RA buildings within this area that were investigated as part of the interior program included Containment Building, Spray Building, PAB, Fuel Building, and portions of the Service Building. These studies also included soil and groundwater samples associated with SWMU-1, area of SCC and PCC historic spill.

4.4.1.1 Soil

Soil was investigated in the RA area using soil borings, surface sample collection and sub-slab soil sample collection from areas of known or suspected contamination (**Figure 2-7 and 2-8**).

<u>Former RWST and SCAT Tanks</u>

Six soil borings (MY05SB04 through MY05SB09) were completed in the area of the former RWST and SCAT tanks (**Figure 2-8**). The borings were completed to assess the potential impact of spills and releases associated with RWST and SCAT on surface and subsurface soils.

Analyses included pH, TCL, and EPH on the groundwater or soil/bedrock interface sample from each of the borings. The samples screened with a photoionization detector (PID) and found to have the highest readings (**Table 4-1**) were tested for EPH. In instances when PID readings were non-detect, the VOC sample was collected at the mid-point between the surface sample and the groundwater or soil/bedrock interface sample.

As shown on **Table 4-9**, the soils testing identified TAL metals at concentrations generally consistent with reference soils. One exception was calcium, detected at a concentration of 8,960J mg/kg in MY05SB09 (4 to 6 feet). The reference soil maximum was 3,020 mg/kg (refer to **Table 4-2**). The only compound detected above the PALs was iron in borings MY05SB05, MY05SB07 and MY05SB08. The concentrations detected ranged from 23,200 to 23,500 mg/kg. The PAL for iron is 23,000 mg/kg; the reference soil maximum was 44,900 mg/kg.

Pesticides were detected at two boring locations, MY05SB04 (12-13.2 feet) and MY05SB05 (12-13.5 feet). Dieldrin (5.02 ug/kg) was detected in MY05SB04, and Gamma-BHC (3.99J ug/kg) was detected in MY05SB05. The PAL for dieldrin is 30 ug/kg; a PAL was not identified for Gamma-BHC.

SVOCs consisting of PAHs were detected in borings MY05SB04 (12-13.2 feet) and MY05SB05 (12-13.5 feet). Benzo(a)pyrene (90 ug/kg) in MY05SB04 was the only compound detected above the respective PAL (62 ug/kg).

A low concentration of one VOC, carbon disulfide, was detected in MY05SB05 (12-13.5 feet) at a concentration of 4J ug/kg; the PAL is 360,000 ug/kg. Because only a trace of this compound was found at this depth and was not detected in other samples in the RFI study, it is most likely an artifact of the laboratory analysis. EPH and PCBs were not detected in the samples tested. An elevated pH of 11.6 was measured for MY05SB09 (4-6 feet).

The presence of relatively low concentrations of pesticides and PAHs at considerable depth (greater than 12 feet) suggests these compounds were contained in the fill brought on site during plant construction. Each of the borings in this area encountered apparent fill materials to the top of bedrock.

RA Yard

Four soil borings were drilled in the western portion of the RA yard (**Figure 2-8**). One boring was located south of the yard crane near the area where radiological waste was once stored (MY05SB10) and a second soil boring was located west of the Equipment Hatch (MY05SB11). Two soil borings were installed in the alleyway between the Service Building and the Containment Building: one near the test tanks (MY05SB12) and the other near the DWST (MY05SB13). All four soil borings were sampled continuously.

Samples were collected at the groundwater or soil/bedrock interface for analyses of TAL metals, pH, TCL and EPH. In addition, the surface soil sample from the boring adjacent to the yard crane (MY05SB10) was tested for EPH (only two soil samples were collected from the boring). A surface soil sample from the boring west of the Equipment Hatch (MY05SB11) was analyzed for PCBs.

As shown on **Table 4-9**, the soils testing identified TAL metals at concentrations generally consistent with reference soils. One exception was calcium, detected at concentrations of 6,730J mg/kg in MY05SB10 (14-16 feet) and 9,250J mg/kg in MY05SB11 (12-13.5 feet). The reference soil maximum was 3,020 mg/kg. The only other compound notably above reference soil concentrations was sodium (3,860 mg/kg) in MY05SB13 (4-5.5 feet). The reference soil maximum for sodium was 289 mg/kg.

The only metals detected above the PALs were iron, in borings MY05SB10 and MY05SB11, and arsenic, in MY05SB57 (duplicate of MY05SB11). The iron concentrations detected ranged from 23,400 to 35,900 mg/kg. The PAL for iron is 23,000 mg/kg. The arsenic concentration was 22.3 mg/kg. The PAL for arsenic is 22 mg/kg.

Pesticide testing identified dieldrin at concentrations of 2.41 ug/kg in MY05SB11 (12-13.5 feet), 13 ug/kg in MY05SB12 (8-10 feet) and 2.38J ug/kg in MY05SB13 (4-5.5 feet). Heptachlor epoxide was also detected in the duplicate sample of MY05SB11 (0-0.5 feet) at a concentration of 0.874 ug/kg. In all cases the concentrations were below the PALs of 30 ug/kg for dieldrin and 53 ug/kg for heptachlor epoxide.

One PCB, Aroclor-1254, was detected in MY05SB13 (4-5.5 feet) at a concentration of 20.6 ug/kg; the PAL is 220 ug/kg (**Table 4-9**). EPH (unadjusted C19-C36) was detected at a concentration of 11.3 mg/kg in the duplicate of MY05SB11 (0-0.5 feet). EPH was not detected in the other samples tested, including MY05SB11 (0-0.5 feet). The PAL for EPH is 100 mg/kg.

PAHs were detected above PALs in MY05SB11 (0-0.5 feet) and its duplicate (MY05SB57), and MY05SB11 (12-13.5 feet). The PAHs detected above PALs included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. The concentrations detected ranged from 380 to 2,800 ug/kg; the PALs range from 62 to 620 ug/kg.

The only VOCs detected was a relatively low concentration of methylene chloride (4ug/kg) in MY05SB10 (14-16 feet) and MY05SB11 (12-13.5 feet). The PAL for methylene chloride is 8,900 ug/kg. The methylene chloride detection is most likely the result of laboratory contamination, as it is a common laboratory contaminant. An elevated pH of 10.5 was identified in MY05SB13 (4-5.5 feet).

The relatively low concentrations of pesticides, PAHs, PCBs and EPH detected appear to be linked to the fill brought on site during plant construction and may represent "anthropogenic background" from the source of the borrow material. Site history research has identified no obvious source of these compounds at depth. For example, dieldrin was detected at a depth of 12 to 13.5 feet in MY05SB11, but not detected in the surface sample from the same boring. Also of note is the fact that PCBs, pesticides, PAHs and EPH were not identified in MY05SB10, where no filling was identified (soils were logged as glaciomarine). Fill materials were present to bedrock refusal in the other borings in the RA yard.

Containment Building and Equipment Hatch

Three surface soil samples (MY05SS01 through MY05SS03) were collected around the outside of the Containment Building in the vicinity of the Equipment Hatch (**Figure 2-8**). The soil samples were to be analyzed for PCBs and EPH to assess the potential for PCBs in surface soils from paint removal activities. Due to a laboratory error, the soil samples were tested for pesticides instead of PCBs.

EPH was identified at concentrations below the PAL of 100 mg/kg in MY05SS02 and MY05SS03 (**Table 4-9**). In MY05SS01 (0-0.5 feet), C11-C22 compounds were detected at a concentration of 151 mg/kg.

As shown in **Table 4-9**, a variety of pesticides were detected in the surface soil sample from MY05SS03, including 4,4'-DDT (2.57 ug/kg), dieldrin (5.4J ug/kg), endrin aldehyde (2.41 ug/kg) and methoxychlor (9.78 ug/kg). In each case the concentrations were below the PALs.

The data indicate either residual hydrocarbons in fill brought to the site, or an apparent localized spill or leak of petroleum hydrocarbons in the vicinity of the containment building and equipment hatch. Site background data do not identify an on-site source for the suite of pesticides identified. These compounds may have been contained in the fill brought on site.

Soils were not tested for PCBs as intended due to a laboratory error. This data gap is not likely to affect the risk evaluation for RA soils given that soils in the vicinity of the equipment hatch have, to the extent practicable, been removed down to the bedrock surface based on the presence of radiological constituents (MY, 2002k).

Former Spray Building

One sub-slab soil sample will be collected beneath the three-inch wide shaker space in the southwest corner of the 21-foot elevation of the former Spray Building following demolition late 2003. The sub-slab soil sample (MY05SS62) will be analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

4.4.1.2 Concrete

Concrete samples were collected from sub-grade locations within RA structures in areas of known or suspected contamination (**Figure 2-7**).

Former PAB

Thirteen concrete samples were collected from the 11-foot elevation of the PAB (**Figure 2-8**). The concrete samples (MY05CS03 through MY05CS14, and MY05CS22) were analyzed for PCBs and EPH.

As shown on **Table 4-23**, no PCBs were detected in the concrete samples. EPH, consisting of C19-C36 aliphatics, were detected in each concrete sample except MY05CS21 and its duplicate (MY05CS30). The concentrations of EPH detected ranged from 6.2 to 152 mg/kg. In only one instance did the concentration of EPH exceed the PAL of 100 mg/kg (152 mg/kg in MY05CS14).

The results indicate relatively minor impact to concrete in the PAB from petroleum hydrocarbons. The source of the hydrocarbons is likely routine use of lubricating oils for pumps located in this building.

Fuel Building/RCA

Two concrete samples will be collected from the Fuel Building/RCA following demolition activities in the area late 2004. The concrete samples (MY05CS15 and MY05CS16) will be analyzed for PCBs and EPH.

Containment Building

Four concrete samples will be collected from the minus two-foot elevation of the Containment Building following demolition activities in this area late 2004. The concrete samples (MY05CS17 through MY05CS20) will be analyzed for PCBs and EPH.

4.4.1.3 Groundwater

Groundwater was investigated in areas of known or suspected contamination in the RA utilizing existing wells, newly installed wells, and building sumps open to groundwater in bedrock (**Figure 2-8**). The test results and sample collection dates are shown on **Table 4-10**.

To detect any contaminants moving through the groundwater within the bedrock aquifer, three existing monitoring wells around the RWST (B-202, B-205, and B-206), the Containment Building foundation drain (CS-1), and a monitoring well near the yard crane (BK-1) were sampled (**Figure 2-8**). Two new bedrock wells (B-203B and B-206A) were installed to replace existing wells that could not be located (**Figure 2-8**). A groundwater sample (MY05GW03, MY05GW05 through MY05GW09, and MY05GW29) from each of these wells was analyzed for TAL metals, TCL, SIM vinyl chloride, and nitrates.

To further support groundwater characterization in this portion of the facility, a soil boring in the PAB alleyway between the Service Building and Containment Building (MY05SB12) was completed as a monitoring well (MW-312) in the shallow bedrock. Groundwater from this monitoring well was sampled (MY05GW14) and analyzed for TCL, TAL metals, SIM vinyl chloride, and EPH.

Based on detections in groundwater collected in Phase 1A, a second round of groundwater samples were collected from the RA wells, which included MW-312, B-202, B-203B, B-205, B-206A, BK-1, and CS-1. The groundwater samples collected from these locations (identified with the suffix "-1B" added to the original sample identifiers outlined above) were analyzed for TAL metals, TCL, SIM vinyl chloride, DRO, anion/cation, and nitrates.

Groundwater was also collected from the PAB "test pit" (MY05GW100) during the second round of sampling for the same analyses (**Figure 2-8**). This "test pit" consists of a sump excavated into bedrock and open to groundwater flow. Based on detection of elevated anions/cations in the PAB "test pit," a second round of sampling and testing was conducted in February 2003.

Three bedrock monitoring wells, MW-401A (deep), MW-401B (shallow) and MW-402, were installed in the RA area as part of the License Termination Plan (LTP) hydrogeology assessment (**Figure 2-8**). Groundwater was collected from these three wells (MY05GW101 through MY05GW103) for analysis of TAL metals, TCL, SIM vinyl chloride, DRO, anion/cation, and nitrates. Based on detections in the initial round of sampling, the four wells were sampled a second time (MY05GW101-1C through MY05GW103-1C) for analysis of TAL metals and DRO.

Monitoring Well Data

As shown on **Table 4-10**, the test data for the monitoring wells in the RA indicate elevated concentrations of several metals. In many instances, the concentrations were more than twice those observed for reference groundwater (refer to **Table 4-3)**. These include: arsenic (MW-312), boron (all wells except B-202 and MW-401B), iron (MW-401A), manganese (MW-401A, MW-402), molybdenum (MW401B, MW-312, B-206A), nickel (MW-401B), potassium (B-202, B-205, BK-1, MW-401B, MW-312), sodium (all wells except BK-1, MW-401A, MW-401B), vanadium (MW-401B) and zinc (B-205, MW-402). Concentrations of five metals exceeded PALs: aluminum (MW-401B, MW-402, MW-312), arsenic (MW-312), manganese (MW-401A, MW-402), molybdenum (MW-401B), and sodium (all wells).

Repeat sampling events indicated generally consistent findings for the metals detected. Notable differences between events are detailed below.

- Iron in MW-401A increased from 1,240 to 10,600 ug/l between sampling rounds in June and September of 2002.

- Sodium in MW-402 decreased from 90,900 ug/l in June 2002 to 13,000 ug/l in September 2002. Boron decreased from 161 ug/l to non-detect over the same period.
- Molybdenum in MW-312 decreased from 10.8 ug/l in December 2001 to non-detect in June 2002. Aluminum decreased from 1,980 to 830 ug/l over the same period.
- Molybdenum in B-206A increased from non-detect in December 2001 to 16.7 ug/l in June 2002.
- Arsenic in MW-401B increased from 7.1 J ug/l in June 2002 to 10.6 J ug/l in September 2002.

Concentrations of DRO were detected above the PAL of 50 ug/l in each well tested (testing included all wells except B-206). The DRO concentrations ranged from 67.4 ug/l (MW-401A) to 2,410 ug/l (MW-401B). Notable differences between sampling events include MW-401A where DRO decreased from 67.4 ug/l in June 2002 to non-detect in September 2002 and MW-402 where DRO decreased from 107 ug/l to non-detect over the same period.

Pesticide testing identified one compound, dieldrin, in MW-312 at a maximum concentration of 0.0959 ug/l. The PAL for dieldrin is 0.02 ug/l.

Two SVOCs were detected in one monitoring well, MW-401B. 4-methylphenol was detected at a concentration of 16.5 ug/l (the PAL is 3.5 ug/l) and phenol was detected at a concentration of 265 ug/l (the PAL is 4,000 ug/l).

Generally low concentrations of VOCs relative to reference locations and PALs were detected in the monitoring wells. The compounds include acetone in B-203B (2.6 ug/l) and B-205 (23 ug/l), chloroform in B-206 (1 ug/l) and B-206A (0.66 ug/l), 2-butanone in MW-401B (15 ug/l), methylene chloride in MW-312 (1 ug/l) and vinyl chloride in B-206A (0.134 ug/l). None of the concentrations detected exceeded the PALs. With the exception of vinyl chloride, these compounds are most likely laboratory contaminants.

No PCBs were detected in the monitoring wells. PCB testing was conducted for each well in the RA. Nitrates were detected within several wells, which is evaluated in **Appendix G**.

The anion/cation testing indicates mixing of groundwater in this area with seawater, and the data are consistent with the elevated metals concentrations detected (*e.g.,* boron and sodium). The chemistry also supports influence on groundwater in the RA from Forebay and storm water system leakage during backing up of seawater during extreme high tide events. A detailed analysis of groundwater geochemistry in the RA is included in **Appendix G**.

Other elevated metals concentrations, relative to reference locations, appear to be related to past industrial activity at the site. For example, molybdenum in MW-401B appears to be linked to molybdenum-containing lubricants. The release of lubricants is suggested by relatively high DRO in groundwater in this area. Molybdenum was also detected above reference concentrations in bedrock monitoring wells MW-312 and MW-206A. DRO was also moderately elevated in these wells. No specific source of nickel, vanadium or zinc has been identified. Each of these compounds was detected at concentrations notably greater than reference groundwater concentrations in select wells in the RA (*e.g.*, B-205 and MW-401B).

DRO in MW-312 appears to be related to the weathered petroleum product that was discovered during decommissioning in the PAB alleyway possibly originating during plant construction. Soils impacted by DRO were excavated from the PAB alleyway during a clean-up effort in fall 2002 (JWC, 2003). In addition to the PAB alleyway source of petroleum hydrocarbons, DRO in other wells in the RA is likely related to past leaks or spills of lubricants associated with plant construction or operations.

The presence of dieldrin in MW-312 can be linked to the overlying fill which was found to contain the same compound (refer to soil boring MY05SB12). As discussed below, the SVOCs identified in MW-401B were also detected in the containment foundation drain. MW-401B is located about 120 feet west of the containment foundation drain.

Containment Foundation Drain and PAB Test Pit

The containment foundation drain and PAB test pit were found to contain metals at concentrations substantially higher than those detected in reference groundwater (**Table 4-3**). Most notable were calcium in the PAB test pit (182,000J ug/l); chromium in the containment foundation drain (22.2 ug/l) and PAB test pit (73.8J ug/l); molybdenum in the containment foundation drain (52.1 ug/l) and PAB test pit (119J ug/l); and sodium in the containment foundation drain (135,000 ug/l and 119,000 ug/l) and PAB test pit (254,000J ug/l). Of these compounds, chromium, molybdenum and sodium were detected above the PALs. Other metals detected above PAL were arsenic (17.1 ug/l) and mercury (10.9J ug/l). The PALs for these two metals are 10 ug/l and 2 ug/l, respectively.

As a result of the elevated inorganic detections discovered in the initial round of sampling, a second round of testing (collecting both filtered and unfiltered water samples) was performed in the PAB test pit. During the second round of testing from the PAB test pit in February 2003, concentrations of metals and anions/cations were substantially lower in both filtered and unfiltered samples (see **Appendix G**). For example, calcium decreased from 182,000J ug/l in June 2002 to 9,900 ug/l in February 2003 (unfiltered). Likewise, molybdenum decreased from 119J ug/l to 15 ug/l over the same period. The results of both testing rounds are shown on **Table 4-10**.

DRO was detected in both the containment foundation drain (861J ug/l) and PAB test pit (5,810J ug/l) at concentrations well above the PAL of 50 ug/l. Two SVOCs were detected in the PAB test pit: 2-methylphenol (9.74 ug/l) and phenol (25.7 ug/l). Both concentrations are well below the respective PALs. Benzene at 3.7 ug/l and chloroform at 1.3 ug/l were also detected in the PAB test pit. These concentrations were below the PALs.

Dieldrin was detected in the containment foundation drain and the PAB test pit at concentrations of 0.0972J ug/l and 0.057 ug/l, respectively. The PAL is 0.02 ug/l. No PCBs were detected.

The PAB test pit discharges to the containment foundation drain, resulting in relatively similar water chemistry; water from the foundation drain is periodically pumped to an overboard discharge southeast of the plant. The PAB test pit also received incidental drainage from within the PAB, being open to the PAB interior. Plant operations using metals (*e.g.*, sodium chromate as a corrosion inhibitor in piping systems and metals-based paint) likely resulted in the elevated concentrations of metals detected (*e.g*., chromium and molybdenum). Elevated anions/cations are indicative of cement leaching in the PAB area (refer to **Appendix G**). The elevated DRO concentrations likely resulted from the area of weathered petroleum-contaminated soil removed from the nearby PAB Alleyway (JWC, 2003).

The elevated concentrations observed in June 2002 appear to have been a temporary impact from decommissioning activities given the improved water quality observed in February 2003. Given that the samples collected in June 2002 were unfiltered, it is possible that some of the compounds detected may have been elevated, in part, due to high suspended solids content.

4.4.2 Industrial Area

The Industrial Area encompasses the area within the industrial fence, which includes the Service Building, Turbine Hall, Wart Building, Circulating Water Pump House and the Sewage Treatment Plant (**Figure 2-7**). The field sampling for this portion of the site included collection of soil, concrete and groundwater samples. A soil investigation was also performed around a spare transformer stored within this area, east of the Turbine Hall (**Figure 2-7**). The sampling conducted in the Industrial Area also included AOC-2, floor drains in the water treatment area and SWMU-2, Lube Oil Storage Area.

4.4.2.1 Soil

Turbine Hall Area

Soil was investigated in the Turbine Hall area using soil borings, surface samples and sub-slab soil samples collected from areas of known or suspected contamination (**Figure 2-7)**. Chemical test results are provided in **Table 4-11**.

<u>Transformer Oil Spill Area</u>

Four surface soil samples (MY05SS05 through MY05SS08) were collected along the north/south roadway east of the Turbine Hall (**Figure 2-7**). The samples were collected to assess the impact of a historic release of transformer oil in the roadway. These surface soil samples were analyzed for TAL metals, TCL, and EPH.

The TAL metals results indicated no compounds above the PALs. With the exception of molybdenum in surface soil sample MY05SS07, all of the metals detected fell within the range of concentrations exhibited by the reference soil samples (**Table 4-2**). Molybdenum was detected at a concentration of 2.4 mg/kg in MY05SS07, which is slightly above the maximum of 1.80 mg/kg for the reference soils.

Three PAHs were detected above the PALs in two of the surface soil samples. Benzo(a)pyrene and benzo(b)fluoranthene were detected in MY05SS06. Benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene were detected in MY05SS08. Concentrations of these compounds ranged from 540 to 890 ug/kg; the PALs for these compounds range from 62 to 620 ug/kg.

C-19 to C-36 aliphatics were detected in each of the surface soil samples. The concentrations (lab estimates) ranged from 13 to 74 mg/kg. The PAL is 100 mg/kg. VOCs, PCBs, and pesticides were not detected in the surface soil samples.

The soils analyses indicate that the past transformer oil spill did not result in PCB contamination of surface soils at the locations sampled. This finding is consistent with reports by Maine Yankee that the transformer oil did not contain PCBs (MY, 1999). The relatively low concentrations of PAHs and EPH identified may be remnants of the spilled oil.

Industrial Yard, South of Turbine Hall

Soils were tested from three borings in the industrial yard south of the turbine hall to evaluate potential impacts from routine site operations and a past oil spill onto the roof and ground at the south end of the turbine hall (refer to **Figure 2-1**, Known or Suspected Contamination Sources). The borings are designated MY05SB01, MY05SB02 and MY05SB03 on **Figure 2-7**.

Continuous split-spoon soil samples were collected during advancement of borings MY05SB01 and MY05SB02, later completed as monitoring wells MW-306 and MW-307, respectively (**Figure 2-7**). Both the surface (0 to 6 inches) and the groundwater interface (or soil/bedrock interface if the water table occurred within the bedrock) samples were analyzed for TAL metals and TCL. The groundwater or soil/bedrock interface sample was also tested for EPH. The segment screened with a PID and found to have the highest reading in each boring was analyzed for VOCs and EPH. If there were no PID readings above background or no evidence of staining in a boring, then a sample was taken from the bottom of the interval that appeared to have the highest permeability based on visual inspection in the field.

If there was no evidence of an interval having a high permeability, a soil sample was composited between the bottom of the surface sample and the top of the groundwater or bedrock interface sample. In these cases, a discrete sample for VOC analysis was collected from the depth interval halfway between the surface sample and the groundwater or bedrock interface.

In addition to the above borings completed as monitoring wells, a soil boring (MY05SB03) was completed in the roadway south of the Turbine Hall between the two wells. Split-spoon samples were collected from the groundwater or soil/bedrock interface and analyzed for EPH.

Chemical testing of soils from MY05SB01 and MY05SB02 indicated that concentrations of the TAL metals detected were generally consistent with those in reference soils (refer to **Table 4-11**). However, iron exceeded the PAL of 23,000 mg/kg in MY05SB75 (0-0.5) (72,400 J mg/kg; duplicate of MY05SB01(0-0.5) and MY05SB02 (4.5-6.5) (39,000 mg/kg). Zinc was detected in surface soil from MY05SB01 (249 mg/kg) at levels below the PAL, but significantly higher than in reference soils. Maximum concentrations in the reference soils were 44,900 mg/kg for iron and 94 mg/kg for zinc (**Table 4-2**).

PCBs (Aroclor-1254 and Aroclor-1260) were detected in the surface soil sample from MY05SB01 and the duplicate (MY05SB75). Concentrations of PCBs ranged from 35 to 180 ug/kg and were below the PALs.

PAHs were detected in the surface soil sample from MY05SB01 at concentrations above PALs. PAHs detected above the PALs included benzo(a)anthracene (6,900 ug/kg), benzo(a)pyrene (5,900 ug/kg), benzo(b)fluoranthene (7,800 ug/kg) and indeno(1,2,3-cd)pyrene (2,900 ug/kg). The PALs for these compounds range from 62 to 620 ug/kg.

Two VOCs, acetone and methylene chloride, were detected in soils from borings MY05SB01 and MY05SB02. The concentrations are well below the PALs. These compounds are common laboratory contaminants, and are likely the result of cross contamination during laboratory testing. C11-C22 aromatics were detected in MY05SB02 (0.5 to 4.5-foot depth) at a concentration of 24 mg/kg, below the PAL of 100 mg/kg.

Based on the elevated PAH concentrations, the test results indicate impact to surface soils at MY05SB01 from an oil-bearing material containing low concentrations of PCBs. MY05SB01 is located about 75 feet southeast of a past oil leak at the south end of the turbine hall (refer to **Figure 2-1**).

<u>Industrial Area, North of Service Building</u>

Soils were sampled continuously during installation of the collocated monitoring well MW-308, located north of the Service Building (**Figure 2-7**). The surface and groundwater interface soils from the soil boring (MY05SB15) were collected and analyzed for TAL metals and TCL, as well as EPH for the groundwater or soil/bedrock interface sample. Only two samples were collected prior to bedrock refusal, thus a third sample was not submitted based on PID screening. PID readings for the two samples were non-detect (**Table 4-1**).

As shown on **Table 4-11**, TAL metals were detected at concentrations below PALs, and within the range observed for reference soil concentrations (**Table 4-2**). The chemical testing identified no VOCs, EPH, or PCBs above laboratory detection limits.

Four SVOCs were identified at concentrations above the PALs in the surface soil sample from MY05SB15: benzo(a)anthracene (6,800 ug/kg), benzo(a)pyrene (6,300 ug/kg), benzo(b)fluoranthene (7,700 ug/kg), dibenzo(A,H)anthracene (840 ug/kg), and indeno(1,2,3-cd)pyrene (4,600 ug/kg). Benzo(a)pyrene at a concentration of 510 ug/kg was detected above the PAL in the 2 to 3.3-foot sample from MY05SB15. These results indicate the presence of residual oil in the fill brought on site, or impacts from an incidental release of oil during plant construction or operations.

One pesticide, 4,4'-DDT, was detected at a concentration of 7.2J ug/kg in the surface soil sample. The PAL for this compound is 1,700 ug/kg. The site assessment did not report historical on-site use of 4,4'-DDT, thus the compound was likely a constituent of the fill placed on-site during plant construction (S&W, 1999c).

<u>South Side Drainage Ditch and Solid Waste Storage Area</u>

A drainage ditch running along the south side of the Turbine Hall area was sampled just beneath the crushed stone bottom (MY05SS11) and analyzed for TCL, TAL metals and EPH (**Figure 2-7**). A soil boring (MY05SB16) was continuously sampled on the north, down-gradient side of the concrete barrier bounding the solid waste storage area (**Figure 2-7**). The surface and groundwater or soil/bedrock interface soils from this soil boring were tested for TAL metals and TCL. The interface sample was also analyzed for EPH. The sample collected between the surface sample and groundwater or bedrock interface sample in MY05SB16 was analyzed for VOCs and EPH. Three soil samples were collected from MY05SB16 before refusal was encountered.

TAL metals were detected in the surface soil (MY05SS11) and boring (MY05SB16) samples at concentrations generally consistent with the reference soils (**Table 4-11**). Iron, at a concentration of 28,200 mg/kg, was higher than the PAL of 23,000 mg/kg in MY05SB16, but lower than the reference soil maximum of 44,900 mg/kg.

C11-C22 aromatics were detected at a concentration of 30J mg/kg in MY05SS11. C9-C18 aliphatics were detected in MY05SB16 at concentrations ranging from 6.9 to 7.3 mg/kg. In each case, the concentrations of petroleum compounds were below the PAL of 100 mg/kg.

One SVOC, bis(2-ethylhexyl)phthalate, was detected at a concentration of 1,200J ug/kg; the PAL is 35,000 ug/kg. No VOCs, PCBs, or pesticides were detected in the samples tested.

Water Treatment Area

Eight soil samples (MY05SS37 through MY05SS44) were collected beneath the sumps and drainage system of the former Water Treatment Area (**Figure 2-7**). The soil samples were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

TAL metals were not detected at concentrations above the PALs **(Table 4-11**). The concentrations were generally consistent with reference soil concentrations with the exception of calcium at 15,400 mg/kg in MY05SS37 and 6,260 mg/kg in MY05SS43. The maximum concentration in the reference soils was 3,020 mg/kg. The calcium in the sub-slab soils may be the result of localized leaching from the concrete slab.

As shown in **Table 4-11**, SVOCs were detected above the PALs in each of the sub-slab samples. The compounds included the PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene at concentrations ranging from 220 to 9,600 ug/kg. The PALs for these compounds range from 62 to 620 ug/kg.

PCBs (Aroclor-1254) were detected below the PAL of 220 ug/kg in MY05SS37 (140 ug/kg), MY05SS39 (45 ug/kg), and MY05SS40 (35 ug/kg). Aromatic and aliphatic hydrocarbons were detected below the PAL of 100 mg/kg in sub-slab soils from MY05SS37, MY05SS39, MY05SS40, and MY05SS42. C11-C22 aromatics were detected above the PAL in MY05SS38 at a concentration of 160 mg/kg. No VOCs were detected in the samples.

The sub-slab soil sample data indicates the presence of residual hydrocarbons, such as lubricating oil, likely associated with incidental discharges to the sumps and drainage system, in the former water treatment area. The low concentrations of PCBs detected may have resulted from PCB-containing oil handled in this area, and/or from paint containing these compounds.

Auxiliary Boiler Room

Three soil samples (MY05SS24, MY05SS79, and MY05SS80) were collected beneath the concrete slab on the east side of the former Auxiliary Boiler Room in the northern, central, and southern area of a trench in the floor (**Figure 2-7**). The soil samples were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

The laboratory testing data are summarized in **Table 4-11** and indicate conditions similar to the former Water Treatment Area. No TAL metals were detected above the PALs. Concentrations of calcium and copper were substantially greater than reference soil concentrations in MY05SS24, MY05SS79 and MY05SS80 (and its duplicate, MY05SS95). Concentrations of calcium ranged from 6,080 to 9,100 mg/kg, and concentrations of copper ranged from 138 to 436 mg/kg in these samples. The reference soil maximum for calcium was 3,020 mg/kg, and the reference maximum for copper was 26.6 mg/kg (**Table 4-2**). Silver was also detected at a concentration of 4.6 mg/kg in MY05SS79, which is notably higher than the reference soil maximum of 0.83 mg/kg.

SVOCs were detected above the PALs in each of the sub-slab samples. The compounds included the PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene at concentrations ranging from 220 to 23,000 ug/kg. The PALs for these compounds range from 62 to 6,200 ug/kg.

PCBs (Aroclor-1254) were detected below the PAL of 220 ug/kg in MY05SS24 (78 ug/kg), MY05SS80 (77 ug/kg), and the duplicate of MY05SS80 (90 ug/kg). VOC testing identified m-,p-xylene at a concentration of 4J ug/l in MY05SS24; the PAL is 210,000. Acetone and/or methylene chloride were detected in each of the sub-slab samples, and appear to be the result of cross contamination in the testing laboratory.

EPH C11-C22 aromatics were detected at a concentration of 150J mg/kg in MY05SS80 (120 mg/kg in the duplicate). Low detections of EPH below the PAL of 100 mg/kg were identified in each of the remaining sub-slab samples from the former Auxiliary Boiler Room.

The sub-slab soil sample data indicates the presence of residual hydrocarbons, such as lubricating oil, likely associated with incidental discharges to the floor trench in the former Auxiliary Boiler Room. The low concentrations of PCBs detected may resulted from PCB-containing oil handled in this area, and/or from paint containing these compounds. No TAL metals were detected above the PALs, and no detection of mercury indicates that sub-soil was not impacted by the small mercury spill reported in this area.

Emergency Diesel Generator Room

Four soil samples (MY05SS25 through MY05SS28) were collected beneath the concrete slab of the former Emergency Diesel Generator Rooms (**Figure 2-7**). Samples MY05SS25 and MY05SS27 were located adjacent to floor drains, while MY05SS26 and MY05SS28 were located beneath former floor trenches. The soil samples were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

TAL metals were not detected above the PALs and were generally consistent with the concentrations detected in the reference soils (**Table 4-11**). One exception was calcium, which was detected at a concentration of 56,800 mg/kg in MY05SS25; the maximum concentration detected in the reference soils was 3,030 mg/kg.

One SVOC, benzo(a)pyrene, was detected above the PAL in sub-slab soil samples MY05SS26 (220J mg/kg) and MY05SS28 (490 ug/kg). The PAL for this compound is 62 mg/kg.

PCBs were detected in each of the sub-slab samples at concentrations below the PAL of 220 ug/kg. Aroclor 1242 and/or Aroclor 1254, were detected at concentrations ranging from 22 to 52 ug/kg.

A low concentration of one VOC, 2-butanone (11J ug/kg) was detected in MY05SS25; the concentration detected is several orders of magnitude below the PAL (7,300,000 ug/kg) and is likely the result of cross-contamination in the testing laboratory.

Aromatic and/or aliphatic petroleum hydrocarbons were detected in each of the sub-slab samples below the PAL of 100 mg/kg. The concentrations ranged from 8.4 to 76J mg/kg.

The test data indicate low concentrations of residual hydrocarbons, such as lubricating oil, beneath the former diesel generator room slab. This finding is based on detection of PAHs and EPH in the samples tested. Low concentrations of PCBs detected suggest that these compounds may have been contained in the oil products handled in this area, and/or in the paint used in the generator room.

Cold Side Machine Shop

Two soil samples (MY05SS48 and MY05SS49) were collected beneath the concrete slab of the former Cold Side Machine Shop (**Figure 2-7**). One of the samples, MY05SS48, was located adjacent to a sump. The soil samples were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

TAL metals were not detected above the PALs and are generally consistent with the concentrations detected in the reference soils (**Table 4-11**). Two PAHs, benzo(a)pyrene and dibenzo(a,h)anthracene were detected above the PALs in sample MY05SS49 and its duplicate (MY05SS100). The concentrations in these samples ranged from 350 to 460J ug/kg; the PAL is 62.

One PCB, Aroclor 1242, was detected in MY05SS48 at a concentration of 29 ug/kg. The PAL is 220 ug/kg. C19-C36 aliphatics were detected in each sub-slab sample at concentrations ranging from 24 to 41 mg/kg; the PAL is 100 mg/kg. VOCs were not detected in the samples tested.

The test data indicate low concentrations of residual hydrocarbons, such as lubricating oil, beneath the former machine shop slab. This finding is based on detection of PAHs and EPH in the samples tested.

Primary and Secondary Component Coolant Pump and Heat Exchanger

Two soil samples (MY05SS51 and MY05SS52) were collected beneath the concrete slab of the former Primary and Secondary Component Coolant (PCC/SCC) Pump and Heat Exchanger Area (**Figure 2-7**). MY05SS51 and MY05SS52 were located in the vicinity of several floor drains. The soil samples were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

TAL metals were not detected above the PALs and were generally consistent with the concentrations detected in the reference soils (**Table 4-11**). One exception was copper, detected at concentrations ranging from 137 to 177 mg/kg in the samples tested. The maximum concentration observed in the reference soil samples was 26.6 mg/kg; the PAL is 2,900 mg/kg.

VOC testing identified acetone and/or methylene chloride in the sub-slab samples at concentrations ranging from 5J to 31J ug/kg, which are well below the PALs. These VOC detections are believed to be a function of laboratory contamination. C19-C36 aliphatics were detected at a concentration of 13 mg/kg in MY05SS51; the PAL is 100 mg/kg. PCBs and SVOCs were not detected in the samples tested.

<u>Turbine Oil Reservoir and EHA Oil Pump</u>

Three soil samples (MY05SS34 through MY05SS36) were collected beneath the concrete slab of the former Turbine Oil Reservoir and EHC oil pump (**Figure 2-7**). Sample MY05SS34 was located beneath a former sump; MY05SS35 and MY05SS36 were located adjacent to a hydraulic fluid reservoir. The soil samples were analyzed for PCBs and EPH.

As shown in **Table 4-11**, PCBs (Arochlor-1254) were detected in MY05SS36 at a concentration of 240 ug/kg, above the PAL of 220 ug/kg. PCBs were detected below the PAL in MY05SS35 at concentrations ranging from 21 to 180 ug/kg.

C19-C36 aliphatics were detected in each sub-slab sample at concentrations above the PAL of 100 mg/kg. The concentrations for MY05SS34, MY05SS35 and MY05SS36 were 2,300, 400 and 180 mg/kg, respectively.

The results indicate impact to surface soils from oil storage and handling activities in the turbine oil reservoir area. The low concentrations of PCBs detected are most likely related to PCB-containing oils present in this area.

<u>Outlet Pits</u>

Four soil samples (MY05SS29 through MY05SS32) were collected beneath the concrete slab of each of the former outlet pits supporting the Feedwater Heaters and Pumps (**Figure 2-7)**. The soil samples were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

No TAL metals were detected above the PALs (**Table 4-11**). As seen in other sub-slab samples, calcium was detected substantially above the maximum reference soil concentration of 3,020 mg/kg in MY05SS31 (56,600 mg/kg) and MY05SS32 (8,340 mg/kg). Other metal concentrations were generally consistent with those detected in the reference soils.

Five PAHs were detected above PALs in each of the sub-slab samples: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-CD)pyrene. Concentrations detected ranged from 280J to 10,000 ug/kg (**Table 4-11**); the PALs range for these compounds range from 62 to 620 ug/kg.

PCBs (Aroclor-1254) were detected below the PAL of 220 ug/kg in each sample. Concentrations of PCBs detected ranged from 50 to 140 ug/kg.

With one exception, EPH was detected in each sub-slab sample at concentrations below the PAL of 100 mg/kg. In MY05SS97 (duplicate of MY05SS31), C19-C36 aliphatics were detected at a concentration of 280J mg/kg. These compounds were detected in MY05SS31 at a lower concentration of 37 mg/kg.

One VOC, acetone, was detected at a concentration of 8J ug/kg. This compound is likely a contaminant from the testing laboratory. The data indicate the presence of residual oil (based on identification of PAHs and EPH) in the sub-slab soils in the outlet pit area. The oil may have contained low concentrations of PCBs based on identification of Aroclor-1254 in the soils tested.

Vacuum Priming Sump

One soil sample was collected from beneath the center of the concrete slab of the former Vacuum Priming Sump (**Figure 2-7**). The soil sample (MY05SS53) was analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

Four PAHs, benzo(a)anthracene (2,600 ug/kg), benzo(a)pyrene (2,200 ug/kg), benzo(b)fluoranthene (2,900 ug/kg), and indeno(1,2,3-CD)pyrene (1,200 ug/kg) were detected in the sample. The concentrations detected are above the PALs which range from 62 to 620 ug/kg (refer to **Table 4-11**).

Methylene chloride (28J ug/kg) was the only VOC detected in the sample; this compound is likely a laboratory contaminant. No TAL metals, PCBs, or EPH were detected in MY05SS53.

The data indicate the presence of residual oil in soils beneath the vacuum priming sump (based on detection of PAHs). The impact to sub-slab soils is likely related to storage and handling of petroleum products, such as lubricating oil, in the sump area.

Lube Oil Storage Room

The Lube Oil Storage Room was located along the south end of the Turbine Hall (**Figure 2-7**). This room was investigated in accordance with a MDEP-approved closure plan, which included an investigation of soils beneath the slab following demolition and removal of the room (MY, 2002j). The five sub-slab soil samples (MYLOSS01 through MYLOSS05) collected as required by the plan, were analyzed for VOCs, SVOCs, PCBs, DRO, and Gasoline-Range Organics (GRO).

Low concentrations of 4-methyl-2-pentanone and acetone were the only VOCs detected. 4-Methyl-2-pentanone was detected at a concentration of 8J ug/kg in MYLOSS01, and acetone was detected in MYLOSS01 (18J ug/kg), MYLOSS06/duplicate of MYLOSS01 (9J ug/kg) and MYLOSS05 (62J ug/kg). In each case, the concentrations were several orders of magnitude below the PALs and are likely cross contaminants from the testing laboratory.

One or more SVOCs were detected in each of the sub-slab samples at concentrations generally below the PALs (refer to **Table 4-11**). Concentrations of benzo(a)pyrene exceeded the PAL of 62 ug/kg in samples MYLOSS01 (320J ug/kg), MYLOSS02 (360J ug/kg), and MYLOSS05 (260J ug/kg). Benzo(a)pyrene was not detected in the duplicate of MYLOSS01 (MYLOSS06).

One PCB (Aroclor-1254) was detected in MYLOSS05 at a concentration of 43 ug/kg. This concentration is below the PAL of 220 ug/kg.

Generally low concentrations of DRO were detected in each of the sub-slab samples. In two instances concentrations exceeded the PAL of 50 mg/kg: 64 mg/kg in MYLOSS02 and 110 mg/kg in MYLOSS05. GRO were not detected in the samples tested.

Chemistry Laboratory

Two soil samples were collected beneath the trench system of the former Chemistry Laboratory (**Figure 2-7**). The soil samples (MY05SS58 and MY05SS59) were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

Concentrations of TAL metals were generally consistent with the reference soils (**Table 4-11**). One exception was copper, which was detected at a concentration of 646 mg/kg in MY05SS58 and 757 mg/kg in the duplicate of MY05SS58 (MY05SS99). The reference soil maximum was 26.6 mg/kg.

Aroclor-1254 was detected in both sub-slab samples at concentrations below the PAL of 220 ug/kg; the range detected was 18.9 to 65 ug/kg. Testing identified no SVOCs, VOCs or EPH in the soil samples.

Hotside Machine Shop

Three soil samples (MY05SS55 through MY05SS57) will be collected beneath the concrete slab of the former Hotside Machine Shop following demolition of the structure. The soil samples will be analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

Planning Office

One soil sample will be collected beneath the concrete slab of the former Planning Office following demolition of the structure late 2003. The soil sample (MY05SS81) will be analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

Hydraulic Lift Pit

One soil sample was collected beneath the concrete slab at the center of the hydraulic lift pit in former Warehouse No. 1 (**Figure 2-7**). The soil sample (MY05SS54) was analyzed for PCBs and EPH.

EPH testing identified 120 mg/kg C19-C36 aliphatics. This concentration exceeds the EPH PAL of 100 mg/kg. No PCBs were detected in the sample.

The soils under the lift pit appear to contain relatively low concentrations of residual oil, likely from hydraulic lift operations.

Instrument and Controls Shop in the Wart Building

Following demolition activities in late 2003, one soil sample will be collected beneath the concrete slab corresponding to the stained area in the Instrument and Controls Shop in the Wart Building. The soil sample (MY05SS66) will be analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

Spare Transformer Pit

Sampling of a test pit (MY05TP105) was performed following removal of the interior gravel and concrete walls of the Spare Transformer pit (**Figure 2-7**). A composite side sample (MY05TP105, 3-3.5 feet) and a bottom sample (MY05TP105, 4-4.5 feet) were submitted for analysis of PCBs and EPH.

PCBs and EPH were not detected in the soils sampled.

4.4.2.2 Concrete

An interior sampling program included collection of concrete samples from the Circulating Water Pump House and the Sewage Treatment Building from areas of known or suspected contaminants.

Circulating Water Pump House

Two concrete samples (MY05CS01 and MY05CS02) were collected in the pump area of the former Circulating Water Pump House to determine if oils and lubricants migrated to the concrete (**Figure 2-7**). The concrete samples were analyzed for PCBs and EPH.

The testing identified C19-C36 aliphatics at concentrations of 140 mg/kg and 63 mg/kg in MY05CS01 and MY05CS02, respectively (**Table 4-23**). The PAL for EPH is 100 mg/kg. No PCBs were identified in the two concrete samples. The test results indicate residual hydrocarbons, likely lubricating oil, in the concrete.

Sewage Treatment Plant

One concrete sample was collected from the sump located in the south central area of the former Sewage Treatment Plant (**Figure 2-7**). The concrete sample (MY05CS21) was analyzed for PCBs and EPH.

As shown on **Table 4-23**, PCBs and EPH were not detected in the concrete sample.

4.4.2.3 Groundwater

Turbine Hall Area

Groundwater was investigated in the Turbine Hall area using an existing well and RCRA RFI wells located in areas of known or suspected contamination (**Figure 2-7**). Chemical test results, including sample collection dates, are shown on **Table 4-12**.

Two rounds of groundwater were collected from existing monitoring well B-201 (**Figure 2-7**). The initial groundwater sample (MY05GW04) was submitted for analysis of TAL metals, TCL, SIM vinyl chloride, anions/cations, nitrates, and DRO. A follow-up sample (MY05GW04-1C) was collected from B-201 for analysis of TAL metals and DRO.

Three new wells (MW-306, MW-307 and MW-318) were installed to complete the semicircular ring of wells generally east and south of the Turbine Hall (**Figure 2-7**). Groundwater from each of these wells was sampled (MY05GW01, MY05GW02, and MY05GW25) and analyzed for TCL, TAL metals, SIM vinyl chloride, nitrates, and DRO. MW-306 and MW-307 were also tested for anions/cations.

Follow-up (confirmatory) sampling of MW-306 (MY05GW01-1C and duplicate MY05GW153-1C) was completed for testing of VOCs, SIM vinyl chloride, TAL metals and DRO. Follow-up/confirmatory sampling of MW-307 (MY05GW02-1C and MY05GW25-1C) and MW-318 (MY05GW25-1C) was conducted for analysis of TAL metals and DRO.

A fourth monitoring well, MW-403, was installed within this area as part of the LTP hydrogeology assessment (**Figure 2-7**). Groundwater was collected from this well (MY05GW104) for analysis of TCL, TAL metals, SIM vinyl chloride, DRO, anions/cations, and nitrates. Based on detections in the initial round of sampling, this well was sampled a second time (MY05GW104-1C) for analysis of TAL metals and DRO.

Metals results for wells in the vicinity of the Turbine Hall indicate two compounds above PALs: sodium and manganese (**Table 4-12**). Sodium was detected in the wells at a range of 24,600 ug/l (MW-318) to 324,000 ug/l (B-201); the PAL is 20,000 ug/l. Manganese exceeded the PAL of 500 ug/l in all wells except MW-306 and MW-403. The range detected above the PAL was 509 (MW-318) to 3,340 ug/l (B-201).

Metals identified at concentrations notably above reference groundwater (**Table 4-3**) included the following:

- boron in MW-306 and B-201, at maximum concentrations of 70.5 and 156 ug/l, respectively (the reference groundwater maximum was 26.3 ug/l);
- calcium in MW-306, MW-307, B-201, and MW-403 at concentrations ranging from 48,800 to 106,000 ug/l (the reference maximum was 30,000 ug/l);
- molybdenum in MW-307 at a concentration of 12.7 ug/l (the reference maximum was 3.7 ug/l); and
- potassium in MW-307, B-201 and MW-403 at concentrations ranging from 13,500 to 20,400 ug/l (the reference maximum was 5,350 ug/l).

Metals results were relatively consistent between successive sampling rounds.

DRO were detected above the PAL of 50 ug/l in each well sampled (**Table 4-12**). The range detected was from a concentration of 149J ug/l in MW-306 to 930 ug/l in MW-318.

Significant variations in DRO concentrations between sampling rounds were detected in MW-306, B-201 and MW-318. In June 2002, DRO concentrations of 149 ug/l and 156 ug/l were detected in MW-306 and B-201, respectively. In October 2002, DRO in each well was non-detect. A DRO concentration of 440 ug/l was detected in MW-318 in June 2002; the concentration in October 2002 was 930 ug/l.

Nitrates were detected in some of the wells, which is discussed in **Appendix G**. No SVOCs, VOCs, PCBs or pesticides were detected in the samples from the Turbine Hall area. The anion/cation testing indicates mixing of groundwater in this area with seawater, and the data are consistent with the elevated metals concentrations detected (*e.g.*, sodium).

Several analysis of groundwater chemistry suggests influence in the Turbine Hall area from potential salt-water sources. Seawater intrusion at depth appears to have resulted in relatively high dissolved metals concentrations in B-201. Storm water system leakage during backing up of seawater during extreme high tide events appears to be the cause of high metals concentrations in MW-306 and MW-318, both located more than 200 feet from the shoreline east of the Turbine Hall. Other potential sources in each of the wells in the Turbine Hall area are the application of road salts and historical leakage from the buried circulating water lines. Additional details on the geochemistry of the Industrial Area are included in **Appendix G**.

The presence of DRO in groundwater in the Turbine Hall area could be linked to a number of petroleum sources. MW-307, for example, is located in the vicinity of former underground diesel fuel tanks (refer to **Figure 2-1**). Oil spills have also been documented in the Turbine Hall area, including spills to the ground east and south of the Turbine Hall building. Other potential sources of DRO include incidental discharges to drains and sumps in the Lube Oil Storage Room, and Water Treatment area (**Figure 2-1**).

North Transformer Area

Additional groundwater information from the area around the North Transformers was collected by sampling collocated monitoring well MW-308 north of the Service Building in the vicinity of former well B-204 (**Figure 2-7**). This well is situated in blasted rock fill. A groundwater sample (MY05GW10) was collected and tested for TAL metals, TCL, SIM vinyl chloride, EPH, and nitrate. A second groundwater sample (MY05GW10-1B) was collected from MW-308 during Phase 1B activities for analysis of TCL, TAL metals, SIM vinyl chloride, DRO, cations/anions, and nitrate.

Metals testing identified two compounds above PALs in MW-308: manganese and molybdenum. Manganese was detected at a maximum concentration of 1,140 ug/l; the PAL is 500 ug/l. Molybdenum was detected at a maximum concentration of 59.8 ug/l; the PAL is 35 ug/l.

Chloroform (2 ug/l), a likely laboratory contaminant, was the only VOC detected. Nitrate (maximum of 0.215 ug/l) was detected at concentrations consistent with reference groundwater. DRO was detected at a concentration of 75 ug/l, slightly above the PAL of 50 ug/l. No SVOCs, PCBs, pesticides or EPH were detected in the samples tested.

4.4.3 Main/North Transformers

As outlined in the QAPP, an investigation of soil/concrete will be performed in and around the transformer areas: the Main Transformers east of the Turbine Hall and the North Transformers located north of the RA area (**Figure 2-7**). The investigation of the North Transformers will be conducted in the fall of 2004. The Main Transformer confirmatory sampling was completed in spring 2004 and the results will be presented in the CMS.

4.4.4 Ferrous Sulfate Tank

One soil sample (MY05SS04) was collected for iron testing from the bottom of the excavation following removal of the Ferrous Sulfate Tank for iron analysis (**Figure 2-7**). A soil boring (MY05SB14) was collocated with monitoring well MW-317 installed off the southeast corner of the Information Center for comparative evaluation of iron (**Figure 2-7**).

Surface sample MY05SS04 and MY05SB14(12-14) were submitted to the laboratory for iron testing. Iron was detected at 11,400 mg/kg and 9750 mg/kg, respectively, well below the PAL of 23,000 mg/kg.

Groundwater test results for MW-317 are discussed in section 4.4.9 of this report.

4.4.5 Forebay Area

An investigation of the Forebay area (AOC 4) was performed prior to remedial activities, which included collection of soil and sediment samples from within the Forebay and seep water samples from the western (Bailey Cove side) berm outside of the Forebay (**Figure 2-7**).

4.4.5.1 Soil

To evaluate potential migration of contaminants into the Forebay berm, six hand auger soil samples were taken from soils below the rip-rap on the inside of both berms up to a depth of one foot (**Figure 2-7**). Three samples were collected from the east berm (MY05HA01 through MY05HA03) and three samples were collected from the west berm (MY05HA04 through MY05HA06). Each soil sample was analyzed for TAL metals, TCL, and EPH (**Table 4-13**). Maine Yankee provided the RCRA confirmatory sampling approach to MDEP (MY, 2002p).

The TAL metals results were generally consistent with concentrations exhibited by the reference soils (**Table 4-2**). With the exception of iron (PAL 23,000 mg/kg) exceedences in soil samples collected at MY05HA01, MY05HA03, and MY05HA10 (duplicate of MY05HA06) of 24,600, 24,200, and 28,600 mg/kg, respectively, no other PAL was exceeded in the hand auger samples. Additional analytes tested for in these soils included PCBs, pesticides, VOCs, SVOCs, and EPH. Results for these analytes were non-detect or well below the PALs.

4.4.5.2 Sediment

Two sediment samples (MY05SD01 and MY05SD03) were collected from within the Forebay from the north and south side of the weir (**Figure 2-7**). Additionally, six sediment samples were taken from sediments located outside (the east and west sides) of the Forebay berm. Three samples were collected on the west side (MY05SD09 through MY05SD11), and three samples were collected from the east side (MY05SD12 through MY05SD14) of the Forebay structure. All sediment samples were tested for TAL metals, TCL, SIM PAH, and EPH.

MY05SD01 was collected immediately adjacent to and north of the weir from the "seal pit." Sediments tested for TAL metals that exceeded their PALs included copper (209J mg/kg), mercury (0.28J mg/kg), nickel (25.5 mg/kg), and zinc (213 mg/kg) (**Table 4-22A**). PCB test results did not exceed their PALs although Aroclor-1254 was near the PAL with a result of 22.5 ug/kg (PAL value equals 22.7 ug/kg). Pesticides were non-detect in the sediment sample.

PAH PAL exceedences included: benzo(a)anthracene (500 ug/kg), chrysene (450J ug/kg), fluoranthene (1100J ug/kg), phenanthrene (340J ug/kg), and pyrene (840J ug/kg). When detected, VOCs and EPH were below their PALs.

MY05SD32 was collected as a duplicate of MY05SD01. TAL metals exceeded their PALs for arsenic (8.3J mg/kg), copper (88.1J mg/kg), mercury (1.6J mg/kg), nickel (23.5 mg/kg), and zinc (230 mg/kg). Aroclor-1254 test results exceed the PAL with a result of 32.6 ug/kg. Pesticides were non-detect in the sediment sample. PAH PAL exceedences included: acenaphthene (23J ug/kg), benzo(a)anthracene (350 ug/kg), chrysene (470J ug/kg), fluoranthene (1000J ug/kg), fluorene (50J ug/kg), phenanthrene (400J ug/kg), and pyrene (800J ug/kg). VOCs and EPH were non-detect.

MY05SD03 was collected immediately adjacent to and south of the weir. Sediments tested for TAL metals that exceeded their PALs included: arsenic (14.4J mg/kg), copper (61.1J mg/kg), lead (47 mg/kg), mercury (0.21J mg/kg), nickel (43.5 mg/kg), and zinc (300 mg/kg). PCB test results exceeded their PALs for Aroclor-1260 (40.6J ug/kg). Pesticides 4,4'-DDE (6.9J ug/kg) and 4,4'-DDT (7.28J ug/kg) were detected in the sediment sample. With the exception of fluorene (23J ug/kg) all PAHs were below their respective PALs. VOCs were below their PALs while EPH were reported as non-detect.

Sediment sample MY05SD09 was collected from the outside of the western Forebay berm (Bailey Cove side). With the exception of arsenic (10.6 mg/kg), mercury (0.26 mg/kg), and (nickel 28.3 mg/kg), TAL metals were below the PALs. PCBs and pesticides were not detected in the sediment while SVOCs, VOCs, and EPH were below their respective PALs, when available.

Sediment sample MY05SD10 was collected from the outside of the western Forebay berm (Bailey Cove side). With the exception of arsenic (11.5 mg/kg), mercury (0.23 mg/kg), and nickel (29.2 mg/kg), TAL metals were below the PALs. PCBs were not detected in the sediment while pesticides, SVOCs, VOCs, and EPH were below their respective PALs, when available.

Sediment sample MY05SD11 was collected from the outside of the western Forebay berm (Bailey Cove side). With the exception of arsenic (11.7 mg/kg), mercury (0.23 mg/kg), and (nickel 29.7 mg/kg), TAL metals were below the PALs. PCBs and pesticides were not detected in the sediment while SVOCs, VOCs, and EPH were below their respective PALs.

Sediment sample MY05SD31 (duplicate of MY05SD11) was collected from the outside of the western Forebay berm (Bailey Cove side). With the exception of arsenic (10.8 mg/kg), mercury (0.22 mg/kg), and (nickel 27.4 mg/kg), TAL metals were below the PALs. PCBs and pesticides were not detected in the sediment while SVOCs, VOCs, and EPH were below their respective PALs.

Sediment sample MY05SD12 was collected from the outside of the eastern Forebay berm (Back River side). With the exception of arsenic (10.3 mg/kg), and mercury (0.15 mg/kg), TAL metals were below the PALs. PCBs and pesticides were not detected in the sediment while SVOCs, VOCs, and EPH were below their respective PALs.

Sediment sample MY05SD13 was collected from the outside of the eastern Forebay berm (Back River side). With the exception of arsenic (11.2 mg/kg), mercury (0.22 mg/kg), and (nickel 29 mg/kg), TAL metals were below the PALs. PCBs and pesticides were not detected in the sediment while SVOCs, VOCs, and EPH were below their respective PALs.

Sediment sample MY05SD14 was collected from the outside of the eastern Forebay berm (Back River side). With the exception of arsenic (18.8 mg/kg), copper (35 mg/kg), mercury (0.23 mg/kg), and (nickel 29.8 mg/kg), TAL metals were below the PALs. PCBs and pesticides were not detected in the sediment while SVOCs, VOCs, and EPH were below their respective PALs.

Sediment samples collected from inside the Forebay berm typically exhibited TAL metal exceedences for arsenic, copper, mercury, nickel, and zinc. PCBs exceeded the PAL in the MY05SD32 and MY05SD03 samples. Pesticides exceeded the PAL in MY05SD03. Several PAHs exceeded their PALs in the sediment collected inside the Forebay berm. VOCs and EPH were below their PALs and non-detect for each sample.

Sediment samples collected from outside the Forebay berm exhibited TAL metal exceedences for arsenic, mercury, and nickel. PCBs were non-detect and pesticides, when detected (one sample), were below the PALs. SVOCs, VOCs and EPH were below their respective PALs. The sediment samples from outside the berm were generally consistent with the sediments at he nearby Outfall 005/006 area.

4.4.5.3 Surface Water (Seep)

One seep location along the western berm of the Forebay was sampled (**Figure 2-7**). To characterize the water flowing in the seep, a surface water sample (MY05SW04) was collected and analyzed for TCL, TAL metals, SIM vinyl chloride, and EPH.

Aluminum (149 ug/l) and lead (10.8 ug/l) exceeded their PALs in the MY05SW04 seep sample (**Table 4-24**). The rest of the metals were either below the PAL or were reported as non-detect. Acetone was reported at 3R ug/l (rejected value) and EPH at 60 ug/l. SVOCs, PCBs, pesticides, and vinyl chloride were not detected in the seep water sample.

4.4.6 Warehouse 2/3 Area

The Warehouse 2/3 area is on the southwest side of Bailey Point (refer to **Figure 2-8**). Investigations in this area included sampling and testing of soils below the warehouse slab and around the exterior, as well as a groundwater investigation to evaluate potential impacts from past operations. Results of chemical testing are summarized on **Tables 4-14A & B and 4-15**.

4.4.6.1 Soil

Investigations

Six soil borings (MY05SB36 through MY05SB41) were installed to a depth of 20 feet or to the soil/groundwater or soil/bedrock interface in the area in front (east) of the warehouse where drums and other materials were handled (**Figure 2-8**). Refusal was encountered at approximately three feet below grade at soil boring locations MY05SB38, MY05SB40 and MY05SB41, and therefore a sample at the soil/bedrock interface was collected for TAL metals, TCL, and EPH analysis. At the remaining locations investigation included: (a) testing for EPH and VOCs for samples from either the mid-point between the surface sample and the bedrock/groundwater interface sample, or from zones marked by a change in apparent soil permeability; and (b) testing for TAL metals, and TCL for samples from the groundwater or bedrock interface. Soil boring MY05SB37 was completed as a monitoring well (MW-311).

To determine if any residual heavy metals or other contaminants were present from the temporary storage of blasting grit behind the warehouse, three test pits (MY05TP01 through MY05TP03) were excavated (**Figure 2-8**). Soil samples were taken from both the surface and groundwater or soil/bedrock interface (i.e., base of test pit) and were analyzed for TAL metals and TCL. The interface samples were also analyzed for EPH. A composite sidewall sample from soils between the surface and interface were taken based on visual indications for the presence of blasting grit and analyzed for TAL metals and TCL (semivolatile compounds only).

Based on identified data gaps, the program in the Warehouse 2/3 area was expanded in the first QAPP Change Order to include an additional nine investigative test pits behind the warehouse in the vicinity of MY05TP01 (**Figure 2-8**). Geologic and headspace information was recorded at each test pit (**Table 4-1**), and based on the PID headspace screening results; six samples (MY05TP10, MY05TP12, MY05TP13, MY05TP15, MY05TP16, and MY05TP19) were submitted for analysis of VOCs, SVOCs and EPH.

The sampling program at the Warehouse 2/3 area was again expanded in QAPP Change Order No. 2 based on detection of PAHs in the vicinity of MY05TP02. Three additional surface soil samples were collected (MY05SS101 through MY05SS103) for analysis of SVOCs (**Figure 2-8**).

QAPP Change Order No. 2 also included additional soils and groundwater investigations to follow-up on VOC detections in the Phase 1A groundwater samples collected on the east side of the warehouse, the former alleyway between Warehouse 2 and Warehouse 3, and VOCs identified in test pits completed west of the warehouse. Collocated monitoring wells (MW-404 through MW-409) were installed in six locations around the warehouse complex (**Figure 2-8**). Three of the monitoring well locations (MW-406A/B, MW-

407A/B and MW-409A/B) were completed as a pair of wells; one installed at the top of the soft clay-silt zone (designated by a "B") and one installed below the soft clay-silt zone to a maximum depth of 25 feet into rock (designated by an "A"). Six soil borings were installed during well installation (MY05SB101 through MY05SB106) and sampled at two depths, the highest PID-screened interval and the soil/groundwater or soil/bedrock interface, for analysis of VOCs and SVOCs.

The soil investigation around the warehouse area was further expanded as described in QAPP Change Order No. 4 to include a soil boring and a Geoprobe investigation (**Figure 2-8**). A soil boring (MY05SB110) was installed on the south side of the warehouse to assess the depth to bedrock. Fourteen (14) soil Geoprobes (MY05GP101 through MY05GP114) were installed on the east side of the warehouse based on detection of TCA in previous soil borings. These Geoprobe soil samples were submitted for analysis of VOCs.

Four soil samples (MY05SS71 through MY05SS74) were collected beneath the concrete slab of the warehouse (**Figure 2-8**). The samples were analyzed for TAL metals, VOCs, SVOCs, PCBs, and EPH.

<u>Results</u>

Drum Storage Area, East of Warehouse 2/3

Metals testing during the initial phase of soil borings in this area indicated concentrations generally consistent with reference soils (**Table 4-2**). Iron, in boring MY05SB36 (6.5-8.5 feet), was the only metal detected above the PAL of 23,000 mg/kg. The concentration detected was 39,100 mg/kg.

Relatively low concentrations of acetone, and/or 1,1,1-trichloroethane were identified in borings MY05SB37, MY05SB38, MY05SB40 and MY05SB41 at depths between 2 and 8 feet below ground surface. Acetone and 2-butanone were detected in one of the fourteen Geoprobes, MY05GP102 (0-2 feet). The results of the Geoprobe soil sampling program on the east side of Warehouse 2/3 is summarized in **Table 4-14B**. No chlorinated VOCs (i.e., 1,1,1-trichloroethane or daughter products) were detected in any of the geoprobes samples. Acetone and 2-butanone, ranging from 6 to 630 ug/kg, were several orders of magnitude below their respective PALs and are believed to be a function of laboratory contamination.

Two PCBs, Arochlor-1254 (52 ug/kg) and Arochlor-1260 (31J ug/kg) were detected in MY05SB38 (2-2.9 feet). The concentrations were below the PAL of 220 ug/kg. EPH testing identified C19-C36 aliphatics at a concentration of 13 mg/kg in the same sample. C19-C36 aliphatics were also detected in MY05SB41 (2-2.4 feet) at a concentration of 7.1 mg/kg. The PAL for EPH is 100 mg/kg.

One SVOC, di-n-butylphthalate (510 ug/kg) was detected in MY05SB105 (0-2.0 feet). A PAL has not been established for this compound. No pesticides were detected in the samples tested.

The results indicate relatively localized releases of petroleum hydrocarbons, which may have contained low concentrations of PCBs in one of two locations where EPH were detected. The VOC data do not indicate a significant impact to the soils tested.

Storage Area, West of Warehouse 2/3

Multiple phases of exploration west of Warehouse 2/3 confirmed impact to soils in four areas. These include an area used for temporary storage of blasting grit, an area of apparent waste paint and thinner release, and two areas where petroleum hydrocarbons, such as used oil, were apparently released.

Test pits completed in a former blasting grit storage area identified concentrations of iron above the PAL of 23,000 mg/kg in two of the test pits, MY05TP01 and MY05TP03 (refer to **Table 4-14A and Figure 2-8**). Iron concentrations above the PAL ranged from 29,100 to 41,800 mg/kg. Iron was not detected above the PAL in discrete samples collected at depths greater than 7 feet below ground surface. Concentrations of other metals in the test pits were consistent with those observed in the reference soil samples. The maximum iron concentration in the reference soils was 44,900 mg/kg. The iron identified in the test pits likely originated in the blasting grit.

VOCs, apparently resulting from disposal of waste paint and/or paint thinner, were identified in one test boring and several test pits west of Warehouse 2/3. These included MY05SB102, MY05TP01, MY05TP10, MY05TP12 and MY05TP15. The predominant VOCs detected included toluene, ethylbenzene and xylenes; benzene was detected in one sample from MY05TP01. Other VOCs, such as acetone and 2-butanone, were detected at relatively low concentrations and may be minor constituents in the paint waste, or cross contaminants from the testing laboratory.

The concentrations of toluene, ethylbenzene and xylenes detected ranged from 6 ug/kg (toluene) to 200,000 ug/kg (m-p-xylene); the concentrations identified did not exceed the respective PALs for these compounds. The highest concentrations of VOCs were detected in MY05TP01, located just west of the southwest corner of Warehouse 2/3 (**Figure 2-8**). VOCs were detected in the test pit soils between depths of 3 and 10 feet (bedrock refusal).

The MY05TP01 area appears to be the primary area of waste paint/thinner disposal. Paint chips and associated solvent odors were noted at a depth of between 0.5 and 1.5 feet during excavation of MY05TP01. The highest PID readings in TP01 were at a depth of 6 to 7 feet below grade (1,224 ppm); bedrock was encountered at a depth of 10 feet. Soils in the vicinity of this test pit appear to have been impacted through lateral and downward spreading from the MY05TP01 area.

EPH and associated SVOCs were detected west of Warehouse 2/3 in MY05TP15, MY05TP02 and surface soil samples MY05SS101 through MY05SS103 (**Figure 2-8**). At MY05TP15, C11-C22 aromatics and C9-C18 aliphatics were detected at concentrations ranging from 35 to 170 mg/kg; the PAL is 100 mg/kg. C9-C18 aliphatics were also detected in MY05TP02 at a concentration of 6.6 mg/kg; the surface soil samples were not tested for EPH.

The SVOCs detected in these soils consisted primarily of PAHs (refer to **Table 4-14A**). PAHs were detected above PALs in the surface sample from MY05TP02 and surface soil samples MY05SS101 through MY05SS103. The compounds above the PALs included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene in MY05TP02, MY05SS101 and MY05SS102. Benzo(a)pyrene was also detected above the PAL in MY05SS103 and its duplicate (MY05SS115). The concentration of compounds exceeding the PALs ranged from 190 to 5,300 ug/kg. The corresponding PALs range from 62 to 620 ug/kg. The EPH and SVOCs detected may be related to the release of a relatively high molecular weight oil product, such as lubricating oil.

PCBs were detected above the PAL of 220 ug/kg in MY05TP01 (three samples between 0 and 10 feet) and MY05TP02 (0-0.5 feet). Arochlor-1254 was detected in MY05TP01 and Arochlor-1260 was detected in MY05TP02. The PCBs were likely contained within the paint released to this area.

Two pesticides, dieldrin and endrin, were detected in only one location, MY05TP02 (0-0.5 feet) at concentrations of 12 and 9.6 ug/kg, respectively. The PALs are 30 ug/kg for dieldrin and 18,000 ug/kg for endrin. Maine Yankee operations did not involve the use of pesticides, thus the source of these compounds may be fill brought to the site during construction.

Warehouse 2/3 Sub-Slab

Testing of soils from beneath the warehouse slab identified concentrations of metals that are consistent with those observed in the reference soil samples (**Table 4-2**). Low concentrations of one VOC, trichloroethene, were detected in MY05SS73 (3J ug/kg) and MY05SS74 (4J ug/kg), located near the south end of the warehouse. The PAL for trichloroethene is 2,800 ug/kg.

4.4.6.2 Groundwater

Investigations

An initial monitoring well (MW-311) was installed in Phase 1A in front of Warehouse 2/3 where drums and other materials were handled (**Figure 2-8**). Groundwater was sampled (MY05GW13) from the completed well and analyzed for TAL metals, TCL, SIM vinyl chloride, and EPH.

The investigation in this area was expanded in QAPP Change Order No. 2 (Phase 1B) to include the installation of nine monitoring wells (MW-404, MW-405, MW-406A/B, MW-407A/B, MW-408, and MW-409A/B) in six locations around the warehouse complex (**Figure 2-8**). The shallow wells (designated "B") were installed within overburden to depths between 15 and 37 feet below ground surface. The remaining wells were screened in bedrock to depths between 50 and 55 feet below ground surface. The groundwater samples (MY05GW106 through MY05GW114) collected from the wells were tested for TAL metals, VOCs, SVOCs, and SIM vinyl chloride.

The groundwater investigation around the warehouse area was further expanded based on detections in Phase 1A and 1B samples, as outlined in QAPP Change Order No. 4. Six additional monitoring wells (MW-420, 421, 422A/B, and 423A/B) were installed around and south of the warehouse complex and sampled (MY05GW120 through MY05GW124, and MY05GW129) for analysis of TAL metals, VOCs, and SIM vinyl chloride (**Figure 2-8**). The shallow wells (MW-422B and MW-423B) were completed in overburden at depths between 16 and 29 feet. The remaining wells were completed in bedrock to depths of about 30 feet. One final well (MW-429) in the Warehouse 2/3 area was installed south of MW-407A/B and MW-409A/B and north of MW422A/B and MW-423A/B.

An additional round of groundwater samples was collected from the ten previously installed monitoring wells (MW-311 and MW-404 through 409A/B) for analysis of TAL metals, VOCs, and SIM vinyl chloride (Phase 1C). These groundwater samples were identified by adding the suffix "-1C" to the original sample identifiers. Monitoring well MW-429 was sampled in September 2003 and analyzed for VOCs and SIM vinyl chloride.

<u>Results</u>

A summary of the groundwater test results are shown on **Table 4-15**. As indicated by the data, elevated concentrations of several metals were detected in the warehouse vicinity. The key findings are summarized below.

- Arsenic was detected above the PAL of 10 ug/l in MW-404 (16.6 ug/l and 23.3 ug/l).

- Aluminum was detected above the PAL of 1,430 ug/l in MW-405 (3,850 ug/l) and MW-407B (1,520 ug/l).

- Iron was detected in MW-404 (west of Warehouse 2/3) at concentrations of 32,300 ug/l (June 2002) and 43,500 ug/l (October 2002). The PAL for iron is 11,000 ug/l. Iron was also detected substantially above the reference groundwater maximum of 2,190 ug/l in MW-405; the concentration in this well was 4,640 ug/l.

- Concentrations of manganese were detected above the PAL of 500 in MW-404, MW-405, MW-406B, MW-408 and MW-311. The concentrations above the PAL ranged from 562 ug/l (MW-311) to 5,700 ug/l (MW-404).

- Molybdenum was detected above the PAL of 35 ug/l in MW-405, MW-407B, and MW-311. The concentrations above the PAL ranged from 43.9 ug/l (MW-407B) to 3,170 ug/l (MW-405). The concentration in MW-405 decreased from 3,170 ug/l in June 2002 to 467 ug/l in October 2002. Likewise, the concentration in MW-311 decreased from 314 ug/l in November 2001 to 18.1 ug/l in September 2002. Molybdenum was also detected at a concentration more than twice the reference groundwater maximum of 3.7 ug/l in MW-404 (19.3 ug/l).

- Nickel was detected at concentrations substantially above the reference groundwater maximum of 12.8 ug/l in MW-405 where 139 ug/l were detected in June 2002 and 76.5 ug/l were detected in October 2002.

- Silver, at a concentration of 49.9 ug/l, was detected above the PAL of 35 ug/l in MW-405 (June 2002). The concentration in a subsequent sampling round (October 2002) decreased to 4.5 ug/l. The maximum concentration in reference groundwater was 0.15 ug/l.

- Concentrations of sodium above the PAL of 20,000 ug/l were detected in MW-405, MW-406A, MW-408, MW-420, and MW-421 (refer to **Figure 2-8**). The concentrations detected above the PAL ranged from 20,300 ug/l (MW-405) to 48,600 ug/l (MW-408).

The elevated metal concentrations are likely related, for the most part, to storage and maintenance activities at Warehouse 2/3. Elevated concentrations of molybdenum may be linked to molybdenum-containing lubricants in some locations, but may also be released from natural molybdenum-bearing minerals in other locations. Aluminum is most likely due to leaching of aluminum from soil and rock. Silver and nickel could be related to paint and sand blast grit wastes, but could also have a natural origin in the bedrock.

Groundwater testing for VOCs (refer to **Table 4-15**) indicated two primary areas of groundwater impact: apparent petroleum-based solvent contamination in wells sampled west of the warehouse, and chlorinated solvent contamination in wells generally east and south of the warehouse. These areas are discussed in more detail below.

Drum Staging Area, East of Warehouse 2/3

Chlorinated VOCs were detected in all of the bedrock monitoring wells east of Warehouse 2/3 in the vicinity and downgradient of the former drum staging area (**Table 4-15**). With the exception of chloroform, chlorinated VOCs were not detected in MW-420 (bedrock well located upgradient of VOC source area) and the overburden wells

(**Figure 2-8**). The low concentrations of chloroform and other non-chlorinated VOCs detected (*e.g.,* acetone), are likely laboratory contaminants.

The VOCs detected were relatively consistent between sampling rounds and predominantly include 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, and vinyl chloride. These compounds were detected above PALs at concentrations ranging from 0.26 ug/l (vinyl chloride) to 670 ug/l (1,1,1-trichloroethane). The highest concentrations were detected in MW-408, followed by MW-409A to the south. VOC concentrations drop off substantially to the north, east and west. Low concentrations of chlorinated VOCs were detected in bedrock wells MW-422A and MW-423A located about 300 feet south and downgradient of MW-408.

The data indicate an apparent release of chlorinated solvents in the vicinity of MW-408. The boring for this well encountered bedrock at 5 feet below grade. Apparent downward migration of VOCs from this area has resulted in impact to bedrock wells most notably in downgradient monitoring wells to the south. The source of the chlorinated compounds is reported to be handling of drums that contained 1,1,1 -TCA on the east side of the warehouse.

Paint Disposal Area, West of Warehouse 2/3

Petroleum-based VOCs including benzene, ethylbenzene, toluene and xylenes (BTEX) were detected in the two bedrock monitoring wells installed west of Warehouse 2/3 (MW-404 and MW-405). Substantially higher concentrations of BTEX were detected in MW-404. For example, total BTEX detected in MW-404 was about 500 ug/l, whereas total BTEX in MW-405 was approximately 3 ug/l. MW-404 is located 40 feet west of MY05TP101 where the highest concentrations of VOCs were detected in the area soils.

Only one of the VOCs detected, ethylbenzene in MW-404, exceeded the PALs. Ethylbenzene was detected at a maximum concentration of 160 ug/l in this well; the PAL is 70 ug/l.

Follow-up sampling for VOCs indicated consistent results for MW-404. Low concentrations of BTEX were detected in MW-405 in June 2002, but BTEX were non-detect in this well in October 2002. The petroleum-based VOCs detected appear to have resulted from the release of paints and paint thinner in the vicinity of MY05TP01. The movement of VOCs from MY05TP01 appears to be primarily to the west. Vinyl chloride in MW-405, not detected in June 2002, was detected at a concentration of 0.26 ug/l, slightly above the PAL of 0.20 ug/l.

4.4.7 115 kV Switchyard Area

The 115 kV Switchyard Area is south of Warehouse 2/3, and consists of the 115kV Switchyard and a Construction Transformer (**Figure 2-8**). Surface and subsurface soil samples were collected from this area, which are summarized below and **Tables 4-16A and 16B**.

115 kV Switchyard

Three test pits (MY05TP06 through MY05TP08) were installed in the 115 kV switchyard (**Figure 2-8**). Prior to excavating the test pits, the 115 kV switchyard was visually inspected for the presence of surface soil stains. A PID was utilized to screen surface soils. The field team did not note petroleum-stained soils during the inspection and randomly located the test pits in the switchyard.

The test pits were excavated to a depth of between 5.8 and 6.8 feet (refusal) and a side wall composite sample and bottom sample were collected from each test pit. The side wall composite sample was tested for PCBs and EPH. The bottom sample was analyzed for TAL metals, TCL, and EPH.

Test pit side wall composite sample MY05TP06(0.5-6.5) was analyzed for PCBs, EPH, and Total Solids (**Table 4-16A)**. PCBs were not detected in the sample and EPH was below the 100 mg/kg PAL with C19-C36 aliphatics at 56J mg/kg and C9-C18 aliphatics at 19J mg/kg. Bottom sample MY05TP06(6.5-6.8) was analyzed for TAL metals, TCL, PCBs, pesticide, EPH, and Total Solids. TAL metals were all below their respective PALs with the exception of iron (24,900 mg/kg) which falls within the range of concentrations exhibited by the reference soil samples (**Table 4-2**). EPH, PCBs, and pesticides were non-detect. With the exception of acetone (13 ug/kg) and methylene chloride (90J ug/kg), VOCs were non-detected in the soils collected from MY05TP06(6.5-6.8).

The 0.5-5.0 foot test pit side-wall composite sample collected at MY05TP07(0.5-5.0) was analyzed for PCBs, EPH, and Total Solids and had similar test results as the MY05TP06(0.5-6.5). PCBs were non-detect and EPH was below the PAL with a C19-C36 aliphatics result of 6.8J mg/kg . Soil collected from test pit bottom sample MY05TP07(5.5-5.8) was analyzed for TCL, TAL metals, PCBs, pesticides, EPH, and Total Solids. TAL metal concentrations were all within their respective PALs. EPH, PCBs, pesticides, and VOCs were not detected in the soil. With the exception of benzo(a)pyrene (380 ug/kg versus a PAL of 62 ug/l), all SVOCs were below their respective PALs.

Test pit side-wall composite sample MY05TP08(0.5-6.5) was analyzed for PCBs, EPH, and Total Solids. PCBs and EPH were not detected in the 0.5-6.5 foot side-wall sample. Test pit bottom sample MY05TP08(6.5-6.8) was analyzed for TAL metals, TCL, PCBs, Pest, EPH, and Total Solids. With the exception of iron (33,200 mg/kg) all TAL metals were below their respective PALs. The PAL exceedence for iron falls within the range of concentrations exhibited by the reference soil samples (**Table 4-2**). EPH, PCBs, Pesticides, SVOCs, VOCs, and PAHs were not detected in the 6.5-6.8 foot sample.

The 115 kV switchyard test pitting program data suggests that with the exception of iron PAL exceedences and a benzo(a)pyrene PAL exceedence at MY05TP07(5.5-5.8), the switch yard soil results are below the respective PALs. The PAL exceedence for iron falls within the range of concentrations exhibited by the reference soil samples.

A ditch draining south from the main warehouse (directly west of the 115 kV switchyard) drains a portion of this area. A surface soil sample (MY05SS10) was collected from the ditch and analyzed for TAL metals, TCL, and EPH (**Figure 2-8**).

Metal concentrations in surface soil sample MY05SS10(0-0.5) were consistent with concentrations exhibited by the reference soil samples (**Table 4-2**). With the exception of a PAL exceedence of iron (31,700 mg/kg), TAL metals concentrations were below the PALs (**Table 4-16A**). PCBs and pesticides were not detected in the surface soil sample. SVOCs, VOCs and EPH were non-detect in the MY05SS10(0-0.5) sample.

A duplicate sample MY05SS14 was collected at the MY05SS10(0-0.5) location. MY05SS14 exceeded the iron PAL (23,000 mg/l) with a 33,800 mg/kg result. Chemical testing did not detect PCBs or pesticides. SVOCs and VOCs were non-detect, and EPH were below the PAL with a C11-C22 aromatics EPH result of 22J mg/kg.

Construction Transformer (X-5)

A Construction Transformer used during decommissioning is located directly south of the 115 kV switchyard. Four hand auger borings (MY05HA07 through MY05HA09 and MY05HA11) were drilled around the Construction Transformer (**Figure 2-8**). Soil samples were collected from two intervals (0 to 0.5 and 2 to 2.5 feet) and were analyzed for PCBs, VOCs and EPH.

Hand auger sample MY05HA07(0-0.5) exhibited results below the PAL of 220 mg/kg for PCBs with an estimated 150J ug/kg result for Aroclor -1260 (**Table 4-16B**). VOCs were non-detect while EPH was slightly above the PAL of 100 mg/kg with C11-C22 aromatics at 17 mg/kg and the C19-C36 aliphatics at an estimated 90J mg/kg. MY05HA07(2.0-2.5) was non-detect for PCBs and VOCs, and exhibited results below the EPH PALs with a C19-C36 aliphatics estimated value of 12J mg/kg and a C9-C18 aliphatics result of 6.4 mg/kg.

The surface soil sample collected at MY05HA08(0-0.5) was non-detect for PCBs, non-detect for VOCs and below the 100 mg/kg PAL for EPH (C11-C22 aromatics 17 mg/kg). MY05HA08(2.0-2.5) results were also non-detect for PCBs and VOCs, and were below the PALs for EPH (C9-C18 aliphatics 7.2 mg/kg).

The surface soil sample at MY05HA09(0-0.5) exceeded the 220 ug/kg PAL with a PCB Aroclor-1260 result of 600J ug/kg. The sample was below PALs for VOCs, and exceeded the EPH PAL of 100 mg/kg as follows: C11-C22 aromatics 2,300J mg/kg, C19-C36 aliphatics 12,000J mg/kg, and C9-C-18 aliphatics 8,800 mg/kg. MY05HA09(2.0-2.5) results were non-detect for PCBs and VOCs, and were below the PALs for EPH with results for the C11-C22 aromatics fraction of 17 mg/kg and the C9-C18 aliphatics fraction of 6.3 mg/kg.

Hand auger sample MY05HA11(0-0.5) soils did not detect PCBs or VOCs, and EPH was below the 100 mg/kg PAL with a C9-C18 aliphatics result of 6.5 mg/kg. MY05HA11(2.0-2.5) was non-detect for PCBs and VOCs, and a C19-C36 aliphatics result of 110J mg/kg, exceeding the EPH PAL of 100 mg/kg.

Four additional hand auger locations (MY05HA101 through MY05HA104) were drilled at a distance of 10 feet from each side of the transformer pad following an evaluation of the initial four hand auger results (**Figure 2-8**). Soil samples from these additional hand augers were collected from the surface (0-0.5) and a depth interval of 2 to 2.5 feet for analysis of PCBs and EPH.

MY05HA101(0-0.5) soils did not detect PCBs and were below the EPH PAL of 100 mg/kg (C19-C36 aliphatics 11J mg/kg). The 2 to 2.5-foot hand auger sample collected at MY05HA101(2-2.5) was non-detect for both PCBs and EPH.

MY05HA102(0-0.5) soils did not contain PCBs and EPH concentrations were below the PALs for EPH (C11-C22 aromatics 18 mg/kg, C19-C36 aliphatics 9.2J mg/kg). The 2 to 2.5 foot hand auger sample collected at MY05HA102(2-2.5) was non-detect for both PCBs and EPH.

Soil collected at MY05HA103(0-0.5) did not contain PCBs, and EPH concentrations were below the PALs (C11-C22 aromatics 23 mg/kg, C19-C36 aliphatics 7.4J mg/kg). Samples collected at MY05HA103(2-2.5) were non-detect for PCBs and were below the EPH PALs (C11-C22 aromatics 22 mg/kg).

Testing of MY05HA104(0-0.5) soils did not detect PCBs or EPH. The 2 to 2.5 foot hand auger sample collected at MY05HA104(2-2.5) was non-detect for PCBs and contained EPH concentrations below the PALs (C11-C22 aromatics 36 mg/kg, C19-C36 aliphatics 11J mg/kg).

The second set of hand auger samples (MY05HA101 through MY05HA104) taken 10 feet from the transformer corners indicate the absence of PCBs at all depths with EPH as either non-detect or below the PALs. These data suggest that the area immediately under and adjacent to the Construction Transformer was impacted by a release of transformer oil.

4.4.8 Fire Pond

The Fire Pond received water from Montsweag Brook that was utilized for fire suppression during plant operation. The Fire Pond and associated Pump House were removed as part of decommissioning activities. A sediment sample was collected from the bottom of the pond prior to water removal and soil and concrete samples were collected from beneath the Pump House following demolition (**Figure 2-8**).

4.4.8.1 Soil

A soil test pit (MY05TP119) was excavated west of a stain on the concrete slab near the southwest corner of the former Pump House October 2001 (see further concrete sampling discussion below). The soils were PID-screened in 2-foot increments and a sample was collected from the surface and base of the pit for EPH analysis.

MY05TP119(0-0.5 and 3.5-4) and the duplicate sample (MY05TP120(3.5-4)) of MY05TP119(3.5-4) indicated EPH at concentrations below the 100 mg/kg PAL (**Appendix D**). Results ranged from a high of 90 mg/kg (C9-C18 aliphatics) to a low of 13 mg/kg (C19-C36 aliphatics). PID readings during the test pit excavation were non-detect (**Table 4-1**). The test pit was terminated on the bedrock surface at 4.0 feet below ground surface.

Soil data collected directly adjacent to the Fire Pond Pump House slab exhibited EPH detections below the PAL. As discussed below, the source of the petroleum contamination is believed to have been a small fuel oil spill to the Fire Pond Pump House slab that has since been remediated.

4.4.8.2 Concrete

During the building assessment program, a petroleum stain was identified on the concrete floor in the southwest corner of the Fire Pump House. A concrete surface sample (MY05CS101) was collected and a sample at depth (MY05CS103) was analyzed for EPH (**Figure 2-8**). The surface and 11-inch depth sample indicated elevated concentrations of EPH. The stain was subsequently removed with an excavator utilizing a hoe-ram attachment and the remaining concrete was sampled (MY05CS107) for EPH. Based on EPH detections following the initial concrete removal, a final confirmatory sample (MY05CS109) was collected.

The initial MY05CS101 surface concrete sample exceeded the EPH PAL of 100 mg/kg based on detection of the following EPH fractions: C11-C22 aromatics (3,000J mg/kg), C9-C-18 aliphatics (5,800 mg/kg), and C19-C36 aliphatics (2,800 mg/kg) (**Table 4-23**).

A duplicate sample of MY05CS101 was collected (MY05CS102) and had similar EPH exceedences with a C11-C22 aromatics result of 4,000J mg/kg, a C9-C18 aliphatics result of 6,300 mg/kg, and a C19-C36 aliphatics result of 2,900 mg/kg.

As described above, concrete sample (MY05CS103) was collected at depth (11-inches) and immediately adjacent to MY05CS101. EPH exceeded the PAL although concentrations decrease with depth. The EPH results were as follows: C11-C22 aromatics (1,000J mg/kg), C9-C-18 aliphatics (2,800 mg/kg), and C19-C36 aliphatics (950 mg/kg).

Following the collection of concrete samples MY05CS101 and MY05CS103 the petroleum-impacted area was removed with an excavator utilizing a hoe-ram attachment. Another concrete sample was collected (MY05CS107) and analyzed for EPH. EPH (C9-C-18 aliphatics with a result of 230J mg/kg) exceeded the PAL in the MY05CS107 sample.

MY05CS108 was collected as a duplicate sample of MY05CS107. Test results were similar to MY05CS107 with EPH PAL exceedences observed (C9-C-18 aliphatics (290J mg/kg) and C19-C36 aliphatics (110 mg/kg)).

An additional confirmatory sample MY05CS109 was collected following additional excavator hoe-ramming activity and analyzed for EPH. Results from this concrete sample revealed that the C11-C22 aromatics fraction was not detected and the C9-C18 aliphatics and C19-C36 aliphatics were below the EPH PAL at 14J mg/kg.

The Fire Pond Pump House concrete data indicates EPH PAL exceedences prior to concrete slab remediation. Confirmatory concrete sample MY05CS109 test results support the conclusion that the area is no longer impacted by the apparent petroleum release identified during the building assessment program.

4.4.8.3 Sediment

One sediment sample was collected from the bottom of the Fire Pond (MY05SS09) prior to the de-watering and demolition activities (**Figure 2-8**). The source of the minor amount of bottom sediment in the Pond was from freshwater pumped to the Fire Pond from Montsweag Brook. The sample was analyzed for TAL metals, TCL and SIM PAHs.

Sediment sample MY05SS09 test results showed that the concentrations of ten inorganics were above the maximum reference soil concentrations (**Table 4-22B**). The non-detect PCBs, pesticides, SVOCs, and VOCs data were rejected during the data validation process because of a low total solids percentage (19%), while the detected concentrations were J-flagged as estimated values. A duplicate sediment sample (MY05SS15) was taken of MY05SS09 and exhibited similar analytical results.

Following collection of the sediment sample, the Fire Pond was drained and backfilled with the soil that formed the walls of the Pond, leaving the original bottom approximately 10 feet below the new ground surface. The majority of the bottom sediments were removed along with the liner of the Pond and disposed off-site.

4.4.9 Personnel Buildings and Parking Lot Areas

Three personnel buildings - the Staff Building, Administration Building and former Information Center - are located north of the industrial fenced area in the southern portion of Bailey Point. A sub-slab soil sample was collected from beneath each building. A monitoring well (MW-317) was installed immediately east of the former Information

Center, and surface water was collected (**Figure 2-7**). Three paved parking lots are located in close proximity to the personnel buildings. One lot is located to the north of the former Information Center, and Parking Lot C and D are located north of the Administration and Staff Buildings, respectively.

4.4.9.1 Soil

Parking Lot C

One soil boring (MY05SB17) was installed at a location correlating to a known gasoline leak in Parking Lot C (**Figure 2-7**). Both surface and groundwater or soil/bedrock interface soil samples were collected from this boring for analysis of TAL metals, TCL, EPH, and VPH. The highest screened PID interval was tested for VOCs, EPH and VPH.

PID readings obtained at MY05SB17 indicated that there were no readings above background (**Table 4-1**) and no evidence of staining during advancement of the boring. Because the overburden soils were relatively thin (5 feet), a sample was collected at the surface, the 2-4 foot interval, and the 4-5 foot interval.

TAL metal results for MY05SB17 were generally consistent with concentrations exhibited by the reference soils (**Table 4-2**). The surface soil sample MY05SB17(0-0.5) TAL metal results were all below their respective PALs (**Table 4-17**). Soils collected from the boring did not contain SVOCs, PCBs, or pesticides. One VOCs (acetone) was estimated at 22J ug/kg, well below the 160,000 ug/kg PAL. The C11-C22 aromatics (150J mg/kg) and C19-C36 aliphatics (440 mg/kg) exceeded the 100 mg/kg EPH PAL. VPH was not detected in the surface sample.

MY05SB17(2-4) test results indicate VOCs were non-detect with the exception of a rejected 10R ug/kg 2-butanone result. EPH results ranged between 38 and 39 mg/kg and were below the 100 mg/kg PAL. The soils collected from the 2-4 foot interval did not contain VPH.

The bedrock interface soil sample MY05SB17(4-5) was below the TAL metals PALs and consistently below results exhibited in reference soils (**Table 4-2**). With the exception of benzo(a)pyrene (300J ug/kg) exceeding the 62 ug/kg PAL, the rest of the SVOCs were below their respective PALs. The soil samples did not contain PCBs or pesticides. With the exception of a rejected 13R ug/kg 2-butanone result, VOCs were not detected in the 4-5 foot sample. EPH results ranged between 7.3 and 26 mg/kg and were below the 100 mg/kg PAL. The soils collected from the 4-5 foot interval did not contain VPH.

Parking Lot D

Four soil borings (MY05SB18 through MY05SB21) were drilled at equally spaced locations across Parking Lot D (**Figure 2-7**) near the Staff Building. Continuous split-spoon soil samples were collected during advancement of each soil boring. One sample was collected from each boring at the groundwater or soil/bedrock interface and analyzed for TAL metals, TCL, and EPH.

Soil boring MY05SB18(6-8) penetrated the groundwater interface. TAL metal concentrations were generally consistent with reference soils (**Table 4-2**) and were below the PALs. PCBs, pesticides, SVOCs, and VOCs were non-detect (**Table 4-17**). With the exception of a rejected C9-C18 aliphatics 7R mg/kg), EPH results were non-detect. PID readings were all below 1.5 ppm (**Table 4-1**).

MY05SB19(10-12) penetrated the groundwater interface. With the exception of iron (39,600 mg/kg), TAL metal concentrations were below the PALs and generally consistent with reference soils (**Table 4-2**), PCBs, pesticides, and SVOCs were non-detect. VOC testing detected 58 ug/kg for trichloroethene (the PAL is 2,800 ug/kg). With the exception of a rejected 7.8R C9-C18 aliphatics result, EPH was not detected in the soil. PID readings were non-detect (**Table 4-1**).

Soil boring MY05SB20(6-8) was collected at the soil bedrock interface. TAL metal concentrations were generally consistent with reference soils (**Table 4-2**) and below the PALs. PCBs, pesticides, SVOCs, and VOCs were non-detect. With the exception of a rejected 6.9R C9-C18 aliphatics result, EPH was not detected in the soil. PID readings were non-detect in each sample collected from MY05SB20(6-8) (**Table 4-1**).

MY05SB21(4-5.2) was collected at the soil bedrock interface. With the exception of iron (25,400 mg/kg), TAL metal concentrations were below the PALs and were generally consistent with reference soils (**Table 4-2**). PCBs, pesticides, SVOCs, and VOCs were all non-detect. With the exception of a rejected 7.7R C9-C18 aliphatics result, EPH was not detected in the soil. PID readings were non-detect (**Table 4-1**).

Information Center Parking Lot

A soil boring (MY05SB22) was drilled in the footprint of a former UST east of the Information Center Parking Lot (**Figure 2-7**). The soils were sampled continuously and screened with a PID. The soil sample from the groundwater or soil/bedrock interface was analyzed for EPH and VPH. The sample results for MY05SB22(8-8.4) were non-detect for EPH and VPH (**Table 4-17**). PID readings recorded during the boring advancement at MY05SB22(8-8.4) were non-detect (**Table 4-1**).

A duplicate sample MY05SB60(8-8.4) was collected at the soil bedrock interface from MY05SB22. The sample results were non-detect for EPH and VPH.

Staff Building

Two sub-slab soil samples (MY05SS67 and MY05SS69) were collected in the Staff Building. One sample was collected beneath the HVAC room sump (MY05SS67) and a second in the elevator pit (MY05SS69) of the Staff Building (**Figure 2-7**). An additional sample was proposed in the HVAC room in the QAPP (MY, 2001b) and will be collected at a later date as this sump is still operational.

The sample in the HVAC room (MY05SS67) was analyzed for TAL metals, PCBs, SVOCs, VOCs, and EPH. The sample from the elevator pit (MY05SS69) was analyzed for PCBs and EPH.

Sub-slab soil sample MY05SS67 (HVAC room sump) TAL metal results were generally consistent with reference soils (**Table 4-2**) and were below the PALS (**Table 4-17**). PCBs, SVOCs, and EPH results were non-detect. Acetone (7J ug/kg) was the only VOC detected and was well below the 1,600,000 ug/kg PAL.

MY05SS69 was collected beneath the Staff Building elevator pit and was non-detect for PCBs. C19-C36 aliphatics were detected at 9.4 mg/kg and was the only EPH fraction detected in the soil sample.

Information Center

Following removal of the concrete slab at the Information Center, one soil sample was collected in the north-eastern portion of the building beneath the area of the former vehicle repair shop (**Figure 2-7**). The soil sample (MY05SS75) was analyzed for TAL metals, PCBs, SVOCs, VOCs, and EPH.

Sub-slab soil sample MY05SS75 test results were generally consistent with reference soils (**Table 4-2**) and were typically below the PAL concentrations for TAL metals. Lead was the exception, which exceeded the 400 mg/kg PAL with a concentration of 969 mg/kg (**Table 4-17**). PCBs, SVOCs, and EPH were not detected in the sub-slab soils. 2-butanone with a PAL of 7,300,000, had a rejected result of 13R ug/kg and was the only detected VOC.

Following an evaluation of the initial surface soil results, four geoprobe boring locations (MY05GP202 through MY05GP205) were installed a distance of 10 feet from each side of MY05SS75, and a fifth geoprobe location (MY05GP201) was sited directly at the previous surface soil location (**Figure 2-7**). The geoprobe soil borings were installed to a depth of four feet and soil samples from each boring were taken at three depths (0-0.5, 1.8-2, and 3.8-4 feet). The fifteen soil samples and two duplicates (MY05GP237(1.8-2) and MY05GP206(0-0.5)) were analyzed for lead and sulfate. The lead values ranged from 14.4 mg/kg to 22.2 mg/kg and sulfate was non-detect in all but MY05GP202(1.8-2) where 120 mg/kg were reported (**Table 4-17**).

The lead results from the 15 surface and subsurface geoprobe soil samples are consistent with the range of lead concentrations observed in the reference soils (**Table 4-2**). The maximum lead concentration (969 mg/kg) was not reproduced with MY05GP201(0-0.5) (14.4 mg/kg) that was sited at the original surface soil location, or the field duplicate (MY05GP206(0-0.5), 16.2 mg/kg) for MY05GP201(0-0.5). The additional lead testing demonstrates that no significant lead concentrations are present in soils at the former location of the Information Center. The initial lead result associated with MY05SS75 was either an artifact of the laboratory analysis or is indicative of a very small and insignificant area of lead impacted soil.

Administration Building

One soil sample was collected from beneath a stained portion of the concrete slab of the HVAC room of the Administration Building (**Figure 2-7**). The sub-slab soil sample (MY05SS70) was analyzed for TAL metals, PCBs, SVOCs, VOCs, and EPH.

Sub-slab soil sample MY05SS70 TAL metals test results were generally consistent with reference (**Table 4-2**) and were below the PAL concentrations (**Table 4-17**). PCBs, SVOCs, and VOCs were not detected in the sub-slab soils. EPH results for the C19-C36 aliphatics and C9-C18 aliphatics were below the 100 mg/kg PAL at concentrations of 19J and 6.8R mg/kg.

Soil analytical results for the Personnel Buildings and Parking Lot Areas indicate the majority of these samples fall below the PALs. Iron was at or slightly exceeded its PAL but was within the reference range of concentrations (**Table 4-2**). The surface soil sample collected at MY05SS75(0-0.5) exceeded the lead PAL and is potentially associated with vehicle maintenance activities that occurred in the garage. PCBs were not detected in the samples tested. With the exception of benzo(a)pyrene, detected in MY05SB17(4-5), SVOCs were below their respective PALs or not detected. VOCs were all below their PAL values. With the exception of the two EPH exceedences in the surface soil sample MY05SB17(0-0.5) collected in the area identified as a historic gasoline release, EPH PALs were not exceeded. The sample collected at the former UST location (MY05SB22) did not contain detectable concentrations of EPH or VPH.

4.4.9.2 Groundwater

A monitoring well (MW-317) was drilled adjacent to the southeast corner of the former Information Center to measure groundwater elevation and to compare with groundwater modeling results (**Figure 2-7**). The well was sampled (MY05GW24) for analysis of TAL metals, TCL, SIM vinyl chloride, EPH, and nitrates. As discussed above, a soil boring (MY05SB14) was collocated with this monitoring well for comparative iron analysis to support closure of the Ferrous Sulfate Tank removal.

TAL metal concentrations were generally consistent with reference groundwater (**Table 4-3**). One exception was a manganese exceedence of 672 ug/l, over the PAL of 500 ug/l (**Table 4-12**). PCBs, pesticides, SVOCs, VOCs, and SIM vinyl chloride were not detected. EPH exceeded the PAL with a result of 200 ug/l. A nitrate concentration of 0.5 mg/l did not exceed the PAL of 10 mg/l. Groundwater data collected from MW-317 indicates this location was impacted by EPH.

4.4.9.3 Surface Water (Seep)

Infiltration to the pedestrian tunnel drain, located between the Staff Building and Wart Building, was observed discharging during non-stormwater periods to Outfall 011. To assess the potential surface water impact at Outfall 011 located east of the Information Center, a surface water sample (MY05SW05) was collected from the outfall (**Figure 2-7**). The water sample was analyzed for TAL metals, TCL, SIM vinyl chloride, and EPH.

Surface water sample MY05SW05 exceeded the TAL metals PALs for aluminum and zinc (217 and 163 ug/l, respectively) (**Table 4-24**). The remaining TAL metals were below their respective PALs. PCBs, pesticides, SVOCs, VOCs, SIM vinyl chloride, and EPH were all non-detect in the surface water sample.

4.4.10 345 kV Transmission Line Area

This portion of the Maine Yankee facility includes the area west of the railroad tracks and north of the 345 kV switchyard to Old Ferry Road (**Figure 2-9**). Based on historical fill and silt-spreading activities, investigations included sampling soil, sediment, surface (seep) water, and groundwater.

4.4.10.1 Soil

Soil Borings 345 kV Transmission Line Area

Four collocated groundwater monitoring wells (MW-309, MW-319, MW-320 and MW-323) were installed in this area to assess historical fill activities (**Figure 2-9**). Soils from the borings (MY05SB23, MY05SB48, MY05SB49 and MY05SB52) were continuously sampled and analyzed as follows: surface soil: TAL metals and TCL; highest PID-screened sample: VOCs and EPH; and groundwater interface: TAL metals, TCL, and EPH. If there were no PID readings above background or no evidence of staining in a boring, then a sample was taken from the bottom of the interval that appeared to have the highest permeability based on visual inspection in the field.

If there was no evidence of an interval having a high permeability, a soil sample was composited between the bottom of the surface sample and the top of the groundwater or bedrock interface sample. In these cases, a discrete sample for VOC analysis was collected from the depth interval half-way between the surface sample and the groundwater or bedrock interface.

An additional soil boring (MY05SB24) was installed in the former silt spreading area and analyzed in the same manner (**Figure 2-9**).

Chemical testing for soils collected from MY05SB23, MY05SB48, MY05SB49, MY05SB52, and MY05SB24 identified TAL metals concentrations that were generally consistent with reference soil locations (**Table 4-2**). With the exception of MY05SB48, iron was the only PAL exceedence ranging between 23,000 mg/kg and 37,000 mg/kg (**Table 4-18A**).

With the exception of a fluoranthene result of 200J ug/kg (PAL of 2,300,000 ug/kg) in MY05SB49, there were no SVOC, pesticide, or PCB detections in any of the soil borings listed above. Acetone (21 ug/kg), chloroform (3J ug/kg), and two rejected 2-butanone result (17R ug/kg and 23R ug/kg) were the only detected VOCs and both occurred in MY05SB52. These VOC results were well below their respective PALs of 1,600,000 and 7,300,000 ug/kg.

EPH concentrations were below their PAL concentrations in soils collected from MY05SB23, MY05SB48, MY05SB49, MY05SB52, and MY05SB24. Test results ranged between 6.7R and 23 mg/kg.

<u>345 kV Switchyard Area</u>

To assess the potential impact of the 345 kV switchyard on this portion of the facility, two monitoring wells (MW-321 and MW-322) with soil borings (MY05SB50 and MY05SB51) were drilled along the northern end of the switchyard (**Figure 2-9**). Due to their location in the low drainage swale, these borings were drilled with hand augers and post hole diggers as the locations were inaccessible for drilling with a conventional environmental drill rig. Soils from the borings were continuously sampled.

The QAPP specified soils from the two borings to be analyzed as follows: surface soil: TAL metals/TCL; highest PID-screened sample, VOCs and EPH; and groundwater interface: TAL metals, TCL and EPH. During drilling, the water table was encountered close to ground surface eliminating the highest PID sample (PID results did not exceed 0.0 ppm) and making the 0-0.5 sample also the groundwater interface sample (**Table 4-1**). MY05SB50(0-0.5) and MY05SB51(0-0.5) were analyzed for TAL metals, TCL, VOCs, and EPH.

TAL metals concentrations were generally consistent with reference soil locations (**Table 4-2**). MY05SB50(0-0.5) and its duplicate sample MY05SB58(0-0.5) with the exception of iron (35,400 mg/kg) in MY05SB50(0-0.5) and iron (38,200 mg/kg) and manganese (1,890J mg/kg) in duplicate sample MY05SB58(0-0.5) did not exceed the TAL metals PALs (**Table 4-18A**). The TAL metal results for MY05SB51(0-0.5) and its duplicate sample MY05SB56(0-0.5) were all below their respective PALs.

With the exception of a 45 ug/kg concentration of acetone in the duplicate sample MY05SB58(0-0.5), the MY05SB50(0-0.5) and MY05SB58(0-0.5) samples were non-detect for TCL, VOCs and EPH. MY05SB51(0-0.5) contained a 230J ug/kg result for pyrene, while its duplicate MY05SB56(0-0.5) contained 250J bis(2-ethylhexyl) phthalate. Both results were below their PALs of 2,300,000 and 35,000 ug/kg, respectively. With the exception of the SVOC and VOC analytes discussed above, PCBs, Pesticides, EPH and the balance of the SVOC and VOC analytes were not detected in the soils.

Surface Soil Samples 345 kV Transmission Line Area

Two surface soil samples (MY05SS12 and MY05SS13) were collected in the area and analyzed for TAL metals and TCL (**Figure 2-9**).

TAL metals concentrations were generally consistent with reference soil locations (**Table 4-2**). MY05SS12(0-0.5) and MY05SS13(0-0.5) exceeded the PAL for iron with results of 24,500 and 26,100 mg/kg, respectively (**Table 4-18A**).

With the exception of SVOC detections, TCL analytes were not detected in either surface soil sample. SVOCs, including benzo(a)anthracene (1,100 mg/kg), benzo(a)pyrene (860 mg/kg), and benzo(b)fluoranthene (1,100 mg/kg), exceeded their PALs of 620, 62, and 620 mg/kg, respectively. The remaining SVOC analytes were below their PALs.

As outlined in QAPP Change Order No. 3, the investigation north of the 345 kV switchyard was expanded to include additional surface soil samples. Ten additional surface soil samples (MY05SS104 through MY05SS113) were collected from the central portion of the area (**Figure 2-9**). These samples were analyzed for TAL metals, TCL, VOCs, and EPH.

Surface soil samples MY05SS104 through MY05SS113 and duplicate samples MY05SS98, MY05SS150 and MY05SS151 (**Table 4-18A**), TAL metal concentrations were generally consistent with reference soil locations (**Table 4-2**). Metals concentrations ranged from the PAL of 23,000 mg/kg to 37,200 mg/kg. The following samples exceeded the PAL for iron: MY05SS105 (23,200 mg/kg), MY05SS106 (28,500 mg/kg), MY05SS107 (37,200 mg/kg), MY05SS108 (27,400 mg/kg), MY05SS109 (24,200 mg/kg), MY05SS111 (25,200 mg/kg), MY05SS112 (31,700 mg/kg), MY05SS113 (29,000 mg/kg). Duplicate samples MY05SS150 (duplicate of MY05SS111) had an iron PAL exceedence of 29,000 mg/kg and MY05SS151 (duplicate of MY05SS113) had a 28,800 mg/kg result. PCBs and pesticides were not detected in any of the surface soil samples or their respective duplicate samples.

With the exception of a benzo(a)pyrene concentration of 240J ug/kg (PAL 62 ug/kg) in the duplicate sample MY05SS150 (duplicate of MY05SS111), none of the SVOC PALs were exceeded. In most samples SVOCs were non-detect. An increased number of SVOCs were detected in soils collected from MY05SS150 (duplicate of MY05SS111) and MY05SS113. MY05SS111 did not include any of the SVOC analytes detected in MY05SS150, while MY05SS151 (duplicate of MY05SS113), with the exception of pyrene, did not detect any of the SVOCs detected in MY05SS113.

All of the surface soil samples contained the VOC 2-butanone which ranged in concentration from 10R to 39J ug/kg (7,300,000 ug/kg PAL). As previously discussed, 2-butanone is a common laboratory contaminant and was often rejected during data validation. All of the other VOCs were well below their PALs with the majority shown as non-detect.

With the exception of the C19-C36 aliphatics, EPH was not detected in surface soil samples MY05SS104 through MY05SS113, or their corresponding duplicate samples. C19-C36 aliphatics ranged from a low of 7.4J mg/kg (MY05SS112) to a high of 16J mg/kg (MY05SS107). All EPH results fell below the 100 mg/kg PAL.

Surface Soil Samples Ballfield Area

To further assess the northern portion of this area, including the ball field, six composite surface soil samples (MY05SS114 through MY05SS119) were collected (**Figure 2-9**). The composite samples were developed from four grab samples collected from six approximate one-acre sub-areas and were analyzed for TAL metals, PCBs, pesticides SVOCs, and EPH.

TAL metals concentrations were generally consistent with reference soil locations (**Table 4-2**). Iron was the only metal to exceed its PAL and did so in each of the surface soil sample locations (MY05SS114 through MY05SS119) (**Table 4-18A**). Values ranged between 26,000 mg/kg at MY05SS119 to 30,400 mg/kg at MY05SS114.

PCBs, pesticides and SVOCs were not detected in any of the surface soil samples (MY05SS114 through MY05SS119). With the exception of a 12 mg/kg C19-C36 aliphatics detection (100 mg/kg PAL), EPH was not detected at any of the surface soil locations.

Investigation Trench Construction Debris Area

To further assess the potential for sub-surface contamination and investigate an alleged construction debris dump in this area, an approximate 575-foot long investigation trench was installed across the central portion of the 345 kV transmission line area as outlined in QAPP Change Order No. 3 (**Figure 2-9**). The trench location was designed to include the deep tidal area that was historically filled and the construction debris area on the southern end of the trench (**Figure 2-9**). The investigation trench was excavated in the fill material to a depth of approximately 15 feet. Observations and PID field screening (headspace) results were documented every 25 feet along the trench, and samples were collected from the surface, mid-depth and trench base (**Table 4-1**). PID readings collected during the excavation of the trench ranged from 0 to 12 ppm, with typical concentrations observed between 0 to 1 ppm. Based on observed conditions and field screening results, nine (9) soil samples (MY05TP107A, 110A, 111A, 113, 115, 116, 118, 125 and 129) were collected for testing of TAL metals, TCL, VOCs, and EPH.

TAL metals concentrations were generally consistent with reference soil locations along the trench (**Table 4-2**). Consistent with other surface soil samples collected north of the 345 kV switchyard and in the silt spreading/ball field area, iron exceeded the PAL. Iron concentrations ranged from 24,700 mg/kg at MY05TP115(7-9) to 42,600 mg/kg at MY05TP107A(7-9) (**Table 4-18A**).

PCBs were below their respective PALs and were detected in the following samples: MY05TP107A, 110A, 111A, 113. PCB concentrations ranged from 24 ug/kg to 130 ug/kg with the PCB PAL at 220 ug/kg.

With the exception of dieldrin (7 ug/kg in TP107A), (4.5 ug/kg in TP110A), and aldrin with a result of 4.1 ug/kg in TP113, detected pesticide results were below their respective PALs.

SVOC concentrations in the samples collected from the trench were typically non-detect or below the PAL. SVOCs that exceeded their PALs included the following PAHs: benzo(a)pyrene (620 ug/kg) and benzo(b)fluoranthene (740 ug/kg) at MY05TP107A(9-11), benzo(a)pyrene (470 ug/kg) and dibenzo(a,h)anthracene (420 mg/kg) at MY05TP111A(9-11), and benzo(a)pyrene (410 ug/kg) at MY05TP129(7-9).

There were no VOC PALs exceeded from the samples collected during trenching activities. Many of the VOC results are shown as non-detect.

EPH PALs were exceeded at the following locations: MY05TP107A(9-11) C11-C22 aromatics (190 mg/kg) and C19-C36 aliphatics (450J mg/kg), MY05TP110A(7-9) C19-C36 aliphatics (200J mg/kg) and C9-C-18 aliphatics (120J mg/kg), MY05TP111A(9-11) C19-C36 aliphatics (310J mg/kg), and MY05TP113(7-9) C19-C36 aliphatics (560 mg/kg).

Summary of Soil Results - 345 kV Transmission Line Area

Surface soil and soil boring analytical results for the 345 kV/silt spreading area indicate TAL metals concentrations generally consistent with reference soils (**Table 4-2**). Exceptions to this were PAL exceedence for iron.

SVOC testing was typically non-detect with the exception of fluoranthene in MY05SB49. With the exception of acetone and 2-butanone, VOCs were not detected in the surface soil and soil borings. As previously discussed, 2-butanone is a common laboratory contaminant and was often rejected during data validation.

Benzo(a) anthracene, benzo(a)pyrene and benzo(a)fluoranthene were the typical PAHs detected in the soils. Dibenzo(a,h)anthracene was detected in the silt spreading area trench. PCBs and pesticides were not detected in any of the surface soils or the soil borings. PCBs were detected in four of the eleven trench samples. All PCB detections were below the PCB PAL of 220 mg/kg.

EPH data indicated non-detect results or low detected concentrations in the soil samples with detections typically below the EPH PAL. The exception to this was seen in the EPH data collected from the northern end of the 575-foot trench. PID and visual observations made during the trench excavation (northern portion) identified several isolated, small potential petroleum sources. PID and headspace readings collected during excavation of the 575-foot trench indicated background to low PID detections.

4.4.10.2 Groundwater

345 kV Switchyard Area

The two collocated monitoring wells (MW-321 and MW-322) located along the northern end of the 345 kV switchyard were sampled (MY05GW21 and MY05GW22) and analyzed for TAL metals, TCL, SIM vinyl chloride, EPH, and nitrate (**Figure 2-9**). These wells were re-sampled (MY05GW21-1B and MY05GW22-1B) for analysis of DRO and nitrates following an evaluation of the first-round results. The results of the laboratory testing are discussed below.

TAL metals concentrations, with the exception of manganese and sodium, were below the PALs (**Table 4-19**). Metal concentrations that did not exceed the PALs were typically above reference groundwater concentrations (**Table 4-3**) and are attributed to the fill material that was used in this area during plant construction.

Manganese exceeded the PAL in MW-321 and MW-322 with results of 609 and 11,500 ug/l, respectively. Sodium exceeded the PAL in MW-321 and MW-322 with results of 41,000 and 78,300 ug/l, respectively.

PCBs and pesticides were included in the Phase 1A groundwater analytical suite, but were not detected in any of the samples.

Bis(2-ethylhexyl)phthalate was the only SVOC detected at a concentration of 7 J ug/l in MW-321, well below the PAL of 25 ug/l. VOCs were not detected in any of the samples. Nitrates were detected in MW-321 and MW-322 at concentrations of 3 and 2.6 mg/l, respectively, and although no leaks have been reported, may be attributed to the facility sewer line that is directly adjacent to these monitoring wells.

EPH results exceeded their PALs in each of the Phase 1A samples, and DRO exceeded the PAL in the Phase 1B sample. EPH concentrations were 310 ug/l (MW-321) and 760 ug/l (MW-322). DRO concentrations in MW-321 and MW-322 were 63 and 620 ug/l, respectively.

345 kV Transmission Line/Ballfield Area

The four collocated groundwater monitoring wells (MW-309, MW-319, MW-320 and MW-323) installed in this area were sampled (MY05GW11, MY05GW19, MY05GW20, and MY05GW23) and analyzed for TAL metals, TCL, SIM vinyl chloride, EPH, and nitrate (**Figure 2-9**). Following an evaluation of the initial results, these four wells were re-sampled for TAL metals and DRO. The samples were identified with the suffix "-1B" added to the original sample identifiers. The results of the laboratory testing are discussed below.

TAL metals concentrations, with the exception of arsenic (MW-319 and MW-323), boron (MW-323), iron (MW-309 and MW-323), manganese (MW-309, MW-319, MW-320 and MW-323), and sodium (MW-309, MW-319, MW-320 and MW-323), were below the PALs (**Table 4-19**). Remaining metal concentrations that did not exceed the PALs were typically above reference groundwater concentrations (**Table 4-2**) and are attributed to the fill material that was used in this area during plant construction.

Boron exceeded its PAL in groundwater samples collected during Phase 1A and 1B with concentrations of 1,280 and 1,530 ug/l, respectively. The iron PAL was exceeded in four of the eight samples and ranged from 34,600 (MW-323) in December 2001 to 543,000 ug/l (MW-323) in July 2002. Manganese exceeded the PAL in all of the samples and ranged from a low of 952 to 41,800 ug/l. Sodium exceeded the PAL in all of the samples and ranged from a low of 29,100 (MW-319) to a high of 524,000 ug/l (MW-309).

PCBs and pesticides were included in the Phase 1A groundwater analytical suite. PCBs and pesticides were not detected in any of the samples.

SVOCs were non-detect in the samples collected during Phase 1A. VOCs and vinyl chloride were not detected in any of the samples. With the exception of 0.1 mg/l nitrate concentrations in MW-319 and MW-323, nitrates were non-detect.

EPH results exceeded their PALs in each of the Phase 1A samples, and DRO exceeded the PAL in each of the Phase 1B samples. EPH concentrations ranged from 240 ug/l (MW-319) to 590 ug/l (MW-320). DRO concentrations ranged from 120 ug/l (MW-319) to 350 ug/l (MW-323).

Four monitoring wells (MW-413 through MW-416) were added to the program based on an evaluation of preliminary Phase 1A results outlined in QAPP Change Order No. 3 (**Figure 2-9**). Groundwater samples (MY05GW115 through MY05GW118) were collected from these wells and analyzed for TAL metals and DRO. Following an evaluation of the initial results, these four wells were re-sampled for TAL metals and DRO. The samples were identified with the suffix "-1C" added to the original sample identifiers.

TAL metals results for the above referenced samples indicate PAL exceedences for boron, iron, manganese, and sodium (**Table 4-19**). The boron concentration at MW-414 (2450 ug/l) exceeds the PAL for boron of 630 ug/l. Iron concentrations ranged from 16,700J (MW-416) to 241,000 ug/l (MW-415). Manganese results ranged from 3,440 (MW-413 duplicate sample MY05GW115-C) to 27,200 ug/l, while sodium concentrations were between 30,800 (MW-413) and 2,340,000 ug/l (MW-415). Remaining metal concentrations that did not exceed PALs were typically above reference groundwater concentrations (**Table 4-2**) and are attributed to the fill material that was used in this area during plant construction.

Groundwater samples collected from MW-413 through MW-416 exceeded the DRO PAL of 50 ug/l. DRO concentrations at MW-413 ranged between 1,300J (MY05GW150, duplicate sample of MY05GW115-C) to 2,100J ug/l. Elevated DRO concentrations at MW-413 are attributed to a kerosene spill that occurred up-gradient of these monitoring wells. The details of the remediation of the kerosene spill were provided to MDEP (Stratex, 2000c).

Summary of Groundwater Results

Groundwater data collected from the wells installed north of the 345 kV switchyard in the silt spreading/ball field area show TAL metal exceedences for arsenic, boron, iron, manganese, and sodium. Remaining metals that did not exceed PALs were typically above reference groundwater concentrations (**Table 4-3**). These exceedences are attributed to either saltwater pore water draining out of marine dredge spoils or release of iron, manganese and arsenic from natural soil and rock due to chemical reduction caused by filling over a former salt marsh.

PCBs and pesticides were non-detect in all samples. The only SVOC detected was bis(2-ethylhexyl)phthalate which was below its PAL, while VOCs and vinyl chloride were not detected in any of the groundwater samples.

Nitrates were occasionally detected and were below the PAL in all samples. The samples that had the highest nitrate concentrations may be attributed to the facility sewer line that is directly adjacent to the monitoring wells.

Groundwater samples were tested for EPH during the Phase 1A program. All groundwater samples collected from the wells in this area exceeded the 50 ug/l EPH PAL. During the Phase 1B and 1C programs, groundwater was tested for DRO. The DRO PAL of 50 ug/l was exceeded in all of the groundwater samples.

4.4.10.3 Sediment

Three sediment sampling locations (MY05SD17, MY05SD19 and MY05SD20) were identified in the natural drainage that flows northwest towards Bailey Cove (**Figure 2-9**). The three sediment samples were analyzed for TAL metals, TCL, SIM PAHs, and EPH.

Several metals (barium, boron, chromium, iron, manganese, nickel, vanadium, and zinc) were detected in the samples at concentrations above the maximum concentrations in the reference soil data (**Table 4-22B**). As a result, the metal concentrations were compared to ecological screening values, if available, to evaluate the potential ecological risk. Ecological screening values used for freshwater sediment are provided in NOAA Screening Quick Reference Tables (Buchman, 1999) and USEPA Ecotox Thresholds (USEPA, 1996d).

The concentration of barium, chromium, and iron are below ecological screening values. No ecological screening value exists for boron. The concentration of zinc (170 mg/kg) in one sample (MY05SD20) slightly exceeds the ecological screening value of 150 mg/kg for freshwater sediments published in Buchman, 1999 (NOAA Screening Quick

Reference Tables). The concentration of manganese, nickel, and vanadium slightly exceed freshwater sediment ecological screening values in each of the samples, as shown by the hazard quotients (concentration divided by the screening value) in the table below:

Metal	Screening Value (mg/kg)	Hazard Quotients		
		MY05SD17	MY05SD19	MY05SD20
Manganese	630 (Buchman, 1999)	1.4	1.2	1.3
Nickel	21 (USEPA, 1996d)	1.9	2.3	2.6
Vanadium	57 (Buchman, 1999)	0.9	1.1	1.1

Although the concentrations of these metals slightly exceed the ecological screening values, their ecological risk is likely not significant in this area since there is not sufficient habitat for benthic invertebrates, which is the basis for these screening values. The habitat in this area is comprised of a drainage swale that conveys intermittent runoff from the site. Therefore, there is little to no standing water overlying these sediments for extended periods of time and thus it does not provide suitable habitat for benthic invertebrates.

PCBs and pesticides were not detected in any of the sediment samples. PAHs, EPH, and VOCs were detected at low levels (**Table 4-22B**). The total PAH concentration in these samples ranged from 129 to 614 ug/kg, well below the total PAH ecological screening value of 4,000 ug/kg for freshwater sediment (USEPA, 1996d). Acetone was detected in two of the samples and bromomethane was detected in one sample. Acetone is a common laboratory contaminant and therefore its presence in the samples is likely not site-related. An ecological screening value is not available for bromomethane.

At the request of MDEP, three sediment samples (MY06SD50 through MY06SD52) were collected from the small, intertidal mudflat area southwest of the ballfield area (**Figure 2-10**). The samples were analyzed for SVOCs, PCBs, pesticides, TAL metals, and EPH. The results of this sediment sampling are discussed below in Section 4.5 (Study Area 6).

Three sediment samples (MY05SD15, MY05SD16 and MY05SD18) were located in this area to assess drainage from the former pre-operation cleaning basin (**Figure 2-9**). The results of this sediment sampling are discussed below in Section 4.4.11.3.

4.4.10.4 Surface Water (Seep)

Two seeps that appear to flow consistently throughout the year were identified along the western portion of this area. These seeps are believed to be representative of shallow groundwater breaking out in this area. Two seep samples (MY05SW01 and MY05SW02) were collected (**Figure 2-9**). The seep samples were tested for TAL metals, TCL, SIM vinyl chloride, and EPH.

With the exception of a lead PAL exceedence in MY05SW01(14.2 ug/l), TAL metals concentrations did not exceed the PALs in the seep water collected from MY05SW01 and MY05SW02 (**Table 4-24**). PCBs, pesticides and SIM vinyl chloride were not detected in the seep samples. SVOC bis(2-ethylhexyl) phthalate was detected at a concentration of 67 ug/l (PAL 360 ug/l) in the sample collected from MY05SW01. The VOC, acetone, was detected at 3J ug/l at MY05SW01. No surface water PAL is available for this compound. SVOCs and VOCs were not detected in MY05SW02. EPH (130 ug/l) was detected in the MY05SW01 sample. No PAL is available for this compound, however the seep water results are consistent with the EPH and DRO results in shallow groundwater from this area (Section 4.4.10.2).

4.4.11 Pre-Operation Cleaning Basin

This area is located in the northeastern portion of Study Area 5 and includes an assessment of soils, groundwater, sediment, and surface water associated with an existing pond (**Figure 2-9**).

4.4.11.1 Soil

Five soil borings (MY05SB42 through MY05SB46) were installed in the area of the former cleaning basin (**Figure 2-9**). Three of the soil borings (MY05SB44 through MY05SB46) had monitoring wells (MW-313 through MW-315) installed. Soils from the completed borings were continuously sampled and analyzed as follows: between elevation 21.0 feet (the bottom of the pre-operation cleaning basin) and 19.0 feet: TAL metals, TCL, VOCs, and EPH; highest PID-screened sample: VOCs and EPH; and groundwater interface: TAL metals, TCL, and EPH.

With the exception of a PID measurement of 0.1 ppm (MY05SB42(2-4)) and measurements of 3 and 1.4 ppm in the 8-10 and 10-12 foot intervals, respectively, of MY05SB46, no PID measurements were recorded that exceeded 0 ppm (**Table 4-1**).

Soil samples collected from the former pre-operational cleaning basin, with the exception of iron and a C11-C22 aromatics result of 110 mg/kg (PAL 100 mg/kg) in MY05SB44(6.7-14), did not exceed any of the PALs (**Table 4-18B**). Iron concentrations ranged from 28,200 (MY05SB45(2-4) to 40,500 mg/kg (MY05SB44(4.7-6.7) and were generally consistent with reference soil locations (**Table 4-2**).

PCBs and pesticides were not detected in any of the samples when analysis was specified by the QAPP. VOCs were non-detect in each sample with the exception of 5J ug/kg trichloroethene in MY05SB42(0-0.5), and 160 ug/kg 2-butanone in MY05SB46(0-0.5). SVOCs were not detected in these samples.

With the exception of iron and one EPH exceedence, soil samples collected adjacent to the pre-operation cleaning basin were within the PALs. TAL metals concentrations were generally consistent with reference soil locations (**Table 4-2**).

PCBs and pesticides were non-detect. With the exception of a trichloroethene and a 2-butanone detection, VOCs were not detected. SVOC concentrations in the soil were below the PALs.

4.4.11.2 Groundwater

Three collocated monitoring wells (MW-313 through MW-315) were installed in this area to evaluate potential impacts to groundwater (**Figure 2-9**). The monitoring wells were screened in the overburden, and groundwater from each monitoring well was sampled (MY05GW15 through MY05GW17) and analyzed for TAL metals, TCL, SIM vinyl chloride, EPH and nitrates.

With the exception of manganese, sodium and thallium, TAL metal concentrations were below the PALs and generally consistent with reference groundwater results (**Table 4-2**). The manganese exceeded the PAL in MW-313, MW-314 and MW-315 with results of 1,240, 5,610 (5,730 in duplicate sample), and 8,160 ug/l, respectively (**Table 4-19**). Sodium exceeded the PAL in the same three wells with a range of results between 40,000 and 73,000 ug/l. Thallium in MW-313 (2.9 ug/l) slightly exceeded the PAL of 2.4 ug/l.

PCBs were not detected in any of the samples. With the exception of a heptachlor (0.52 ug/l) PAL exceedence in MW-315, pesticides were non-detect. The PAL for heptachlor is 0.08 ug/l. A groundwater sample from MW-315 associated with Phase 1B sampling was non-detect for heptachlor.

SVOCs were non-detect in the groundwater samples. VOCs and vinyl chloride were not detected in any of the samples except for methylene chloride (2J ug/l to 3J ug/l) and toluene (0.5J ug/l to 2 ug/l). Nitrates were detected in MW-313 (0.37 mg/l) and were not detected in the groundwater samples collected from MW-314 or MW-315.

EPH results exceeded their PALs in MW-314 and MW-315 with concentrations of 180 and 270 ug/l, respectively. The duplicate sample of MW-314 (dup. MY05GW26) exceeded the EPH PAL with a 210 ug/l concentration. The EPH PAL for groundwater is 50 ug/l. EPH was not detected in MW-313.

Based on the preliminary review of the Phase 1A groundwater results, a second set of groundwater samples were collected from monitoring wells MW-313 through MW-315. This round of groundwater samples (MY05GW15-1B through MY05GW17-1B) was submitted for analysis of DRO and pesticides. A third sample (MY05GW15-1C) was collected from MY-313 for analysis of DRO.

Pesticides were not detected in any of the Phase 1B groundwater samples collected from MW-313 through MW-315 (**Table 4-19**).

DRO results exceed the PAL in samples collected from MW-313 (4,500 ug/l), MW-314 (130 ug/l), and MW-315 (300 ug/l). The third sample collected from MW-313 (MY05GW15-1C) exceeded the PAL with a 78 ug/l result. Based on the initial non-detect result for EPH and the follow-up DRO testing performed at MW-313, the DRO result of 4,500 ug/l is believed to be an anomalous detection and not representative of site conditions.

TAL metals data in the groundwater indicate manganese, sodium, and thallium exceeded respective PALs. In MW-315, heptachlor exceeded the 0.08 ug/l PAL with a result of 0.52 ug/l, however the pesticide was not detected in the other wells or in a subsequent sampling event at MW-315. The SVOCs were non-detect in all groundwater samples. VOCs and vinyl chloride were both non-detect. Nitrates were detected in one of the monitoring wells but was well below the nitrate PAL.

EPH was exceeded in two (MW-314 and MW-315) of the three monitoring wells. With the exception of the DRO result of 4,500 ug/l in MW-313, samples collected for DRO analysis during the Phase 1B and Phase 1C sampling programs indicated similar DRO exceedences as were seen in the EPH test results.

4.4.11.3 Sediment

To assess the surface water drainage west of the pond where wastewater from the cleaning basin was released during its brief operation in 1971, two sediment samples (MY05SD15 and MY05SD16) were collected (**Figure 2-9**). MY05SD15 is a freshwater sediment sample and MY05SD16, collected from within the intertidal area of Bailey Cove, is a marine sediment sample. Each sediment sample was analyzed for TAL metals, TCL, SIM PAHs, and EPH (**Tables 4-22A and 4-22B**).

Only a few metals (boron, manganese and zinc) were detected at concentrations above the maximum reference soil concentrations at the freshwater sediment location MY05SD15. No ecological screening value is available for boron, therefore the potential risk posed by its presence could not be evaluated. The concentration of manganese and zinc (1,130 and 214 mg/kg, respectively) exceed freshwater sediment ecological screening values for these metals (630 and 150 mg/kg, respectively) published in NOAA's Screening Quick Reference Tables (Buchman, 1999). However, the ecological risk posed by these metals is likely not significant because the habitat for benthic invertebrates is marginal in this area as it is a drainage swale that intermittently conveys runoff from the site.

The marine sediment sample, MY05SD16, had several metals (arsenic, mercury and nickel) that exceeded their PALs, however these metal concentrations were commonly exceeded at the reference marine sediment locations in Brookings Bay (**Table 4-4**).

PCBs, pesticides and VOCs were not detected in the two sediment samples. PAHs were detected at low concentrations. The total PAH concentration (370 ug/kg) at MY05SD15 is well below the freshwater Ecotox Threshold screening value of 4,000 ug/kg (USEPA, 1996d). EPH was detected only in MY05SD16 at a 72 mg/kg concentration (C11 to C22 aromatics).

A small pond currently exists in the area of the former cleaning basin area. To assess the potential impact of the former cleaning basin on the pond, a sediment sample (MY05SD18) was taken from the pond (**Figure 2-9**). The sample was analyzed for TAL metals, TCL, SIM PAHs, and EPH (**Table 4-22B**).

Zinc was the only metal detected above the maximum soil reference concentration. Zinc was detected at a concentration of 122 mg/kg and the maximum soil reference concentration for zinc is 94 mg/kg. This concentration of zinc is below the ecological screening value of 150 mg/kg (Buchman, 1999), and therefore is unlikely to pose any ecological risk in the pond. Although none of the other metals were detected above the maximum soil reference values, two metals (arsenic and nickel) did exceed ecological screening values. Arsenic was detected at a concentration of 14.1 mg/kg, which exceeds the freshwater sediment ecological screening value of 5.9 mg/kg (Buchman, 1999), and nickel was detected at a concentration of 42 mg/kg, which exceeds the freshwater sediment ecological screening value of 21 mg/kg (USEPA, 1996d). Therefore, a potential risk to benthic invertebrates, if they are present in the emergent wetlands, cannot be ruled out. However, the risk may be overestimated since the metals are consistent with background concentrations.

PCBs, pesticides and VOCs were not detected. PAHs were detected at low levels. The total PAH concentration (958 ug/kg), however, is well below the ecological screening value for total PAHs of 4,000 ug/kg (USEPA, 1996d), and therefore PAHs pose no elevated ecological risk. EPH (C11-C22 aromatics) was detected at 210 mg/kg.

4.4.11.4 Surface Water

A surface water sample (MY05SW03) was collected from the pond that currently exists in the area of the former cleaning basin (**Figure 2-9**). The sample was analyzed for TAL metals, TCL, SIM vinyl chloride, and EPH.

TAL metals concentrations in MY05SW03, and its duplicate MY05SW10, were below the PALs (**Table 4-24**). PCBs, pesticides, and SIM vinyl chloride were not detected in the surface water samples. Analysis of MY05SW10 detected the SVOC bis(2-ethylhexyl) phthalate (25J ug/l). SVOCs and VOCs were non-detect in MY05SW03. EPH was detected at MY05SW03 and MY05SW10 with results of 130 and 150 ug/l, respectively.

4.4.12 Former Truck Maintenance Garage

Soil borings, investigation trenches/test pits and monitoring wells were installed to assess potential contamination in the vicinity of the former truck maintenance garage on the east side of Study Area 5 (**Figure 2-9**).

4.4.12.1 Soil

A soil boring (MY05SB47) was installed in this area and completed as a monitoring well (**Figure 2-9**). Soils from the completed boring were continuously sampled and analyzed as follows: surface soil: TAL metals, TCL, and VOCs, highest PID-screened sample: VOCs and EPH; and groundwater interface, TAL metals, TCL and EPH.

TAL metal concentrations in soil samples collected from MY05SB47 were below all PALs with the exception of iron (24,700 mg/kg) (see **Table 4-18C**) and were consistent with reference soil locations (**Table 4-2**).

EPH, PCBs, pesticides, SVOCs, and VOCs were not detected in the soils collected from MY05SB47. PID measurements were non-detect in the soil collected at MY05SB47 (**Table 4-1**).

To evaluate the area for the presence of dry wells or old drains, a shallow investigation trench was excavated in Phase 1A in a north/south orientation, downgradient of the former maintenance building location (**Figure 2-9**). Visual observations and PID headspace screening were noted in field logs about every 10 feet at various depths (Test Trenches 10 through 80) during installation of the investigation trench (**Table 4-1**).

Based on field observations (stained soil and olfactory evidence) made while excavating the investigation trench an elevated PID headspace screening result (29 ppm at 8-10 feet bgs) and an evaluation of groundwater results from the Phase 1A program, further investigations were proposed in this area. As outlined in QAPP Change Order No. 2,a series of continuous test pit trenches (MY05TP104A through MY05TP104Q) were excavated in and around the former truck maintenance garage to further characterize the area (**Figure 2-9**). Based on PID screening results (**Table 4-1**), two samples were collected from two depths (7 to 9 feet and 9 to 10 feet) within the trench network at location MY05TP104I [(MY05TP104(7-9) and MY05TP104(9-10)] and were submitted for analysis of TAL metals, TCL, VOCs and EPH.

TAL metals concentrations in soil samples collected from MY05TP104(7-9), MY05TP104(9-10), and MY05TP106(7-9) a duplicate sample of MY05TP104(7-9) were below the PALs (refer to **Table 4-18C**) and were consistent with reference soil locations (**Table 4-2**).

PCBs and pesticides were not detected in any of the samples. With the exception of an isolated bis (2-ethylhexyl) phthalate detection of 370J ug/kg (35,000 ug/kg PAL) reported in the duplicate sample, SVOCs were non-detect in all samples. Common laboratory contaminants 2-butanone and methylene chloride were the only VOCs detected in each sample, and the concentrations were well below their respective PALs.

MY05TP104(7-9) and its duplicate sample MY05TP106(7-9) were biased samples collected based on a high PID reading (123 ppm) (**Table 4-1**). MY05TP104(7-9) and MY05TP106(7-9) test results for C11-C22 aromatics were 130 and 160 mg/kg, respectively. MY05TP104(7-9) and MY05TP106(7-9) test results for C19-C36 aliphatics were 300 and 240 mg/kg, respectively. MY05TP104(7-9) and MY05TP106(7-9) test results for C9-C18 aliphatics were 2,400 and 2,000 mg/kg, respectively. The second soil sample from the test pit taken at a depth of nine to 10 feet below ground surface (MY05TP104(9-10)) was non-detect for all three EPH fractions. The biased test pit sample (and duplicate sample) from the 7 to 9 foot depth exceeded the EPH PAL.

In addition to the laboratory analysis from the soil samples from MY05TP104I, soils from 16 additional test pits along the shallow trenches were sampled and screened with a PID (**Table 4-1**). Several soil samples were typically taken from each test pit location and the subsurface geology of each test pit was logged. The test pit logs for the 16 test pits are included in **Appendix C**. The test pits and trenches indicate that the area in and around the former truck maintenance garage has one to three feet of fill on top of six to 15 feet of natural glaciomarine soils below. The glaciomarine soils were typically silt- and clay –rich with a more sand-rich component at depth. Bedrock was commonly encountered and varied from six to 18 feet bgs. Groundwater was observed in many of the test pits, typically at depths of 10 to 12 feet bgs. Elevated PID readings (44 ppm to 123 ppm) and petroleum odors were observed in two general locations in five of the seventeen test pits (**Figure 2-9**). One area with elevated PID values is located just north of the former garage location and includes test pits TP104L, and TP104M (**Figure 2-9**). The second area is located approximately 75 feet east of the former garage and includes test pits TP104B, TP104D, and TP104I (**Figure 2-9**).

Test pits TP104L and TP104M were located within the trench adjacent to the former garage location (**Figure 2-9**). Elevated PID readings (65 ppm) from TP104M were observed at approximately five feet bgs within silty glaciomarine soils, while low PID values were observed in the fill above the glaciomarine soils (1.9 ppm) and in the sandy glaciomarine soils (2.5 ppm) near the water table approximately 10 feet bgs. Elevated PID values and petroleum-contaminated soil were also observed in TP104L located approximately 20 feet north of TP104M. The elevated PID readings (116 ppm) were only observed in deeper soils near the water table approximately 12 feet bgs. Low PID values (3.9 ppm to 4.3 ppm) were reported in the fill and silt-rich glaciomarine soils above the deeper soils. The lack of elevated PID values in the shallow soils of TP104L and the occurrence of the elevated PID readings in deeper soils associated with the water table indicates that the source of the petroleum contamination did not occur at the ground surface near TP104L, but most likely migrated to that location via groundwater transport. The presence of much shallower petroleum contamination associated with TP104M, well above the water table, indicates that the source of the petroleum contamination was very near that location. These observations, and the proximity of the contaminated soils to the former garage, suggest that the source of the contamination may be related to a drain or dry well associated with the former garage.

The second area with elevated PID values includes three test pits (TP104B, TP104D, and TP104I) and is located approximately 75 feet east of the former garage. The three test pits are in close proximity to each other, but elevated PID readings were observed in shallow soils only at TP104D. The PID values for TP104D increase from 26.3 ppm in the shallow fill material to 68 ppm in the sandy glaciomarine soils at nine feet bgs. Elevated PID values in TP104B (55 to 66 ppm) andTP104I (116 ppm) were only observed in the sand-rich glaciomarine soils approximately 10 feet bgs, very near the water table. These observations indicate that a release of petroleum may have historically occurred in the area near TP104D. As indicated by the increasing PID values with depth, the petroleum migrated via infiltration into the deeper soils until the water table was encountered. The elevated PID values and petroleum contamination observed in the deeper soils of TP104B and TP104I has most likely migrated to those areas via groundwater transport. These observations indicate that this area east of the former garage most likely represents a separate release from that observed adjacent to the former garage.

In addition to the five test pits with elevated PID values, 12 test pits located along the trenches had very low or non-detect PID readings. These other test pits occur between the former garage location and the elevated values observed east of the former garage, and in test pits further east along the trench near MW-425 (**Figure 2-9**).

Further investigation may be warranted to further define the extent of petroleum contamination in this area.

4.4.12.2 Groundwater

A collocated monitoring well (MW-316) was installed and screened in the overburden aquifer (**Figure 2-9**). A groundwater sample (MY05GW18) was collected from the monitoring well and analyzed for TAL metals, TCL, SIM vinyl chloride, EPH, and nitrate.

TAL metals were below the PALs and were consistent with reference groundwater locations (**Table 4-3**). PCBs, pesticides, and SIM vinyl chloride were not detected in the groundwater sample. With the exception of an acetone (2J ug/l) value VOCs were non-detect (**Table 4-19**). Nitrates were below the PAL of 10 mg/l with a concentration of 1.3 mg/l. EPH (400 ug/l) exceeded the PAL of 50 ug/l.

Following an evaluation of Phase 1A groundwater results as outlined in QAPP Change Order No. 2, a second groundwater sample (MY05GW18-1B) was collected from monitoring well MW-316 for PCBs, SVOCs, nitrate, and DRO analysis.

PCBs were not detected in MY05GW18-1B or in its duplicate sample MY05GW53-1B (**Table 4-19**). With the exception of rejected values for 2,4-dinitrophenol (25R ug/l), 4-methylphenol (10R ug/l), and pentachlorophenol (25R ug/l), SVOC results were below their respective PALs in both the sample and its duplicate. Nitrates were below the PAL and reported at 2.6 mg/l in both samples. DRO exceeded the PAL in MY05GW18-1B and the duplicate (MY05GW53-1B) with results of 220 and 190 ug/l, respectively.

QAPP Change Order No. 4 outlined additional characterization performed in this area based on detections in groundwater samples collected in Phase 1B. Three additional monitoring wells (MW-424A/B and MW-425) were installed in the former concrete truck maintenance garage area (**Figure 2-9**). The wells were sampled (MY05GW126 through MY05GW128) and the groundwater was tested for DRO. In addition, the existing well (MW-316) was sampled a third time (MY05GW18-1C) and tested for SVOC and DRO.

DRO concentrations in groundwater collected from MW-424A, MW-424B and MW-425 exceeded the PAL with results of 51, 65 and 150 ug/l, respectively. SVOCs were not detected in the sample from MW-316 sample (MY05GW18-1C). DRO exceeded the PAL with a 200 ug/l result.

TAL metals concentrations were consistent with reference soil locations (**Table 4-2**). PCBs, pesticides, and vinyl chloride were not detected in the groundwater. The SVOC detections were typically shown as rejected values and were all below the PALs. EPH and DRO exceeded the PALs at all of the monitoring well locations.

4.4.13 Bailey Farm House Area

Features investigated within this area include a septic system/leach field (west of the farm house), a graywater leach field (east of the farm house) and a fuel oil tank in the basement of the Farm House (**Figure 2-9**).

4.4.13.1 Soil

Soil borings (MY05SB25 and MY05SB54) were drilled during installation of a collocated monitoring well in each of the leach fields (**Figure 2-9**). Soil samples from the borings were sampled continuously and tested for TAL metals, TCL, and VOCs at all three levels: surface, highest PID segment and groundwater interface. The lower two samples were also analyzed for EPH.

With the exception of iron exceeding its PAL in MY05SB25(0-0.5), MY05SB54(2-4) and MY05SB54(6-8), metals did not exceed the PALs in the other depth intervals (refer to **Table 4-20**), and were consistent with reference soil locations (**Table 4-2**).

Aroclor-1260 was detected in MY05SB54(2-4) at a concentration of 49J ug/kg but did not exceed the PAL of 220 ug/kg. Pesticides were non-detect at all of the depth intervals of MY05SB25 and MY05SB54. With the exception of MY05SB55(0-0.5), SVOCs were not detected in the samples described above. Fluoranthene and pyrene were detected in MY05SB55(0-0.5) at 200J and 220J ug/kg, respectively. These values were well below the PALs of 2,300,000 ug/kg. When VOCs were detected, they were below the PALs or were rejected values.

With the exception of samples collected from MY05SB54(2-4), EPH was not detected when it was specified for testing. The C19-C36 aliphatics from the MY05SB54(2-4) sample exceeded the PAL with a 400J mg/kg result, but were non-detect for the surface sample above and below this location. The remaining EPH detections were below the PAL of 100 mg/kg.

To provide additional characterization of the leach field west of the Farm House, three test pits (MY05TP101 through MY05TP103) were installed (**Figure 2-9**). As described in QAPP Change Order No. 2, the soil from these test pits were tested for PCBs, VOCs and EPH.

PCBs (Aroclor-1260) were detected in MY05TP101 through MY05TP103 and ranged between 37 and 59 ug/kg but did not exceed the PAL of 220 ug/kg (**Table 4-20**). VOCs and EPH were detected in the test pit samples but were below their respective PALs.

One soil sample (MY05SS76) was collected beneath the concrete slab of the oil tank in the northeast corner of the house basement (**Figure 2-9**). This sample location was identified during the building assessments based on a small area of stained soil identified beneath the oil filter (Stratex, 2001c). Test results of MY05SS76 indicate EPH soil concentrations that exceed the PAL of 100 mg/kg. The C11-C22 aromatic and C19-C36 aliphatics fractions results were 190 mg/kg (**Table 4-20**). The C9-C18 aliphatics were reported at 490J mg/kg.

TAL metals in the Bailey Farm House area were consistent with reference soil locations (**Table 4-2**). Iron was the only metal to exceed its PAL.

Arochlor-1260 was detected in several of the leach field samples and one soil boring (MY05SB54(2-4)) west of the Bailey Farmhouse. All PCB test results were below the PALs. Pesticides were not detected in the soil samples. Detected concentrations of SVOCs and VOCs were below the PALs. EPH exceeded its PAL in one of the soil borings (MY05SB54(2-4)) and in the sample collected beneath the oil tank in the farm house basement.

4.4.13.2 Groundwater

Collocated monitoring wells (MW-310 and MW-324) were installed adjacent to each of the leach fields (**Figure 2-9**). Groundwater samples (MY05GW12 and MY05GW28) collected from these wells were tested for TAL metals, TCL, SIM vinyl chloride, EPH, and nitrate.

With the exception of a manganese PAL exceedence (1,110 ug/l at MW-324), TAL metals concentrations in MY05GW12 and MY05GW28 were below their PALs (refer to **Table 4-21**) and were consistent with reference groundwater locations (**Table 4-3**). PCBs, pesticides, SVOCs, and SIM vinyl chloride were not detected in either sample. Acetone (3J ug/l) was the only VOC detected and was below its PAL of 700 ug/l. The acetone detection is believed to be a function of laboratory contamination. Nitrate concentrations in both samples were below the PAL. Detections are attributed to the impact of the leach field.

EPH was not detected in MW-324, however the PAL of 50 ug/l was exceeded in MW-310 (130 ug/l).

4.5 Study Area 6 – Shoreline (Outfalls)

Study Area 6 comprises the intertidal and subtidal zones around the plant industrial area. It is the area into which the storm drain system discharges, which is shown in **Figure 3-2**. Intertidal sediment and biota samples were collected from Outfalls 005/006, 008, 010, 011, and 012/N12, and subtidal sediment and biota samples were collected from Outfalls 008, 009, 011, and 012/N12 (**Figures 2-10 and 2-11**). In addition, mummichog was collected in shallow water off Bailey Point and lobster was collected off Long Ledge (**Figure 2-11 and Figure 2-4, respectively)**. At the request of MDEP, an additional three sediment samples were collected in the northern reaches of Bailey Cove from a gully west of the 345 kV Transmission Line area (**Figure 2-10**).

4.5.1 Sediment

<u>Outfall Locations</u>

The general strategy for collection and analysis of sediment samples (MY06SD01 through MY06SD36) at each of the identified outfalls was as follows:

- With the exception of Outfall 009, 3 intertidal sediment samples were collected and analyzed for TCL VOCs and SVOCs, TAL metals, SIM PAHs, grain size, and TOC. Outfall 009 exists within a steep bank and does not have a clearly defined intertidal area.

- With the exception of Outfalls 005/006 and 010, 3 subtidal sediment samples were collected and analyzed for TCL VOCs and SVOCs, TAL metals, SIM PAHs, grain size, and TOC. Due to the close proximity of Outfall 005 and Outfall 006, and the extent of mudflats in this area, four intertidal samples were collected from the mudflats, and two subtidal samples were collected in the area of Outfalls 005 and 006. Subtidal sediment could not be collected at Outfall 010 because of hard, scoured substrate in the subtidal region.

Due to the close proximity of Outfalls 012 and N12, samples were collected at Outfall 012 only.

Additional sediment for possible analysis of PCBs using a PCB homologue and congener method and grab samples for BCSA (MY06BI01A-D through MY06BI36A-D) were collected concurrent with the intertidal and subtidal samples collected for chemical analysis.

The results and conclusions of the initial sediment screening at each of the outfalls were presented in a technical memorandum to the MDEP in November 2001 (CH2M Hill, 2001b) and are discussed in Section 6 and provided in **Table 4-25A**. In general, the initial round of outfall sediment results indicated non-detect concentrations of target organic compounds, with the exception of several low level detections of SVOCs. The SVOCs that exceeded PALs were primarily PAHs, and were limited to Outfalls 005/006 (intertidal and subtidal), Outfall 009 (subtidal), Outfall 010 (intertidal), and Outfall 011 (intertidal). Outfall 009 (location MY06SD16) had the highest concentrations of SVOCs and Outfall 011 slightly exceeded the PAL for only one compound (benzo(a)anthracene).

Three TAL metals - arsenic, mercury and nickel - were commonly detected at each of the outfalls exceeding PALs. These metals also exceeded PALs at the reference sediment areas (**Table 4-4**). Outfall 009 had one sample location (MY06SD16) with a concentration of zinc of 195 mg/kg that exceeded the PAL of 150 mg/kg.

Based on the initial chemistry results at each of the outfalls, additional sediment samples were collected in November 2001 for analysis of bulk sediment toxicity to amphipods (BSTA) and sand worms (BSTS). These additional tests were conducted at the sediment sampling locations where the chemical results exceeded applicable screening levels (CH2M Hill, 2001b). At sediment sampling locations where sediment screening criteria were exceeded, samples were taken for both the previously performed chemical analysis and the BSTA and BSTS toxicity analysis. Samples were collected at Outfall 005/006 (MY06SD04A and MY06TX04), Outfall 009 (MY06SD16A and MY06TX16) and Outfall 010 (MY06SD20A and MY06TX20).

For comparability of data, BCSA analysis was performed on selected samples collected in the initial round of sediment sample collection. BCSA analysis was performed at Outfall 005/006 (MY06BI01A-D through MY06BI04A-D), Outfall 009 (MY06BI16A-D) and Outfall 010 (MY06BI20A-D).

PCB congener and homologue analysis, which produces lower detection limits, was performed at the sample location nearest to the outfall, since the initial round of sample results did not indicate detection of PCBs using the 8082 methodology. This additional analysis was performed at sediment sample locations MY06SD04A, MY06SD08, MY06SD16A, MY06SD20A, MY06SD26, and MY06SD32.

The results of this phase of sampling were summarized in a technical memorandum (May 2002) addressing the ecological risk to the benthic community near each outfall (CH2M Hill, 2002a). The second round of chemistry results, shown in **Table 4-25A**, were consistent with the concentrations in the first round of sediment sampling. However, the concentrations of SVOCs at MY06SD04 (Outfall 005/006) were generally lower in the second round, with none of the SVOCs exceeding benchmarks. Additionally, the two SVOCs, acenaphthene and fluorene, which exceeded the screening benchmarks at only Outfall 005/006, location MY06SD04, in the first round of sampling, were not detected in the second round of sampling at this location. Fluorene was also detected at

MY06SD16A (Outfall 009) at the highest concentration observed at any of the stations, although it was not detected there in the first round of sampling.

The second round sample at Outfall 009 (MY06SD16A) indicated a zinc concentration lower than the level detected in the first round (113 mg/kg versus 195 mg/kg) and less than the zinc PAL of 150 mg/kg.

Several individual PCB congeners were detected at each of the outfall locations; however none exceeded their respective PAL.

The pesticide 4,4'-DDT was detected above the PAL of 1.58 ug/kg in the second round of sampling at Outfalls 009 and 010. Sample MY06SD16A had a 4,4'-DDT concentration of 12 ug/kg, while sample MY06SD20A and its duplicate (MY06SD41) had concentrations of 5.7J and 11J, respectively. The pesticides endrin aldehyde and heptachlor were also detected in sample MY06SD20A.

Delineation of PAHs at Outfall 009

As outlined in QAPP Change Order No. 4, additional sediment samples were collected from the Outfall 009 area to bound the extent of PAHs identified in the initial round of sampling. The additional sediment samples from this outfall area (MY06SD101A through MY06SD107B and MY06SD110 through MY06SD114) were collected at three intervals (0 to 3.5 inches, 3.5 to 9 inches and 9 to 12 inches) where possible depending on depth of refusal, using a sediment gravity corer. They were located along two sampling transects intersecting MY06SD16, where elevated PAH concentrations (118,280 ug/kg total PAH) were the greatest. A deep-water sediment sample (MY06SD116) from 0 to 6 inches was collected from the intake channel just north of Outfall 009 using a petite ponar dredge. The sediment samples were analyzed for SVOCs/SIM PAHs.

The results of this additional sampling effort conducted at Outfall 009 between August and October 2002, was outlined in Maine Yankee's remediation plan for Outfall 009 (MY, 2003a) and is summarized in **Table 4-25B**. The results of this sampling effort indicated that the distribution of PAHs is confined to an approximate 50-foot radius from the base of the slope, covering an area of about 5,500 square feet, and nearly 4 inches in depth. The area of contamination is physically bounded by the intake channel and bedrock/hard substrate to the north and east, and diminishing PAH concentrations to the south. The deeper sediment intervals (generally 3.5 to 9 inches) all contained much lower total PAH concentrations than did the surface intervals. In areas of sediment deposition, refusal was generally encountered at a depth of 9 to 12 inches. The MDEP approved Maine Yankee's Outfall 009 remediation plan (MDEP, 2003b), which was implemented in fall 2003. The results of the remediation activities will be docucmented in the CMS.

345 kV Transmission Line Gully

As outlined in QAPP Change Order No. 4 at the request of the MDEP, three samples (MY06SD50 through MY06SD52) were collected in the upper portion of Bailey Cove from the gully west of the 345 kV Transmission Line area (**Figure 2-10**). The sediment samples were analyzed for SVOCs, PCBs, pesticides, TAL metals, and EPH. A summary of the results is provided in **Table 4-25A**.

EPH C19-C36 aliphatics were detected at all three samples and the duplicate sample ranging from 39 to 85 mg/kg. C9-C18 aliphatics were detected in two of the samples (MY06SD50 and 51) at less than 26 mg/kg.

Three TAL metals, arsenic, mercury and nickel, were detected at each of the locations (including the duplicate sample collected at MY06SD52) exceeding PALs. These metals also exceeded PALs at the reference sediment areas (**Table 4-4**). A concentration of lead of 49J mg/kg at MY06SD52 slightly exceeded the PAL of 46.7 mg/kg, however the duplicate sample collected at this location (MY06SD53) showed a lead concentration of 29.5J mg/kg.

PCBs, pesticides (with the exception of a rejected value of methoxychlor at MY06SD50), and VOCs were non-detect.

4.5.2 Biota

In addition to sediment, biota samples were collected from outfall areas for tissue residue analysis. Blue mussels were collected from subtidal or low intertidal locations, and soft-shell clams were collected from intertidal mud flat locations (**Figure 2-11**). Mummichog were collected for tissue analysis along the shoreline adjacent to the facility (**Figure 2-11**). Lobster were collected from the Long Ledge area of the Back River adjacent to the facility (**Figure 2-4**). The general strategy for collection and analysis of biota samples was as follows:

- With the exception of Outfall 009, collect up to 20 soft-shell clams from 3 intertidal locations (MY06BC01 through MY06BC18) for analysis of SVOCs, pesticides, PCBs, TAL metals, SIM PAHs, and lipids. A duplicate sample (MY06BC19) was collected at location MY06BC15.

- With the exception of Outfall 005/006, collect up to 30 blue mussels from 3 subtidal locations (MY06BM01 through MY06BM15) for analysis of SVOCs, pesticides, PCBs, TAL metals, SIM PAHs, and lipids.

- A total of approximately 400 mummichog were collected from shallow water on the east and west side of Bailey Point. Two composite samples (MY06MM01 and MY06MM02) and one duplicate sample (MY06MM03) of MY06MM02 were submitted for analysis of SVOCs, pesticides, PCBs, TAL metals, and lipids.

- Twenty (20) lobster specimens were collected from Montsweag Bay in the vicinity of Long Ledge. The lobster were divided into four groups (MY06BL01 through MY06BL04) consisting of four lobsters, and one duplicate sample (MY06BL05) of MY06BL04 consisting of four lobsters for analysis of SVOCs, pesticides, PCBs, TAL metals, and SIM PAHs. A composite lobster tomalley (pancreas) sample (MY06BL06) was generated from the 20 lobster for like analysis.

The results of this assessment phase, excluding lobster, were presented in a technical memorandum to the MDEP in July 2002 (CH2M Hill, 2002b) and are further evaluated in the Ecological Risk Assessment outlined in Section 6 of this report. The human-health risk associated with biota is detailed in Section 5 of this report. The results of the tissue analyses are provided in **Table 4-26** and are briefly discussed below.

Soft-Shell Clams

All of the clam tissue samples (including the duplicate sample MY06BC19 collected at MY06BC15) showed detected inorganic and organic analytes comparable to the reference samples (**Table 4-5**). The clam samples collected from the outfall areas, as well as the reference area, exceeded PALs for arsenic, iron, PCBs (Aroclor 1254 and 1260), several SIM PAHs (benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(a,h)anthracene), and the SVOC pentachlorophenol. The highest metal concentrations were detected in samples MY06BC01 through MY06BC06 from the Outfall 005/006 area. PCB concentrations were greatest in samples MY06BC01 and MY06BC02 from the area of Outfall 005/006, however, the PCB concentrations in all of the outfall clam samples were below the reference clam concentrations. PAH concentrations were consistent throughout the outfall areas. The detected pesticides and remaining SVOCs were less than their respective PALs.

Blue Mussels

All of the mussel tissue samples showed detected inorganic and organic analytes comparable to the reference samples (**Table 4-5**). The mussel samples collected from the outfall areas, as well as the reference area, exceeded PALs for arsenic and the PAH benzo(a)pyrene. The one exception was sample MY06BM04 collected from Outfall 009 that exceeded the PAL for additional PAH compounds benzo(a)anthracene and benzo(b)fluoranthene, and had the highest level of benzo(a)pyrene.

PCBs were non-detect, and pesticides and remaining SVOCs were less than their respective PALs for mussel samples from each of the outfall areas.

Mummichogs

All of the mummichog tissue samples (including the duplicate sample MY06MM03 collected at MY06MM02) showed detected inorganic and organic analytes comparable to the reference sample (**Table 4-5**). The mummichog samples collected from the plant area, like the reference sample, exceeded PALs for arsenic and PCBs (Aroclor 1254 and 1260). The one exception is iron at 616J mg/kg at MY06MM02, which exceeded the PAL of 410 mg/kg. However, the duplicate sample (MY06MM03) of MY06MM02 revealed a much lower iron concentration (37J).

With the exception of the rejected value of n-nitroso-di-n-propylamine at each of the sample locations, all SVOCs and pesticides concentrations were less than their respective PALs.

Lobster

The four lobster samples (MY06BL01 through MY06BL04) and duplicate sample MY06BL05 of MY06BL04 detected several inorganic and organic analytes (**Table 4-26**). Of the detected metals, only arsenic, ranging from 2.46 to 2.86 mg/kg, significantly exceeded its PAL of 0.014 mg/kg. Mercury detections were consistent with the PAL of 0.2 mg/kg.

PCBs were not detected in samples MY06BL01 through MY06BL04, however the duplicate sample of MY06BL04 (MY06BL05) indicated an Aroclor 1260 concentration of 2.2J and rejected Aroclor 1221 through 1254 concentrations of 3.3R, which exceed the PAL of 1.6 ug/kg.

With the exception of the rejected toxaphene concentration in the duplicate sample MY06BL05, all pesticide levels are less than their assigned PALs. The majority of the detected SVOC concentrations are less than their PALs, with the exception of pentachlorophenol concentrations ranging from 0.033J to 0.34J mg/kg (above the PAL of 0.026 mg/kg) and the rejected concentrations of n-nitroso-di-n-propylamine.

A composite lobster tomalley sample (MY06BL06) was analyzed for SVOCs, pesticides, PCBs, TAL metals, and SIM PAHs (**Table 4-26**). The tomalley sample exceeded PALs for arsenic (4.29 mg/kg vs. 0.014 mg/kg), PCB Aroclor 1260 (130J ug/kg vs. 1.6 ug/kg), and the pesticides 4,4'-DDE (38J ug/kg vs. 9.3 ug/kg) and alpha-BHC (1.1J ug/kg vs. 0.5 ug/kg). The analytical results of several PCB Aroclors and the pesticide toxaphene were above their respective PALs, however results were rejected by data validation. Several PAHs were detected above PALs, including: benzo(a)anthracene (5.6J ug/kg vs. 4.3ug/kg), benzo(a)pyrene (2.7J ug/kg vs. 0.43 ug/kg), benzo(b)fluoranthene (8.8J ug/kg vs. 4.3ug/kg), dibenzo(a,h)anthracene (0.49J ug/kg vs. 0.43ug/kg). The SVOC pentachlorophenol (0.11J mg/kg) was also detected above its PAL of 0.026 mg/kg.

4.6 Diffuser Sampling Program

Deep-water sediment samples were collected from the Back River to support an evaluation of decommissioning the plant submerged diffuser system (AOC-4) and to assess potential chemical releases through the Forebay. Six sediment samples (MYSDDIF01 through MYSDDIF03 and MYSDDIF05 through MYSDDIF07) were collected in and around the diffuser system, which consists of two submerged pipes (**Figure 2-12**).

One sediment sample was collected from inside the approximate middle of each diffuser. The sample from within the north diffuser (MYSDDIF01) was taken adjacent to Nozzle 11N and the sample from within the south diffuser (MYSDDIF02) was taken adjacent to Nozzle 10S. Two additional sediment samples were collected from the immediate vicinity of the outside of each diffuser. The north diffuser was sampled directly outside Nozzle 8N (MYSDDIF03 and duplicate sample MYSDDIF04) and Nozzle 19N (MYSDDIF05). The south diffuser was sampled directly outside Nozzle 6S (MYSDDIF06) and Nozzle 19S (MYSDDIF07).

Two deep-water reference sediment samples were collected from the Back River approximately 2000 feet north (MYSDDIF09) and south (MYSDDIF10) of the diffuser system for comparison (**Figure 2-4**). All sediment samples were analyzed for TCL, TAL metals, PCBs (including congener and homologue analysis), EPH, grain size, and TOC. A summary of the diffuser sediment analytical results is provided in **Table 4-27**.

Low levels of EPH aromatics and aliphatics were detected in and within close proximity to the diffuser system at similar concentrations to the levels detected in the reference samples. The C19-C36 aliphatics ranged from 23 to 53 mg/kg, below the reference range of 69 to 100 mg/kg, and the C9-C18 aliphatics ranged from non-detect to 15 mg/kg, below the reference range of 16 to 18 mg/kg. A C11-C22 aromatic was detected in only one of the samples (MYSDDIF06) of 23 mg/kg.

The sediment samples collected from the middle of each diffuser (MYSDDIF01 and MYSDDIF02) had low detections of PCBs (Aroclor 1260), approximately half of the PAL of 22.7ug/kg. The southern reference sample (MYSDDIF10) had a PCB (Aroclor 1248) concentration of 39 ug/kg. Several low-level PCBs using the congener method were detected within Back River below PCB PALs, with the exception of the southern reference sample (MYSDDIF10) that had a tetrachlorobiphenyl concentration of 33J ug/kg.

Three TAL metals, arsenic, mercury and nickel, were commonly detected at each of the diffuser locations exceeding PALs. These metals also exceeded PALs at the reference sediment areas in Brookings Bay (**Table 4-4**) and the two reference locations in Back River. Silver, detected in Brookings Bay at less than 0.2 mg/kg, exceeded the PAL of 1 mg/kg in two of the seven diffuser samples and both of the reference locations.

Several pesticides were detected in three of the diffuser locations. The sample collected from the middle of the north diffuser (MYSDDIF01) had a 4,4'-DDT concentration (3.5J ug/kg) that exceeded the PAL of 1.58 ug/kg. Concentrations of this pesticide ranging between 5.7 and12 ug/kg were also detected in sediment collected from Outfall 009 and Outfall 010 on the Back River.

With the exception of SVOCs detected in the middle sediment sample from the north diffuser (MYSDDIF01), only low-level PAHs were detected in the diffuser and reference samples. The duplicate sample MYSDDIF04 (duplicate of MYSDDIF03) had the lone SIM PAH compound that exceeded a PAL; benzo(a)anthracene with a concentration of 280 ug/kg versus a PAL of 261 ug/kg. The majority of the detected PAHs were also detected in the reference samples and with comparable concentrations.

Sporadic VOC compounds were detected in the diffuser and reference samples; however, with the exception of carbon disulfide, they were either rejected through data validation or are common laboratory contaminants. Carbon disulfide, not detected in the two reference samples, was detected in and around the diffusers with a maximum concentration of 19J ug/kg.

4.7 Summary of Characterization Results

The nature and extent of chemical constituents on the Bailey Point portion of the Maine Yankee site has been defined through an investigation of soil, groundwater, sediment, surface water, concrete, and biota. The following is a summary of the investigation results by media, and a comparison to reference data and Project Action Limits (PALs). The human-health and ecological risk assessment associated with the investigation results are presented in Sections 5 and 6 of this RFI Report.

4.7.1 Soil

Table 4-28 summarizes PAL exceedences for soil within the Bailey Point area. The most prevalent compounds exceeding PALs were iron and petroleum hydrocarbons, primarily EPH and PAHs. In general, the iron PAL exceedences were consistent with the range of iron concentrations observed in reference samples.

The reference surface and subsurface soil results indicated non-detect concentrations of target organic compounds and TAL metal concentrations that are consistent with published background data (**Table 4-2** and MY, 2004). The average iron concentration (22,815 mg/kg) is very near the PAL of 23,000 mg/kg, and had a maximum reference concentration of 44,900 mg/kg. With the exception of iron exceeding the PAL in one sample, the surface soils collected from Study Area 3 (Foxbird Island) to characterize the soil associated with historic construction of the diffuser pipeline did not detect any chemical constituents of concern. The concentration of iron was consistent with reference data. Based on this understanding, no risk to human health or the environment is indicated for Foxbird Island and no risk characterization is conducted for Foxbird Island in **Section 5.0** of this RFI report.

In general except as noted below (**Section 4.8.1.1**), metal concentrations observed in soils from Study Areas 3, 4 and 5 were consistent with reference soils (**Table 4-2 and Tables 4-6, 4-7, 4-9, 4-11, 4-13, 4-14, 4-16, 4-17, 4-18, and 4-20**). Of particular interest is the distribution of arsenic in the Bailey Point soils. The concentration of arsenic observed in Bailey Point soils ranged from 2 mg/kg to 21.3 mg/kg. Arsenic concentrations were below the PAL (22 mg/kg) and were consistent with the observed range in reference soil concentrations (0.16 mg/kg to 16.4 mg/kg) from the Backlands portion of Maine Yankee (MY, 2004). The range of arsenic concentrations observed in the Bailey Point soils represents a background levels. The significant source of arsenic in the Maine Yankee soils is related to the presence of sulfide minerals including pyrite and pyrrhotite (Ayuso, et. al., 2003). These naturally occurring minerals are commonly present in metamorphic rocks and glacially derived soils in Maine and New England (Ayuso, et. al., 2003).

The range of observed arsenic concentrations present in the reference and Bailey Point soils is consistent with both published data and other soil sampling efforts conducted by Maine Yankee at several off-site borrow pit locations. Shacklette and Boerngen (1984) established a range of arsenic concentrations in the eastern portion of the United States (0.1 mg/kg to 73 mg/kg) with a mean concentration of 7.4 mg/kg. Maine Yankee collected 14 soil samples from nine borrow pits in Maine to identify appropriate clean fill to support decommissioning activities. Arsenic concentrations ranged from 1.3 mg/kg to 77.6 mg/kg with an average concentration of 21 mg/kg. Based on the observed range of arsenic in the reference and Bailey Point soil samples compared to both the published and recently collected samples from Maine borrow pits, and the ubiquitous presence of pyrite and pyrrhotite in glacial soils and bedrock in Maine, the arsenic distribution in the Backlands reference and Bailey Point soils is indicative of background levels.

An investigation of soils in the remaining area of Bailey Point (Study Area 5) has identified several areas of contamination related to some aspect of plant construction or operation. The following areas of interest were identified:

- Industrial and Radiological Restricted Areas. Surface and subsurface soils contain elevated concentrations of PAHs and detected concentrations of PCBs, pesticides, and EPH (AOC-2).

- Warehouse 2/3. Surface soils on the northwest side of Warehouse 2/3 contain elevated levels of PAHs, lead and PCBs, and detected concentrations of pesticides. Subsurface soils on the southwest side of Warehouse 2/3 contain elevated levels of VOCs (xylenes, ethylbenzene, and toluene) associated with the disposal of paint thinners, paint and PCB-containing paint.

- Construction Transformer. Surface soils contain elevated concentrations of EPH and PCBs.

- Former Truck Maintenance Garage. Subsurface soils contain elevated concentrations of EPH.

- 345 kV Transmission Line Area. Subsurface soils contain elevated concentrations of EPH and PAHs and detected concentrations of PCBs.

- Bailey Farm House. Subsurface soils from the leachfield contain elevated levels of EPH and detected concentrations of PCBs.

- Parking Lot C. Shallow soils contain elevated levels of EPH and PAHs.

These areas of interest are evaluated for potential risk to human health in Section 5.0 of this report. The results for the Former Truck Maintenance Garage indicate the presence of elevated concentrations of petroleum hydrocarbons, although specific target compounds that can be utilized to evaluate site risk were below PALs or had non-detect values. The petroleum hydrocarbon concentrations in soil indicated that further action is necessary for the Former Truck Maintenance Garage, and Maine Yankee plans to conduct additional soil characterization to support the CMS. Quantitative risk assessment will not be conducted at the Former Truck Maintenance Garage in Section 5.0 of this report due to the lack of target compounds detected and the additional soil characterization that will be conducted to support the CMS..

Although the soil and sediment results have indicated minimal impact of RCRA constituents, the Forebay has undergone significant remediation that was driven by radiological constituents. During 2003, the upper five feet of the dike material and approximately 777 cubic yards of sediment were removed from the Forebay. Confirmatory samples from the sediment removal area will be included in the CMS. Due to the remediation activities completed in the Forebay, no additional risk characterization is conducted for the Forebay in **Section 5.0** of this RFI report.

A few areas remain to be investigated upon completion of ongoing decommissioning activities. These areas, proposed in the QAPP, include several sub-slab soil samples from the RA/Turbine Hall areas. Sampling will be completed within these areas as they become available to confirm final site conditions.

4.7.2 Groundwater

Table 4-29 summarizes PAL exceedences for groundwater within the Bailey Point area. The most common PAL exceedences were metals such as manganese and sodium, and petroleum hydrocarbons in the form of DRO.

Groundwater in the reference wells was interpreted as having no target organic compounds reported above the project quantitation limits and having metal concentrations generally consistent with a background distribution.

Sampling of groundwater monitoring wells on Bailey Point has revealed a number of contaminants that are related to some aspect of plant construction or operational activities. The contaminants may have been introduced by way of surface release to soils, subsurface pipe leaks or from natural geologic releases, such as the release of iron and manganese.

An investigation of groundwater beneath the Bailey Point area (Study Areas 4 and 5) has identified several areas of contamination related to some aspect of plant construction or operational activities:

- DRO, aluminum, arsenic, molybdenum, manganese, sodium, and dieldrin in groundwater in several wells located throughout the RA/Industrial Area and the northern portion of Bailey Point, including ISFSI and the Pre-operation Cleaning Basin;

- DRO, boron, iron, manganese, molybdenum, and sodium in groundwater north of ISFSI and under the 345 kV transmission line area within the dredge spoil disposal area;

- TCA and related chlorinated daughter products, manganese and sodium in groundwater east and south of Warehouse 2/3; and

- BTEX compounds, vinyl chloride, aluminum, arsenic, iron, manganese, and molybdenum in groundwater west of Warehouse 2/3.

4.7.3 Concrete

Concrete samples were collected from subgrade areas within Study Area 5 identified during the facility assessment phase. Areas of minor petroleum-contamination (PAL exceedence of EPH C19-C36 aliphatics) were identified within the PAB and the CWPH, which are not expected to migrate. An area of petroleum-contaminated concrete from the slab of the Fire Pond Pump House was remediated during the RFI to levels well below applicable PALs.

Several areas remain to be investigated as a result of ongoing decommissioning activities. These areas, proposed in the QAPP, include several sub-slab concrete samples from structures within the RA area. These areas will be sampled prior to final site closure as areas become available.

4.7.4 Surface Water

Few PAL exceedences were associated with the surface water samples collected from Study Area 5 as part of the RFI. The exceptions include three metals: aluminum, lead and zinc. The following areas were identified:

- The seep location along the western berm of the Forebay exceeded PALs for aluminum and lead;

- The excess flow from Outfall 011 exceeded the PAL for aluminum and zinc; and

- A seep from the west side of the 345 kV Transmission Line Area had a lead PAL exceedence.

These areas are small in size relative to the receiving water bodies (Back River and Bailey Cove) and consist of low intermittent flows.

4.7.5 Sediment (Study Area 5)

The most common PALs exceeded in marine sediment within Study Area 5 were metals such as arsenic, nickel and mercury, which are commonly exceeded in the reference marine sediment. PAL exceedences of other metals (i.e., copper, lead and zinc), PCBs, pesticides and SVOCs were associated with the sediment within the Forebay, which will be removed as part of radiological remediation activities. The concentration of metals on the exterior of the Forebay berms were consistent with reference sediment.

A freshwater sediment sample was collected from the bottom of the Fire Pond. The source of the sediment was from the Montsweag Brook pumped to the Fire Pond. Ten of the inorganic results exceeded the maximum reference soil concentrations. The Fire Pond was drained and backfilled with the soil that formed the walls of the Pond, leaving the original bottom approximately 10 feet below the new ground surface. The majority of the bottom sediments were removed along with the liner of the Pond and disposed off-site.

Freshwater sediment samples collected from swale areas downgradient of potential contaminant sources in the 345 kV Transmission Line and Pre-Operation Cleaning Basin Areas exceeded maximum reference soil concentrations for nine metals (barium, boron, chromium, iron, manganese, mercury, nickel, vanadium, and zinc). Although four of these metals (manganese, nickel, vanadium, and zinc) slightly exceeded ecological screening values, a significant ecological risk does not exist within these areas because of the lack of standing water and/or critical habitat. Low levels of EPH and PAHs were detected in several of the freshwater sediment samples. The total PAH concentration in each of these samples, however, were well below the total PAH ecological screening value.

4.7.6 Sediment (Study Area 6)

Study Area 6 comprises the intertidal and subtidal zones around the Bailey Point area where the majority of industrial area stormwater discharges occurred, as well as a gully in the northern reach of Bailey Cove that received runoff from the construction debris/silt spreading area north of the 345 kV Switchyard. The following areas identified contaminants relative to applicable PALs, benchmarks and/or reference values in the initial round of sampling:

- SVOCs at intertidal and subtidal stations at Outfall 005/006;
- A subtidal station at Outfall 009 had the highest concentration of SVOCs (primarily PAHs);

- SVOCs at one intertidal station at Outfall 010; and
- SVOCs at an intertidal station at Outfall 011.

Based on the results of the initial outfall sediment screening presented to MDEP November 2001, it was concluded that three of the sampling locations required further investigation in the form of sediment toxicity testing and BCSA. Further sampling at one location was identified within the following areas:

- Outfall 005/006 intertidal;
- Outfall 009 subtidal; and
- Outfall 010 intertidal.

Three TAL metals, arsenic, mercury and nickel, exceeded PALs in marine sediment collected from the gully west of the 345 kV Transmission Line Area. These metals commonly exceeded PALs at the reference sediment areas. A concentration of lead at one of the sample locations slightly exceeded the PAL, however the duplicate sample at this location showed approximately one-half the lead concentration.

4.7.7 Sediment (Diffuser)

The sediment samples collected within and in close proximity to the diffuser system (AOC-4) were comparable to the reference samples collected upstream and downstream of the diffuser. The concentration of three metals that exceeded PALs (arsenic, mercury and nickel) were consistent with the diffuser reference samples from Montsweag Bay and comparable to the reference samples collected from Brookings Bay. Silver slightly exceeded the PAL at two of the seven diffuser locations and the two reference sites in Montsweag Bay, however was about five times greater than the silver concentrations detected in Brookings Bay. The majority of the detected PAHs were also detected in the reference samples at comparable concentrations. There was an isolated 4,4'-DDT and benzo(a)anthracene PAL exceedence within the north diffuser. The lone PCB PAL exceedence occurred in one of the reference samples.

4.7.8 Biota

As part of the risk evaluation for the marine benthic community near the outfalls, soft-shelled clam, blue mussel, and mummichog samples were collected and their tissue were analyzed for chemical residues to assess potential risk from bioaccumulative chemicals. The results of this assessment phase were presented in a technical memorandum to the MDEP in July 2002 and discussed with MDEP and federal regulators October 2002 (CH2M Hill 2002b and 2002c).

To evaluate the potential human-health risks, soft-shelled clam, blue mussel and lobster tissue were analyzed for chemical residues. There does not appear to be a significant difference between the chemical composition of the site and reference clam and mussel tissue. The lobster tissue and tomalley samples exceeded the PAL for arsenic. Concentrations of pesticides, PCBs and SVOCs were greater in the tomalley than the whole-body tissue samples.

4.8 Contaminant Fate and Transport

This section provides an interpretation of the fate and transport of compounds detected in the RFI conducted at the Maine Yankee facility. The fate and transport of both organic and inorganic compounds in the environment is typically controlled by physical and chemical properties including density, solubility and miscibility (determines leaching capability in water and other fluids present), vapor pressure, Henry's law constant, organic carbon partition coefficient (Koc), the octanol water partition coefficient (Kow), and chemical and biological processes including sorption (including ion exchange and chemical precipitation), hydrolysis, volatilization, photolysis, and biodegradation (Ney, 1995).

Different properties are dominant in the unsaturated lithologic zones compared with the saturated zones. Once a contaminant enters the groundwater regime, either as a dissolved or separate phase liquid, or in colloidal form as a solid phase, the characteristics of the groundwater flow regime are important. In low permeability materials, diffusion may dominate over advective transport. In fractured media, the nature of the fracture system and dual porosity issues dominate. The geochemistry of the groundwater and considerations of chemical equilibrium become important to the removal and addition of some chemicals in the dissolved phase. Dispersivity is a function of the heterogeneity of the hydraulic conductivity tensor and causes spreading of a contaminant plume. Vertical and horizontal groundwater gradients control density flow effects and the advective transport of contaminants throughout the system.

This section of the report deals with observed distributions of the contaminants in both soil and groundwater and attempts to relate those observed distributions to the dominant standard physical and chemical processes that are interpreted to control the movement and spatial and temporal changes in concentration of contaminants on this site.

4.8.1 Contaminant Sources in Soil

The RFI conducted at the Maine Yankee facility has identified a number of potential contaminant sources in soil. A summary of the potential contaminant sources in soil includes the following:

- Industrial and Radiological Restricted Areas. Surface and subsurface soils contain elevated concentrations of PAHs and detected concentrations of PCBs, pesticides, and EPH (AOC-2).

- Warehouse 2/3. Surface soils on the northwest side of Warehouse 2/3 contain elevated levels of PAHs, lead and PCBs, and detected concentrations of pesticides. Subsurface soils on the southwest side of Warehouse 2/3 contain elevated levels of VOCs (xylenes, ethylbenzene, and toluene) associated with the disposal of paint thinners, paint and PCB-containing paint.

- Construction Transformer. Surface soils contain elevated concentrations of EPH and PCBs.

- Former Truck Maintenance Garage. Subsurface soils contain elevated concentrations of EPH.

- 345 kV Transmission Line Area. Subsurface soils contain elevated concentrations of EPH and PAHs and detected concentrations of PCBs.

- Bailey Farm Area. Subsurface soils contain elevated levels of EPH and detected concentrations of PCBs.

- Parking Lot C. Shallow soils contain elevated levels of EPH and PAHs.

4.8.1.1 Metals

TAL metals were analyzed in surface and subsurface soils at locations specified in the QAPP (Stratex, 2001c). The concentration of detected TAL metals was typically below PALs and consistent with reference concentrations established in the backland soils (MY, 2003). Exceptions include iron, manganese, and lead. Detected iron concentrations commonly exceeded the PAL, but were consistent with the range of iron concentrations observed in reference samples (**Table 4-2 and Tables 4-6, 4-7, 4-9, 4-11, 4-13, 4-14, 4-16, 4-17, 4-18, and 4-20)** (MY, 2004). Thus, the iron concentrations in the Bailey Point soils are representative of background levels. Manganese and lead were typically below the PAL and consistent with the range of reference soil concentrations except for MY05TP02(0-0.5) (lead, 397 mg/kg) and MY05SS75 (lead, 969 mg/kg) and the surface sample associated with soil boring MY05SB58 (manganese, 1890 mg/kg). The surface sample from MY05SB58 is a duplicate sample of MY05SB50 where the manganese concentration was reported at 710 mg/kg, below the PAL (1800 mg/kg) and consistent with reference soils.

The primary factors controlling the fate and transport of metals in soils include the speciation or mineral stabilizing the metal, adsorption capacity, pH, leaching, and water solubility of the metal/metal complex. For metals with the potential to occur at different valence states, the redox potential of the environment is also important (Adriano, 1992).

Iron and manganese detected in soil at the Maine Yankee facility are most likely stabilized in oxide and hydrated oxide minerals. Iron in surface and subsurface soils typically occurs in the Fe^{2+} and Fe^{3+} oxidation states in the minerals goethite, limonite, and hematite. Manganese is typically present in hydrated oxides or carbonate minerals as Mn^{2+}, Mn^{3+}, and Mn^{4+}, commonly substituting for iron in iron-bearing oxides and hydrated oxides. Iron and manganese will typically be stabilized in oxide or hydrous oxide minerals unless the stability of these minerals changes.

Lead is most likely stabilized in hydrous oxides or as metallic lead adsorbed to soil. Lead has limited mobility in the environment. Lower pH environments will enhance the mobility of lead, while soils high in clay minerals will minimize lead mobility (Adriano, 1992). The elevated lead concentrations reported in the surface sample for MY05TP02 (397 mg/kg) are not observed in the soil sample from 4 to 4.5 feet below ground surface (14.1J mg/kg). The lower lead concentration in the deeper soils at MY05TP02 demonstrates the limited mobility of lead site soils.

At Maine Yankee, numerous areas of the facility on Bailey Point were modified during the early construction of the facility and native soils (glaciomarine soils), blasted rock, and marine sediments were used as fill material at the facility. In general, gravelly sand borrow from nearby pits and blasted rock were used as fill material in the southern portion of Bailey Point including the RA, Industrial Area, and Warehouse 2/3 areas, while dredged marine sediments were a significant component of the fill material associated with the northern portion of Bailey Point.

The fill material has contributed to the distribution of iron and manganese at the site. As illustrated in **Figures 4-1 and 4-2**, total iron and manganese soil concentrations are generally lower in the soils from the southern portion of Bailey Point (RA, Industrial and Warehouse 2/3 areas) as compared to soils from the northern area of bailey Point (345 kV Transmission Line area). In addition to the difference in iron and manganese concentrations, the manganese/iron ratio is different for the two areas. Both areas have a nearly constant manganese/iron ratio, but the ratio associated with soils from the 345 kV Transmission Line area is greater than that for the RA, Industrial, and Warehouse 2/3 area (**Figures 4-1 and 4-2**).

The constant value of manganese/iron in the soils indicates that one mineral is controlling the distribution of iron and manganese in the soils. The most likely mineral containing and controlling the iron and manganese distribution is hydrated iron oxides, as iron is present at much greater concentrations relative to manganese. The greater manganese/iron ratio associated with the 345 kV Transmission Line area in the northern portion of the site is most likely due to the inclusion of marine sediments in those soils and the lack of this material in the RA, Industrial, and Warehouse area soils, as marine sediments typically have higher manganese concentrations relative to non-marine soils.

Iron and manganese will be stabilized in the hydrous oxides. The stability of the hydrous oxides will mainly be a function of pH and subsurface redox conditions (Adriano, 1992). As pH decreases or the redox potential of the environment decreases, iron and manganese solubilities will increase and the oxide stability will decrease, resulting in increased mobility of iron and manganese. Both metals can have significant solubility under the pH and redox conditions established at Maine Yankee.

4.8.1.2 Petroleum Hydrocarbons

Soils with elevated concentrations of EPH have been identified at several locations across Bailey Point including the former truck maintenance garage (up to 2,830 mg/kg total EPH), subsurface soils in the 345 kV Transmission and ISFSI areas (8.6 mg/kg to 1,016 mg/kg total EPH), shallow soils in the industrial area and RA (7 mg/kg to 2,720 mg/kg total EPH), shallow soils adjacent to the construction transformers (up to 23,100 mg/kg total EPH), shallow soils in the Bailey Farmhouse area (477 mg/kg to 870 mg/kg total EPH), and shallow soils in Parking Lot C (75 mg/kg to 590 mg/kg).

Several areas of the facility have had historic releases of petroleum hydrocarbons that have been remediated via soil removal including the kerosene spill, historic releases in the ISFSI area, and PAB alleyway. Additionally, several USTs have been removed along with small amounts of associated contaminated soil.

Most of the EPH detected as part of the Maine Yankee RFI represents aliphatics in the C19-C36 compositional range and C11-C22 aromatics. However, lighter petroleum hydrocarbons in the C9-C18 range are predominant in the area of the Former Truck Maintenance Garage.

Petroleum hydrocarbons in surface and subsurface soils will biodegrade under both aerobic and anaerobic conditions. Biodegradation of petroleum hydrocarbons is more effective under aerobic conditions where oxygen or other electron acceptors are readily available to support the microbial activity (Schnoor, 1991).

Infiltrating rainwater will also act to leach petroleum hydrocarbons from the soils to groundwater below. In addition to the rate of infiltrating water, leaching of petroleum hydrocarbons is a function of several factors including the solubility in water and the organic carbon partition coefficient (Koc)(Ney, 1995). These parameters are a function of the composition of the petroleum hydrocarbons (Gustafson, Tell, and Orem, 1997). Water solubility decreases with increasing carbon number for both aliphatic and aromatic petroleum hydrocarbons. For a given carbon number the water solubility for aromatic petroleum hydrocarbons is significantly greater than that for aliphatics. Similarly, the Koc increases with increasing carbon number for both aliphatic and aromatic petroleum hydrocarbons, and for a given carbon number aromatics have a significantly lower Koc value relative to the aliphatics (Gustafson, Tell, and Orem, 1997). Based on the relationship between the composition of the petroleum hydrocarbons and the parameters controlling leaching, for a given carbon number aromatics will be preferentially leached relative to aliphatics, and leaching potential for both aliphatic and aromatic hydrocarbons will decrease with increasing carbon number (Gustafson, Tell, and Orem, 1997). Since most of the petroleum hydrocarbons at the site are C19-C36 aliphatics and C11-C22 aromatics, some leaching of the lighter compounds and slow biodegradation of the heavier petroleum hydrocarbons will continue to occur.

4.8.1.3 VOCs

Significant concentrations of VOCs were reported in subsurface soils only from the west side of Warehouse 2/3. Other detected VOCs were at low concentrations near the quantitation limit or well below the PAL. VOCs detected in the soils adjacent to Warehouse 2/3 include 2-butanone (17 µg/kg to 94 mg/kg), 2-hexanone (41J µg/kg), 4-methyl pentanone (370 µg/kg to 2,900 µg/kg), benzene (16J µg/kg), ethylbenzene (1,500 µg/kg to 61,000 µg/kg), xylenes (338 µg/kg to 279,000 µg/kg), toluene (9J µg/kg to 490J µg/kg), and trichloroethene (4J µg/kg). The VOCs are believed to be related to the disposal of paint and paint thinners adjacent to the rear of the warehouse.

The significant process controlling the fate and transport of the VOCs are volatilization, leaching and biodegradation. The detected VOCs have relatively high vapor pressures, Henry's law constant, and water solubilities, and relatively low Koc values (**Table 4-30**). These properties give rise to the potential for volatilization from shallow soils and significant potential for leaching through the soil column (Ney, 1995). These VOCs will also biodegrade under aerobic conditions in the presence of oxygen or other electron acceptors.

The vertical distribution of the VOCs in the subsurface soils adjacent to Warehouse 2/3 demonstrates that both volatilization and leaching have controlled the migration of the VOCs. Surface soils in the area of highest VOC concentration (MY05TP01) are non-detect for the VOCs and the highest concentrations are observed at the soil/bedrock interface (9.5 to 10 feet below ground surface), while intermediate VOC concentrations occur at 3 to 3.5 feet below the ground surface. The waste paint and paint thinners were historically disposed at the ground surface and have migrated through the soil horizon via leaching and infiltration processes. The lack of detectable VOCs in the surface soils (up to six inches) is consistent with volatilization to the atmosphere.

The same VOCs observed in the soils adjacent to the warehouse are also observed in groundwater in the shallow bedrock aquifer adjacent to the warehouse, indicating that the leaching and infiltration processes have driven the VOCs into the shallow groundwater.

Soils on the east side of Warehouse 2/3 were sampled to evaluate a potential source of 1,1,1-trichloroethane (TCA) observed in groundwater. The geoprobe study of overburden soils in this area detected only low TCA concentrations (10 µg/kg) and no daughter compounds. These results and the relative low Koc and high solubility of TCA, indicate that the TCA released to surface soils associated with the historic drum handling activities has migrated through the overburden soils into the shallow bedrock aquifer.

4.8.1.4 PAHs

PAHs were detected at several areas of the facility in surface and subsurface soils. Elevated concentrations of PAHs in surface soils were reported adjacent to Warehouse 2/3 associated with the disposal of sand blast grit (1,900 µg/kg to 27,580 µg/kg), in the

Industrial Area and RA (non-detect to 148,200 μg/kg), and in three of eighteen surface soil locations in the 345kV Transmission Line area (490 μg/kg to 12,600 μg/kg). PAHs in subsurface soils were reported in Parking Lot C (3,730 μg/kg) and the 345 kV Transmission Line area (4,270 μg/kg to 15,430 μg/kg). The PAH detections in subsurface soils were typically associated with petroleum hydrocarbons.

PAHs are naturally present in many petroleum-derived compounds and occur naturally from from the incomplete combustion of organic material and fossil fuels (Ney, 1995). PAHs are comprised of aromatic rings of various sizes. Similar to petroleum hydrocarbons, the important factors controlling fate and transport are solubility and the Koc. Values for solubility decrease with increasing molecular weight of the PAHs, while the Koc increases with molecular weight (Gustafson, Tell, and Orem, 1997). Most of the PAHs have low solubilities and high Koc values (**Table 4-30**). This results in limited mobility of the PAHs in surface and subsurface soils.

Biodegradation rates for PAHs are low resulting in persistence in the environment (Ney, 1995). The lack of biodegradation and mobility indicates that PAHs will remain attached to surface and subsurface soils. The most significant migration potential for PAHs in surface soils is via erosion or runoff and as fugitive dust.

4.8.1.5 Pesticides

Pesticides were typically not detected in surface and subsurface soils as part of the Maine Yankee RFI study. When detected, the reported concentrations were less than 13 μg/kg. Dieldrin was detected in several locations (2.4 μg/kg to 13 μg/kg) and is believed to be associated with subsurface fill material. Several other pesticides including DDT, endrin, endrin aldehyde, gamma-BHC, heptachlor epoxide, and methoxychlor were sporadically detected in surface soils at concentrations less than 10 μg/kg.

Pesticides typically have low solubility, high Koc values, low vapor pressure, and limited biodegradation capacity (**Table 4-30**) (Schnoor, 1992). These chemical and physical properties result in limited mobility and significant persistence in the environment (Schnoor, 1992). This is significant for the low dieldrin concentrations detected in the subsurface soils in the restricted area. The soils in this area are mostly comprised of fill material, and dieldrin was not reported in the surface or near surface soils at locations where it was detected in the subsurface. Due to the limited mobility and persistence of dieldrin, the dieldrin detected in these soils was most likely present in the material used to fill these areas.

4.8.1.6 PCBs

PCBs were detected at several locations in both surface and subsurface soils. Locations where PCBs were reported in surface soils include the west side of Warehouse 2/3 (440 μg/kg to 1,400 μg/kg), the Industrial Area and RA (20.6 μg/kg to 240 μg/kg), and the construction transformers (600J μg/kg). PCBs in subsurface soils were detected in soils on the west side of Warehouse 2/3 (270 µg/kg to 370 µg/kg), 345 kV Transmission Line Area (27 µg/kg to 303 µg/kg), and Bailey Farm Area (37 µg/kg to 59 µg/kg).

PCBs exhibit low water solubility, are moderately volatile, and have a large Koc (**Table 4-30**). Based on these properties, PCBs will strongly adsorb to organics and preferentially partition to soil and sediments. The more highly chlorinated Aroclors (1254 and 1260) absorb more strongly to soils and sediment relative to less chlorinated PCBs (1016, 1021, and 1032), reflecting their differences in water solubility, octanol water partition coefficient, and Koc. PCBs are persistent in the environment and the more highly chlorinated PCBs are the most persistent and least amenable to degradation (Ney, 1995).

PCBs detected at Maine Yankee are typically the more chlorinated Aroclors 1254 and 1260. These PCBs are found in both surface and subsurface soils. Based on the fate and transport properties, the PCBs reported in surface soils will have some potential to volatilize to the atmosphere, but will mainly absorb to soils and persist in the environment. PCBs in surface soils can be transported via erosion of surface soils and as fugitive dust. PCBs in subsurface soils would be expected to have minimal leaching potential and remain adsorbed to soils. This typically appears to be the case at Maine Yankee with one exception. The PCB detected in the surface soils from test pit MY05TP01 on the west side of Warehouse 2/3 (Aroclor 1254, 1,400 µg/kg) is also observed in soil samples at depths of 3-3.5 feet (Aroclor 1254, 370 µg/kg) and 9.5-10 feet (Aroclor 1254, 270 µg/kg) in the test pit samples from MT05TP01. Leaching through the subsurface soils is not consistent with the fate and transport properties of PCBs. The PCBs were mobilized at this location, as they were most likely included in the waste paint material. PCBs have a relatively high octanol-water partition coefficient and would preferentially partition into the paint waste, VOC contamination. As the VOCs are readily leached in subsurface soils, the mobility of the PCBs is also increased. Although the VOCs have further migrated into groundwater, the low solubility and high octanol-water partition coefficient for Aroclor 1254 has most likely inhibited the migration of PCBs into shallow groundwater.

4.8.2 Contaminant Sources in Groundwater

This section describes the major groundwater contaminants and their distribution on the site and what can be inferred about their fate and transport. Sampling of groundwater monitoring wells on Bailey Point has revealed a number of contaminants that were most likely related to some aspect of plant construction or operation. Some contaminants may have been introduced on the surface of the soil through accidental spills or leaks (e.g., DRO from above-ground petroleum releases; sodium resulting from spreading of salted sand on roadways). Some contaminants have been introduced at depth such as chromium introduced from leaks from buried piping in the RA area. Other contaminants were not directly associated with plant activities, but were released from natural geologic materials as a secondary effect of site activities. The releases of iron and manganese from natural geologic materials covered by marine dredge spoils are an example of the last category.

4.8.2.1 Groundwater Flow and Bedrock Surface Topography Influence on Fate and Transport

Groundwater flow on Bailey Point has been described in **Section 3**. Most of the site consists of variable amounts of fill or natural glaciomarine clay-silt over bedrock. With the exception of small areas of sandy fill located beneath the water table in the RA and Industrial Area, most of the groundwater on the site is moving in a medium of low hydraulic conductivity. This type of terrain implies a phreatic surface that is a subdued reflection of the ground surface contours. Therefore, near-surface groundwater in most areas will flow perpendicular to the ground surface contours. However, past groundwater modeling and the Knoll Well groundwater chemistry (**Table G-1**) suggests that groundwater flow in deep bedrock (100 feet to 700 feet deep) is primarily north to south along the length of the point. Near the shoreline, the deep bedrock flow turns east or west to flow toward and upward into the near-shore tidal areas.

There is an indication from the sodium chemistry on the site that much of the seawater that formed the pore water of the marine dredge spoils deposited 30 years ago north and west of the ISFSI has been purged. Therefore, the hydraulic conductivity of the dredge spoil fill and the original stiff fissured clays lying above the permanently saturated clay-silt elevations must be sufficiently high to permit this to occur. As part of the CMS, we will attempt to use these data to back-calculate hydraulic conductivity and effective porosity of these clay-silt fills. The dividing line between the original soils north of the ISFSI and the fill material can be determined from the pre-construction topography characterized in **Figure 3-4**.

The interplay between the bedrock surface and shallow groundwater flow for the northern portion of Bailey Point is shown in **Figures 4-3, 4-4 and 4-5. Figure 4-3** is a computer-contoured version of the top of bedrock topography of the area north of the Knoll. The deep bedrock depressions are filled with low permeability soft clay-silt. **Figure 4-4** shows the phreatic surface contours in the soil north of the Knoll. A few bedrock groundwater elevation values are used to extend the map where no soil values exist. This is a more detailed computer-contoured version of **Figure 3-12A**, with posted values. **Figure 4-5** is a detailed computer-contoured version of the shallow bedrock groundwater contours shown on **Figure 3-12B**. Where no bedrock data are available, the soil groundwater levels are used in **Figure 4-5** to provide some data to extend the contour map for shape, although the actual values will not be correct in the north and west part of the figure. The figures are generally accurate however, in the vicinity of the concrete maintenance garage where the location of the groundwater divide is a critical feature.

As shown by **Figures 4-3**, **4-4**, and **4-5**, the area of the former concrete truck maintenance garage is on a groundwater divide for both soil and bedrock. Groundwater to the west of the maintenance garage area moves generally westerly in the soil and shallow bedrock. The bedrock surface is a local flat high in the former concrete truck maintenance garage area. Glaciomarine fine sand soils underlying clay-silt in this area encourage the transport of contaminants that make it to the bedrock surface to flow to either east or west, depending on whether it starts 100 feet east of the former garage location, or 100 feet west of the former garage location. The bedrock surface configuration is quite variable west of the main access road, with some deep holes going well below sea level. Bedrock is high along Old Ferry Road, and high on the Knoll, so contaminants flowing along the surface of the rock would generally migrate westward from starting points west of the main access road between the Knoll and Old Ferry Road.

4.8.2.2 Distribution of Metals in Site Groundwater

Iron and Manganese

The distribution of iron and manganese in groundwater across Bailey Point is illustrated on **Figures 4-6 and 4-7**, which are isocon maps of the total iron and manganese in the Bailey Point groundwater. Where there are paired monitoring wells, the higher of the two concentrations was used to contour the results. The EPA Region 9 PRG for iron in groundwater is 11 mg/l, and the iron PAL is exceeded in the north-central and northwestern portion of Bailey Point. The State of Maine MEG for manganese is 0.5 mg/l, and much of the Bailey Point groundwater exceeds the MEG. The highest manganese concentrations are coincident with the highest iron concentrations in the northwestern portion of Bailey Point (**Figures 4-6 and 4-7**). The source of iron and manganese in groundwater is the natural geologic materials.

Both iron and manganese occur in several valence states that typically are a function of the redox potential of the environment. Iron occurs as Fe^{2+} or Fe^{3+}, while Manganese occurs as Mn^{2+}, $Mn^{3+}$and Mn^{4+}. For both iron and manganese, the divalent species (Fe^{2+} and Mn^{2+}) are readily dissolved in water, while the more oxidized forms of iron and manganese are typically stabilized in solid phases (Hem, 1985). The distribution of iron and manganese in groundwater is typically controlled by the presence of iron- and manganese-bearing hydrous oxide minerals (i.e., limonite, goethite, and MnOOH), and the pH and redox potential established in the groundwater. The concentration of iron and manganese as a function of pH and redox potential (Eh or ORP) is displayed in **Figure 4-8** (Hem, 1985)**.** The relationship between pH and Eh for iron and manganese shown in **Figure 4-8** is calculated for a specific set of conditions, and the exact values of Eh and pH for a given iron or manganese concentration are not necessarily consistent for all groundwater conditions. However, the relative iron and manganese concentrations displayed on the pH-Eh diagrams are applicable to iron and manganese solubility in groundwater. As shown in **Figure 4-8**, there is a broad range of Eh-pH conditions where significant concentrations of iron and manganese can occur. Manganese concentrations can range from values in excess of 50 mg/l to less than 1 mg/l within the pH (5.5-8) and Eh (-100 mV to 300 mV) values commonly observed in groundwater. A similar relationship is also observed for iron, but the contours of equal concentration are functions of both Eh and pH for iron, while the iso-contours for manganese are independent of Eh within the Eh-pH range of typical groundwater (**Figure 4-8**).

The range of Eh(or ORP)-pH values for groundwater at Maine Yankee are illustrated in **Figures 4-9 and 4-10** for both the southern portion of Bailey Point (Industrial and RA areas) and the northern potion of the site (345kV Transmission Line area). The range of

Eh (ORP) for both areas of the site is similar (-100 mV to 300 mV), but the range of pH for the northern portion of the site is smaller with lower pH values (5.5 to 6.75) relative to that for the southern portion of the site (5.8 to 8) (**Figures 4-9 and 4-10**). The Eh (ORP)-pH conditions for the southern and northern portions of Bailey Point are consistent with the range of Eh (ORP)-pH conditions that support both low and high iron and manganese concentrations (**Figure 4-8**). Both iron and manganese are more soluble at lower pH values in the range of Eh-pH conditions observed in the northern and southern portions of the site.

The generally lower pH conditions in the northern portion of the site are consistent with the higher iron and manganese concentrations in groundwater relative to the southern portion of Bailey Point. Due to the orientation of the iron iso-contours relative to those for manganese, there are also regions of the Eh-pH diagram where high manganese concentrations will occur coincident with low iron concentrations (**Figure 4-8**). The Eh-pH conditions where low iron and high manganese concentrations occur for the range of Eh-pH conditions observed in the northern portion of Bailey Point are at higher Eh and pH values. A number of monitoring wells in the northern portion of the site have relatively low iron concentrations (1 mg/l or less) associated with elevated manganese values (greater than 5 mg/l) and all occur in the portion of **Figure 4-10** with higher Eh-pH values**.** Similarly, groundwater samples with both elevated values of iron and manganese occur at lower Eh and pH values in **Figure 4-10**, consistent with the orientation of the iron and manganese iso-contours in **Figure 4-8**. These relationships indicate that the Eh-pH conditions established in Maine Yankee groundwater are controlling the distribution of iron and manganese at the site.

The Eh-pH conditions of the northern portion of the site have developed as a function of the history associated with this portion of the site. This northern area of Bailey Point is a former salt marsh and wetland area that was filled with primarily excavated soil and dredge spoils. As the organic material associated with the salt marsh and wetland decayed beneath the fill material, pH was decreased by the formation of organic acids, and oxygen was consumed by the degradation of the organic material, resulting in both a reducing and low-pH environment. These Eh-pH conditions gave rise to significant solubilities for iron and manganese, and naturally occurring iron and manganese in the soils occurring in hydrous oxide minerals have dissolved into the groundwater. The zone of very high iron and manganese concentrations in the northern portion of Bailey Point coincides with the known location of the former salt marsh under the dredge spoils fill area. Based on these conditions, iron and manganese are not likely to decrease in concentration in this area in the foreseeable future.

Locally, iron and manganese concentrations can also be high in the vicinity of organic fill (such as the area of construction demolition debris placed under the 345 kV transmission lines) and near releases of petroleum or fuel-related VOCs. These conditions give rise to Eh-pH values that increase the solubility for iron and manganese (**Figure 4-8**). Elevated concentrations of fuel-related VOCs (ethylbenzene, xylenes, and toluene) occur in MW-404 adjacent to Warehouse 2/3, and both manganese and iron are elevated in this monitoring well. The oxidative degradation of the fuel-related VOCs often will result in a decrease of the redox potential of the local environment and dissolve iron and manganese from natural geologic materials.

Molybdenum

Molybdenum is a constituent of petroleum-based lubricants, it is part of some steel alloys (such as high strength tools and high temperature steel), and it can occur naturally. The natural occurrence of molybdenum is typically in aplites or pegmatites associated with the water-rich fluids that occur during the late stages of the crystallation of some granites. The molybdenum-bearing minerals associated with the late-stage aplites and pegmatites include molybdenite (molybdenum sulfide), powellite (calcium molybdate) and wulfenite (lead molybdate). Molybdenite has been identified in the Tunk Lake area of Maine and in southwestern New Brunswick, but there is no literature describing its occurrence in the Wiscasset area (Yang *et al.*, 2003). We have not examined or tested the Maine Yankee core in detail to look for molybdenum-bearing minerals.

The State of Maine MEG for molybdenum is 35 ppb. The distribution of molybdenum, other metals and organic chemicals in water in New England has been conducted by the USGS by sampling of 58 private wells in Maine, New Hampshire, Massachusetts, and Rhode Island (USGS, 2000). Most of the samples are from Maine. The wells were selected randomly and sampled using USGS methodology. The mean value of molybdenum in groundwater for felsic igneous or non-calcareous metamorphic rock was about 3 µg/l with a maximum of 19 µg/l. The range of molybdenum in Maine Yankee groundwater is non-detect to 3,170 µg/l. **Figure 4-11** shows the distribution of molybdenum on Bailey Point. Although the number of data points in the middle of Bailey Point is small, the contouring of the most recently collected sample data suggests a large area of Bailey exceeds the MEG for molybdenum.

Most of the monitoring wells with elevated molybdenum are screened in bedrock that is commonly granite or aplite/pegmatite-rich granite. Similarly, shallow-deep paired wells typically have much higher molybdenum concentrations in the deep well that is screened in bedrock relative to the shallow well screened in the overburden (e.g., MW302A/B, MW303A/B, MW 304A/B, and MW305A/B). These relationships indicate the potential for a natural source of the molybdenum.

A second potential source of molybdenum is the molybdenum-containing lubricating oils used in the Industrial and RA areas. If lubricating oils were the source of molybdenum, a positive correlation between molybdenum and EPH/DRO in groundwater would be expected, and the highest molybdenum concentrations would be expected to be associated with elevated EPH/DRO. MW-405 has the highest concentration of molybdenum (3,170 µg/l on 6/18/02 and 467 µg/l on 10/2/02). It is a bedrock well, sealed just below the bedrock surface adjacent to the southwest corner of Warehouse 2/3. Although no EPH or DRO samples have been taken from this well, no indications (i.e., odor or low ORP) of elevated EPH or DRO were noted. MW-311 is on the east side of Warehouse 2/3 and is a bedrock well sealed just below the surface with elevated molybdenum (314 µg/l to 18.1 µg/l). EPH measured at this well found 60 µg/l total EPH, a low value just above the EPH quantitation limit of 50 μg/l. This low EPH concentration does not seem like a value high enough to suggest that the molybdenum is associated with petroleum-based lubricants. Similarly, MW-302A and MW-304A, deep bedrock wells, have relatively high molybdenum (176 μg/l and 181 μg/l, respectively), but only low concentrations, 80 μg/l and 140 μg/l, respectively, of total EPH. MW-305A is another deep bedrock well with high molybdenum (128 μg/l) but only 51 μg/l of total EPH. MW-308 is a well in blasted rock fill with 54 to 60 μg/l of molybdenum and only 55 μg/l of total EPH. Thus, the higher molybdenum concentrations are typically not correlated with elevated EPH or DRO concentrations. One well where molybdenum and petroleum hydrocarbons are correlated is MW-401B. MW-401B is a well in clay-silt that has had a fairly consistent concentration of molybdenum (50 μg/l to 55 μg/l), but also has a relatively high DRO concentration of 2,350 μg/l. Based on these relationships, only the molybdenum occurring in MW-401 potentially appears to be related to a site-related release of molybdenum-bearing material.

It is noteworthy that there were major decreases in molybdenum concentrations in MW-405 (3,170 to 467 μg/l), MW-311 (314 to 18.1 μg/l), MW-407B (43.9 to 10.8 μg/l), and MW-406A (24.1 to 15.4 μg/l) from first to second sampling episode, suggesting that well trauma may have affected early concentration results. All of these monitoring wells except MW-407B are screened in granite/pegmatite-bearing bedrock, consistent with a natural source of molybdenum.

In summary, there is little correlation between EPH/DRO and molybdenum concentrations although lubricants containing molybdenum may be the cause of high concentrations at specific wells (i.e., MW-401B). In most of the wells, however, there is no ready explanation for the above-normal groundwater concentrations of molybdenum other than a possible natural origin as a mineral occurring in the granite or pegmatite bedrock.

<u>Sodium</u>

Figure 4-12 shows the distribution of sodium in groundwater. **Appendix G** describes the various sources of sodium on the site in detail and that discussion will not be repeated here. Because of all the sources for sodium, most of Bailey Point has groundwater with sodium concentrations exceeding the MEG. The highest concentrations are in the northwest portion of the Point, coincident with the high iron and manganese concentrations and related to the filling of marine dredge spoils in that area. In areas of Bailey Point away from potential sodium sources, concentrations are typically in the 10 mg/l to 25 mg/l range. The gradual purging of the groundwater of high sodium is taking place from east to west in the shallow wells in the fill, as groundwater in that fill is generally flowing from east to west. The State of Maine MEG for sodium is 20 mg/l, which is relatively close to background values of sodium that would normally occur in wells within about 100 feet of the ocean in Maine.

We have no chloride concentrations in the northern portion of Bailey Point to compare with the sodium concentrations, but suspect they are less than or equal to the sodium concentrations as they have historically been in the Knoll Well. As discussed in **Appendix G**, the deep Knoll Well just south of the ISFSI has had a history of elevated sodium (67 mg/l shown on **Figure 4-12**) that we interpret to have come from the filling of the area north of the well with marine dredge spoils. There is a suggestion that deep bedrock groundwater flow on the Point is primarily from north to south, although soil groundwater flow may be east to west north of the Knoll.

Miscellaneous Metals

There were isolated exceedences of MEGs and MCLs of some additional metals in the Bailey Point groundwater, including aluminum, arsenic, boron, lead, silver, and thallium.

Aluminum and arsenic are most likely derived from natural geologic materials. MEG exceedences for both parameters are less than three times the respective standard. Arsenic is well known in metasedimentary rocks of Maine as a naturally occurring contaminant. It is often elevated in areas affected by petroleum spills or decaying organic deposits that produce low oxygen and reducing conditions. Aluminum is very abundant in soils and rock. Where monitoring wells are located in clayey soils or broken rock zones, aluminum-bearing minerals can be transported into the well in colloidal form. Both acidic and basic conditions favor the dissolution of aluminum, with the lowest aluminum concentrations associated with more neutral pH conditions. Elevated aluminum was found in wells with high pH as well as wells with pH below 7, suggesting a pH control on the elevated aluminum groundwater concentrations in lower and higher pH samples.

Boron is a natural constituent of seawater. In the northwestern corner of Bailey Point, under the 345 kV line, there are elevated boron concentrations. These elevated boron levels are associated with high sodium in that area, which was derived from the seawater that formed the pore water of the deposited, dredged marine sediments in this area. The presence of elevated boron concentrations in this area is consistent with the presence of the marine sediments, and will eventually flush from the system.

A single lead exceedence of the MCL occurred at MW-305A located in the northern portion of Bailey Point downgradient of the current ISFSI. There is no known or suspected source of lead contamination at this location, and other monitoring wells in the area do not have elevated lead concentrations. Anthropogenic sources of lead contamination are often related to battery acid spillage, solder, or metal plating wastewater discharges, which were not present at Maine Yankee. Since the pegmatites of the site are suspected to have high molybdenum concentrations and are typically associated with molybdenum-bearing minerals (molybdenite (molybdenum sulfide), powellite (calcium molybdate) and wulfenite (lead molybdate)), a more likely source might be a natural mineral. Both lead and molybdenum exceed their respective MEGs in MW-305A, and lead is commonly found in the mining districts in association with elevated molybdenum values. Lead is mobilized by acidic conditions and the pH of MW-305A at the time of lead sampling was 6.63. Both the limited distribution and the association with elevated molybdenum indicate a natural source for the elevated lead in MW-305A.

Silver exceeded its MEG (49.9 versus 35 µg/L) only from MW-405 (southwest corner of Warehouse 2/3). Small concentrations of silver were found in some of the soil samples in this area next to Warehouse 2/3, but not enough to draw any connections. Interestingly, MW-405 also has the highest concentration of molybdenum found on the site (3170 µg/L). As with lead, silver is one of the typical metals that can be found in mining districts in association with molybdenum and other metallic minerals. Although dumping of paint derivatives and thinners in this area could have conceivably contributed the elevated molybdenum and silver, a natural source appears more likely.

Thallium was found at MW-313 (2.9 µg/L) and MW-322 (3.3 µg/L) to slightly exceed the MCL (2 µg/L). Concentrations ranging from 1.4 µg/ to 1.9 µg/l were observed in the reference wells located in the Backlands, but follow-up sampling of those same Backland wells had non-detect thallium concentrations (MY, 2004). There are no known sources of thallium on the site and other monitoring wells in the vicinity of MW-322 and MW-313 were either non-detect for thallium or had thallium concentrations less than 1 µg/l.

4.8.2.3 TCA and Breakdown Products Originating near Warehouse 2/3

Following the preparation of the QAPP, Maine Yankee became aware of a possible release of TCA on the east side of Warehouse 2/3. Maine Yankee historically stored TCA, a solvent, in 55-gallon drums at Warehouse 2/3. A leaking drum of TCA resulted in a small amount of TCA released to the ground in front of Warehouse 2/3. Although very little residual soil contamination by TCA remains, there is an identifiable TCA plume in the bedrock groundwater moving south to the cove where Outfalls 005 and 006 are located. The lack of significant residual TCA in soil adjacent to the east side of Warehouse 2/3 is a function of the relatively low Koc and high solubility for TCA which have enhanced the effectiveness of leaching and infiltration processes. The TCA has migrated through the overburden soils via infiltration processes, and has degraded groundwater quality in the shallow bedrock. The observed concentrations of TCA and other chlorinated VOCs is well below the solubility concentration, indicating only the presence of a dissolved phase, and no separate dense non-aqueous phase liquid (DNAPL). A DNAPL would only be indicated when TCA concentrations in groundwater were within 1% of the solubility limit (9,500 µg/l). The highest observed TCA concentration is 670J µg/l, orders of magnitude below the 1% solubility value.

Figure 4-13 is a computer-generated detailed bedrock surface topography map in the vicinity of Warehouse 2/3. This is a more detailed map than **Figure 3-6** and is intended to suggest the complexity of the bedrock surface topography in this area. As described in Section 3 of this report, one of the major zones of bedrock weathering on Bailey Point extends north-south through the general axis of the TCA plume. **Figure 4-14** is a computer-generated contour map of the bedrock groundwater levels in the Warehouse 2/3 area. This figure, combined with **Figure 4-13**, suggests that the most likely route of the

TCA contaminant plume would be along the west side of the 115 kV switchyard to MW-423. However, the plume maps (discussed below) show the plume closer to the eastern side of the 115 kV switchyard, towards MW-422.

In addition to TCA, the monitoring wells also have daughter compounds 1,1 dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), and vinyl chloride (VC) associated with the reductive de-chlorination and abiotic degradation of TCA (McCarty, 1997). TCA degrades to these daughter compounds once dissolved in groundwater. Thus, monitoring wells near the source area would be expected to have a high ratio of TCA to degradation compounds, and monitoring wells downgradient of the source would be expected to have lower ratios. **Figures 4-15A, B and C** show overlays of contoured 1,1-DCA, 1,1-DCE, and VC groundwater concentrations relative to contours of TCA. The center of the TCA plume is on the east edge of Warehouse 2/3, the known source area for the TCA release(s). The centers of the 1,1-DCA, 1,1-DCE and VC plumes are shifted at least as far south as MW-409, and possibly farther. The State of Maine MEGs for the four constituents of concern in this plume are 200 µg/l for TCA, 70 µg/l for 1,1-DCA, 0.6 µg/l for 1,1-DCE, and 0.2 µg/l for VC. MEGs are exceeded for all four parameters but by the largest magnitude with 1,1-DCE where the concentration at MW-409A is 190 µg/l.

Monitoring well MW-408 is located in the vicinity of the former drum handling area and has the highest TCA concentration and TCA ratio to degradation compounds. Both MW-311 and MW-409A have lower TCA concentrations and lower TCA to degradation compound ratios. These observations indicate that the source area for the TCA is in the former drum handling area adjacent to the northeast corner of the warehouse. The TCA has migrated via infiltration into the thin soils and shallow bedrock in this area, resulting in the observed region of groundwater contamination along the east side and to the south of Warehouse 2/3. As TCA has dissolved into the site groundwater in the source area, degradation reactions in the shallow groundwater have resulted in a decrease of TCA and an increase of DCA, DCE, and VC over time, most prominent at MW-409A.

The chlorinated VOCs dissolved in groundwater have low values for Henry's Law Constant, indicating the potential for the VOCs to partition to the vapor phase and migrate to the bedrock and soils above the groundwater plume. The presence of bedrock and the clay- silt-rich nature of the overlying soils will act to minimize this migration pathway.

The transformation of TCA to the daughter compounds indicates that the TCA is undergoing natural degradation in the environment, and as demonstrated in many recent cases, will ultimately result in natural attenuation (McCarty, 1997). Although TCA is not a conservative tracer, the approximate history of the TCA leakage and the observed distribution of TCA and daughter products can be used in the CMS phase to estimate the approximate time for the plume to degrade below MEGs under natural attenuation.

4.8.2.4 BTEX Compounds

On the southwest corner of Warehouse 2/3, paint derivatives (ethylbenzene, xylenes, and toluene, among others) were discovered in relatively high concentrations in MY05TP01. The fate and transport behavior of the paint-related VOCs in soil has resulted in high concentrations of the VOCs in soils at the soil/bedrock interface (see **Section 4.7.1**). Groundwater monitoring wells MW-404 and MW-405 were drilled into bedrock to the west and south of this test pit to assess groundwater for the presence of the paint-related VOC contamination. Based on **Figure 4-14**, it appears that groundwater in this area is moving westerly towards Bailey Cove, and the two wells are located down gradient of the VOC soil contamination.

In MW-404, exceedences of MEGs and other PALs for metals were found for aluminum, arsenic, iron, manganese, molybdenum, silver, and sodium. In terms of VOCs, ethylbenzene exceeded the MEG of 70 µg/l in MW-404, and vinyl chloride exceeded the MEG of 0.2 µg/l in the first round of MW-405 testing. Other VOCs present were acetone, benzene, chloroform, m-,p-xylene, o-xylene, and toluene. These VOCs have relatively high water solubilities and low Koc values and readily partition into groundwater (Ney, 1995) (**Table 4-30**). The dissolved VOCs will also have the potential to volatilize into the unsaturated zone due to the relatively low values for Henry's Law Constant (**Table 4-30**). Once dissolved in groundwater these VOCs will also biodegrade via oxidative process in the presence of dissolved oxygen or other electron acceptors.

Many of these VOCs are present in the unsaturated soil nearby and we expect that once the source is removed, the VOC and related parameter concentrations will decrease toward background concentrations via biodegradation and natural attenuation processes.

4.8.2.5 EPH and DRO Distribution

The most prevalent contaminant on the Maine Yankee site is petroleum. Numerous lubricant and fuel spills have been documented, and all of the identified spills have been remediated to an industrial standard according to the DEP Decision Tree. Initial soil and groundwater sampling was assessed using the Massachusetts DEP EPH analytical method, based on an early agreement between Maine Yankee and the regulatory agencies in the development of the QAPP. In April 2002, MDEP expressed their preference for using the Maine DRO analytical method rather than EPH (MDEP, 2002d and MY, 2002q). Therefore, we have two sets of groundwater results that are indicative of petroleum: the first set is based on Phase 1A sampling and consists of EPH concentrations as shown on **Figure 4-16**; the second set is based on Phase 1B sampling and consists of DRO as shown on **Figure 4-17**. Additional monitoring wells were installed and sampled for DRO during Phase 1B accounting for more data points in **Figure 4-17** compared to **Figure 4-16**.

The solubility of petroleum hydrocarbons in groundwater is a function of the size or carbon number of the specific petroleum hydrocarbon mixture, and decreases with increasing carbon number for both aliphatic and aromatic petroleum hydrocarbons (**Table**

4-30). Aromatics with the same carbon number as aliphatics typically have water solubilities two to three orders of magnitude greater than the corresponding aliphatics (**Table 4-30**). Similarly, the Koc for aromatics is two to three orders of magnitude lower than that for aliphatics of the same carbon number (**Table 4-30**). These relationships indicate that aromatics will be preferentially leached from EPH or DRO-contaminated soils, and that groundwater concentrations in excess of 500 µg/l are mostly composed of aromatics due to the limited solubility of aliphatic fractions (solubility of total aliphatic fraction C8-C21 is less than 500 µg/l). Once dissolved in groundwater, the petroleum hydrocarbons will biodegrade aerobically if a source of oxygen or other electron acceptor is available.

The highest concentrations of EPH were found in the northern portion of Bailey Point at several locations including the north end of the 345 kV switchyard, wells to both east and west of the former concrete truck maintenance garage, the area from the northern side of the ISFSI to the reflecting pond, and the northwestern portion of the fill under the 345 kV line area. Concentrations are typically in the range of several hundred micrograms per liter. Two of these four areas - the concrete truck maintenance garage and the 345 kV switchyard - appear to have discrete sources in subsurface soils (i.e., EPH soil contamination associated with the former truck maintenance garage and former kerosene spill), but the two other areas seem to be affected by more diffuse sources. Based on simple linear interpolation contouring, most of Bailey Point appears to have groundwater concentrations greater than 50 µg/l total EPH.

The DRO distribution shown on **Figure 4-17** confirms the EPH distribution, but also shows that most of the RA and Industrial Area has relatively high concentrations of DRO, most of which are in the hundreds of micrograms per liter. One very high concentration in the RA is MW-401B (2,350 µg/l of DRO). This location will have to be examined as part of the CMS studies, as the potential source for this high level of groundwater contamination has not been characterized. A petroleum source was identified in deep fill material in the PAB alleyway in November 2002 and the contaminated soil was removed. This source has likely contributed to elevated DRO concentrations in several adjacent and downgradient wells (MW-312, B-202, B-205, and B-206).

Another area with relatively high DRO concentration is just west and downgradient of the area of the kerosene spill that originated at the spare generator enclosure. MW-413 had 1,700 µg/l of DRO. MW-414 to the north of MW-413, but probably unrelated as to source, had a DRO concentration of 940 µg/l. MW-413 is apparently measuring the residual effects of the kerosene leak. The chromatogram of MW-413 indicates a relatively fresh source consistent with the kerosene as a source, compared with the chromatograms of most other samples, which are indicative of older, more degraded sources. One other relatively high DRO result was found in MW-318 (930 µg/l), which is located just southeast of the area of the main transformer fire where transformer oil was released as a result of the fire.

Because many of the petroleum sources may be somewhat dispersed, limited in size, and associated with the construction activities during the 1960 and early 1970s, most of the readily leachable fraction of petroleum has most likely been removed from the original source material and dissolved in groundwater. Additional leaching of petroleum hydrocarbon constituents to the groundwater is expected to be slow, but relatively constant. Until the petroleum hydrocarbons that are partitioned to the soil in the unsaturated and saturated portions of the aquifer are totally biodegraded or dissolved, groundwater concentrations will remain unchanged.

4.8.2.6 Pesticides

Two pesticides, dieldrin and heptachlor, have been identified in groundwater on the site. Dieldrin has also been identified in several deep soil samples in the RA, including soil samples in fill taken from the MW-312 boring at 8-10' (13 μg/kg). Dieldrin was detected in the groundwater from the containment foundation drain, in the PAB test pit, and in MW-401A at concentrations up to 0.1 μg/l, about 5 times its MEG. Dieldrin was used to control insects such as termites and insects that attack food crops such as corn. Its use on crops was banned in 1974, and it has been banned since 1987 for all uses. It is persistent in the environment, and does not move readily from soil to groundwater. Dieldrin was not used in any plant process or application. The presence of low concentrations of dieldrin in the deep gravelly sand fill around the containment area likely explains the occurrence in groundwater in that area. Much of this fill will be removed as part of the radioactive source removal in this area.

Heptachlor was detected (0.52 μg/L compared to an MCL of 0.4 μg/L) in only one groundwater sample from one time out of two tests in MW-315. Heptachlor is an insecticide used to manage similar pests as dieldrin. Its sale was banned in 1988 although its use is still permitted to control fire ants in electrical transformers. Heptachlor is also persistent in the environment and does not partition easily into water. There is no known usage of this insecticide at Maine Yankee. These observations suggest that the presence of the low heptachlor concentration in one of the two analyses conducted for MW-315 is an artifact of the laboratory analysis and not representative of site groundwater conditions.

4.8.3 Physical Fate and Transport of Sediment

Freshwater Sediment

The two major types of freshwater sediments expected to be transported on Bailey Point would be sand from road and parking lot fill, and clay-silt from insitu and filled glaciomarine soils and marine dredge spoils.

Chemical contaminants absorb much more readily per unit weight to the clay-silt particles than to the sand particles, because of the much larger surface area per unit weight of the clay-silt. The sand particles settle rapidly in water and will only be moved along a stream or pipe when velocities in the conveyance reach a critical parameter approximated on Hjulstrom's Diagram (Krunbein and Sloss, 1953). For sand, velocities in the range of about 20 to 50 cm/sec of velocity will pick up and transport the sand.

With clay-silt, with a median diameter of about 3 microns, the velocity necessary to erode and suspend clay-silt is higher than with sand, but the settling time is much longer and is given approximately according to Stokes' Law if the Reynolds number is less than or equal to one. Practically speaking, it takes a day or two for the finer particles in the clay-silt to settle out in quiescent waters.

The practical effect is that most sediments washed into the drainages—both natural and manmade—on Bailey Point are likely to be carried into the surrounding Bay, unless the drainages pass into the pond north of the ISFSI first. The pond north of ISFSI would cause all sand and most of the clay-silt to settle out. Where stormwater enters catchbasins, the sediment trap at the bottom of the catch basin is likely to hold some sand particles. Otherwise, sediment would have moved along drainages episodically with storm events and been deposited in the Bay waters.

<u>Marine Sediment</u>

Once contaminated sediments move into the Bay, the sand-sized particles would settle out quickly near the entrance into the Bay. Since the tide rises and falls over about a 9-foot range, this would distribute the sand generally within the intertidal area. Littoral transport can move the material parallel to the shore, but detailed sampling in the Outfall 009 area shows that the elevated concentration of PAHs were confined to an area within 50 feet of the discharge point.

Clay-silt particles would stay in suspension and distribute themselves over a wide area in Montsweag Bay. The chemistry of sediments sampled throughout Montsweag Bay is fairly similar, reflecting the homogenizing effect of the slow settling of clay-silt over the Bay and mixing with sediments from many other parts of the watershed.

Sedimentation rates have been slow in the vicinity of Maine Yankee since plant construction, based on the small amount of sedimentation that occurred in the circulating water intake channel over time and the fact that sediment samples showing the chemical effects of plant operations showed a marked decrease in concentration below about 6 inches in all areas sampled.

In the aquatic environment, PAHs may evaporate, disperse in the water column, become incorporated into bottom sediments, concentrate in aquatic biota, or experience photooxidation, chemical oxidation and biodegradation (Eisler, 1987). Most PAHs in aquatic environments are associated with particulate materials and PAHs dissolved in the water column likely degrade rapidly through photooxidation. The ultimate fate of PAHs in sediments is believed to be biotransformation and biodegradation by benthic organisms; however, PAHs may persist indefinitely in oxygen poor waters or in anoxic sediments (Eisler, 1987). Bioturbation, the sediment processing as a result of the activity of benthic organisms, can remobilize PAHs from deeper sediments, but also increase the rate of biodegradation by bringing PAHs to the sediment surface from deeper anoxic sediments.

4.8.4 Summary of Fate and Transport

Table 4-31 summarizes the areas and constituents of concern to RCRA closure on Bailey Point prior to an evaluation of risk to human-health and the environment, which is outlined in Sections 5 and 6 of this RFI Report. As summarized in **Table 4-31**, there are several remaining potential sources of contaminants on the site. Some are held in the unsaturated zone of soil or soil fill, such as petroleum spills. Most of the identified petroleum spills have been remediated. A few remaining petroleum sources (i.e., Former Truck Maintenance Garage and Construction Transformer) will be evaluated.

4.8.4.1 Soil

Chemicals in soil were identified at several locations at the Maine Yankee facility and the fate and transport potential of detected chemicals is presented above. Based on the observed soil concentrations, the distribution of contaminated soil, and the fate and transport potential, the following locations are identified.

- Industrial and Radiological Restricted Areas. Surface and subsurface soils beneath the Turbine Hall in the Industrial Area contain elevated concentrations of PAHs and detected concentrations of PCBs, pesticides and EPH. These compounds are believed to be derived from the use of PCB-containing, petroleum-based compounds, and were typically detected in association with specific sources (i.e., oil reservoirs, sumps, and drains) and industrial activities. These compounds have limited mobility in the environment and are expected to remain adsorbed to the shallow soils.

- Warehouse 2/3. Surface soils located on the northwest side of Warehouse 2/3 contain elevated levels of lead, PAHs and PCBs. PAHs were only observed in surface soils. The PAHs and PCBs have limited mobility and biodegradation potential and will remain in the surface soils. Lead also has limited mobility, as the elevated lead observed in the surface soils is not observed in the deeper soils.

  Subsurface soils on the west side of Warehouse 2/3 contain elevated levels of VOCs (xylenes, ethylbenzene, and toluene) and PCBs. A focused test pit study has determined the distribution of VOCs and PCBs in the subsurface soils. The VOCs have leached through the soil horizon via infiltration process and have degraded the adjacent groundwater. The PCBs associated with the paint wastes have gained enhanced mobility due to their inclusion in the waste material, and are present at decreasing concentrations with depth in the subsurface soils. The low water solubility of Aroclor 1254 (12 µg/l) has minimized the migration of PCBs into groundwater. The presence of these compounds is associated with the localized disposal of paint thinners and paint.

- Construction Transformer. Elevated concentrations of EPH and PCBs are located in surface soils associated with the Construction Transformer. The distribution of EPH and PCBs is focused in oil-stained surface soils adjacent to the transformer. These compounds have limited mobility in the environment and are expected to remain adsorbed to the shallow soils.

- Former Truck Maintenance Garage. Subsurface soils contain elevated concentrations of EPH. The extent of petroleum hydrocarbon contamination in this area was not completely bounded during the RFI and may require additional characterization. The major portion of the detected EPH was comprised of C9-C18 aliphatic petroleum hydrocarbons, consistent with a diesel-like source material. This range of petroleum hydrocarbons has limited solubility, but the relatively high concentrations of EPH will continue to degrade groundwater quality via infiltration and leaching processes. Biodegradation will also occur under aerobic conditions, provided there is a source of oxygen or other electron acceptors.

- 345 kV Transmission Line Area. Subsurface soils contain elevated concentrations of EPH and PAHs and detected concentrations of PCBs. These chemicals were included with construction debris used to fill this portion of the site as observed in test pits installed in this portion of the site. The PAHs and PCBs are relatively immobile and will generally remain adsorbed to the subsurface soils. The two compounds will biodegrade slowly through time. The lighter aliphatic and aromatic petroleum hydrocarbon fractions will degrade groundwater quality via infiltration and leaching processes, and EPH and DRO are detected in groundwater in this area. Biodegradation will also occur under aerobic conditions where there is a source of oxygen or other electron acceptors.

- Bailey Farm House. Subsurface soils contain elevated levels of EPH and detected concentrations of PCBs. The EPH was detected in oil-stained soils adjacent to No. 2 fuel oil tank in the dirt floor of the Bailey Farmhouse basement and in shallow soils adjacent to and within a septic leachfield associated with the farmhouse. Low concentrations of PCBs were reported in shallow soils adjacent to and within the leachfield soils.

- Parking Lot C. Shallow soils in Parking Lot C have elevated levels of EPH and PAHs as a result of a reported gasoline leak from a vehicle waiting at the Gatehouse, and the EPH is mainly comprised of C19-C36 aliphatics. These compounds have limited mobility in the environment and are expected to remain adsorbed to the shallow soils.

- Low concentrations (2.3 μg/kg to 13 μg/kg) of pesticides were detected in surface and subsurface soils at several locations. The pesticides were typically present in surface soils. Dieldrin was detected in several subsurface samples at depths up to 13 feet below ground surface. When detected in the subsurface soils, dieldrin was not observed in shallower soil samples at those locations. These dieldrin–containing soils were typically comprised of fill material. The limited mobility of dieldrin, the lack of dieldrin in shallow samples and the occurrence in fill material indicates that the source of the dieldrin is the original fill material. The low solubility and high Koc value for dieldrin will act to minimize the migration potential for dieldrin.

4.8.4.2 Groundwater

There are several groundwater regimes on Bailey Point including the upper regime that encompasses the phreatic surface, and a deep bedrock regime. Maps have been developed and presented in the QAPP (Stratex, 2001d), and **Sections 3** and **4** of this report that show actual and expected groundwater flow regimes on Bailey Point. Flow generally moves perpendicular to ground surface topography in the soils and shallow bedrock. In the deeper bedrock, flow is generally down the axis of the peninsula from north to south. As bedrock flow approaches the edge of the shore, it turns toward it and flows upward to discharge in the nearshore area.

Iron, manganese, and, to a much lesser extent, arsenic are naturally occurring geologic materials that have dissolved into the groundwater. The metal solubility is a function of Eh-pH conditions that occur at the site. The Eh-pH conditions of the site have been established by the burying of former organic marsh deposits with marine dredge spoils, by the presence of petroleum spills and VOC spills, and by other oxygen-consuming contaminants. These metals are not likely to become lower in concentration with time. Molybdenum is more complicated and may have exceeded the State of Maine MEG over a large area of Bailey Point due to a possible combination of having entered the groundwater through petroleum lubricants containing molybdenum and a natural occurrence from minerals in the granite and pegmatite bedrock.

Another contaminant source on the site is residual sodium that is moving from the solid phase to the liquid phase and degrading the groundwater quality. This sodium has a number of sources on the site and occurs broadly over the site in concentrations exceeding the State of Maine MEG.

TCA and its breakdown products 1,1-DCA, 1,1-DCE and VC, occur in a small groundwater plume originating east of Warehouse 2/3 and flowing south to discharge in the nearshore area of Outfalls 005 and 006. The presence of the TCA daughter compounds in groundwater downgradient of the source area indicates that TCA is naturally degrading and will attenuate over time.

On the west side of Warehouse 2/3, there are BTEX compounds and metals in groundwater associated with a nearby source of contamination in soil. The removal of the source should reduce the groundwater contamination in a fairly short period of time. Meanwhile, the groundwater from this area is flowing westward to discharge in the nearshore areas of Bailey Cove.

The areas of interest are summarized in **Table 4-31**, along with the description of the likely causes of the contamination and a summary of the likely fate of these contaminants in groundwater. Most groundwater contaminants will experience fairly fast reduction in bedrock once the soil sources are removed, however, iron, manganese, and DRO are expected to take a very long time for contaminant concentrations to be reduced. Sodium concentration reductions in groundwater will also take a long time, but will eventually occur as sodium that was once removed from solution moves back into solution and is flushed from the system.

4.9 Data Usability and Limitations

The sampling activities associated with the Maine Yankee RFI included the collection of 263 surface and subsurface soil samples, 118 groundwater, 5 surface water samples, 103 sediment samples, 20 concrete, and 47 tissue samples (**Table 2-2**). Parameters analyzed in the RFI program are summarized in **Table 2-1** and include Target Compound List (TCL) organics (VOCs, SVOC, pesticides, and PCBs), Target Analyte List (TAL) inorganics, anions, EPH and DRO. All analyses were conducted by Katahdin Analytical Services of Westbrook, Maine, Southwest Research laboratory of San Antonio, Texas, Research and Productivity Council, Fredericton, New Brunswick Canada, and Arthur D. Little Inc., Cambridge, MA. The laboratories reported as part of the data deliverable that all analyses were performed in accordance with the QAPP.

The data were validated using *Region I USEPA-New England Laboratory Data Validation Functional Guidelines For Evaluating Inorganic and Organic Analyses* (USEPA, 1996b) and as identified in the QAPP (Stratex, 2001d). All data were validated by either Tier II or Tier III guidelines in accordance with the *USEPA Region I Tiered Organic and Inorganic Data Validation Guidelines*, and as identified in the QAPP (Stratex, 2001d). The first sample delivery group (SDG) for each media was validated using Tier III, while all other subsequent SDGs received Tier II validation. An index of SDGs and data validation reports is contained in **Appendix E** of this report.

Validation/usability is based on considerations of analytical error resulting from evaluation of validated sample results as compared to project quality objectives (PQOs) and site knowledge. The PQOs for this project include the generation of data to characterize contaminant sources and the nature and extent of contamination, support fate and transport analysis, conduct risk assessment for human health and the environment, and support future remedial activities necessary to minimize potential risk. The PQOs also include developing quantitation limits for analytes that will meet or exceed regulatory standards.

To ensure that the PQOs for this RFI were met, data quality indicators (DQIs) were evaluated against the measurement performance criteria (MPC) for each DQI, and quality control (QC) samples were collected to meet the MPCs. The DQIs include precision, accuracy, representativeness, comparability, completeness, and sensitivity parameters. PQOs were also met by meeting certain goals for the Project Quantitation Limits (PQLs) concentrations. To provide for reliability of field sampling procedures and materials, QC samples were collected at a defined frequency for each medium sampled, sample shipment, and each sampling event as identified in the QAPP. These field QC samples were collected as follows:

- At least one duplicate sample was collected for every 10 field samples;
- At least one MS/MSD for organic and one MS for inorganic samples was collected for every 20 field samples; and
- Additional samples were forwarded to the laboratory for QA/QC purposes, including an equipment rinsate blank collected each day of field sampling, a trip blank forwarded with all volatile organic samples, and a temperature blank accompanied each cooler.

The data validation reports indicate which laboratory results are considered non-compliant when compared to the MPCs identified in the QAPP (**Appendix E**). In general, sample results with qualifiers other than "R" are considered usable. Rejected data ("R" qualifier) may or may not represent unusable data, depending on the reason for the qualifier and the project DQOs. The data validation reports also identify some results as estimated, the majority of which are minor quality control problems and do not affect data usability. In most cases these problems are typical analytical difficulties or are the result of sample matrix problems (**Appendix E**).

Samples were re-extracted or re-analyzed to address specific matrix or laboratory QC issues. However, due to matrix effects or other laboratory issues, QC criteria were sometimes slightly above or below values specified in the QAPP, even with the additional analysis performed. In these cases, the parameters were estimated and J-flagged as part of the data validation process.

VOC compounds acetone, methylene chloride, and 2-butanone were consistently observed in laboratory method blanks and the low reported detections of these VOCs in the soil and groundwater samples are believed to be a function of laboratory contamination. These VOCs are recognized as common laboratory contaminants (USEPA, 1996b).

Rejected results were typically associated with laboratory QA/QC issues or moisture content and occurred sporadically throughout the RFI program (**Appendix E**). Several compounds that were rejected on a more consistent basis included antimony, 3-nitroaniline, C9-C18 EPH fraction, and phenol-bearing SVOCs. The antimony results were typically rejected due to low instrument blank and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Antimony is very insoluble, and the low MS/MSD recoveries are believed to be related to precipitation of small amounts of antimony-bearing oxides that formed following the addition of the matrix spike. The 3-nitroaniline results were rejected due to continuing calibration, percent difference and relative response factor QC issues. These two rejected compounds were typically reported at non-detect concentrations, and all other acceptable analyses are also typically non-detect. Based on these observations, the rejected antimony and 3-nitroaniline results are interpreted to be non-detect as well and the do not impact site understanding.

The C9-C18 EPH fraction was rejected in several samples due to poor recovery of the laboratory control sample duplicate and the resultant precision between the laboratory control sample and duplicate. Most of these rejected values were associated non-detect results and were consistent with the results for C19-C36 and C11-C22 reported for the samples. The site understanding is not impacted by the rejected C9-C18 EPH values.

The non-detect values for acid SVOCs (phenol-bearing SVOCs) were rejected due to poor surrogate and MS/MSD recoveries **(Appendix E)**. The results were typically reported as non-detect and the phenol-bearing compounds were typically non-detect across the site and do not impact the site understanding.

Three sediment samples were added to the RFI program in fall 2002 (MY06SD50 through MY06SD52). These three samples and a duplicate of MY06SD52 were analyzed for TCL organics and TAL metals and EPH, consistent with the QAPP, except for the inclusion of SIM PAH analysis. The lack of SIM PAH analysis was subsequently identified and the samples were analyzed for SIM PAH 61 days after extraction. Based on the validation criteria of exceeding the 60-day time period for analysis following extraction, non-detect concentrations were rejected and detected concentrations were J-flagged during data validation. The PAH results associated with the initial SVOC analysis were all reported as non-detect with quantitation limits ranging from 750 µg/kg to 950 µg/kg. The SIM PAH results reported many low PAH detections and some non-detect values with quantitation limits typically less that 50 µg/kg. Due to the much lower quantitation limits associated with the SIM PAH analysis and the minimal exceedence of the 60-day time limit criteria, the SIM PAH results are interpreted to reflect the PAH distribution in the sediment samples.

A Data Assessment TSA report was prepared following the Phase 1A portion of the program (MY, 2002e). No significant issues were identified as part of the Data Assessment TSA and no impacts to data quality were recognized (**Table 2-11**).

4.9.1 Precision

Precision is a quantitative determination of the reproducibility of an analytical value. Precision was measured by performing duplicate measurements in the field and laboratory. Quality assurance objectives for precision were also supported through the use of written laboratory SOPs and properly calibrated instruments. Laboratory precision was assessed by the analysis of matrix spike/matrix spike duplicate and laboratory duplicates. For this program, duplicate samples were collected to assess overall precision of the sampling, preparation and analytical process, and matrix spike/matrix spike duplicates were required to address aliquoting reproducibility, and to provide information on matrix reproducibility otherwise unobtainable from samples reported below analytically reproducible and statistically valid levels. The duplicate and MS/MSD samples were collected at the frequencies specified in the QAPP and the MPCs were evaluated as part of data validation activities (**Appendix E**).

Matrix spikes also provided an indication of the accuracy of native results; this will be discussed in the accuracy section. The collocated samples further addressed the ability to obtain a representative sample of the medium investigated; this will be discussed further in the representativeness section.

4.9.2 Accuracy/Bias

Accuracy/Bias is the proximity of the reported analytical value to the true concentration in the sample, and is a measure of how a concentration is in agreement with a reference concentration. Accuracy/Bias of laboratory analytical measures was evaluated through the analysis of method blanks, sample matrix spikes, matrix spike duplicates, sample surrogate recoveries, and Laboratory Control Samples as part of the data validation activities (**Appendix E**). Accuracy/Bias-contamination was assessed by trip blanks (VOCs and VPH), equipment blanks, method blanks, and instrument blanks evaluated as part of the data validation activities (**Appendix E**).

To support a determination of laboratory accuracy, the laboratories analyzed standard reference material (SRM) for each media prior to initiating the laboratory analytical program. The results of the analysis were compared to the standard values and were used to assess overall accuracy of the laboratory methods. The SRM samples were utilized in lieu of performance evaluation samples.

4.9.3 Representativeness

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variation, or environmental condition. Representativeness was controlled by the consistent collection and analysis of samples according to standardized procedures. Representativeness was also assessed through the measures of precision and accuracy. Field documentation, field duplicate analyses, laboratory QC sample results, also provided indices for the evaluation of data representativeness. Representativeness of specific samples was achieved by the following:

- Collecting samples from the location fully representing the site condition;
- Using appropriate sampling procedures, sample containers, and equipment;
- Using appropriate analytical methodologies for the parameters and detection limits required;
- Using applicable techniques for homogenizing samples prior to analysis where appropriate;
- Analyzing the sample within the appropriate holding time; and
- Properly preserving and storing the samples.

4.9.4 Comparability

Comparability is a qualitative objective, which indicates the extent to which comparisons among different measurements of the same quantity will yield valid conclusions. The QA objective for comparability is to ensure that the results of analyses for this project can be compared with analyses by other laboratories. The comparability objective was attained by:

- Demonstrating traceability of standards to the National Institute of Standards and Technology or USEPA sources;
- Using standard methodologies and analytical methods identified in the QAPP;
- Reporting results from similar matrices in consistent units and in units consistent with other organizations reporting similar data;
- Applying appropriate levels of QC within the context of the QAPP; and
- Analysis of SRM to document general laboratory performance.

The RFI program changed the analysis of petroleum hydrocarbons from MA DEP EPH Method to the Maine DEP DRO methodology between Phase 1A and Phase 1B field programs. The two methodologies are generally similar except that the EPH method quantifies petroleum hydrocarbons from C9 through C36, while the DRO method utilizes C10 through C28. Review of the EPH and DRO results from monitoring wells where both EPH and DRO were analyzed were generally in agreement and comparable, as chromatograms indicated that most petroleum hydrocarbons occurred in the C10 through C28 range.

One monitoring well (MW-313) had results for EPH and DRO that were significantly different, and not comparable. The well was initially sampled in fall 2001 and reported EPH as non-detect (130 µg/l). Subsequent sampling of MW-313 in summer 2002 reported 4,500 µg/l of DRO, while DRO results from fall 2002 indicated a concentration of 78 µg/l. The elevated results for MW-313 reported for the summer 2002 are not consistent with the fall 2001 or fall 2002 results. Likewise, the EPH and DRO results for two adjacent monitoring wells (MW-314 and MW-315) sampled in fall 2001 and summer 2002 had concentrations ranging from 130 µg/l to 300 µg/l. These results indicate that the elevated DRO concentration reported for MW-313 during the summer 2002 sampling round is not comparable with the previous or subsequent sampling results or the results of nearby monitoring wells. The elevated DRO result for MW-313 is interpreted to be an artifact of the laboratory analysis, and not representative of petroleum hydrocarbon concentration at MW-313.

4.9.5 Completeness

Completeness is a measure (percentage) of the amount of valid data obtained from a measurement system relative to the amount that would be expected to be obtained under correct, normal conditions. Valid data are data that are soundly founded as evidenced by the successful attainment of the PQOs identified in the QAPP. For this program a completeness goal was established at 90%. The percentage of usable data determined for this RFI was greater than 99%, well in excess of the 90% completeness goal established in the QAPP. The ability to obtain a sample, (human) error, and sample characteristics are major contributors to reduced completeness. For this investigation, all intended samples were collected and received by the laboratory. The laboratory analyzed all of the samples for all of the intended parameters, with one exception.

Three surface soil samples (MY05SS01 through MY05SS03) were taken from surface soils adjacent to the equipment hatch. The samples were to be analyzed for EPH and PCBs as specified in the QAPP. The COC identified the EPH and PCB analysis, but specified the PCB analysis as EPA Method 8081 (pesticides) instead of EPA Method 8082 for PCBs. Due to the inconsistency of the COC, the pesticide analysis was conducted instead of the PCB analysis. The lack of PCB results for these three samples will not impact the RFI study, as the area associated with these soil samples has been identified as contaminated with radiological parameters and is planned for removal and off-site disposal.

4.9.6 Sensitivity and Quantitation Limits

Sensitivity is the ability of the method or instrument to detect the constituent of concern and other target analytes at the levels of interest. Method and instrument sensitivity was evaluated through instrument detection limit studies, method detection limit studies, calibration standards, and Laboratory Fortified Blanks (LFB). A LFB is a blank matrix that is spiked at the Quantitation Limit with the analytes of interest. The results of the assessment are included in the data validation reports and indicate that laboratory quantitation limits specified in the QAPP were met (**Appendix E**).

The data sets were assessed to determine whether laboratory quantitation limits met the measure performance criteria specified in the QAPP. Sample quantitation limits were calculated and reported for all parameters where dilutions, percent moisture, and sample aliquot size and final concentrated volume affect the quantitation limit.

The project quantitation limits (PQLs) for soil VOC, SVOC, pesticides, and EPH compounds were sometimes slightly greater than those described in the QAPP, but this was typically related to percent solids observed in the soil samples. The PQLs included in the QAPP are based on 100% solids. The occurrence of slightly elevated PQLs did not impact the data quality, as the reported PQL was always well below the appropriate PAL. Occasionally, the elevated PQL was related to a quality control (QC) parameter being above that required by the QAPP. In these situations, the resultant quantitation limit was always well below the compound-specific PAL.

4.9.7 Data Limitations and Actions

Data sets were assessed with regard to MPCs identified in the QAPP. Based on how the data are to be used, data that did not meet all the criteria were appropriately flagged (**Appendix E**). In most cases rejected data were not included for risk assessment activities, except as discussed above. All J-flagged data were included in the risk assessment evaluations.

Table 4-1
PID Headspace Screening Results

Exploration Number	Well Number	Depth (feet below ground surface)																	
		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32	32-34
STUDY AREA 4																			
MW-302A (1)	MW-302A	*	0.4	*	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1	1.1	1.1
MW-303A	MW-303A	0.0	*	0.4	0.0	0.0	0.2	24	1.2	*	*	*	*	*	*	*	*	*	*
MW-305A (2)	MW-305A	3.7	*	3.7	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STUDY AREA 5																			
MY05SS25	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS26	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS27	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS28	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS29	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS30	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS32	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS34	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS35	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS36	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS37	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS38	NA	14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS39	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS40	NA	12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS41	NA	1.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS42	NA	7.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS43	NA	3.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS44	NA	7.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS48	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS49	NA	0.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS51	NA	0.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS52	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS53	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS59	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS75	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS79	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS101	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS102	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS103	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS105	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS106	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS107	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS108	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS109	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS110	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS111	NA	0.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS111A	NA	2.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS111B	NA	1.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS111C	NA	0.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS112	NA	0.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS114	NA	0.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS114A	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS114B	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 4-1
PID Headspace Screening Results

Exploration Number	Well Number	Depth (feet below ground surface)																	
		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32	32-34
MY05SS114C	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS115	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS115A	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS115B	NA	0.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS115C	NA	0.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS116	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS116A	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS116B	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS116C	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS117	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS117A	NA	0.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS117B	NA	0.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS117C	NA	0.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS118	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS118A	NA	0.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS118B	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS118C	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS119	NA	1.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS119A	NA	0.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SS119C	NA	0.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
B-203B	B-203B	*	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
B-206A	B-206A	*	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-318	MW-318	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*
MW-401A	MW-401A	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	0.0	*	0.0	*
MW-402	MW-402	*	0.0	*	6.0	*	11	*	0.0	*	0.0	*	*	*	*	*	*	*	*
MW-403	MW-403	*	0.0	0.0	0.0	0.0	0.0	*	*	22	*	19	*	*	8.1	*	7.3	*	*
MW-413	MW-413	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.3	1.2	0.0	*	*	*	*	*	*
MW-414	MW-414	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*
MW-415	MW-415	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*
MW-416	MW-416	*	0.0	0.6	0.0	0.0	0.0	0.0	0.6	1.1	0.0	*	*	*	*	*	*	*	*
MW-420	MW-420	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-421	MW-421	*	0.0	0.0	0.4	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-422A	MW-422A	*	2.0	*	0.0	0.8	26	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*
MW-423A	MW-423A	*	0.6	*	0.6	0.8	0.8	0.0	0.3	2.3	*	*	*	*	*	*	*	*	*
MW-424A	MW-424A	2.0	*	*	0.0	0.8	26	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*
MY05SB01	MW-306	1.1	*	0.3	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB02	MW-307	1.7	1.1	1.1	0.8	*	0.0	0.0	*	0.0	*	*	0.0	*	*	*	*	*	*
MY05SB04	NA	*	0.1	0.0	0.1	0.0	0.2	0.1	0.1	*	*	*	*	*	*	*	*	*	*
MY05SB05	NA	*	0.1	0.0	0.2	0.0	0.0	0.0	0.1	*	*	*	*	*	*	*	*	*	*
MY05SB06	NA	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB07	NA	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB08	NA	*	0.0	0.2	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB09	NA	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB10	NA	*	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	*	*	*	*	*	*	*	*	*
MY05SB11	NA	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*
MY05SB12	MW-312	*	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB13	NA	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB14	MW-317	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*
MY05SB15	MW-308	0.0	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 4-1
PID Headspace Screening Results

Exploration Number	Well Number	Depth (feet below ground surface)																	
		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32	32-34
MY05SB16	NA	0.0	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB17	NA	0.0	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB18	NA	*	1.5	0.0	0.2	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB19	NA	*	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*
MY05SB20	NA	*	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB21	NA	*	0.0	0.1	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB22	NA	*	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB23	MW-309	*	0.0	0.0	0.0	0.0	0.0	0.1	0.0	*	0.0	0.0	*	*	*	*	*	*	*
MY05SB24	NA	*	0.0	0.0	0.0	0.3	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB25	MW-310	*	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB36	NA	0.0	*	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB37	MW-311	0.1	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB38	NA	0.0	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB39	NA	0.0	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB40	NA	0.0	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB41	NA	0.6	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB42	NA	0.0	*	0.1	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB43	NA	*	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB44	MW-313	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*
MY05SB45	MW-314	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	*	*	*	*	*	*	*	*
MY05SB46	MW-315	*	0.0	0.0	0.0	0.0	3.0	1.4	0.0	0.0	*	*	*	*	*	*	*	*	*
MY05SB47	MW-316	0.0	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB48	MW-319	*	0.0	0.1	0.0	0.3	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*
MY05SB49	MW-320	*	1.0	0.0	0.0	0.9	0.9	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
MY05SB52	MW-323	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*
MY05SB54	MW-324	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*
MY05SB101	MW-404	66.4	*	13	2.0	0.2	0.8	0.2	*	*	*	*	*	*	*	*	*	*	*
MY05SB102	MW-405	0.3	*	0.0	0.0	30	53	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB103A	MW-407A	0.2	*	0.6	0.2	0.2	0.2	0.3	0.1	0.2	0.1	0.2	0.2	0.0	0.0	0.0	*	*	*
MY05SB103B	MW-407B	*	*	0.0	*	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB104A	MW-409A	0.0	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	*	*	*	*
MY05SB105	MW-408	*	17	3.0	1.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05SB106A	MW-406A	*	1.1	1.5	1.6	1.8	*	1.2	1.2	1.0	*	0.0	0.1	0.0	0.2	*	*	*	*
MY05GP01	NA	*	2.0	1.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP02	NA	*	2.1	1.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP03	NA	*	0.9	0.8	1.1	0.9	0.9	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP04	NA	*	0.7	0.7	0.8	0.3	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP05	NA	*	1.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP06	NA	*	1.7	1.6	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP07	NA	*	1.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP08	NA	*	1.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP09	NA	*	1.5	2.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP10	NA	*	1.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP11	NA	*	0.7	1.0	0.6	1.0	1.9	1.1	2.4	1.4	1.8	*	*	*	*	*	*	*	*
MY05GP12	NA	*	1.2	1.9	1.0	2.4	3.4	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP13	NA	*	2.7	2.3	2.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05GP14	NA	*	0.6	0.5	0.3	2.1	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05HA07	NA	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05HA08	NA	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05HA09	NA	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05HA11	NA	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 4-1
PID Headspace Screening Results

Exploration Number	Well Number	Depth (feet below ground surface)																	
		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32	32-34
MY05HA101	NA	0.5	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05HA102	NA	0.5	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05HA103	NA	0.0	*	0.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05HA104	NA	0.7	*	0.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MYLOSS02	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MYLOSS03	NA	0.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MYLOSS04	NA	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MYLOSS05	NA	0.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP01	NA	2.5	682	1224	772	451	423	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP02	NA	*	0.9	1.4	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP03	NA	1.8	*	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP06	NA	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP07	NA	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP08	NA	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP09	NA	*	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP10	NA	*	0.0	0.5	0.0	*	0.5	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP12	NA	*	0.0	0.5	0.0	20	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP13	NA	*	0.0	0.5	0.0	0.5	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP15	NA	*	1.1	163	131	101	142	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP16	NA	*	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP18	NA	*	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP19	NA	*	1.7	0.5	0.5	0.0	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*
MY05TP21	NA	*	0.5	0.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP101	NA	*	0.7	*	1.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP102	NA	*	0.7	*	0.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP103	NA	*	0.2	*	3.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104A	NA	*	*	0.0	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104B	NA	0.0	*	0.0	*	66	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104C	NA	*	0.2	*	0.0	*	0.0	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104D	NA	*	0.0	26	44	*	68	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104E	NA	*	1.2	2.8	*	1.5	*	1.3	*	*	*	*	*	*	*	*	*	*	*
MY05TP104F	NA	*	1.6	*	*	1.5	*	1.7	*	*	*	*	*	*	*	*	*	*	*
MY05TP104G	NA	*	1.3	*	*	1.1	*	1.5	*	*	0.5	*	*	*	*	*	*	*	*
MY05TP104H	NA	*	0.8	*	*	1.4	*	*	*	2.5	*	*	*	*	*	*	*	*	*
MY05TP104I	NA	*	*	*	*	123	2.1	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104J	NA	*	2.0	1.6	1.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104K	NA	*	1.8	0.8	1.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP104L	NA	*	3.9	*	4.3	*	*	*	*	116	*	*	*	*	*	*	*	*	*
MY05TP104M	NA	*	1.9	*	65	*	*	*	2.6	*	*	*	*	*	*	*	*	*	*
MY05TP104N	NA	*	2.6	*	2.0	*	*	*	2.5	*	*	*	*	*	*	*	*	*	*
MY05TP104O	NA	*	0.9	*	*	0.8	*	*	1.0	*	*	*	*	*	*	*	*	*	*
MY05TP104P	NA	*	1.6	*	*	1.0	*	*	*	*	*	*	5.4	*	*	*	*	*	*
MY05TP104Q	NA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP107	NA	*	0.0	*	*	0.0	*	*	*	0.0	*	*	*	*	*	*	*	*	*
MY05TP107A	NA	*	0.0	*	*	0.0	*	0.6	*	0.0	*	*	*	*	*	*	*	*	*
MY05TP108-345	NA	*	0.0	*	*	*	0.0	*	*	0.0	*	*	*	*	*	*	*	*	*
MY05TP108-BH		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP109	NA	*	0.0	*	*	*	0.4	*	*	0.0	*	*	*	*	*	*	*	*	*
MY05TP110	NA	*	0.0	*	*	0.0	*	*	*	0.0	*	*	*	*	*	*	*	*	*
MY05TP110A	NA	*	*	*	*	*	4.2	*	*	*	*	*	*	*	*	*	*	*	*

Table 4-1
PID Headspace Screening Results

Exploration Number	Well Number	Depth (feet below ground surface)																	
		0-0.5	0.5-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32	32-34
MY05TP111	NA	*	0.0	*	*	3.8	*	*	*	5.4	*	*	*	*	*	*	*	*	*
MY05TP111A	NA	*	*	*	*	*	*	6.4	*	*	*	*	*	*	*	*	*	*	*
MY05TP112	NA	*	0.0	*	*	*	4.1	*	*	6.7	*	*	*	*	*	*	*	*	*
MY05TP113	NA	*	1.0	*	*	1.4	*	*	*	1.4	*	*	*	*	*	*	*	*	*
MY05TP114	NA	*	1.4	*	*	1.9	*	*	*	1.9	*	*	*	*	*	*	*	*	*
MY05TP115	NA	*	1.3	*	*	12	*	*	*	3.3	*	*	*	*	*	*	*	*	*
MY05TP116	NA	*	2.1	*	*	1.5	*	*	*	1.5	*	*	*	*	*	*	*	*	*
MY05TP117	NA	*	0.7	*	*	*	1.5	*	*	0.7	*	*	*	*	*	*	*	*	*
MY05TP118	NA	*	0.0	*	*	*	0.0	*	*	2.1	*	*	*	*	*	*	*	*	*
MY05TP119 - 345	NA	*	0.1	*	*	0.4	*	*	*	0.4	*	*	*	*	*	*	*	*	*
MY05TP119 - FPPH	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP120	NA	*	1.8	*	*	1.8	*	*	*	0.9	*	*	*	*	*	*	*	*	*
MY05TP121	NA	*	1.8	*	*	1.5	*	*	*	0.7	*	*	*	*	*	*	*	*	*
MY05TP122	NA	*	0.4	*	*	*	0.9	*	*	0.4	*	*	*	*	*	*	*	*	*
MY05TP123	NA	*	0.7	*	*	*	0.7	*	*	0.1	*	*	*	*	*	*	*	*	*
MY05TP124	NA	*	0.1	*	*	*	1.0	*	*	0.7	*	*	*	*	*	*	*	*	*
MY05TP125	NA	*	0.7	*	3.2	*	*	*	0.1	*	*	*	*	*	*	*	*	*	*
MY05TP126	NA	*	0.4	0.7	*	1.0	*	*	*	*	*	*	*	*	*	*	*	*	*
MY05TP129	NA	*	0.7	*	*	0.1	*	*	*	0.4	*	*	*	*	*	*	*	*	*
MY05TP130	NA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-10 (3)	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-20	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-30	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-40	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-50	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-60	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-70	NA	*	0.0	*	*	*	29	*	*	*	*	*	*	*	*	*	*	*	*
Test Trench-80	NA	*	0.0	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
TP-101 (4)	NA	0.7	*	*	1.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
TP-102	NA	0.7	*	*	0.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
TP-103	NA	0.2	*	*	3.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Notes:
All results reported in parts per million (ppm)
* No Data Collected
NA = Not Applicable
PID data is matched to the nearest foot interval.
Where more than one PID value was reported per interval, the highest reading is included in the table.
Raw Data in Boring Logs and Test Pit Logs in Appendix A and C, respectively.
(1) MW-302A results from 34 to 44 feet = 0.0 ppm.
(2) MW-305A results from 34 to 60 feet = 0.0 or 0.1 ppm.
(3) Test Trench-10 to 80 refer to Phase 1A test excavation at the former truck maintenance garage.
(4) TP-101 to 103 refer to testpits excavated at the Bailey House septic system leach field.

Table 4-2
Reference Soil Statistical Values

Metals (mg/kg)	PAL	Average	Upper 95% Confidence Level	Minimum	Maximum
ALUMINUM	76,000	19,686	24,149	3,110	32,500
ANTIMONY	31	0.14	0.21	0.01	0.37
ARSENIC	22	7.26	9.61	0.16	16.40
BARIUM	5,400	58.46	76.06	9.40	114.00
BERYLLIUM	150	0.86	1.20	0.19	2.70
BORON	5,500	1.99	2.53	0.92	4.70
CADMIUM	37	0.38	0.44	0.27	0.56
CALCIUM	*	1,159	1,685	106	3,020
CHROMIUM	210	31.62	40.99	2.40	59.80
COBALT	4,700	9.78	13.32	0.72	23.20
COPPER	2,900	12.80	17.42	0.52	26.60
IRON	23,000	22,815	28,874	546	44,900
LEAD	400	12.75	16.19	4.60	25.00
MAGNESIUM	*	5,224	7,081	170	11,500
MANGANESE	1,800	317.86	420.28	31.30	718.00
MERCURY	6.1	0.06	0.08	0.01	0.19
MOLYBDENUM	390	0.64	0.85	0.15	1.80
NICKEL	*	22.49	30.54	0.75	52.30
POTASSIUM	*	2,675	3,702	348	5,950
SELENIUM	390	0.86	1.27	0.51	3.60
SILVER	390	0.52	0.62	0.33	0.83
SODIUM	*	122.31	166.29	32.70	289.00
THALLIUM	520	0.25	0.34	0.13	0.76
VANADIUM	550	35.40	44.38	4.40	61.00
ZINC	23,000	44.50	58.40	3.00	94.00

Notes:
Reference Soil analytical results are provided in the Backlands RFI Report (MY, 2003b).

Table 4-3
Reference Groundwater Statistical Values

Metals (ug/l)	All Reference Wells				Bedrock Reference Wells				Overburden Reference Wells			
	Average	Upper 95% Confidence Level	Minimum	Maximum	Bedrock Average	Upper 95% Confidence Level	Minimum	Maximum	Overburden Average	Upper 95% Confidence Level	Minimum	Maximum
ALUMINUM	335.71	630.79	15.35	1,760.00	165.19	437.73	15.35	712.00	530.59	1,384.16	15.35	1,760.00
ANTIMONY	0.36	0.47	0.10	0.85	0.32	0.35	0.10	0.59	0.41	0.42	0.10	0.85
ARSENIC	2.01	2.31	1.20	3.60	1.73	0.75	1.20	2.08	2.34	1.02	2.00	3.60
BARIUM	23.35	32.05	5.10	57.00	31.15	29.27	17.00	57.00	14.43	22.57	5.10	38.30
BERYLLIUM	0.39	0.53	0.10	1.30	0.47	0.61	0.10	1.30	0.29	0.14	0.18	0.38
BORON	12.51	14.84	5.43	26.30	10.85	4.99	5.43	15.40	14.40	9.77	8.50	26.30
CADMIUM	0.11	0.14	0.05	0.24	0.10	0.08	0.05	0.15	0.11	0.16	0.05	0.24
CALCIUM	13,087	18,021	2,940	30,000	11,665	19,932	2,940	28,500	14,713	12,824	9,590	30,000
CHROMIUM	2.00	2.57	0.85	5.40	1.76	1.15	1.10	3.00	2.26	2.63	0.85	5.40
COBALT	4.11	5.43	0.42	8.80	5.05	5.02	0.42	8.80	3.04	2.99	0.92	5.13
COPPER	2.24	3.00	0.84	6.50	2.58	3.20	0.86	6.50	1.84	1.52	0.84	3.30
IRON	520.80	858.30	5.00	2,190.00	443.05	531.74	67.40	857.00	609.66	1,656.47	5.00	2,190.00
LEAD	0.34	0.49	0.05	0.92	0.29	0.50	0.05	0.92	0.40	0.52	0.07	0.76
MAGNESIUM	5,134	6,715	1,890	12,300	3,761	3,891	1,890	7,190	6,703	5,831	3,750	12,300
MANGANESE	186.23	254.44	0.68	354.00	285.25	101.60	193.00	354.00	73.07	175.64	0.68	242.00
MERCURY	0.07	0.10	0.01	0.26	0.06	0.08	0.01	0.16	0.08	0.15	0.02	0.26
MOLYBDENUM	1.93	2.43	0.45	3.70	1.78	1.91	0.45	3.70	2.09	1.52	0.94	3.70
NICKEL	8.88	11.03	0.89	12.80	8.92	7.27	2.70	12.80	8.84	7.87	0.89	11.92
POTASSIUM	3,802	4,235	1,900	5,350	3,745	1,901	1,900	5,350	3,867	828	3,140	4,420
SELENIUM	3.37	3.81	2.36	4.33	3.35	1.45	2.36	4.33	3.40	1.59	2.36	4.33
SILVER	0.06	0.08	0.05	0.15	0.06	0.06	0.05	0.15	0.06	0.07	0.05	0.15
SODIUM	9,953	11,624	4,890	13,900	8,149	5,939	4,890	13,900	12,014	2,330	10,100	13,500
THALLIUM	0.56	0.86	0.10	1.90	0.58	0.98	0.10	1.40	0.53	1.15	0.10	1.90
VANADIUM	3.44	4.31	0.44	6.20	3.09	2.94	0.44	4.50	3.84	2.98	0.52	6.20
ZINC	7.82	11.98	1.08	23.60	12.31	15.38	3.90	23.60	2.69	3.30	1.08	6.00

Notes:
Reference Groundwater analytical results are provided in the Backlands RFI Report (MY, 2003b).

Table 4-4
Reference Marine Sediment Analytical Results
Detected Compounds

Analyte / Date Collected / Sample Delivery Group	PAL	MYRSSD01 9/27/2001 MY006	MYRSSD02 9/27/2001 MY006	MYRSSD02A 11/20/2001 MY019/MYT101	MYRSSD03 9/27/2001 MY006	MYRSSD04 9/27/2001 MY006	MYRSSD05 9/27/2001 MY006	MYRSSD06 9/27/2001 MY006
Metals (mg/kg)								
ALUMINUM	*	13900	15000	15200	15500	14400	17000	15600
ANTIMONY	2	ND	ND	0.07 R	ND	ND	ND	ND
ARSENIC	8.2	8.1	**8.7**	**9.1**	**8.5**	**9.1**	**10.4**	**9**
BARIUM	*	30.9	32.7	42.7	33.6	33	38.7	33.3
BERYLLIUM	*	0.47	0.54	0.58	0.55	0.5	0.59	0.56
BORON	*	23.8	24.5	23.8	24.2	22	24.6	24.7
CADMIUM	1.2	0.23	0.18	0.18	0.19	0.2	0.2	0.18
CALCIUM	*	2890	2910	13600 J	3940	2990	3130	3330
CHROMIUM	81	46.2	52.4	45	53.5	50.4	59.4	52.2
COBALT	*	8	8.6	9.1	8.7	8.4	9.3	8.6
COPPER	34	17	19	17.7	18.8	17.7	20.7	18.8
IRON	*	20200	22000	20200	22400	21600	24200	23400
LEAD	46.7	21.5	24.1	22.3	24.3	23	27.7	24.5
MAGNESIUM	*	6560	7190	6850	7100	6720	7800	7260
MANGANESE	*	221	237	262	241	237	265	253
MERCURY	0.15	**0.33 J**	**0.36 J**	**0.27**	**0.34 J**	**0.3 J**	**0.36 J**	**0.33 J**
MOLYBDENUM	*	1	1	1.6	0.95	1.1	1.4	0.95
NICKEL	20.9	20.1	**22.6**	**22.8**	**22.4**	**21.1**	**24.5**	**23.2**
POTASSIUM	*	2970	2970	3940	3010	2940	3650	3350
SELENIUM	*	0.56 J	0.57 J	0.7	0.55 J	ND	0.54 J	0.56 J
SILVER	1	ND	ND	0.2	ND	ND	ND	ND
SODIUM	*	8010	8960	7360	7650	7560	9410	8120
THALLIUM	*	ND	ND	0.2	ND	ND	ND	ND
VANADIUM	*	36	39.2	40.7	40	38	43.9	39.8
ZINC	150	67.3	74.1	77.9	73.8	70.6	79.7	73.1
PCBs (ug/kg)		ND	ND	ND	ND	ND	ND	ND
PCB Congeners (ug/kg)								
138 - Hexachlorobiphenyl	22.7	NA	NA	0.34 J	NA	NA	NA	NA
153/132/168 - Hexachlorobiphenyl	22.7	NA	NA	0.67 J	NA	NA	NA	NA
180/172 - Heptachlorobiphenyl/Heptachlorobiphenyl	22.7	NA	NA	0.18 J	NA	NA	NA	NA
182/187 - Heptachlorobiphenyl/Heptachlorobiphenyl	22.7	NA	NA	0.18 J	NA	NA	NA	NA
206 - Nonachlorobiphenyl	22.7	NA	NA	0.11 J	NA	NA	NA	NA
209 - Decachlorobiphenyl	22.7	NA	NA	0.12 J	NA	NA	NA	NA
Heptachlorobiphenyls	22.7	NA	NA	0.9 J	NA	NA	NA	NA
Hexachlorobiphenyls	22.7	NA	NA	3.8	NA	NA	NA	NA
Trichlorobiphenyls	22.7	NA	NA	4.2	NA	NA	NA	NA
Pesticides (ug/kg)		ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)								
3-NITROANILINE	*	1600 R	1700 R	ND	ND	ND	ND	ND
ACENAPHTHYLENE	44	22 J	30 J	ND	ND	ND	ND	ND
ANTHRACENE	85	24 J	26 J	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	261	190 J	180	210	200	180	240	160
BENZO(A)PYRENE	430	160	190	190	180	150	190	190
BENZO(B)FLUORANTHENE	*	210	250	240	240	200	200	260
BENZO(K)FLUORANTHENE	*	45	89	63 J	ND	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	120	140	110	ND	97	110	120
CHRYSENE	384	130	160	150 J	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	63	30 J	34 J	ND	ND	ND	ND	ND
FLUORANTHENE	600	270	310	230 J	300	160	270	260
INDENO(1,2,3-CD)PYRENE	*	160 J	190 J	140	160 J	130 J	150 J	170 J
PHENANTHRENE	240	50 J	49 J	100 J	ND	ND	ND	82 J
PYRENE	665	160	170	280 J	190	140	150	200
VOCs (ug/kg)								
BROMOMETHANE	*	500 J	ND	ND	ND	ND	ND	ND
Other Compounds (mg/kg)								
TOTAL ORGANIC CARBON	*	30200	26200	20600 J	30200	17800	32100	31900

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL

J = Estimated Value
R = Rejected Value

ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-5

Reference Tissue Analytical Results

Detected Compounds

Analyte	PAL	MYRSBC01	MYRSBC02	MYRSBC03	MYRSBM01	MYRSBM04	MYRSBM02	MYRSBM03	MYRSMM01
Duplicates						MYRSBM01			
Date Collected		10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/3/2001
Sample Delivery Group		MYT002	MYT002	MYT002	MYT003	MYT003	MYT003	MYT003	MYT001
Metals (mg/kg)									
ALUMINUM	1400	328 J	427 J	368 J	57.8 J	76.6 J	93.6 J	74.3 J	6.82 J
ANTIMONY	0.54	0.014	0.064	0.012	ND	ND	ND	ND	ND
ARSENIC	0.014	**3.3**	**3.42**	**2.84**	**0.98**	**1.47**	**1.53**	**1.5**	**0.65**
BARIUM	95000	1.86	2.64	2.16	0.31 J	0.49 J	0.53 J	0.47 J	0.23 J
BERYLLIUM	2.7	0.02	0.023	0.022	ND	ND	0.006 J	0.005 J	ND
BORON	120000	3.13	3.3	2.85	3.95	4.43	4	4.32	1.03
CADMIUM	2.2	0.05	0.037	0.046	0.214	0.316	0.281	0.293	ND
CALCIUM	*	2930	3830	1090	687 J	1150 J	1690 J	2060 J	9450 J
CHROMIUM	7	0.88	1.37	0.93	0.38	0.5	0.58	0.6	0.14 J
COBALT	81	0.316	0.336	0.331	0.092	0.14	0.138	0.136	0.016 J
COPPER	54	3.25 J	7.61 J	5.3 J	1.3 J	1.35 J	3.82 J	1.9 J	28.4 J
IRON	410	**1330**	**1500**	**1100**	95 J	132 J	166 J	138 J	29 J
LEAD	*	1.09 J	1.47 J	1.08 J	0.219	0.291	0.411	0.305	0.484
MAGNESIUM	*	759	791	763	740	679	609	631	498
MANGANESE	302	42.9 J	41.8 J	57.4 J	4.74 J	7.2 J	3.35 J	4.02 J	4.18 J
MERCURY	0.2	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.04
MOLYBDENUM	6.8	0.36	0.35	0.34	0.17	0.17	0.18 J	0.29	0.06
NICKEL	4.3	0.66 J	0.91 J	0.62 J	0.23	0.28	0.41	0.51	0.48 J
POTASSIUM	*	1930	1950	1940	1380	1760	1740	1810	2810
SELENIUM	6.8	ND	ND	ND	0.38 J	0.62 J	0.58 J	0.56 J	0.43
SILVER	11	0.172 J	0.178 J	0.129 J	0.008 J	0.02	0.012	0.01 J	0.044 J
SODIUM	*	4200	4340	4270	5270	4640	4180	4340	1620
THALLIUM	0.095	ND	0.005 J	0.006 J	ND	ND	ND	ND	ND
VANADIUM	6	1.92	2.17	1.86	0.32 J	0.4 J	0.41 J	0.64 J	0.12 J
ZINC	648	16	18	17.6	8.98	11.3	13.8	14	39.4
PCBs (ug/kg)									
Total Aroclor 1254	1.6	**3.4**	**4.6**	**3.9**	ND	ND	ND	ND	**42**
Total Aroclor 1260	1.6	**3.3 J**	**4 J**	**3.9 J**	ND	ND	ND	ND	**37**
Pesticides (ug/kg)									
4,4'-DDD	13	0.12 J	0.14 J	0.14 J	0.19 J	0.3 J	0.4	0.38 J	2 J
4,4'-DDE	9.3	0.29 J	0.39	0.36	0.44	0.74	0.9 J	0.92	5.1
4,4'-DDT	64	0.053 J	0.056 J	0.065 J	ND	ND	ND	ND	0.18 J
ALPHA-CHLORDANE	17	0.14 J	0.13 J	0.14 J	0.17 J	0.24 J	0.24 J	0.3 J	0.46 J
DIELDRIN	1.4	0.058 J	0.059 J	0.074 J	0.04 J	0.064 J	0.073 J	0.072 J	0.61 J
ENDOSULFAN SULFATE	*	0.048 J	0.059 J	0.057 J	0.045 J	0.084 J	0.084 J	0.088 J	0.17 J
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	ND	ND	ND	1.6 J
ENDRIN KETONE	*	0.41	0.46	0.41	0.25 J	0.37 J	0.34	0.33 J	3 J
GAMMA-CHLORDANE	17	0.079 J	0.12 J	0.083 J	0.062 J	0.06 J	0.096 J	0.13 J	0.28 J
HEPTACHLOR EPOXIDE	2.4	0.012 J	0.012 J	0.02 J	ND	ND	0.011 J	ND	0.16 J
LINDANE	17	0.04 J	0.045 J	0.046 J	0.021 J	0.036 J	0.044 J	0.036 J	0.15 J
ALPHA-BHC	0.5	0.025 J	0.026 J	0.036 J	0.017 J	0.03 J	0.03 J	0.034 J	0.24 J
BETA-BHC	1.8	0.5	0.26 J	0.33	ND	ND	ND	ND	ND
DELTA-BHC	*	ND	ND	0.041 J	ND	ND	ND	ND	ND

Table 4-5

Reference Tissue Analytical Results

Detected Compounds

Analyte	PAL	MYRSBC01	MYRSBC02	MYRSBC03	MYRSBM01	MYRSBM04	MYRSBM02	MYRSBM03	MYRSMM01
Duplicates						MYRSBM01			
Date Collected		10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/9/2001	10/3/2001
Sample Delivery Group		MYT002	MYT002	MYT002	MYT003	MYT003	MYT003	MYT003	MYT001
SIM PAHs (ug/kg)									
ACENAPHTHENE	81000	ND	ND	ND	ND	ND	ND	ND	0.21 J
ACENAPHTHYLENE	*	0.4 J	0.48 J	0.52 J	0.32 J	0.48 J	0.56 J	0.6 J	0.22 J
ANTHRACENE	410000	0.32 J	0.4 J	0.38 J	0.3 J	0.46 J	0.53 J	0.56 J	0.14 J
BENZO(A)ANTHRACENE	4.3	3.3	3.6	4	1.6	2.3	2.5	2.6	ND
BENZO(A)PYRENE	0.43	**3.6**	**3.9**	**4.1**	**1.1 J**	**1.7 J**	**1.7**	**1.7 J**	ND
BENZO(B)FLUORANTHENE	4.3	**5.8 J**	**6.7 J**	**7.1 J**	3.1	**4.7**	**4.9**	**5.2**	0.18 J
BENZO(K)FLUORANTHENE	4.3	2.1	2.2	2.5	1 J	1.6 J	1.5 J	1.6 J	0.097 J
BENZO[G,H,I]PERYLENE	*	4.3	4.8	5	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	0.43	**0.46 J**	**0.47 J**	**0.5 J**	0.18 J	0.25 J	0.26 J	0.27 J	0.081 J
CHRYSENE	430	4.5	5.1	6.2	2.3	3.3	4	3.8	0.21 J
FLUORANTHENE	54000	6.2	7	7.8	3.5	4.8	6	5.9	ND
FLUORENE	54000	0.33 J	0.29 J	0.24 J	ND	ND	ND	ND	0.32 J
INDENO(1,2,3-CD)PYRENE	43	2.8	3.1	3.2	0.96 J	1.4 J	1.5 J	1.5 J	0.077 J
NAPHTHALENE	27000	ND	ND	ND	ND	ND	ND	ND	1.7 J
PHENANTHRENE	*	1.8 J	2 J	1.9 J	ND	ND	ND	ND	ND
PYRENE	41000	7.6	8.5	9.2	4.5	6.2	7.8	7.5	ND
SVOCs (mg/kg)									
1,2,4-TRICHLOROBENZENE	14	ND	ND	ND	ND	ND	ND	ND	0.01 J
2,4,5-TRICHLOROPHENOL	14	0.1 J	0.033 J	ND	ND	ND	ND	ND	0.23 J
2,4,6-TRICHLOROPHENOL	0.29	0.038 J	ND	ND	ND	ND	ND	ND	0.094 J
2,4-DICHLOROPHENOL	4.1	0.043 J	0.013 J	ND	ND	ND	ND	ND	0.12 J
2,4-DIMETHYLPHENOL	27	0.061 J	0.031 J	0.021 J	ND	ND	ND	ND	0.36 J
2-CHLOROPHENOL	6.8	ND	ND	ND	ND	ND	ND	ND	0.38 J
2-METHYLPHENOL	62	0.035 J	0.019 J	0.016 J	ND	ND	ND	ND	0.17 J
4-CHLORO-3-METHYLPHENOL	*	0.2 J	0.1 J	0.064 J	ND	ND	ND	ND	4.2
4-METHYLPHENOL	6.8	0.09 J	0.067 J	0.033 J	ND	ND	ND	ND	0.26 J
4-NITROPHENOL	11	0.31 R	0.17 R	1.3 R	0.26 R	1.6 R	0.11 R	1.3 R	5 R
ISOPHORONE	3.3	ND	ND	ND	ND	0.025 J	0.028 J	0.028 J	ND
PENTACHLOROPHENOL	0.026	**0.17 J**	**0.049 J**	ND	ND	ND	ND	ND	**2.2 J**
PHENOL	81	ND	ND	ND	ND	ND	ND	ND	1.3 J
Other Compounds									
PERCENT SOLIDS	*	14	14.8	14.7	0.583	13.1	1.06	1.22	24.7
PERCENT LIPIDS	*	0.784	0.892	0.914	1.6	0.946	1.6	1.9	7.99

Notes:

PAL = Project Action Limit
J = Estimated Value
ND = Compound(s) Not Detected
* PAL Not Available
R = Rejected Value
NA = Compound(s) Not Analyzed
Bold values indicate an exceedence of the PAL

Table 4-6
Study Area 3 - Foxbird Island Soil Analytical Results
Detected Compounds

Analyte Date Collected Sample Delivery Group	PAL	MY03SS01(0-0.5) 9/24/2001 MY004	MY03SS14(0-0.5) 9/24/2001 MY004	MY03SS15(0-0.5) 9/24/2001 MY004
EPH (mg/kg)	100	ND	ND	ND
Metals (mg/kg)				
ALUMINUM	76000	20700	10900	9670
ANTIMONY	31	0.08 R	0.01 R	0.03 R
ARSENIC	22	11.6	21.3	6.4
BARIUM	5400	79.6	130	43.4
BERYLLIUM	150	0.74	0.41	0.43
CALCIUM	*	2530	2280	1520
CHROMIUM	210	47.3 J	36.7 J	24.9 J
COBALT	4700	15.5	7.9	7.4
COPPER	2900	19.2	37.4	21.7
IRON	23000	**30200**	16900	22500
LEAD	400	12.6	32.9	9.1
MAGNESIUM	*	8220	5780	4760
MANGANESE	1800	618	343	346
MERCURY	6.1	0.02 J	ND	0.02 J
MOLYBDENUM	390	0.92	1.3	1.3
NICKEL	*	35.5	16.7	16.2
POTASSIUM	*	4830	2460	2340
SODIUM	*	165 J	140 J	91.4 J
VANADIUM	550	45.2	27.2	22.2
ZINC	23000	69.5	72.8	62.8
PCBs (ug/kg)		ND	ND	ND
Pesticides (ug/kg)		ND	ND	ND
SVOCs (ug/kg)		ND	ND	ND
VOCs (ug/kg)				
2-BUTANONE	7300000	ND	88	ND
Other Compounds				
Total Solids (%)	*	87	96	91

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected

Table 4-7
Study Area 4 - ISFSI Soil Analytical Results
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY04SS01 5/31/2000 MY6100	MY04SS02 5/31/2000 MY6100	MY04SS02DUP dup. of MY04SS02 5/31/2000 MY6100	Trench Sample 2 2/22/2000	Trench Sample 3 6/1/2000
EPH (mg/kg)						
C11-C22 AROMATICS	100	**96**	ND	ND	NA	NA
C19-C36 ALIPHATICS	100	**470 J**	54	ND	NA	NA
C9-C18 ALIPHATICS	100	**450 J**	ND	ND	NA	NA
DRO (mg/kg)	100	NA	NA	NA	32	ND
Metals (mg/kg)						
ARSENIC	22	NA	NA	NA	8.1	7.9
BARIUM	5400	NA	NA	NA	50	58
CADMIUM	37	NA	NA	NA	ND	ND
CHROMIUM	210	NA	NA	NA	25	36
LEAD	400	NA	NA	NA	8.9	6.8
MERCURY	6.1	NA	NA	NA	ND	0.038
SILVER	390				ND	ND
SELENIUM	390	NA	NA	NA	ND	ND
PCBs (ug/kg)						
		ND	ND	ND	NA	NA
Pesticides (ug/kg)						
		NA	NA	NA	NA	NA
SVOCs (ug/kg)						
BENZO(A)PYRENE	62	**210 J**	ND	ND	NA	NA
CHRYSENE	62000	160 J	ND	ND	NA	NA
BENZO(B)FLUORANTHENE	620	390	ND	ND	NA	NA
BENZO(G,H,I)PERYLENE	*	140 J	ND	ND	NA	NA
N-NITROSODIPHENYLAMINE	99000	ND	ND	50 J	NA	NA
PYRENE	2300000	480 J	ND	40 J	NA	NA
FLUORANTHENE	2300000	490 J	ND	40 J	NA	NA
VOCs (ug/kg)		NA	NA	NA	ND	ND

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedance of the PAL
J = Estimated Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-8
Study Area 4 - ISFSI Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY04GW01	MY04GWD01	MY04GW02	MY04GW03	MY04GW04A	MY04GW04A-1B
Well Number		**98-1-OW**	**98-1-OW**	**98-9-OW**	**98-10-OW**	**MW-302A**	**MW-302A**
Duplicates			**Dup. of MY04GW01**				
Sample Date		**3/15/2000**	**3/15/2000**	**3/6/2000**	**6/14/2000**	**12/13/2002**	**6/26/2002**
Sample Delivery Group		**MYW2**	**MYW2**	**MYW1**	**MY61500**	**MY023**	**MY113**
EPH/DRO (ug/l)							
EPH	50	ND	ND	20	**110 J**	**140 J**	NA
DIESEL RANGE ORGANICS	50	NA	NA	NA	NA	NA	**54**
Metals (ug/l)							
ALUMINUM	1430	**2200 J**	1200 J	**6900 J**	**30000 J**	**3240**	NA
ANTIMONY	3	ND	ND	**11 J**	**33 J**	ND	NA
ARSENIC	10	ND	ND	ND	**42 J**	3.5 J	NA
BARIUM	2000	15	ND	46 J	230 J	26.3	NA
BERYLLIUM	73	ND	ND	ND	ND	0.6	NA
BORON	630	ND	ND	ND	ND	30.3	NA
CADMIUM	3.5	ND	ND	1.4 J	ND	ND	NA
CALCIUM	*	13000	12000	18000	130000	7690	NA
CHROMIUM	40	ND	ND	12 J	**70**	ND	NA
COBALT	2200	ND	ND	ND	ND	1.9	NA
COPPER	1300	ND	ND	ND	ND	9.2	NA
IRON	11000	2600 J	1800 J	6900 J	**52000**	3820	NA
LEAD	10	ND	ND	ND	**35 J**	2.2	NA
MAGNESIUM	*	7300	6700	9300	56000	3530	NA
MANGANESE	500	320	340	190	**6300**	170	NA
MERCURY	2	ND	ND	ND	ND	0.03 J	NA
MOLYBDENUM	35	NR	ND	ND	ND	**176**	NA
NICKEL	140	ND	ND	ND	62	7.1	NA
POTASSIUM	*	2700	2400	4400 J	16500 J	7960	NA
SELENIUM	35	ND	ND	10 J	ND	ND	NA
SILVER	35	ND	ND	11 J	ND	0.96	NA
SODIUM	20000	**26000**	**24000**	16000	**41000 J**	**50600**	NA
THALLIUM	2.4	ND	ND	ND	ND	ND	NA
VANADIUM	260	ND	ND	ND	73	5.5	NA
ZINC	2000	ND	ND	ND	170 J	ND	NA
PCBs (ug/l)		ND	ND	ND	ND	ND	NA
Pesticides (ug/l)		ND	ND	ND	ND	ND	NA
SVOCs (ug/l)							
3-NITROANILINE	*	ND	ND	ND	ND	ND	NA
DI-N-BUTYL PHTHALATE	700	ND	ND	ND	ND	1 J	NA
VOCs (ug/l)							
BROMOMETHANE	10	ND	ND	ND	ND	ND	NA
CHLOROFORM	57	ND	ND	ND	ND	1 J	NA

Notes:
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* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-8
Study Area 4 - ISFSI Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY04GW04B	MY04GW04B-1B	MY04GW04B-1C	MY04GW05A	MY04GW05A-1B	MY04GW05B
Well Number		MW-302B	MW-302B	MW-302B	MW-303A	MW-303A	MW-303B
Duplicates							
Sample Date		11/27/2001	7/1/2002	9/30/2002	12/11/2001	6/24/2002	12/5/2001
Sample Delivery Group		MY021	MY113	MY122	MY023	MY113	MY021
EPH/DRO (ug/l)							
EPH	50	**310**	NA	NA	ND	NA	**470**
DIESEL RANGE ORGANICS	50	NA	**140**	**140**	NA	**220 J**	NA
Metals (ug/l)							
ALUMINUM	1430	**2470**	NA	NA	612	NA	84.4
ANTIMONY	3	NA	NA	NA	ND	NA	ND
ARSENIC	10	4.8 J	NA	NA	1.5 J	NA	ND
BARIUM	2000	25.2	NA	NA	60.4	NA	14.2
BERYLLIUM	73	0.42 J	NA	NA	ND	NA	ND
BORON	630	4.8 J	NA	NA	19.4	NA	29.5
CADMIUM	3.5	0.17 J	NA	NA	ND	NA	ND
CALCIUM	*	34200	NA	NA	22700	NA	11200
CHROMIUM	40	7	NA	NA	1.9	NA	1.4
COBALT	2200	17.1	NA	NA	0.35	NA	ND
COPPER	1300	4.9	NA	NA	2.1	NA	ND
IRON	11000	3560	NA	NA	400	NA	118
LEAD	10	1.4	NA	NA	ND	NA	3.1
MAGNESIUM	*	29200	NA	NA	8420	NA	6890
MANGANESE	500	**5120**	NA	NA	223	NA	393
MERCURY	2	0.05 J	NA	NA	0.03 J	NA	ND
MOLYBDENUM	35	NA	NA	NA	8.7	NA	0.68 J
NICKEL	140	12.1	NA	NA	1.6	NA	ND
POTASSIUM	*	2940	NA	NA	3500	NA	1460
SELENIUM	35	NA	NA	NA	ND	NA	3.4 J
SILVER	35	NA	NA	NA	ND	NA	ND
SODIUM	20000	**27900**	NA	NA	**32500**	NA	13300
THALLIUM	2.4	NA	NA	NA	ND	NA	0.92
VANADIUM	260	6.9 J	NA	NA	0.73	NA	ND
ZINC	2000	26.3 J	NA	NA	ND	NA	ND
PCBs (ug/l)		NA	NA	NA	ND	NA	ND
Pesticides (ug/l)		NA	NA	NA	ND	NA	ND
SVOCs (ug/l)							
3-NITROANILINE	*	NA	NA	NA	ND	NA	ND
DI-N-BUTYL PHTHALATE	700	NA	NA	NA	ND	NA	ND
VOCs (ug/l)							
BROMOMETHANE	10	NA	NA	NA	ND	NA	ND
CHLOROFORM	57	2	NA	NA	1	NA	2

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-8
Study Area 4 - ISFSI Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY04GW05B-1B	MY04GW05B-1C	MY04GW06A	MY04GW06A-1B	MY04GW06B
Well Number		MW-303B	MW-303B	MW-304A	MW-304A	MW-304B
Duplicates						
Sample Date		6/24/2002	10/1/2002	11/15/2001	6/25/2002	11/15/2001
Sample Delivery Group		MY113	MY122	MY017	MY113	MY017
EPH/DRO (ug/l)						
EPH	50	NA	NA	ND	NA	ND
DIESEL RANGE ORGANICS	50	**650 J**	**460**	NA	ND	ND
Metals (ug/l)						
ALUMINUM	1430	NA	NA	412	NA	27 J
ANTIMONY	3	NA	NA	ND	NA	ND
ARSENIC	10	NA	NA	ND	NA	ND
BARIUM	2000	NA	NA	12.5	NA	8.2
BERYLLIUM	73	NA	NA	ND	NA	ND
BORON	630	NA	NA	9	NA	5.6 J
CADMIUM	3.5	NA	NA	ND	NA	ND
CALCIUM	*	NA	NA	11300	NA	2480
CHROMIUM	40	NA	NA	ND	NA	3.8
COBALT	2200	NA	NA	ND	NA	ND
COPPER	1300	NA	NA	7	NA	ND
IRON	11000	NA	NA	583	NA	ND
LEAD	10	NA	NA	ND	NA	ND
MAGNESIUM	*	NA	NA	2830	NA	894
MANGANESE	500	NA	NA	**862**	NA	42.2
MERCURY	2	NA	NA	ND	NA	ND
MOLYBDENUM	35	NA	NA	**181**	NA	1.3
NICKEL	140	NA	NA	ND	NA	ND
POTASSIUM	*	NA	NA	2460	NA	1480
SELENIUM	35	NA	NA	3.04 R	NA	3.04 R
SILVER	35	NA	NA	ND	NA	ND
SODIUM	20000	NA	NA	ND	NA	8000
THALLIUM	2.4	NA	NA	ND	NA	ND
VANADIUM	260	NA	NA	ND	NA	ND
ZINC	2000	NA	NA	ND	NA	ND
PCBs (ug/l)		NA	NA	ND	NA	ND
Pesticides (ug/l)		NA	NA	ND	NA	ND
SVOCs (ug/l)						
3-NITROANILINE	*	NA	NA	25 R	NA	ND
DI-N-BUTYL PHTHALATE	700	NA	NA	ND	NA	ND
VOCs (ug/l)						
BROMOMETHANE	10	NA	NA	1 J	NA	ND
CHLOROFORM	57	NA	NA	ND	NA	ND

Notes:
PAL = Project Action Limit
* PAL Not Available
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J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-8
Study Area 4 - ISFSI Groundwater Analytical Results
Detected Compounds

Analyte / Well Number / Duplicates / Sample Date / Sample Delivery Group	PAL	MY04GW06B-1B	MY04GW06B-1C	MY04GW10-1C	MY04GW07A	MY04GW07A-1B
Well Number		MW-304B	MW-304B	MW-304B	MW-305A	MW-305A
Duplicates				Dup. of MY04GW06B-1C		
Sample Date		6/25/2002	10/1/2002	10/1/2002	11/29/2001	6/26/2002
Sample Delivery Group		MY113	MY122	MY122	MY021	MY113
EPH/DRO (ug/l)						
EPH	50	NA	NA	NA	**51**	NA
DIESEL RANGE ORGANICS	50	**83 J**	**90**	**60**	NA	**60**
Metals (ug/l)						
ALUMINUM	1430	NA	NA	NA	512	NA
ANTIMONY	3	NA	NA	NA	NA	NA
ARSENIC	10	NA	NA	NA	NA	NA
BARIUM	2000	NA	NA	NA	36.3	NA
BERYLLIUM	73	NA	NA	NA	NA	NA
BORON	630	NA	NA	NA	14.3	NA
CADMIUM	3.5	NA	NA	NA	NA	NA
CALCIUM	*	NA	NA	NA	14300	NA
CHROMIUM	40	NA	NA	NA	1.9	NA
COBALT	2200	NA	NA	NA	NA	NA
COPPER	1300	NA	NA	NA	4.1	NA
IRON	11000	NA	NA	NA	1640	NA
LEAD	10	NA	NA	NA	**18.6**	NA
MAGNESIUM	*	NA	NA	NA	4200	NA
MANGANESE	500	NA	NA	NA	**512**	NA
MERCURY	2	NA	NA	NA	0.04 J	NA
MOLYBDENUM	35	NA	NA	NA	**128**	NA
NICKEL	140	NA	NA	NA	10.1 J	NA
POTASSIUM	*	NA	NA	NA	3150	NA
SELENIUM	35	NA	NA	NA	NA	NA
SILVER	35	NA	NA	NA	0.85	NA
SODIUM	20000	NA	NA	NA	**24600**	NA
THALLIUM	2.4	NA	NA	NA	NA	NA
VANADIUM	260	NA	NA	NA	NA	NA
ZINC	2000	NA	NA	NA	NA	NA
PCBs (ug/l)		NA	NA	NA	NA	NA
Pesticides (ug/l)		NA	NA	NA	NA	NA
SVOCs (ug/l)						
3-NITROANILINE	*	NA	NA	NA	NA	NA
DI-N-BUTYL PHTHALATE	700	NA	NA	NA	NA	NA
VOCs (ug/l)						
BROMOMETHANE	10	NA	NA	NA	NA	NA
CHLOROFORM	57	NA	NA	NA	7	NA

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-8
Study Area 4 - ISFSI Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY04GW07B	MY04GW07B-1B
Well Number		MW-305B	MW-305B
Duplicates			
Sample Date			6/26/2002
Sample Delivery Group			MY113
EPH/DRO (ug/l)			
EPH	50	**490**	NA
DIESEL RANGE ORGANICS	50	NA	**190**
Metals (ug/l)			NA
ALUMINUM	1430	873	NA
ANTIMONY	3	NA	NA
ARSENIC	10	1.9 J	NA
BARIUM	2000	122	NA
BERYLLIUM	73	NA	NA
BORON	630	6.1 J	NA
CADMIUM	3.5	NA	NA
CALCIUM	*	148000	NA
CHROMIUM	40	5	NA
COBALT	2200	13.6	NA
COPPER	1300	2.7 J	NA
IRON	11000	1310	NA
LEAD	10	2.4	NA
MAGNESIUM	*	108000	NA
MANGANESE	500	**12800**	NA
MERCURY	2	NA	NA
MOLYBDENUM	35	2.8	NA
NICKEL	140	24.7	NA
POTASSIUM	*	9850	NA
SELENIUM	35	6.6 J	NA
SILVER	35	NA	NA
SODIUM	20000	**106000**	NA
THALLIUM	2.4	NA	NA
VANADIUM	260	NA	NA
ZINC	2000	NA	NA
PCBs (ug/l)		NA	NA
Pesticides (ug/l)		NA	NA
SVOCs (ug/l)			
3-NITROANILINE	*	NA	NA
DI-N-BUTYL PHTHALATE	700	NA	NA
VOCs (ug/l)			
BROMOMETHANE	10	NA	NA
CHLOROFORM	57	15	NA

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-9
Study Area 5 - RA Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB04(8-10)	MY05SB04(12-13.2)	MY05SB05(4-6)	MY05SB05(12-13.5)	MY05SB06(2-4)	MY05SB06(4-5)
Duplicates							
Date Collected		10/16/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/17/2001
Sample Delivery Group		MYR001	MYR001	MYR001	MYR001	MYR001	MYR001
EPH (mg/kg)							
Unadjusted C11-C22	100	ND	ND	ND	ND	ND	ND
Unadjusted C19-C36	100	ND	ND	ND	ND	ND	ND
Unadjusted C9-18	100	ND	ND	ND	ND	ND	ND
Metals (mg/kg)							
ALUMINUM	76,000	NA	9430	NA	10900	NA	12200
ANTIMONY	31	NA	1.3 R	NA	1.3 R	NA	1.2 R
ARSENIC	22	NA	6	NA	11.1	NA	12.2
BARIUM	5,400	NA	38.6 J	NA	51.7 J	NA	67.4 J
BERYLLIUM	150	NA	ND	NA	0.5	NA	ND
BORON	5,500	NA	ND	NA	ND	NA	ND
CADMIUM	37	NA	ND	NA	ND	NA	ND
CALCIUM	*	NA	2640 J	NA	3040 J	NA	1720 J
CHROMIUM	210	NA	21.3 J	NA	21.1 J	NA	29.8 J
COBALT	4,700	NA	6.4	NA	7.5	NA	8.6
COPPER	2,900	NA	16.1	NA	22.9	NA	22.9
IRON	23,000	NA	13700	NA	**23500**	NA	21700
LEAD	400	NA	6.5	NA	18.2	NA	18.6
MAGNESIUM	*	NA	4360	NA	6270	NA	6930
MANGANESE	1,800	NA	246 J	NA	475 J	NA	428 J
MOLYBDENUM	390	NA	ND	NA	0.93 J	NA	0.97 J
NICKEL	*	NA	16.9	NA	18.8	NA	20.6
POTASSIUM	*	NA	2370	NA	5100	NA	3110
SODIUM	*	NA	152	NA	244	NA	160
VANADIUM	550	NA	22.6	NA	24.4	NA	29.9
ZINC	23,000	NA	52.1	NA	109	NA	110
PCBs (ug/kg)							
AROCHLOR-1254	220	NA	ND	NA	ND	NA	ND
Pesticides (ug/kg)							
4,4'-DDT	1,700	NA	ND	NA	ND	NA	ND
DIELDRIN	30	NA	5.02	NA	ND	NA	ND
ENDRIN ALDEHYDE	18,000	NA	ND	NA	ND	NA	ND
GAMMA-BHC	*	NA	ND	NA	3.99 J	NA	ND
HEPTACHLOR EPOXIDE	53	NA	ND	NA	ND	NA	ND
METHOXYCHLOR	310,000	NA	ND	NA	ND	NA	ND
SVOCs (ug/kg)							
2-METHYLNAPHTHALENE	*	NA	ND	NA	ND	NA	ND
ACENAPHTHENE	3,700,000	NA	ND	NA	ND	NA	ND
ANTHRACENE	2,200,000	NA	ND	NA	ND	NA	ND
BENZO(A)ANTHRACENE	620	NA	150 J	NA	ND	NA	ND
BENZO(A)PYRENE	62	NA	**90 J**	NA	ND	NA	ND
BENZO(B)FLUORANTHENE	620	NA	120 J	NA	ND	NA	ND
BENZO(K)FLUORANTHENE	6,200	NA	81 J	NA	ND	NA	ND
BENZO[G,H,I]PERYLENE	*	NA	ND	NA	ND	NA	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	NA	ND	NA	ND	NA	ND
CARBAZOLE	24,000	NA	ND	NA	ND	NA	ND
CHRYSENE	62,000	NA	110 J	NA	ND	NA	ND
DIBENZ(A,H)ANTHRACENE	62	NA	ND	NA	ND	NA	ND
DIBENZOFURAN	290,000	NA	ND	NA	ND	NA	ND
FLUORANTHENE	2,300,000	NA	400	NA	140 J	NA	ND
FLUORENE	2,600,000	NA	ND	NA	ND	NA	ND
INDENO(1,2,3-CD)PYRENE	620	NA	ND	NA	ND	NA	ND
NAPHTHALENE	56,000	NA	ND	NA	ND	NA	ND
PHENANTHRENE	*	NA	330	NA	ND	NA	ND
PYRENE	2,300,000	NA	260	NA	100 J	NA	ND
VOCs (ug/kg)							
2-METHYLNAPHTHALENE	*	NA	ND	NA	ND	NA	ND
CARBON DISULFIDE	360,000	NA	ND	NA	4 J	NA	ND
METHYLENE CHLORIDE	8,900	NA	ND	NA	ND	NA	ND
Other Compounds							
pH (S.U.)	*		8.30	NA	8.72	NA	7.10
Total Solids (%)	*	82	93.8	91.9	91.2	95.4	95.8

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
S.U. Standard Units
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-9
Study Area 5 - RA Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB07(2-4)	MY05SB07(4-6)	MY05SB08(2-4)	MY05SB08(6-7.5)	MY05SB09(2-4)	MY05SB09(4-6)
Duplicates							
Date Collected		10/17/2001	10/17/2001	10/18/2001	10/18/2001	10/18/2001	10/18/2001
Sample Delivery Group		MYR001	MYR001	MYR001	MYR001	MYR001	MYR002
EPH (mg/kg)							
Unadjusted C11-C22	100	ND	ND	ND	ND	ND	ND
Unadjusted C19-C36	100	ND	ND	ND	ND	ND	ND
Unadjusted C9-18	100	ND	ND	ND	ND	ND	ND
Metals (mg/kg)							
ALUMINUM	76,000	NA	14500	NA	14200	NA	12000
ANTIMONY	31	NA	1.2 R	NA	1.3 R	NA	1.2 R
ARSENIC	22	NA	14.6	NA	11.5	NA	4.3
BARIUM	5,400	NA	83.1 J	NA	96.8 J	NA	64.9
BERYLLIUM	150	NA	ND	NA	0.42	NA	ND
BORON	5,500	NA	ND	NA	ND	NA	ND
CADMIUM	37	NA	ND	NA	ND	NA	ND
CALCIUM	*	NA	2950 J	NA	1950 J	NA	8960 J
CHROMIUM	210	NA	32.4 J	NA	29.2 J	NA	26.6
COBALT	4,700	NA	8.3	NA	9	NA	6.8
COPPER	2,900	NA	23.4	NA	36.3	NA	11.7
IRON	23,000	NA	**23200**	NA	**23500**	NA	20000
LEAD	400	NA	20.2	NA	17.2	NA	5
MAGNESIUM	*	NA	7780	NA	7280	NA	6480
MANGANESE	1,800	NA	471 J	NA	442 J	NA	390
MOLYBDENUM	390	NA	0.91 J	NA	0.88 J	NA	ND
NICKEL	*	NA	22.4	NA	21.4	NA	16.4
POTASSIUM	*	NA	3780	NA	4900	NA	1720 J
SODIUM	*	NA	300	NA	324	NA	279 J
VANADIUM	550	NA	36	NA	35.6	NA	33.4
ZINC	23,000	NA	109	NA	107	NA	43.1 J
PCBs (ug/kg)							
AROCHLOR-1254	220	NA	ND	NA	ND	NA	ND
Pesticides (ug/kg)							
4,4'-DDT	1,700	NA	ND	NA	ND	NA	ND
DIELDRIN	30	NA	ND	NA	ND	NA	ND
ENDRIN ALDEHYDE	18,000	NA	ND	NA	ND	NA	ND
GAMMA-BHC	*	NA	ND	NA	ND	NA	ND
HEPTACHLOR EPOXIDE	53	NA	ND	NA	ND	NA	ND
METHOXYCHLOR	310,000	NA	ND	NA	ND	NA	ND
SVOCs (ug/kg)							
2-METHYLNAPHTHALENE	*	NA	ND	NA	ND	NA	ND
ACENAPHTHENE	3,700,000	NA	ND	NA	ND	NA	ND
ANTHRACENE	2,200,000	NA	ND	NA	ND	NA	ND
BENZO(A)ANTHRACENE	620	NA	ND	NA	ND	NA	ND
BENZO(A)PYRENE	62	NA	ND	NA	ND	NA	ND
BENZO(B)FLUORANTHENE	620	NA	ND	NA	ND	NA	ND
BENZO(K)FLUORANTHENE	6,200	NA	ND	NA	ND	NA	ND
BENZO[G,H,I]PERYLENE	*	NA	ND	NA	ND	NA	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	NA	ND	NA	ND	NA	ND
CARBAZOLE	24,000	NA	ND	NA	ND	NA	ND
CHRYSENE	62,000	NA	ND	NA	ND	NA	ND
DIBENZ(A,H)ANTHRACENE	62	NA	ND	NA	ND	NA	ND
DIBENZOFURAN	290,000	NA	ND	NA	ND	NA	ND
FLUORANTHENE	2,300,000	NA	ND	NA	ND	NA	ND
FLUORENE	2,600,000	NA	ND	NA	ND	NA	ND
INDENO(1,2,3-CD)PYRENE	620	NA	ND	NA	ND	NA	ND
NAPHTHALENE	56,000	NA	ND	NA	ND	NA	ND
PHENANTHRENE	*	NA	ND	NA	ND	NA	ND
PYRENE	2,300,000	NA	ND	NA	ND	NA	ND
VOCs (ug/kg)							
2-METHYLNAPHTHALENE	*	NA	ND	NA	ND	NA	ND
CARBON DISULFIDE	360,000	NA	ND	NA	ND	NA	ND
METHYLENE CHLORIDE	8,900	NA	ND	NA	ND	NA	ND
Other Compounds							
pH (S.U.)	*	NA	8.10	NA	7.85	NA	11.6
Total Solids (%)	*	95.8	94.8	92.8	94.4	95.7	97.2

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- S.U. Standard Units
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-9
Study Area 5 - RA Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB10(6-8)	MY05SB10(14-16)	MY05SB11(0-0.5)	MY05SB57(0-0.5)	MY05SB11(12-13.5)
Duplicates					Dup. of MY05SB11(0-0.5)	
Date Collected		10/29/2001	10/29/2001	10/20/2001	10/20/2001	10/24/01 & 10/29/01 (VOCs)
Sample Delivery Group		MYR002	MYR002	MYR002	MYR002	MYR002
EPH (mg/kg)						
Unadjusted C11-C22	100	ND	ND	ND	ND	ND
Unadjusted C19-C36	100	ND	ND	ND	11.3	ND
Unadjusted C9-18	100	ND	ND	ND	ND	ND
Metals (mg/kg)						
ALUMINUM	76,000	NA	22900	15300	13600	7930
ANTIMONY	31	NA	1.3 R	1.3 R	1.3 R	1.4 R
ARSENIC	22	NA	7.6 J	11.1 J	**22.3 J**	6.6
BARIUM	5,400	NA	89.7	120	116	41.4
BERYLLIUM	150	NA	0.51	ND	ND	ND
BORON	5,500	NA	5.9	ND	2.2 J	4.5 J
CADMIUM	37	NA	ND	ND	ND	1.3
CALCIUM	*	NA	6730 J	2960 J	3490 J	9250 J
CHROMIUM	210	NA	55.5	79.5	69	20
COBALT	4,700	NA	16.8	11.8	13.3	5.1
COPPER	2,900	NA	31.9	24.9	36.1	51.9
IRON	23,000	NA	**35900**	**25900**	**23400**	15200
LEAD	400	NA	13.3	8.3	9	14.9
MAGNESIUM	*	NA	13100	12100	10400	4560
MANGANESE	1,800	NA	735	376	357	292
MOLYBDENUM	390	NA	ND	ND	1.1 J	ND
NICKEL	*	NA	49.4 J	47.7 J	42.8 J	20.6
POTASSIUM	*	NA	7320 J	11100 J	8920 J	1980 J
SODIUM	*	NA	391	448	487	312 J
VANADIUM	550	NA	52.5 J	56.6 J	47.9 J	19.9
ZINC	23,000	NA	80.2	83.5	80.6	88.3 J
PCBs (ug/kg)						
AROCHLOR-1254	220	NA	ND	ND	ND	ND
Pesticides (ug/kg)						
4,4'-DDT	1,700	NA	ND	ND	ND	ND
DIELDRIN	30	NA	ND	ND	ND	2.41
ENDRIN ALDEHYDE	18,000	NA	ND	ND	ND	ND
GAMMA-BHC	*	NA	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	53	NA	ND	ND	0.874	ND
METHOXYCHLOR	310,000	NA	ND	ND	ND	ND
SVOCs (ug/kg)						
2-METHYLNAPHTHALENE	*	NA	ND	ND	ND	100 J
ACENAPHTHENE	3,700,000	NA	ND	ND	ND	650
ANTHRACENE	2,200,000	NA	ND	ND	ND	1100
BENZO(A)ANTHRACENE	620	NA	ND	100 J	110 J	**2800**
BENZO(A)PYRENE	62	NA	ND	**85 J**	**94 J**	**2500**
BENZO(B)FLUORANTHENE	620	NA	ND	95 J	130 J	**2400**
BENZO(K)FLUORANTHENE	6,200	NA	ND	87 J	81 J	2000
BENZO[G,H,I]PERYLENE	*	NA	ND	ND	ND	680
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	NA	ND	ND	ND	120 J
CARBAZOLE	24,000	NA	ND	ND	ND	840
CHRYSENE	62,000	NA	ND	130 J	120 J	2500
DIBENZ(A,H)ANTHRACENE	62	NA	ND	ND	ND	**380**
DIBENZOFURAN	290,000	NA	ND	ND	ND	430
FLUORANTHENE	2,300,000	NA	ND	180	270	6400
FLUORENE	2,600,000	NA	ND	ND	ND	800
INDENO(1,2,3-CD)PYRENE	620	NA	ND	ND	ND	**1700**
NAPHTHALENE	56,000	NA	ND	ND	ND	230
PHENANTHRENE	*	NA	ND	130 J	160	5800
PYRENE	2,300,000	NA	ND	180	280	5500
VOCs (ug/kg)						
2-METHYLNAPHTHALENE	*	NA	ND	ND	40	ND
CARBON DISULFIDE	360,000	NA	ND	ND	ND	ND
METHYLENE CHLORIDE	8,900	NA	3.8 J	ND	ND	2.9 J
Other Compounds						
pH (S.U.)	*	NA	ND	ND	ND	8.46
Total Solids (%)	*	NA	74.7	89	ND	87.5

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

S.U. Standard Units

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-9
Study Area 5 - RA Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB12(8-10)	MY05SB13(4-5.5)	MY05SS01(0-0.5)	MY05SS02(0-0.5)	MY05SS03(0-0.5)
Duplicates						
Date Collected		10/23/2001	10/22/2001	10/18/2002	10/18/2002	10/18/2002
Sample Delivery Group		MYR002	MYR002	MYR001	MYR001	MYR001
EPH (mg/kg)						
Unadjusted C11-C22	100	ND	ND	**151**	42.5	ND
Unadjusted C19-C36	100	ND	ND	ND	42.6	10.8
Unadjusted C9-18	100	ND	ND	ND	13.6	10.7
Metals (mg/kg)						
ALUMINUM	76,000	12400	8850	NA	NA	NA
ANTIMONY	31	1.3 R	1.3 R	NA	NA	NA
ARSENIC	22	9.9	6.9	NA	NA	NA
BARIUM	5,400	61.8	28.4	NA	NA	NA
BERYLLIUM	150	ND	ND	NA	NA	NA
BORON	5,500	ND	ND	NA	NA	NA
CADMIUM	37	0.83 J	ND	NA	NA	NA
CALCIUM	*	2980 J	3860 J	NA	NA	NA
CHROMIUM	210	28.2	18.6	NA	NA	NA
COBALT	4,700	8.2	5.1	NA	NA	NA
COPPER	2,900	21.4	13.4	NA	NA	NA
IRON	23,000	21100	12000	NA	NA	NA
LEAD	400	15.6	6.8	NA	NA	NA
MAGNESIUM	*	6850	4070	NA	NA	NA
MANGANESE	1,800	431	224	NA	NA	NA
MOLYBDENUM	390	ND	ND	NA	NA	NA
NICKEL	*	20.1	13.2	NA	NA	NA
POTASSIUM	*	3010 J	5350 J	NA	NA	NA
SODIUM	*	244 J	3700 J	NA	NA	NA
VANADIUM	550	31.2	21.1	NA	NA	NA
ZINC	23,000	87.2 J	95.7 J	NA	NA	NA
PCBs (ug/kg)						
AROCHLOR-1254	220	ND	20.6	NA	NA	NA
Pesticides (ug/kg)						
4,4'-DDT	1,700	ND	ND	ND	ND	2.57
DIELDRIN	30	13	2.38 J	ND	ND	5.4 J
ENDRIN ALDEHYDE	18,000	ND	ND	ND	ND	2.41
GAMMA-BHC	*	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	53	ND	ND	ND	ND	ND
METHOXYCHLOR	310,000	ND	ND	ND	ND	9.78
SVOCs (ug/kg)						
2-METHYLNAPHTHALENE	*	ND	ND	NA	NA	NA
ACENAPHTHENE	3,700,000	ND	ND	NA	NA	NA
ANTHRACENE	2,200,000	ND	ND	NA	NA	NA
BENZO(A)ANTHRACENE	620	ND	ND	NA	NA	NA
BENZO(A)PYRENE	62	ND	ND	NA	NA	NA
BENZO(B)FLUORANTHENE	620	ND	ND	NA	NA	NA
BENZO(K)FLUORANTHENE	6,200	ND	ND	NA	NA	NA
BENZO[G,H,I]PERYLENE	*	ND	ND	NA	NA	NA
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	ND	ND	NA	NA	NA
CARBAZOLE	24,000	ND	ND	NA	NA	NA
CHRYSENE	62,000	ND	ND	NA	NA	NA
DIBENZ(A,H)ANTHRACENE	62	ND	ND	NA	NA	NA
DIBENZOFURAN	290,000	ND	ND	NA	NA	NA
FLUORANTHENE	2,300,000	ND	ND	NA	NA	NA
FLUORENE	2,600,000	ND	ND	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	620	ND	ND	NA	NA	NA
NAPHTHALENE	56,000	ND	ND	NA	NA	NA
PHENANTHRENE	*	ND	ND	NA	NA	NA
PYRENE	2,300,000	ND	ND	NA	NA	NA
VOCs (ug/kg)						
2-METHYLNAPHTHALENE	*	ND	ND	NA	NA	NA
CARBON DISULFIDE	360,000	ND	ND	NA	NA	NA
METHYLENE CHLORIDE	8,900	ND	ND	NA	NA	NA
Other Compounds						
pH (S.U.)	*	8.5	10.5	NA	NA	NA
Total Solids (%)	*	91	93.2	93.8	96	94.2

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- S.U. Standard Units
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-10
Study Area 5 - RA Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW03	MY05GW03-1B	MY05GW05	MY05GW05-1B	MY05GW50-1B	MY05GW06	MY05GW06-1B	MY05GW07
Well Number		B-202	B-202	B-203B	B-203B	B-203B	B-205	B-205	B-206
Duplicates						MY05GW05-1B			
Date Collected		12/11/2001	6/3/2002	12/5/2001	6/4/2002	6/4/2002	12/5/2001	6/5/2002	12/10/2001
Sample Delivery Group		MYR004	MYR102	MYR004	MYR102	MYR102	MYR004	MYR102	MYR004
Anions (mg/l)**									
ALKALINITY AS CACO3	*	NA	87.4	NA	67.2	71.0	NA	80.1	NA
BICARBONATE AS CACO3	*	NA	87.4	NA	67.2	71.0	NA	80.1	NA
CARBONATE AS CACO3	*	NA	ND	NA	ND	ND	NA	ND	NA
CHLORIDE	*	NA	61.6	NA	30.4	32.4	NA	93.3	NA
HYDROXIDE AS CACO3	*	NA	ND	NA	ND	ND	NA	ND	NA
NITRATE AS N [EPA 300A]	10	NA	1.70	NA	3.02	3.25	NA	0.867	NA
PHOSPHATE AS P	*	NA	ND	NA	ND	ND	NA	ND	NA
SULFATE	*	NA	96.8	NA	124	133	NA	91.2	NA
SULFIDE	*	NA	ND	NA	ND	ND	NA	ND	NA
EPH/DRO (ug/l)									
UNADJUSTED C9-C36	50	NA	NA	NA	NA	NA	NA	NA	NA
DIESEL RANGE ORGANICS	50	NA	**423 J**	NA	**71.5**	**67.8**	NA	**228 J**	NA
Metals (ug/l)									
ALUMINUM	1430	ND	220 J	58.8 J	887 J	145 J	ND	112 J	1320
ARSENIC	10	ND	ND	ND	ND	ND	ND	ND	ND
BARIUM	2000	104	48	30.5	38.4	30	13.8	19.1	38.5
BORON	630	69	47.8 J	68.1	28.8 J	39.9 J	223	93.7	112
CADMIUM	3.5	ND	ND	ND	ND	ND	ND	ND	ND
CALCIUM	*	56200	41800	37500	40200	41300	17900	20300	9960
CHROMIUM	40	ND	ND	ND	4.7	ND	ND	ND	ND
COPPER	1300	10.5	7.4	ND	ND	ND	ND	ND	5.4 J
IRON	11000	ND	418 J	ND	1400 J	214 J	ND	160 J	771
LEAD	10	ND	0.95	ND	0.85	ND	ND	ND	1.7
MAGNESIUM	*	10900	8200	22000	23900	24100	11800	16700	6890
MANGANESE	500	ND	12.6 J	108	45 J	18.9 J	9.8	48.8 J	171
MERCURY	2	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM	35	ND	ND	ND	ND	ND	ND	ND	ND
NICKEL	140	17.6	7.1 J	ND	ND	ND	ND	ND	6.2 J
POTASSIUM	*	29500	17900	4200	3920	3180	7780	10800	8610
SELENIUM	35	2.8	ND	ND	ND	ND	ND	ND	2.4
SILVER	35	ND	ND	0.05 J	ND	ND	ND	ND	0.07 J
SODIUM	20000	**76600**	**55900**	**29100**	**27500**	**27500**	**65900**	**75900**	**86400**
VANADIUM	260	ND	ND	ND	ND	ND	ND	ND	ND
ZINC	2000	28.3	14.6 J	17.1	41.4 J	22.2 J	14.3	131 J	11.7
PCBs (ug/l)									
		ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/l)									
DIELDRIN	0.02	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/l)									
1,2,4-TRICHLOROBENZENE	70	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	21	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLOROPHENOL	*	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	32	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	21	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	730	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	14	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	35	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	1800	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	60	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	3.5	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	60	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	370	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	9.6	ND	ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	3	ND	ND	ND	ND	ND	ND	ND	ND
PHENOL	4000	ND	ND	ND	ND	ND	ND	ND	ND
VOCs (ug/l)									
2-BUTANONE	1440	5 R	ND	ND	ND	ND	ND	ND	ND
4-METHYL-2-PENTANONE	*	5 R	ND	ND	ND	ND	ND	ND	ND
ACETONE	700	5 R	ND	2.6 J	ND	ND	23 J	ND	5 R
BENZENE	12	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	57	ND	ND	ND	ND	ND	ND	ND	1
METHYLENE CHLORIDE	4.3	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	0.2	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds									
NITRATE (mg/l) [EPA 353.2]	10	0.77 R	NA	2.3	NA	NA	0.689	NA	0.78

Notes:

PAL = Project Action Limit

* PAL Not Available

** Data results are not validated

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-10
Study Area 5 - RA Groundwater Analytical Results
Detected Compounds

Analyte / Well Number / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05GW08	MY05GW27	MY05GW08-1B	MY05GW09	MY05GW09-1B	MY05GW100	MYPAB02F	MYPAB02U
Well Number		BK-1	BK-1	BK-1	CS-1	CS-1	PAB Test	PAB Test	PAB Test
Duplicates			MY05GW08				Pit	Pit	Pit
Date Collected		12/6/2001	12/6/2001	6/6/2002	12/6/2001	6/6/2002	6/5/2002	2/20/2003	2/20/2003
Sample Delivery Group		MYR004	MYR004	MYR102	MYR004	MYR002	MYR102	MY022003	MY022003
Anions (mg/l)**									
ALKALINITY AS CACO3	*	NA	NA	48.2	NA	102	1000	51	55
BICARBONATE AS CACO3	*	NA	NA	48.2	NA	34.0	ND	69	70
CARBONATE AS CACO3	*	NA	NA	ND	NA	67.8	212	NA	NA
CHLORIDE	*	NA	NA	151	NA	101	43.9	26	26
HYDROXIDE AS CACO3	*	NA	NA	ND	NA	ND	792	ND	ND
NITRATE AS N [EPA 300A]	10	NA	NA	1.02	NA	0.064	0.402	ND	ND
PHOSPHATE AS P	*	NA	NA	ND	NA	0.137	ND	NA	NA
SULFATE	*	NA	NA	40.7	NA	81.8	62.8	59	61
SULFIDE	*	NA	NA	ND	NA	ND	ND	ND	ND
EPH/DRO (ug/l)									
UNADJUSTED C9-C36	50	NA	NA	NA	NA	NA	NA	NA	NA
DIESEL RANGE ORGANICS	50	NA	NA	**86**	NA	**861 J**	**5810 J**	NA	NA
Metals (ug/l)									
ALUMINUM	1430	ND	ND	ND	86.4 J	71.4 J	999 J	0.1	0.099
ARSENIC	10	ND	ND	ND	ND	**17.1**	ND	0.01	0.01
BARIUM	2000	33.8	33.7	73.7	12.6	5.5	74.6 J	ND	ND
BORON	630	144	140	93	287	189	90.3 J	0.19	0.18
CADMIUM	3.5	ND	ND	ND	ND	ND	0.32 J	ND	ND
CALCIUM	*	23900	24100	58800	15000	9690	182000 J	9.7	9.9
CHROMIUM	40	ND	ND	ND	ND	22.2	**73.8 J**	0.0047	0.0049
COPPER	1300	ND	ND	ND	ND	6.1	37.4 J	0.004	0.0041
IRON	11000	ND	ND	ND	960	ND	291 J	0.012	0.025
LEAD	10	ND	ND	ND	2.2	ND	5.3 J	ND	ND
MAGNESIUM	*	6370 J	6380	11900	6750	3340	365 J	1.1	1.1
MANGANESE	500	1.1	1.1 J	ND	21.6	2.8 J	9.6 J	0.004	0.004
MERCURY	2	ND	ND	ND	ND	0.59	**10.9 J**	ND	ND
MOLYBDENUM	35	ND	ND	ND	ND	**52.1**	**119 J**	0.015	0.015
NICKEL	140	ND	ND	ND	ND	ND	5 J	ND	ND
POTASSIUM	*	8720	8660	12600	14200	17800	143000 J	19	19
SELENIUM	35	ND	ND	ND	1.4 J	1.3	1 J	ND	ND
SILVER	35	0.13 J	0.06 J	ND	0.05 J	ND	ND	ND	ND
SODIUM	20000	**27600**	**27500**	**43300**	**135000**	**119000**	**254000 J**	55	55
VANADIUM	260	ND	ND	ND	ND	20.8	13 J	ND	ND
ZINC	2000	ND	ND	ND	15.3	16 J	13.2 J	ND	ND
PCBs (ug/l)									
		ND	ND	ND	ND	ND	ND	NA	NA
Pesticides (ug/l)									
DIELDRIN	0.02	ND	ND	ND	ND	**0.0972 J**	**0.057**	NA	NA
SVOCs (ug/l)									
1,2,4-TRICHLOROBENZENE	70	ND	ND	ND	ND	ND	ND	NA	NA
1,4-DICHLOROBENZENE	21	ND	ND	ND	ND	ND	ND	NA	NA
2,4,5-TRICHLOROPHENOL	*	ND	ND	ND	ND	ND	ND	NA	NA
2,4,6-TRICHLOROPHENOL	32	ND	ND	ND	ND	ND	ND	NA	NA
2,4-DICHLOROPHENOL	21	ND	ND	ND	ND	ND	ND	NA	NA
2,4-DIMETHYLPHENOL	730	ND	ND	ND	ND	ND	ND	NA	NA
2,4-DINITROPHENOL	14	ND	ND	ND	ND	ND	ND	NA	NA
2-CHLOROPHENOL	35	ND	ND	ND	ND	ND	ND	NA	NA
2-METHYLPHENOL	1800	ND	ND	ND	ND	ND	9.74	NA	NA
2-NITROPHENOL	60	ND	ND	ND	ND	ND	ND	NA	NA
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	NA	NA
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	NA	NA
4-METHYLPHENOL	3.5	ND	ND	ND	ND	ND	ND	NA	NA
4-NITROPHENOL	60	ND	ND	ND	ND	ND	ND	NA	NA
ACENAPHTHENE	370	ND	ND	ND	ND	ND	ND	NA	NA
N-NITROSO-DI-N-PROPYLAMINE	9.6	ND	ND	ND	ND	ND	ND	NA	NA
PENTACHLOROPHENOL	3	ND	ND	ND	ND	ND	ND	NA	NA
PHENOL	4000	ND	ND	ND	ND	ND	25.7	NA	NA
VOCs (ug/l)									
2-BUTANONE	1440	ND	ND	ND	ND	ND	ND	NA	NA
4-METHYL-2-PENTANONE	*	ND	ND	ND	ND	ND	ND	NA	NA
ACETONE	700	3.1 R	5 R	ND	3.1 R	ND	ND	NA	NA
BENZENE	12	ND	ND	ND	ND	ND	3.7	NA	NA
CHLOROFORM	57	ND	ND	ND	ND	ND	1.3	NA	NA
METHYLENE CHLORIDE	4.3	ND	ND	ND	ND	ND	ND	NA	NA
VINYL CHLORIDE	0.2	ND	ND	ND	ND	ND	ND	NA	NA
Other Compounds									
NITRATE (mg/l) [EPA 353.2]	10	1.09	1.24	NA	0.206	NA	NA	NA	NA

Notes:

PAL = Project Action Limit

* PAL Not Available

** Data results are not validated

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-10
Study Area 5 - RA Groundwater Analytical Results
Detected Compounds

Analyte / Well Number / Duplicates / Date Collected / Sample Delivery Group	PAL	MYPAB02D / PAB Test Pit / MYPAB02U / 2/20/2003 / MY022003	MY05GW101 / MW-401A / 6/10/2002 / MYR102	MY05GW101-1C / MW-401A / 9/18/2002 / MYR103	MY05GW102 / MW-401B / 6/10/2002 / MYR102	MY05GW102-1C / MW-401B / 9/17/2002 / MYR103	MY05GW125-1C / MW-401B / MY05GW102-1C / 9/17/2002 / MYR103	MY05GW103 / MW-402 / 6/5/02 & 6/6/02 / MYR102
Anions (mg/l)**								
ALKALINITY AS CACO3	*	52	38.2	NA	203	NA	NA	98.1
BICARBONATE AS CACO3	*	69	38.2	NA	ND	NA	NA	98.1
CARBONATE AS CACO3	*	NA	ND	NA	96.0	NA	NA	ND
CHLORIDE	*	25	66.8	NA	5.72	NA	NA	64.3
HYDROXIDE AS CACO3	*	ND	ND	NA	107	NA	NA	ND
NITRATE AS N [EPA 300A]	10	ND	ND	NA	ND	NA	NA	1.44
PHOSPHATE AS P	*	NA	ND	NA	ND	NA	NA	ND
SULFATE	*	57	21.3	NA	18.6	NA	NA	89.1
SULFIDE	*	ND	ND	NA	1.45	NA	NA	ND
EPH/DRO (ug/l)								
UNADJUSTED C9-C36	50	NA	NA	NA	NA	NA	NA	NA
DIESEL RANGE ORGANICS	50	NA	**67.4 J**	ND	**2410 J**	**2400**	**2300**	**107**
Metals (ug/l)								
ALUMINUM	1430	0.1	ND	32.9 J	**3040 J**	**4130 J**	**2550 J**	206 J
ARSENIC	10	0.011	ND	ND	7.1 J	**10.6 J**	**10.2 J**	ND
BARIUM	2000	ND	38.3	40.2	6.8	8.6 J	7.5 J	49.7
BORON	630	0.27	117	107	ND	ND	29.3 J	161
CADMIUM	3.5	ND	ND	ND	0.32 J	ND	ND	ND
CALCIUM	*	10	20500	27300 J	56900	70800 J	51200 J	17200
CHROMIUM	40	0.0049	2.8	ND	ND	ND	ND	ND
COPPER	1300	0.004	ND	ND	20.8	8.9 J	6 J	ND
IRON	11000	0.015	1240	10600 J	716 J	457 J	696 J	324 J
LEAD	10	ND	ND	ND	0.86	0.8 J	1.1 J	1.2
MAGNESIUM	*	1.2	9720	13400	256	173	275	7700
MANGANESE	500	0.004	**629 J**	**792 J**	13 J	8.2 J	15.3 J	**842 J**
MERCURY	2	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM	35	0.014	ND	ND	**50.3**	**54.8**	**53.1**	ND
NICKEL	140	ND	ND	ND	120	139	114	ND
POTASSIUM	*	20	4260	4720	11700	7280	5400	7750
SELENIUM	35	ND	ND	ND	1.7 J	1.9 J	1.6 J	ND
SILVER	35	ND	ND	ND	ND	ND	ND	ND
SODIUM	20000	59	**25500**	**26100**	**23500**	**23600**	**20000**	**90900**
VANADIUM	260	ND	ND	ND	18.7	11	7.9 J	ND
ZINC	2000	ND	5 J	ND	5.7 J	14.2	6 J	17.4 J
PCBs (ug/l)								
		NA	ND	NA	ND	NA	NA	ND
Pesticides (ug/l)								
DIELDRIN	0.02	NA	**0.1 J**	NA	ND	NA	NA	ND
SVOCs (ug/l)								
1,2,4-TRICHLOROBENZENE	70	NA	ND	NA	5 R	NA	NA	ND
1,4-DICHLOROBENZENE	21	NA	ND	NA	5 R	NA	NA	ND
2,4,5-TRICHLOROPHENOL	*	NA	5 R	NA	ND	NA	NA	ND
2,4,6-TRICHLOROPHENOL	32	NA	5 R	NA	ND	NA	NA	ND
2,4-DICHLOROPHENOL	21	NA	5 R	NA	ND	NA	NA	ND
2,4-DIMETHYLPHENOL	730	NA	5 R	NA	ND	NA	NA	ND
2,4-DINITROPHENOL	14	NA	5 R	NA	ND	NA	NA	ND
2-CHLOROPHENOL	35	NA	5 R	NA	ND	NA	NA	ND
2-METHYLPHENOL	1800	NA	5 R	NA	ND	NA	NA	ND
2-NITROPHENOL	60	NA	5 R	NA	ND	NA	NA	ND
4,6-DINITRO-2-METHYLPHENOL	*	NA	5 R	NA	ND	NA	NA	ND
4-CHLORO-3-METHYLPHENOL	*	NA	5 R	NA	ND	NA	NA	ND
4-METHYLPHENOL	3.5	NA	**5 R**	NA	**16.5**	NA	NA	ND
4-NITROPHENOL	60	NA	5 R	NA	ND	NA	NA	ND
ACENAPHTHENE	370	NA	ND	NA	5 R	NA	NA	ND
N-NITROSO-DI-N-PROPYLAMINE	9.6	NA	ND	NA	5 R	NA	NA	ND
PENTACHLOROPHENOL	3	NA	**5 R**	NA	ND	NA	NA	ND
PHENOL	4000	NA	5 R	NA	265	NA	NA	ND
VOCs (ug/l)								
2-BUTANONE	1440	NA	ND	NA	15	NA	NA	ND
4-METHYL-2-PENTANONE	*	NA	ND	NA	ND	NA	NA	ND
ACETONE	700	NA	ND	NA	ND	NA	NA	ND
BENZENE	12	NA	ND	NA	ND	NA	NA	ND
CHLOROFORM	57	NA	ND	NA	ND	NA	NA	ND
METHYLENE CHLORIDE	4.3	NA	ND	NA	ND	NA	NA	ND
VINYL CHLORIDE	0.2	NA	ND	NA	ND	NA	NA	ND
Other Compounds								
NITRATE (mg/l) [EPA 353.2]	10	NA	NA	NA	NA	NA	NA	NA

Notes:
PAL = Project Action Limit
* PAL Not Available
** Data results are not validated
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-10
Study Area 5 - RA Groundwater Analytical Results
Detected Compounds

Analyte / Well Number / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05GW103-1C MW-402 9/18/2002 MYR103	MY05GW14 MW-312 12/6/2001 MYR004	MY05GW14-1B MW-312 6/11/2002 MYR102	MY05GW51 MW-312 MY05GW14-1B 6/11/2002 MYR102	MY05GW29 B-206A 12/10/2001 MYR004	MY05GW29-1B B-206A 6/4/2002 MYR102
Anions (mg/l)*							
ALKALINITY AS CACO3	*	NA	NA	76.0	77.8	NA	49.1
BICARBONATE AS CACO3	*	NA	NA	55.0	54.8	NA	48.5
CARBONATE AS CACO3	*	NA	NA	21.0	23.0	NA	ND
CHLORIDE	*	NA	NA	33.5	33.2	NA	64.0
HYDROXIDE AS CACO3	*	NA	NA	ND	ND	NA	ND
NITRATE AS N [EPA 300A]	10	NA	NA	0.459	0.543	NA	0.686
PHOSPHATE AS P	*	NA	NA	ND	ND	NA	ND
SULFATE	*	NA	NA	30.7	31.3	NA	60.9
SULFIDE	*	NA	NA	ND	ND	NA	ND
EPH/DRO (ug/l)							
UNADJUSTED C9-C36	50	NA	**186**	NA	NA	NA	NA
DIESEL RANGE ORGANICS	50	ND	NA	**443 J**	**439 J**	NA	**263**
Metals (ug/l)							
ALUMINUM	1430	**1530 J**	**1980**	830	851	57.4 J	446 J
ARSENIC	10	ND	**13.8**	8.6	**10.2**	ND	ND
BARIUM	2000	21.6	34.8	35.9	36.4	40.3	24.2
BORON	630	ND	82.8	68.8	70.6	60.1	32.5 J
CADMIUM	3.5	ND	ND	ND	ND	ND	ND
CALCIUM	*	12000 J	14800	16600	17000	16000	13300
CHROMIUM	40	3.3 J	17	11.4	11.3	ND	ND
COPPER	1300	ND	ND	ND	ND	ND	ND
IRON	11000	1900 J	439	149	137	ND	338 J
LEAD	10	1.6 J	ND	0.45 J	0.63	ND	0.79
MAGNESIUM	*	2770	1140	2630	2680	5980	4590
MANGANESE	500	77.7 J	6.4	16.6	16.8	120	9.7 J
MERCURY	2	ND	ND	ND	ND	ND	ND
MOLYBDENUM	35	ND	10.8 J	ND	ND	ND	16.7
NICKEL	140	ND	ND	ND	ND	9.6 J	ND
POTASSIUM	*	3860	13300	9880	10100	6410	6930
SELENIUM	35	ND	ND	ND	ND	ND	ND
SILVER	35	ND	0.06 J	ND	ND	0.07 J	ND
SODIUM	20000	13000	**52100**	**41400**	**42500**	**67700**	**63800**
VANADIUM	260	ND	10.6	6.9 J	7.4 J	ND	ND
ZINC	2000	53.3	ND	ND	ND	11.4	5.8 J
PCBs (ug/l)							
		NA	ND	ND	ND	ND	ND
Pesticides (ug/l)							
DIELDRIN	0.02	NA	**0.0959**	**0.0664 J**	**0.0885 J**	ND	ND
SVOCs (ug/l)							
1,2,4-TRICHLOROBENZENE	70	NA	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	21	NA	ND	ND	ND	ND	ND
2,4,5-TRICHLOROPHENOL	*	NA	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	32	NA	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	21	NA	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	730	NA	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	14	NA	ND	ND	ND	ND	ND
2-CHLOROPHENOL	35	NA	ND	ND	ND	ND	ND
2-METHYLPHENOL	1800	NA	ND	ND	ND	ND	ND
2-NITROPHENOL	60	NA	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	NA	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	*	NA	ND	ND	ND	ND	ND
4-METHYLPHENOL	3.5	NA	ND	ND	ND	ND	ND
4-NITROPHENOL	60	NA	ND	ND	ND	ND	ND
ACENAPHTHENE	370	NA	ND	ND	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	9.6	NA	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	3	NA	ND	ND	ND	ND	ND
PHENOL	4000	NA	ND	ND	ND	ND	ND
VOCs (ug/l)							
2-BUTANONE	1440	NA	ND	ND	ND	ND	ND
4-METHYL-2-PENTANONE	*	NA	ND	ND	ND	ND	ND
ACETONE	700	NA	2.6 R	ND	ND	5 R	ND
BENZENE	12	NA	ND	ND	ND	ND	ND
CHLOROFORM	57	NA	ND	ND	ND	0.66 J	ND
METHYLENE CHLORIDE	4.3	NA	1 J	ND	ND	ND	ND
VINYL CHLORIDE	0.2	NA	ND	ND	ND	0.134	ND
Other Compounds							
NITRATE (mg/l) [EPA 353.2]	10	NA	ND	NA	NA	0.825	NA

Notes:

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* PAL Not Available

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J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB01(0-0.5)	MY05SB75(0-0.5)	MY05SB01(2-3.3)	MY05SB01(5-5.9)	MY05SB75(5-5.9)	MY05SB02(0-0.5)	MY05SB02(0.5-4.5)	MY05SB02(2.5-4.5)
Duplicates			Dup. of MY05SB01(0-0.5)			Dup. of MY05SB01(5-5.9)			
Date Collected		4/23/2002	4/23/2002	4/23/2002	4/24/2002		4/24/2002	4/24/2002	4/24/2002
Sample Delivery Group		MY101	MY101	MY105	MY101		MY105	MY105	MY105
EPH/DRO (mg/kg)									
C11-C22 AROMATICS	100	NA	NA	ND	ND	ND	ND	24	NA
C19-C36 ALIPHATICS	100	NA	NA	ND	ND	ND	ND	ND	NA
C9-C18 ALIPHATICS	100	NA	NA	ND	ND	ND	ND	ND	NA
DIESEL RANGE ORGANICS	50	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)									
ALUMINUM	76000	9700	9040	NA	1600	NA	13400	NA	NA
ANTIMONY	31	0.48 J	ND	NA	ND	NA	ND	NA	NA
ARSENIC	22	8.4	13.2	NA	ND	NA	11.9	NA	NA
BARIUM	5400	55.2	48.9	NA	7.4	NA	110	NA	NA
BERYLLIUM	150	0.39	0.36	NA	0.31	NA	ND	NA	NA
BORON	5500	5	3.5	NA	ND	NA	ND	NA	NA
CADMIUM	37	0.58	0.45	NA	0.03 J	NA	0.28 J	NA	NA
CALCIUM	*	6940	6100	NA	592	NA	2920	NA	NA
CHROMIUM	210	31	46.3	NA	6.4	NA	56 R	NA	NA
COBALT	4700	6.9	11.5	NA	0.98	NA	8.6	NA	NA
COPPER	2900	35.4 J	110 J	NA	2.8 J	NA	16.3 J	NA	NA
IRON	23000	20800 J	**72400 J**	NA	3410 J	NA	22200	NA	NA
LEAD	400	34.5 J	36.6 J	NA	3.4 J	NA	7.6	NA	NA
MAGNESIUM	*	4090	3910	NA	574	NA	9890	NA	NA
MANGANESE	1800	311	516	NA	68.7	NA	402	NA	NA
MERCURY	6.1	ND	ND	NA	ND	NA	ND	NA	NA
MOLYBDENUM	390	2.5 J	19.8 J	NA	ND	NA	ND	NA	NA
NICKEL	*	25.2 J	83.6 J	NA	3.2 J	NA	39.2 J	NA	NA
POTASSIUM	*	2220	2210	NA	575	NA	8660	NA	NA
SELENIUM	390	ND	ND	NA	ND	NA	ND	NA	NA
SILVER	390	0.23 J	0.26	NA	ND	NA	0.53 J	NA	NA
SODIUM	*	275	251	NA	ND	NA	235	NA	NA
THALLIUM	520	ND	ND	NA	ND	NA	1.5 J	NA	NA
VANADIUM	550	25.7	29.4	NA	3	NA	59.1	NA	NA
ZINC	23000	160	249	NA	12.2	NA	62.6 J	NA	NA
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	NA	ND	NA	ND	NA	NA
AROCLOR-1248	220	ND	ND	NA	ND	NA	ND	NA	NA
AROCLOR-1254	220	180	110	NA	ND	NA	ND	NA	NA
AROCLOR-1260	220	35	42	NA	ND	NA	ND	NA	NA
Pesticides (ug/kg)									
4,4'-DDT	1700	ND	ND	NA	ND	NA	ND	NA	NA
DELTA BHC	*	ND	ND	NA	ND	NA	ND	NA	NA
ENDOSULFAN I	370000	ND	ND	NA	ND	NA	ND	NA	NA
ENDOSULFAN II	370000	ND	ND	NA	ND	NA	ND	NA	NA
SVOCs (ug/kg)									
2,4,5-TRICHLOROPHENOL	6100000	ND	ND	NA	ND	NA	ND	NA	NA
2,4,6-TRICHLOROPHENOL	44000	ND	ND	NA	ND	NA	ND	NA	NA
2,4-DICHLOROPHENOL	180000	ND	ND	NA	ND	NA	ND	NA	NA
2,4-DIMETHYLPHENOL	1200000	ND	ND	NA	ND	NA	ND	NA	NA
2,4-DINITROPHENOL	120000	ND	ND	NA	ND	NA	ND	NA	NA

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB01(0-0.5)	MY05SB75(0-0.5)	MY05SB01(2-3.3)	MY05SB01(5-5.9)	MY05SB75(5-5.9)	MY05SB02(0-0.5)	MY05SB02(0.5-4.5)	MY05SB02(2.5-4.5)
Duplicates			**Dup. of MY05SB01(0-0.5)**			**Dup. of MY05SB01(5-5.9)**			
Date Collected		**4/23/2002**	**4/23/2002**	**4/23/2002**	**4/24/2002**		**4/24/2002**	**4/24/2002**	**4/24/2002**
Sample Delivery Group		**MY101**	**MY101**	**MY105**	**MY101**		**MY105**	**MY105**	**MY105**
2-CHLOROPHENOL	63000	ND	ND	NA	ND	NA	ND	NA	NA
2-METHYLNAPHTHALENE	*	ND	ND	NA	ND	NA	ND	NA	NA
2-METHYLPHENOL	3100000	ND	ND	NA	ND	NA	ND	NA	NA
2-NITROPHENOL	490000	ND	ND	NA	ND	NA	ND	NA	NA
3-NITROANILINE	*	ND	ND	NA	ND	NA	ND	NA	NA
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	NA	ND	NA	ND	NA	NA
4-CHLORO-3-METHYLPHENOL	*	ND	ND	NA	ND	NA	ND	NA	NA
4-METHYLPHENOL	3100000	ND	ND	NA	ND	NA	ND	NA	NA
4-NITROPHENOL	490000	ND	ND	NA	ND	NA	ND	NA	NA
ACENAPHTHENE	3700000	2200	ND	NA	ND	NA	ND	NA	NA
ANTHRACENE	2200000	3700	ND	NA	ND	NA	ND	NA	NA
BENZO(A)ANTHRACENE	620	**6900 J**	ND	NA	ND	NA	ND	NA	NA
BENZO(A)PYRENE	62	**5900 J**	ND	NA	ND	NA	ND	NA	NA
BENZO(B)FLUORANTHENE	620	**7800 J**	ND	NA	ND	NA	ND	NA	NA
BENZO(K)FLUORANTHENE	6200	4100	ND	NA	ND	NA	ND	NA	NA
BENZO[G,H,I]PERYLENE	*	2400	ND	NA	ND	NA	ND	NA	NA
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	NA	ND	NA	ND	NA	NA
BUTYL BENZYL PHTHALATE	12000000	ND	ND	NA	ND	NA	ND	NA	NA
CARBAZOLE	24000	3100	ND	NA	ND	NA	ND	NA	NA
CHRYSENE	62000	6800 J	ND	NA	ND	NA	ND	NA	NA
DIBENZO(A,H)ANTHRACENE	62	ND	ND	NA	ND	NA	ND	NA	NA
DIBENZOFURAN	290000	1700 J	ND	NA	ND	NA	ND	NA	NA
FLUORANTHENE	2300000	19000 J	ND	NA	ND	NA	ND	NA	NA
FLUORENE	2600000	2300	ND	NA	ND	NA	ND	NA	NA
INDENO(1,2,3-CD)PYRENE	620	**2900**	ND	NA	ND	NA	ND	NA	NA
NAPHTHALENE	56000	ND	ND	NA	ND	NA	ND	NA	NA
PENTACHLOROPHENOL	3000	ND	ND	NA	ND	NA	ND	NA	NA
PHENANTHRENE	*	16000 J	ND	NA	ND	NA	ND	NA	NA
PHENOL	37000000	ND	ND	NA	ND	NA	ND	NA	NA
PYRENE	2300000	14000 J	ND	NA	ND	NA	ND	NA	NA
VOCs (ug/kg)									
2-BUTANONE	7300000	11 R	12 R	9 R	15 R	NA	10 R	NA	11 R
4-METHYL-2-PENTANONE	790000	11 R	12 R	9 R	15 R	NA	10 R	NA	11 R
ACETONE	1600000	ND	ND	6 J	ND	NA	18 J	NA	ND
M-,P-XYLENE	210000	ND	ND	ND	ND	NA	ND	NA	ND
METHYLENE CHLORIDE	8900	ND	11 J	ND	10 J	NA	ND	NA	ND
Other Compounds									
TOTAL SOLIDS (%)	*	93	93	94	93	92	97	94	92

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SB02(4.5-6.5)	MY05SB03(2-2.3)	MY05SB15(0-0.5)	MY05SB15(2-3.3)	MY05SB16(0-0.5)	MY05SB16(2-4)	MY05SB16(4-4.5)	MY05SS05	MY05SS06
Date Collected		4/24/2002	4/25/2002	10/30/2001	10/30/2001	10/31/2001	10/31/2001	10/31/2001	10/1/2001	9/27/2001
Sample Delivery Group		MY105	MY106	MY015	MY015	MY015	MY015	MY015	MY007	MY007
EPH/DRO (mg/kg)										
C11-C22 AROMATICS	100	19 J	ND	NA	ND	NA	ND	ND	ND	**73 J**
C19-C36 ALIPHATICS	100	ND	ND	NA	ND	NA	ND	ND	13 J	**72 J**
C9-C18 ALIPHATICS	100	ND	ND	NA	ND	NA	7.3	6.9	6.5 R	**8.1 R**
DIESEL RANGE ORGANICS	50	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)										
ALUMINUM	76000	19400	NA	8120	10300	25400	NA	13600	9520	10400
ANTIMONY	31	ND	NA	ND	ND	ND	NA	ND	ND	ND
ARSENIC	22	2	NA	8.3	8.4	9.5	NA	9.4	9.7	8.4
BARIUM	5400	49.5	NA	42.9	59.4	169	NA	51	46.4	50.6
BERYLLIUM	150	1.2	NA	0.34	0.43	2.1	NA	0.79	0.33	0.43
BORON	5500	ND	NA	ND	ND	4.2	NA	ND	ND	ND
CADMIUM	37	0.38 J	NA	ND	ND	ND	NA	ND	0.16	ND
CALCIUM	*	1450	NA	1600	1440	ND	NA	ND	1280	2270
CHROMIUM	210	36 R	NA	22.7	21.5	44.7	NA	23.6	27.1	39.3
COBALT	4700	11.5	NA	6.3	7.4	12.7	NA	8	6.8	7.8
COPPER	2900	23.3 J	NA	14.3	16.9	14.8	NA	15.9	18.2	23.4
IRON	23000	**39300**	NA	12800	15800	**28200**	NA	16000	16300	17500
LEAD	400	12.2	NA	9.2	10.7	16	NA	6.1	17.2	22.6
MAGNESIUM	*	7820	NA	3950	5680	6080	NA	3900	5240	5650
MANGANESE	1800	434	NA	266	352	835	NA	352	324	332
MERCURY	6.1	0.01 J	NA	ND	ND	0.04	NA	ND	ND	0.01 J
MOLYBDENUM	390	ND	NA	0.64	0.75	0.82	NA	0.64	ND	1
NICKEL	*	28.3 J	NA	17.5	14.2	29	NA	17.4	18.1	26.9
POTASSIUM	*	3160	NA	2410	2930	6730	NA	2700	2280	2360
SELENIUM	390	ND	NA	ND	ND	0.73 J	NA	0.53 J	ND	ND
SILVER	390	0.62 J	NA	ND	ND	0.04	NA	0.73 J	ND	0.78 J
SODIUM	*	77.9	NA	145	145	ND	NA	ND	81.3	186
THALLIUM	520	ND	NA	0.22	0.2	0.24	NA	0.15	ND	ND
VANADIUM	550	44.2	NA	20.2	23.6	48.5	NA	25.3	24.8	30.2
ZINC	23000	77 J	NA	67.2	67.1	76.6	NA	45.9	79.8	107
PCBs (ug/kg)										
AROCLOR-1242	220	ND	NA	ND	ND	ND	NA	ND	ND	ND
AROCLOR-1248	220	ND	NA	ND	ND	ND	NA	ND	ND	ND
AROCLOR-1254	220	ND	NA	ND	ND	ND	NA	ND	ND	ND
AROCLOR-1260	220	ND	NA	ND	ND	ND	NA	ND	ND	ND
Pesticides (ug/kg)										
4,4'-DDT	1700	ND	NA	7.2 J	ND	ND	NA	ND	ND	ND
DELTA BHC	*	ND	NA	ND	ND	ND	NA	ND	ND	ND
ENDOSULFAN I	370000	ND	NA	ND	ND	ND	NA	ND	ND	ND
ENDOSULFAN II	370000	ND	NA	ND	ND	ND	NA	ND	ND	ND
SVOCs (ug/kg)										
2,4,5-TRICHLOROPHENOL	6100000	ND	NA	ND	ND	ND	NA	ND	ND	ND
2,4,6-TRICHLOROPHENOL	44000	ND	NA	ND	ND	ND	NA	ND	ND	ND
2,4-DICHLOROPHENOL	180000	ND	NA	ND	ND	ND	NA	ND	ND	ND
2,4-DIMETHYLPHENOL	1200000	ND	NA	ND	ND	ND	NA	ND	ND	ND
2,4-DINITROPHENOL	120000	ND	NA	ND	ND	ND	NA	ND	ND	ND

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB02(4.5-6.5)	MY05SB03(2-2.3)	MY05SB15(0-0.5)	MY05SB15(2-3.3)	MY05SB16(0-0.5)	MY05SB16(2-4)	MY05SB16(4-4.5)	MY05SS05	MY05SS06
Duplicates										
Date Collected		4/24/2002	4/25/2002	10/30/2001	10/30/2001	10/31/2001	10/31/2001	10/31/2001	10/1/2001	9/27/2001
Sample Delivery Group		MY105	MY106	MY015	MY015	MY015	MY015	MY015	MY007	MY007
2-CHLOROPHENOL	63000	ND	NA	ND	ND	ND	NA	ND	ND	ND
2-METHYLNAPHTHALENE	*	ND	NA	ND	ND	ND	NA	ND	ND	ND
2-METHYLPHENOL	3100000	ND	NA	ND	ND	ND	NA	ND	ND	ND
2-NITROPHENOL	490000	ND	NA	ND	ND	ND	NA	ND	ND	ND
3-NITROANILINE	*	ND	NA	ND	ND	ND	NA	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND	NA	ND	ND	ND	NA	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	*	ND	NA	ND	ND	ND	NA	ND	ND	ND
4-METHYLPHENOL	3100000	ND	NA	ND	ND	ND	NA	ND	ND	ND
4-NITROPHENOL	490000	ND	NA	ND	ND	ND	NA	ND	ND	ND
ACENAPHTHENE	3700000	ND	NA	ND	ND	ND	NA	ND	ND	ND
ANTHRACENE	2200000	ND	NA	2600	ND	ND	NA	ND	ND	ND
BENZO(A)ANTHRACENE	620	ND	NA	**6800**	490	ND	NA	ND	ND	580
BENZO(A)PYRENE	62	ND	NA	**6300**	**510**	ND	NA	ND	ND	**580**
BENZO(B)FLUORANTHENE	620	ND	NA	**7700**	610	ND	NA	ND	ND	**890**
BENZO(K)FLUORANTHENE	6200	ND	NA	2400	210 J	ND	NA	ND	ND	280 J
BENZO[G,H,I]PERYLENE	*	ND	NA	4100	320 J	ND	NA	ND	ND	320 J
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	NA	ND	ND	ND	NA	1200 J	ND	330 J
BUTYL BENZYL PHTHALATE	12000000	ND	NA	ND	ND	ND	NA	ND	ND	ND
CARBAZOLE	24000	ND	NA	1600	ND	ND	NA	ND	ND	ND
CHRYSENE	62000	ND	NA	6700	490	ND	NA	ND	ND	660
DIBENZO(A,H)ANTHRACENE	62	ND	NA	**840**	ND	ND	NA	ND	ND	ND
DIBENZOFURAN	290000	ND	NA	430	ND	ND	NA	ND	ND	ND
FLUORANTHENE	2300000	ND	NA	15000	1000	ND	NA	ND	ND	1400
FLUORENE	2600000	ND	NA	840	ND	ND	NA	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	NA	**4600**	370	ND	NA	ND	ND	360 J
NAPHTHALENE	56000	ND	NA	390	ND	ND	NA	ND	ND	ND
PENTACHLOROPHENOL	3000	ND	NA	ND	ND	ND	NA	ND	ND	ND
PHENANTHRENE	*	ND	NA	9500	670	ND	NA	ND	ND	680
PHENOL	37000000	ND	NA	ND	ND	ND	NA	ND	ND	ND
PYRENE	2300000	ND	NA	10000	820	ND	NA	ND	ND	1500
VOCs (ug/kg)										
2-BUTANONE	7300000	11 R	NA	ND	ND	ND	ND	ND	ND	ND
4-METHYL-2-PENTANONE	790000	11 R	NA	ND	ND	ND	ND	ND	ND	ND
ACETONE	1600000	ND	NA	ND	ND	ND	ND	ND	ND	ND
M-,P-XYLENE	210000	ND	NA	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	NA	ND	ND	ND	ND	ND	ND	ND
Other Compounds										
TOTAL SOLIDS (%)	*	95	95	94	97	73	82	87	92	74

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS07	MY05SS08	MY05SS11(0-0.5)	MY05SS24(0-0.5)	MY05SS152(0-0.5)	MY05SS25(0-0.5)	MY05SS26(0-0.5)	MY05SS27(0-0.5)	MY05SS28(0-0.5)	MY05SS29(0-0.5)
Duplicates						**Dup. of MY05SS24(0-0.5)**					
Date Collected		**10/1/2001**	**10/1/2001**	**9/24/2001**	**4/24/02 & 7/11/02**	**7/11/2002**	**4/17/2002**	**4/17/2002**	**4/17/2002**	**4/17/2002**	**4/17/2002**
Sample Delivery Group		**MY007**	**MY007**	**MY004**	**MY105 & MY114**	**MY114**	**MY102**	**MY102**	**MY102**	**MY102**	**MY102**
EPH/DRO (mg/kg)											
C11-C22 AROMATICS	100	ND	**ND**	30 J	45 J	NA	ND	ND	**28**	ND	**71**
C19-C36 ALIPHATICS	100	13 J	**74 J**	ND	ND	NA	ND	43 J	**76 J**	53 J	**38**
C9-C18 ALIPHATICS	100	6.1 R	**30 R**	ND	7.8	NA	29	ND	**19**	8.4	**ND**
DIESEL RANGE ORGANICS	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)											
ALUMINUM	76000	9660	10600	21000	8050	NA	8820	8380	9490	8760	6720
ANTIMONY	31	ND	ND	0.04 R	ND	NA	ND	ND	ND	ND	0.37 J
ARSENIC	22	8	7.3	8.3	5.5	NA	7.2	6.9	6.3	7.6	6
BARIUM	5400	98.5	39.5	73.9	32.1	NA	42.4	40.6	45.2	44.7	30.3
BERYLLIUM	150	0.37	0.35	0.85	ND	NA	0.34	0.31	0.35	0.33	0.26
BORON	5500	ND	ND	ND	ND	NA	5.5	0.73	5.8	1.6	ND
CADMIUM	37	0.16	0.11	ND	0.37 J	NA	0.14	0.2	0.16	0.7	0.16
CALCIUM	*	1590	1530	1270	6660	NA	56800	4660	56800	8400	2570
CHROMIUM	210	23.7	21.6	40 J	36 R	NA	21.7 J	22 J	22.8 J	19.4 J	18.5 R
COBALT	4700	6.3	5.6	11.2	5	NA	5	5	4.4	5.7	4.2
COPPER	2900	24.5	15.1	19.5	138 J	NA	17.3 J	28.3 J	16.6 J	17.4 J	11.9 J
IRON	23000	16700	14100	22600	14200	NA	12800	14100	13800	14000	10100
LEAD	400	13	10.4	13.8	7.2	NA	5	10.9	5.4	16.8	8.2
MAGNESIUM	*	4660	3880	6270	4530	NA	5770	4190	6110	4490	3520
MANGANESE	1800	290	260	430	244	NA	241	233	239	285	205
MERCURY	6.1	ND	0.02 J	ND	0.05 J	ND	ND	0.06 J	ND	0.09 J	0.02 J
MOLYBDENUM	390	2.4	ND	0.76	ND	NA	ND	2.7	ND	ND	ND
NICKEL	*	18.3	16.6	27.5	21.8 J	NA	21.3	20.3	17.7	15.7	12.2 J
POTASSIUM	*	2230	2060	2980	1560	NA	1990 J	2120 J	2220 J	1960 J	1350
SELENIUM	390	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
SILVER	390	ND	ND	ND	0.57 J	NA	ND	ND	ND	ND	ND
SODIUM	*	177	203	114 J	232	NA	322	300	386	248	167
THALLIUM	520	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
VANADIUM	550	26.2	22.5	39.6	19.2	NA	20.7 J	19.7 J	23.5 J	19.7 J	15.7
ZINC	23000	67.8	50.7	73.1	50.4 J	NA	31.6 J	47.6 J	37.2 J	125 J	33.1 J
PCBs (ug/kg)											
AROCLOR-1242	220	ND	ND	ND	ND	NA	ND	22	ND	47	ND
AROCLOR-1248	220	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
AROCLOR-1254	220	ND	ND	ND	78	NA	ND	30	52	24	140
AROCLOR-1260	220	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Pesticides (ug/kg)											
4,4'-DDT	1700	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
DELTA BHC	*	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	370000	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	370000	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)											
2,4,5-TRICHLOROPHENOL	6100000	ND	ND	ND	ND	NA	920 R	ND	920 R	ND	ND
2,4,6-TRICHLOROPHENOL	44000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
2,4-DICHLOROPHENOL	180000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
2,4-DIMETHYLPHENOL	1200000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
2,4-DINITROPHENOL	120000	ND	ND	ND	ND	NA	920 R	ND	920 R	ND	ND

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS07	MY05SS08	MY05SS11(0-0.5)	MY05SS24(0-0.5)	MY05SS152(0-0.5)	MY05SS25(0-0.5)	MY05SS26(0-0.5)	MY05SS27(0-0.5)	MY05SS28(0-0.5)	MY05SS29(0-0.5)
Duplicates						**Dup. of MY05SS24(0-0.5)**					
Date Collected		**10/1/2001**	**10/1/2001**	**9/24/2001**	**4/24/02 & 7/11/02**	**7/11/2002**	**4/17/2002**	**4/17/2002**	**4/17/2002**	**4/17/2002**	**4/17/2002**
Sample Delivery Group		**MY007**	**MY007**	**MY004**	**MY105 & MY114**	**MY114**	**MY102**	**MY102**	**MY102**	**MY102**	**MY102**
2-CHLOROPHENOL	63000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	NA	ND	ND	ND	ND	1700
2-METHYLPHENOL	3100000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
2-NITROPHENOL	490000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	NA	920 R	ND	920 R	ND	ND
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
4-NITROPHENOL	490000	ND	ND	ND	ND	NA	920 R	ND	920 R	ND	ND
ACENAPHTHENE	3700000	ND	ND	ND	250 J	NA	ND	ND	ND	ND	2900
ANTHRACENE	2200000	ND	380	ND	520	NA	ND	ND	ND	290 J	5200
BENZO(A)ANTHRACENE	620	ND	**640**	ND	**1100**	NA	ND	230 J	ND	480	**8100**
BENZO(A)PYRENE	62	ND	**540**	ND	**900**	NA	ND	**220 J**	ND	**490**	**7900**
BENZO(B)FLUORANTHENE	620	ND	**710**	ND	**1200**	NA	ND	260 J	ND	580	**10000**
BENZO(K)FLUORANTHENE	6200	ND	270 J	ND	460	NA	ND	ND	ND	230 J	4500
BENZO[G,H,I]PERYLENE	*	ND	340	ND	340 J	NA	ND	ND	ND	240 J	4600
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	230 J	NA	ND	ND	ND	ND	ND
BUTYL BENZYL PHTHALATE	12000000	ND	ND	ND	2600 J	NA	ND	ND	ND	ND	ND
CARBAZOLE	24000	ND	210 J	ND	460	NA	ND	ND	ND	ND	3100
CHRYSENE	62000	ND	630	ND	1100	NA	ND	230 J	ND	460	7600
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	NA	ND	ND	ND	ND	**1400**
DIBENZOFURAN	290000	ND	ND	ND	ND	NA	ND	ND	ND	ND	2100
FLUORANTHENE	2300000	ND	1500	ND	2900	NA	ND	540	ND	1200	18000
FLUORENE	2600000	ND	210 J	ND	270 J	NA	ND	ND	ND	ND	3000
INDENO(1,2,3-CD)PYRENE	620	ND	410	ND	420	NA	ND	ND	ND	340 J	**5800**
NAPHTHALENE	56000	ND	ND	ND	ND	NA	ND	ND	ND	ND	770
PENTACHLOROPHENOL	3000	ND	ND	ND	ND	NA	920 R	ND	920 R	ND	ND
PHENANTHRENE	*	ND	1400	ND	2000	NA	ND	380	ND	990	16000
PHENOL	37000000	ND	ND	ND	ND	NA	370 R	ND	370 R	ND	ND
PYRENE	2300000	ND	1200	ND	2000	NA	ND	360	ND	960	17000
VOCs (ug/kg)											
2-BUTANONE	7300000	ND	ND	ND	12 R	NA	11 J	21 R	12 R	22 R	13 R
4-METHYL-2-PENTANONE	790000	ND	ND	ND	12 R	NA	ND	ND	ND	ND	ND
ACETONE	1600000	ND	ND	ND	28 J	NA	ND	ND	ND	ND	ND
M-,P-XYLENE	210000	ND	ND	ND	4 J	NA	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND
Other Compounds											
TOTAL SOLIDS (%)	*	98	96	68	95	94	89	93	90	93	92

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS30(0-0.5)	MY05SS31(0-0.5)	MY05SS97(0-0.5)	MY05SS32(0-0.5)	MY05SS34(0-0.5)	MY05SS35(0-0.5)	MY05SS36(0-0.5)	MY05SS37(0-0.5)	MY05SS38(0-0.5)
Duplicates				Dup. of MY05SS31(0-0.5)						
Date Collected		4/17/2002	4/29/2002		5/1/2002	4/18/2002	4/18/2002	4/18/2002	4/15/2002	4/16/2002
Sample Delivery Group		MY102	MY105		MY106	MY105	MY105	MY105	MY102	MY102
EPH/DRO (mg/kg)										
C11-C22 AROMATICS	100	**73 J**	42 J	**50 J**	21 J	**42 J**	**28 J**	**26 J**	33 J	**160**
C19-C36 ALIPHATICS	100	**70**	37 J	**280 J**	12	**2300**	**400**	**180**	24 J	**77 J**
C9-C18 ALIPHATICS	100	**6.6**	ND	**13**	ND	**ND**	**9.6**	**7.3**	ND	**ND**
DIESEL RANGE ORGANICS	50	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)										
ALUMINUM	76000	6080	9680	10400	6470	NA	NA	NA	9220	4990
ANTIMONY	31	ND	ND	ND	ND	NA	NA	NA	ND	ND
ARSENIC	22	4.7	4.8	4.9	5.2	NA	NA	NA	9.9	4.8
BARIUM	5400	33.4	52.2	46.9	29.5	NA	NA	NA	48.8	23.5
BERYLLIUM	150	0.24	0.44	0.41	0.3	NA	NA	NA	0.39	0.2
BORON	5500	ND	8.8	8.4	ND	NA	NA	NA	2.6	0.75
CADMIUM	37	0.12	ND	0.3 J	ND	NA	NA	NA	0.3 J	0.12
CALCIUM	*	1750	56600	54500	8340	NA	NA	NA	15400	2890
CHROMIUM	210	11.4 R	22.4 R	26.7 R	12.5	NA	NA	NA	20.4	9.3 J
COBALT	4700	3.3	5.3	4.7	4	NA	NA	NA	5.9	7.1
COPPER	2900	9.1 J	34.6 J	42 J	10.3	NA	NA	NA	18.8	8.3 J
IRON	23000	8310	17400	16000	9350	NA	NA	NA	15900	9820
LEAD	400	6.2	9.8	13.4	5.6	NA	NA	NA	16.2	4.4
MAGNESIUM	*	2840	5380	6050	3080	NA	NA	NA	5050	2930
MANGANESE	1800	154	346	232	176	NA	NA	NA	342	167
MERCURY	6.1	0.01 J	0.28	0.26	ND	NA	NA	NA	0.04 J	ND
MOLYBDENUM	390	ND	ND	ND	ND	NA	NA	NA	ND	ND
NICKEL	*	8.5 J	19 J	21.7 J	10.8	NA	NA	NA	16.2	8.7
POTASSIUM	*	1240	2010	1690	1420 J	NA	NA	NA	2100	956 J
SELENIUM	390	ND	ND	ND	ND	NA	NA	NA	ND	ND
SILVER	390	ND	ND	ND	ND	NA	NA	NA	ND	ND
SODIUM	*	245	557	547	360	NA	NA	NA	363	150
THALLIUM	520	ND	ND	ND	ND	NA	NA	NA	ND	ND
VANADIUM	550	11.2	21.4	23.8	14.3	NA	NA	NA	21.4	12.8 J
ZINC	23000	28.7 J	101 J	190 J	37.7	NA	NA	NA	71	36.8 J
PCBs (ug/kg)										
AROCLOR-1242	220	ND	ND	ND	ND	NA	NA	NA	ND	ND
AROCLOR-1248	220	ND	ND	ND	ND	NA	64	NA	ND	ND
AROCLOR-1254	220	50	91 J	47 J	52	NA	180	**240**	140	ND
AROCLOR-1260	220	ND	ND	ND	ND	NA	21	NA	ND	ND
Pesticides (ug/kg)										
4,4'-DDT	1700	NA	ND	ND	NA	NA	NA	NA	NA	NA
DELTA BHC	*	NA	2.1 R	ND	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	370000	NA	2.1 R	ND	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	370000	NA	4.1 R	ND	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)										
2,4,5-TRICHLOROPHENOL	6100000	ND	ND	ND	ND	NA	NA	NA	ND	ND
2,4,6-TRICHLOROPHENOL	44000	ND	ND	ND	ND	NA	NA	NA	ND	ND
2,4-DICHLOROPHENOL	180000	ND	ND	ND	ND	NA	NA	NA	ND	ND
2,4-DIMETHYLPHENOL	1200000	ND	ND	ND	ND	NA	NA	NA	ND	ND
2,4-DINITROPHENOL	120000	ND	ND	ND	ND	NA	NA	NA	ND	ND

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS30(0-0.5)	MY05SS31(0-0.5)	MY05SS97(0-0.5)	MY05SS32(0-0.5)	MY05SS34(0-0.5)	MY05SS35(0-0.5)	MY05SS36(0-0.5)	MY05SS37(0-0.5)	MY05SS38(0-0.5)
Duplicates				**Dup. of MY05SS31(0-0.5)**						
Date Collected		**4/17/2002**	**4/29/2002**		**5/1/2002**	**4/18/2002**	**4/18/2002**	**4/18/2002**	**4/15/2002**	**4/16/2002**
Sample Delivery Group		**MY102**	**MY105**		**MY106**	**MY105**	**MY105**	**MY105**	**MY102**	**MY102**
2-CHLOROPHENOL	63000	ND	ND	ND	ND	NA	NA	NA	ND	ND
2-METHYLNAPHTHALENE	*	1200	290 J	490	310 J	NA	NA	NA	370 J	1500
2-METHYLPHENOL	3100000	ND	ND	ND	ND	NA	NA	NA	ND	ND
2-NITROPHENOL	490000	ND	ND	ND	ND	NA	NA	NA	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	NA	NA	NA	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	NA	NA	NA	ND	ND
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	NA	NA	NA	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	NA	NA	NA	ND	ND
4-NITROPHENOL	490000	ND	ND	ND	ND	NA	NA	NA	ND	ND
ACENAPHTHENE	3700000	2200	630 J	890	820	NA	NA	NA	920 J	3000
ANTHRACENE	2200000	4200	1300	1900	1700	NA	NA	NA	1600 J	5200
BENZO(A)ANTHRACENE	620	**6900**	**2300**	**3400**	**2600**	NA	NA	NA	**3500 J**	**8100**
BENZO(A)PYRENE	62	**6500**	**2100**	**3100**	**2200**	NA	NA	NA	**3400 J**	**7900**
BENZO(B)FLUORANTHENE	620	**7900**	**2600**	**3800**	**2900**	NA	NA	NA	**4200 J**	**9600**
BENZO(K)FLUORANTHENE	6200	3300	990	1500	1100	NA	NA	NA	1900 J	3900
BENZO[G,H,I]PERYLENE	*	3200	1100	1500	1100	NA	NA	NA	2000 J	4900
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	1100	1200	ND	NA	NA	NA	ND	ND
BUTYL BENZYL PHTHALATE	12000000	ND	ND	ND	ND	NA	NA	NA	ND	ND
CARBAZOLE	24000	2300	860	1200	1100	NA	NA	NA	1100 J	3200
CHRYSENE	62000	6300	2300	3400	2400	NA	NA	NA	3500 J	7800
DIBENZO(A,H)ANTHRACENE	62	**890**	**280 J**	**370 J**	**280 J**	NA	NA	NA	**520 J**	**1300**
DIBENZOFURAN	290000	1600	450	730	600	NA	NA	NA	620 J	1900
FLUORANTHENE	2300000	12000	6700 J	7300	7000	NA	NA	NA	7700 J	20000
FLUORENE	2600000	2200	680	1100	920	NA	NA	NA	890 J	2800
INDENO(1,2,3-CD)PYRENE	620	**4000**	**1300**	**1800**	**1200**	NA	NA	NA	**2600 J**	**5800**
NAPHTHALENE	56000	550 J	ND	360 J	210 J	NA	NA	NA	220 J	1100
PENTACHLOROPHENOL	3000	ND	ND	ND	ND	NA	NA	NA	ND	ND
PHENANTHRENE	*	11000	5000	7200 J	6000	NA	NA	NA	6300 J	18000
PHENOL	37000000	ND	ND	ND	ND	NA	NA	NA	ND	ND
PYRENE	2300000	9000	4100	6100	5600	NA	NA	NA	5800 J	15000
VOCs (ug/kg)										
2-BUTANONE	7300000	10 R	15 R	25 R	10 R	NA	NA	NA	24 R	24 R
4-METHYL-2-PENTANONE	790000	ND	ND	ND	ND	NA	NA	NA	ND	ND
ACETONE	1600000	ND	8 J	ND	ND	NA	NA	NA	ND	ND
M-,P-XYLENE	210000	ND	ND	ND	ND	NA	NA	NA	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	ND	ND	NA	NA	NA	ND	ND
Other Compounds										
TOTAL SOLIDS (%)	*	93	81	79	93	91	94	90	90	90

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS39(0-0.5)	MY05SS40(0-0.5)	MY05SS41(0-0.5)	MY05SS42(0-0.5)	MY05SS43(0-0.5)	MY05SS44(0-0.5)	MY05SS93(0-0.5)	MY05SS48(0-0.5)
Duplicates								Dup. of MY05SS44(0-0.5)	
Date Collected		4/15/2002	4/16/2002	4/15/2002	4/15/2002	4/16/2002	4/16/2002	4/16/2002	4/17/2002
Sample Delivery Group		MY102	MY102	MY102	MY102	MY102	MY102	MY102	MY102
EPH/DRO (mg/kg)									
C11-C22 AROMATICS	100	ND	**57 J**	ND	23 J	ND	ND	ND	ND
C19-C36 ALIPHATICS	100	10 J	**76 J**	ND	25 J	ND	ND	ND	41 J
C9-C18 ALIPHATICS	100	ND	**ND**	ND	ND	ND	ND	ND	ND
DIESEL RANGE ORGANICS	50	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)									
ALUMINUM	76000	7460	5730	5560	7110	8730	7540	7070	7130
ANTIMONY	31	ND	ND	ND	ND	ND	ND	ND	ND
ARSENIC	22	7	7	4.6	6.8	7.5	6.7	6.8	5.2
BARIUM	5400	35.3	29.5	26.8	32.7	43.4	35.5	35.4	31.2
BERYLLIUM	150	0.3	0.21	0.21	0.28	0.3	0.32	0.35	0.35
BORON	5500	ND	0.39	ND	ND	ND	0.67	0.63	1
CADMIUM	37	0.18 J	0.11	0.12 J	0.26 J	0.18	0.17	0.17	0.16
CALCIUM	*	2160	1470	2720	5040	6260	4150	2940	4050
CHROMIUM	210	16.3	10.4 J	11.6	15.9	17.8 J	16.5 J	16.1 J	18.9 J
COBALT	4700	4.7	3.7	3.6	4.7	5.6	4.8	5.4	4.7
COPPER	2900	11.9	9.3 J	12.5	14.6	16.7 J	14.4 J	14.3 J	13.1 J
IRON	23000	12200	8780	9060	12500	13300	12200	12300	11100
LEAD	400	7.1	8	4.9	10.4	8	9.2	8.9	10.5
MAGNESIUM	*	3960	2840	2900	4050	4610	4100	3410	3850
MANGANESE	1800	247	170	159	246	249	243	212	218
MERCURY	6.1	ND	ND	ND	0.05 J	ND	ND	ND	ND
MOLYBDENUM	390	ND	ND	ND	ND	ND	ND	ND	ND
NICKEL	*	12.4	8.8	13.3	12.2	13.9	13.5	13.6	12.9
POTASSIUM	*	1780	1050 J	1660	1550	1730 J	1750 J	1720 J	1440 J
SELENIUM	390	ND	ND	ND	ND	ND	ND	ND	ND
SILVER	390	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM	*	162	110	239	173	212	127	135	179
THALLIUM	520	ND	1.1	ND	ND	0.51 J	ND	ND	0.82 J
VANADIUM	550	17.3	12.8 J	13.8	17.1	24.4 J	16 J	16.1 J	16.5 J
ZINC	23000	49.4	31.4 J	37.2	60	44.6 J	51.3 J	52.1 J	36.2 J
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	ND	ND	ND	ND	ND	29
AROCLOR-1248	220	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1254	220	45	35	ND	ND	ND	ND	ND	ND
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)									
4,4'-DDT	1700	NA	NA	NA	NA	NA	NA	NA	NA
DELTA BHC	*	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	370000	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	370000	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)									
2,4,5-TRICHLOROPHENOL	6100000	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	44000	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	180000	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	1200000	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	120000	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS39(0-0.5)	MY05SS40(0-0.5)	MY05SS41(0-0.5)	MY05SS42(0-0.5)	MY05SS43(0-0.5)	MY05SS44(0-0.5)	MY05SS93(0-0.5)	MY05SS48(0-0.5)
Duplicates								Dup. of MY05SS44(0-0.5)	
Date Collected		4/15/2002	4/16/2002	4/15/2002	4/15/2002	4/16/2002	4/16/2002	4/16/2002	4/17/2002
Sample Delivery Group		MY102	MY102	MY102	MY102	MY102	MY102	MY102	MY102
2-CHLOROPHENOL	63000	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	*	ND	720	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	3700000	450 J	1600	300 J	240 J	ND	ND	ND	ND
ANTHRACENE	2200000	720 J	2500	520 J	480 J	ND	ND	180 J	ND
BENZO(A)ANTHRACENE	620	**870 J**	**4500**	**870 J**	**1100 J**	200 J	270 J	410	210 J
BENZO(A)PYRENE	62	**750 J**	**4300**	**820 J**	**1100 J**	**220 J**	**250 J**	**400**	ND
BENZO(B)FLUORANTHENE	620	**940 J**	**5300**	**990 J**	**1400 J**	260 J	310 J	490	240 J
BENZO(K)FLUORANTHENE	6200	360 J	2400	480 J	630 J	ND	ND	230 J	ND
BENZO[G,H,I]PERYLENE	*	500 J	2400	440 J	620 J	ND	ND	270 J	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND	ND	ND	ND	ND
BUTYL BENZYL PHTHALATE	12000000	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	24000	250 J	1600	340 J	300 J	ND	ND	ND	ND
CHRYSENE	62000	860 J	4300	910 J	1100 J	220 J	270 J	420	200 J
DIBENZO(A,H)ANTHRACENE	62	ND	**730**	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	290000	540 J	1100	220 J	ND	ND	ND	ND	ND
FLUORANTHENE	2300000	1800 J	11000	2400 J	2700 J	540	580	960	510
FLUORENE	2600000	450 J	1500	290 J	230 J	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	520 J	**3000**	550 J	**740 J**	ND	200 J	310 J	ND
NAPHTHALENE	56000	ND	620	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	3000	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	2700 J	9500	2100 J	1800 J	390	450	740	310 J
PHENOL	37000000	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE	2300000	1700 J	7600	1700 J	2000 J	380	450	730	340 J
VOCs (ug/kg)									
2-BUTANONE	7300000	15 R	12 R	25 R	13 R	12 R	10 R	12 R	10 R
4-METHYL-2-PENTANONE	790000	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	1600000	ND	ND	ND	ND	ND	ND	ND	ND
M-,P-XYLENE	210000	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds									
TOTAL SOLIDS (%)	*	92	87	86	92	94	94	95	92

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS49(0-0.5)	MY05SS100(0-0.5)	MY05SS51(0-0.5)	MY05SS94(0-0.5)	MY05SS52(0-0.5)	MY05SS53(0-0.5)	MY05SS54(0-0.5)	MY05SS58(0-0.5)
Duplicates			Dup. of MY05SS49(0-0.5)		Dup. of MY05SS51(0-0.5)				
Date Collected		4/17/02 & 5/23/02	5/23/02	4/22/2002	4/22/2002	4/22/2002	4/23/2002	4/30/2002	5/14/2002
Sample Delivery Group		MY102	MY102	MY101	MY101	MY101	MY105	MY105	MYR101
EPH/DRO (mg/kg)									
C11-C22 AROMATICS	100	ND	ND	ND	ND	ND	ND	**ND**	ND
C19-C36 ALIPHATICS	100	29 J	24 J	13	ND	ND	ND	**120**	ND
C9-C18 ALIPHATICS	100	ND	ND	ND	ND	ND	ND	**8.5**	ND
DIESEL RANGE ORGANICS	50	NA	ND	NA	NA	NA	NA	ND	NA
Metals (mg/kg)									
ALUMINUM	76000	8350	NA	10000	7920	11200	5820	ND	7720
ANTIMONY	31	ND	NA	ND	0.46 J	ND	ND	ND	ND
ARSENIC	22	5.8	NA	9	6.8	11.9	6.6	ND	5.4
BARIUM	5400	36.4	NA	63.8	40.1	62.9	30.7	ND	37.3
BERYLLIUM	150	0.28	NA	0.38	0.31	0.46	0.24	ND	0.27
BORON	5500	0.46	NA	ND	ND	ND	ND	ND	4.7
CADMIUM	37	0.12	NA	0.29	0.29	0.4	0.13	ND	ND
CALCIUM	*	2420	NA	2730	2350	4460	1740	ND	2660 J
CHROMIUM	210	18.6 J	NA	27.9	23	26.9	11.2 R	ND	17.3
COBALT	4700	4	NA	6.8	5.1	7.3	3.8	ND	5.2
COPPER	2900	9.1 J	NA	153	137	177	23.1 J	ND	646 J
IRON	23000	9150	NA	19700	18000	20600	8940	ND	12900
LEAD	400	6	NA	12.4	9.6	42.5	5.2	ND	4.6
MAGNESIUM	*	3080	NA	5350	4720	6190	2760	ND	4160 J
MANGANESE	1800	165	NA	326	282	438	210	ND	214
MERCURY	6.1	ND	NA	ND	ND	ND	0.01 J	ND	ND
MOLYBDENUM	390	ND	NA	ND	ND	ND	ND	ND	1.7
NICKEL	*	14.5	NA	20.9	15.5	20.3	9.3 J	ND	13.1
POTASSIUM	*	1790 J	NA	3110	2320	2710	1740	ND	2520 J
SELENIUM	390	ND	NA	ND	ND	ND	ND	ND	ND
SILVER	390	ND	NA	0.3	0.33	ND	ND	ND	ND
SODIUM	*	403	NA	245	196	337	326	ND	244
THALLIUM	520	ND	NA	ND	ND	ND	ND	ND	ND
VANADIUM	550	16.9 J	NA	23.5	23.2	24.7	12.9	ND	18.9
ZINC	23000	30.2 J	NA	86	63.5	88.1	27.5 J	ND	31.6 J
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	ND	ND	ND	ND	NA	ND
AROCLOR-1248	220	ND	ND	ND	ND	ND	ND	NA	ND
AROCLOR-1254	220	ND	ND	ND	ND	ND	ND	NA	57.4
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND	NA	ND
Pesticides (ug/kg)									
4,4'-DDT	1700	NA	NA	NA	NA	NA	NA	ND	NA
DELTA BHC	*	NA	NA	NA	NA	NA	NA	ND	NA
ENDOSULFAN I	370000	NA	NA	NA	NA	NA	NA	ND	NA
ENDOSULFAN II	370000	NA	NA	NA	NA	NA	NA	ND	NA
SVOCs (ug/kg)									
2,4,5-TRICHLOROPHENOL	6100000	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	44000	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	180000	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	1200000	ND	ND	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	120000	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS49(0-0.5)	MY05SS100(0-0.5)	MY05SS51(0-0.5)	MY05SS94(0-0.5)	MY05SS52(0-0.5)	MY05SS53(0-0.5)	MY05SS54(0-0.5)	MY05SS58(0-0.5)
Duplicates			**Dup. of MY05SS49(0-0.5)**		**Dup. of MY05SS51(0-0.5)**				
Date Collected		**4/17/02 & 5/23/02**	**5/23/02**	**4/22/2002**	**4/22/2002**	**4/22/2002**	**4/23/2002**	**4/30/2002**	**5/14/2002**
Sample Delivery Group		**MY102**	**MY102**	**MY101**	**MY101**	**MY101**	**MY105**	**MY105**	**MYR101**
2-CHLOROPHENOL	63000	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	850 R	850 R	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	3700000	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	2200000	ND	ND	ND	ND	ND	1200 J	ND	ND
BENZO(A)ANTHRACENE	620	250 J	ND	ND	ND	ND	**2600**	ND	ND
BENZO(A)PYRENE	62	**460 J**	**390**	ND	ND	ND	**2200**	ND	ND
BENZO(B)FLUORANTHENE	620	490 J	410	ND	ND	ND	**2900**	ND	ND
BENZO(K)FLUORANTHENE	6200	380 J	350	ND	ND	ND	1200 J	ND	ND
BENZO[G,H,I]PERYLENE	*	340 J	300 J	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND	ND	2300	ND	ND
BUTYL BENZYL PHTHALATE	12000000	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	24000	ND	ND	ND	ND	ND	1800 J	ND	ND
CHRYSENE	62000	240 J	ND	ND	ND	ND	2500	ND	ND
DIBENZO(A,H)ANTHRACENE	62	**360 J**	**350**	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	290000	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	2300000	570 J	330 J	ND	ND	ND	6600	ND	ND
FLUORENE	2600000	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	400 J	360	ND	ND	ND	**1200 J**	ND	ND
NAPHTHALENE	56000	ND	ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	3000	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	390 J	220 J	ND	ND	ND	4500	ND	ND
PHENOL	37000000	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE	2300000	440 J	300 J	ND	ND	ND	4800	ND	ND
VOCs (ug/kg)									
2-BUTANONE	7300000	14 R	10 R	12 R	10 R	10 R	24 R	ND	ND
4-METHYL-2-PENTANONE	790000	ND	ND	12 R	10 R	10 R	24 R	ND	ND
ACETONE	1600000	11 R	10 R	ND	ND	31 J	ND	ND	ND
M-,P-XYLENE	210000	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	7 J	5 J	6 J	28 J	ND	ND
Other Compounds									
TOTAL SOLIDS (%)	*	96	96	86	85	83	90	92	89.3

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SS99(0-0.5) Dup. of MY05SS58(0-0.5) 5/14/2002 MYR101	MY05SS59(0-0.5) 5/15/2002 MYR101	MY05SS79(0-0.5) 4/24/02 & 7/11/2002 MY102 & MY114	MY05SS96(0-0.5) Dup. of MY05SS79(0-0.5) 4/24/2002 MY102	MY05SS80(0-0.5) 4/23/02 & 7/11/2002 MY105 & MY114	MY05SS95(0-0.5) Dup. of MY05SS80(0-0.5) 4/23/2002 MY105	MY05TP105(3-3.5) 5/16/2002 MY109	MY05TP105(4-4.5) 5/16/2002 MY109
EPH/DRO (mg/kg)									
C11-C22 AROMATICS	100	ND	ND	24 J	31 J	**150 J**	**120**	ND	ND
C19-C36 ALIPHATICS	100	ND	ND	ND	ND	**32**	**ND**	ND	ND
C9-C18 ALIPHATICS	100	ND	ND	ND	7.3	**17 J**	**6.9 J**	ND	ND
DIESEL RANGE ORGANICS	50	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)									
ALUMINUM	76000	8050	9000	9200	9400	9430	7770	NA	NA
ANTIMONY	31	ND	ND	ND	0.5 J	ND	ND	NA	NA
ARSENIC	22	6.2	5.7	9	8.6	6.3	5.6	NA	NA
BARIUM	5400	33.7	52.7	53.2	49.4	53.1	42.5	NA	NA
BERYLLIUM	150	0.31	0.51	0.4	0.43	0.76	0.77	NA	NA
BORON	5500	5.2	7.1	0.43	0.3 J	4.3	5.1	NA	NA
CADMIUM	37	ND	ND	0.29	0.31	0.47 J	0.26 J	NA	NA
CALCIUM	*	3100 J	2060 J	6080	4830	9100	8880	NA	NA
CHROMIUM	210	18.3	19.6	25.2 J	29.2 J	29.4 R	24.7 R	NA	NA
COBALT	4700	4.8	5.8	6	6.5	5.6	5.4	NA	NA
COPPER	2900	757 J	49.8 J	187 J	170 J	426 J	436 J	NA	NA
IRON	23000	12700	13800	20400	22000	**23000**	21500	NA	NA
LEAD	400	5	7.2	15.2	19.1	12.4	13.2	NA	NA
MAGNESIUM	*	3610 J	4700 J	5030	5280	4130	3760	NA	NA
MANGANESE	1800	216	358	331	367	309	280	NA	NA
MERCURY	6.1	ND	ND	ND	ND	0.1 J	0.09 J	NA	NA
MOLYBDENUM	390	1.7	1 J	ND	ND	ND	ND	NA	NA
NICKEL	*	12.4	15.9	18.8	21.1	22.8 J	21.1 J	NA	NA
POTASSIUM	*	1960 J	2550 J	2320 J	2240 J	2030	1630	NA	NA
SELENIUM	390	ND	ND	ND	ND	ND	ND	NA	NA
SILVER	390	ND	ND	4.6	1.3	5.4 J	9.4 J	NA	NA
SODIUM	*	325	519	268	250	370	281	NA	NA
THALLIUM	520	ND	ND	ND	ND	ND	ND	NA	NA
VANADIUM	550	18.6	21.6	19.7 J	22.6 J	21.3	18.2	NA	NA
ZINC	23000	36.4 J	66.2 J	83.6 J	88 J	139 J	150 J	NA	NA
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1248	220	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1254	220	65	18.9	ND	ND	77	90	ND	ND
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)									
4,4'-DDT	1700	NA	NA	NA	NA	NA	NA	NA	NA
DELTA BHC	*	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	370000	NA	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	370000	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)									
2,4,5-TRICHLOROPHENOL	6100000	ND	ND	ND	ND	ND	ND	NA	NA
2,4,6-TRICHLOROPHENOL	44000	ND	ND	ND	ND	ND	ND	NA	NA
2,4-DICHLOROPHENOL	180000	ND	ND	ND	ND	ND	ND	NA	NA
2,4-DIMETHYLPHENOL	1200000	ND	ND	ND	ND	ND	ND	NA	NA
2,4-DINITROPHENOL	120000	ND	ND	ND	ND	ND	ND	NA	NA

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS99(0-0.5)	MY05SS59(0-0.5)	MY05SS79(0-0.5)	MY05SS96(0-0.5)	MY05SS80(0-0.5)	MY05SS95(0-0.5)	MY05TP105(3-3.5)	MY05TP105(4-4.5)
Duplicates		**Dup. of MY05SS58(0-0.5)**			**Dup. of MY05SS79(0-0.5)**		**Dup. of MY05SS80(0-0.5)**		
Date Collected		**5/14/2002**	**5/15/2002**	**4/24/02 & 7/11/2002**	**4/24/2002**	**4/23/02 & 7/11/2002**	**4/23/2002**	**5/16/2002**	**5/16/2002**
Sample Delivery Group		**MYR101**	**MYR101**	**MY102 & MY114**	**MY102**	**MY105 & MY114**	**MY105**	**MY109**	**MY109**
2-CHLOROPHENOL	63000	ND	ND	ND	ND	ND	ND	NA	NA
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	860	1400	NA	NA
2-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	NA	NA
2-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND	NA	NA
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND	NA	NA
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	NA	NA
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	NA	NA
4-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	NA	NA
4-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND	NA	NA
ACENAPHTHENE	3700000	ND	ND	ND	ND	2600	4200	NA	NA
ANTHRACENE	2200000	ND	ND	360 J	330 J	9000	8800	NA	NA
BENZO(A)ANTHRACENE	620	ND	ND	**950**	**920**	**20000**	**18000**	NA	NA
BENZO(A)PYRENE	62	ND	ND	**810**	**790**	**17000**	**15000**	NA	NA
BENZO(B)FLUORANTHENE	620	ND	ND	**1100**	**1000**	**23000**	**19000**	NA	NA
BENZO(K)FLUORANTHENE	6200	ND	ND	400	400	**9500**	**7300 J**	NA	NA
BENZO[G,H,I]PERYLENE	*	ND	ND	460	460	8700	8000	NA	NA
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND	ND	ND	NA	NA
BUTYL BENZYL PHTHALATE	12000000	ND	ND	ND	ND	520 J	620 J	NA	NA
CARBAZOLE	24000	ND	ND	390	380	6400	9800 J	NA	NA
CHRYSENE	62000	ND	ND	970	930	20000	18000	NA	NA
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	**1400**	**2100**	NA	NA
DIBENZOFURAN	290000	ND	ND	ND	ND	1900	3000	NA	NA
FLUORANTHENE	2300000	ND	ND	2600	2500	52000	46000	NA	NA
FLUORENE	2600000	ND	ND	190 J	ND	4500	4600	NA	NA
INDENO(1,2,3-CD)PYRENE	620	ND	ND	520	520	**10000**	**9400**	NA	NA
NAPHTHALENE	56000	ND	ND	ND	ND	ND	550 J	NA	NA
PENTACHLOROPHENOL	3000	ND	ND	ND	ND	ND	ND	NA	NA
PHENANTHRENE	*	ND	ND	1700	1600	36000	33000	NA	NA
PHENOL	37000000	ND	ND	ND	ND	ND	ND	NA	NA
PYRENE	2300000	ND	ND	1800	1800	40000	38000	NA	NA
VOCs (ug/kg)									
2-BUTANONE	7300000	ND	ND	18 R	18 R	16 R	24 R	NA	NA
4-METHYL-2-PENTANONE	790000	ND	ND	ND	ND	16 R	24 R	NA	NA
ACETONE	1600000	ND	ND	ND	ND	24 J	28 J	NA	NA
M-,P-XYLENE	210000	ND	ND	ND	ND	ND	ND	NA	NA
METHYLENE CHLORIDE	8900	ND	ND	10 J	10 J	ND	ND	NA	NA
Other Compounds									
TOTAL SOLIDS (%)	*	86.4	89.2	97	90	96	88	89	91

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MYLOSS01(0-0.5)	MYLOSS06(0-0.5)	MYLOSS02(0-0.5)	MYLOSS03(0-0.5)	MYLOSS04(0-0.5)	MYLOSS05(0-0.5)
Duplicates			Dup. of MYLOSS01(0-0.5)				
Date Collected		5/1/2002	5/1/2002	5/1/2002	5/1/2002	5/1/2002	5/1/2002
Sample Delivery Group		MY108	MY108	MY108	MY108	MY108	MY108
EPH/DRO (mg/kg)							
C11-C22 AROMATICS	100	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS	100	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS	100	NA	NA	NA	NA	NA	NA
DIESEL RANGE ORGANICS	50	33	48	**64**	6	5.5	**110**
Metals (mg/kg)							
ALUMINUM	76000	NA	NA	NA	NA	NA	NA
ANTIMONY	31	NA	NA	NA	NA	NA	NA
ARSENIC	22	NA	NA	NA	NA	NA	NA
BARIUM	5400	NA	NA	NA	NA	NA	NA
BERYLLIUM	150	NA	NA	NA	NA	NA	NA
BORON	5500	NA	NA	NA	NA	NA	NA
CADMIUM	37	NA	NA	NA	NA	NA	NA
CALCIUM	*	NA	NA	NA	NA	NA	NA
CHROMIUM	210	NA	NA	NA	NA	NA	NA
COBALT	4700	NA	NA	NA	NA	NA	NA
COPPER	2900	NA	NA	NA	NA	NA	NA
IRON	23000	NA	NA	NA	NA	NA	NA
LEAD	400	NA	NA	NA	NA	NA	NA
MAGNESIUM	*	NA	NA	NA	NA	NA	NA
MANGANESE	1800	NA	NA	NA	NA	NA	NA
MERCURY	6.1	NA	NA	NA	NA	NA	NA
MOLYBDENUM	390	NA	NA	NA	NA	NA	NA
NICKEL	*	NA	NA	NA	NA	NA	NA
POTASSIUM	*	NA	NA	NA	NA	NA	NA
SELENIUM	390	NA	NA	NA	NA	NA	NA
SILVER	390	NA	NA	NA	NA	NA	NA
SODIUM	*	NA	NA	NA	NA	NA	NA
THALLIUM	520	NA	NA	NA	NA	NA	NA
VANADIUM	550	NA	NA	NA	NA	NA	NA
ZINC	23000	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)							
AROCLOR-1242	220	ND	ND	ND	ND	ND	ND
AROCLOR-1248	220	ND	ND	ND	ND	ND	ND
AROCLOR-1254	220	ND	ND	ND	ND	ND	43
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)							
4,4'-DDT	1700	NA	NA	NA	NA	NA	NA
DELTA BHC	*	NA	NA	NA	NA	NA	NA
ENDOSULFAN I	370000	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	370000	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)							
2,4,5-TRICHLOROPHENOL	6100000	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	44000	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	180000	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	1200000	ND	ND	ND	ND	ND	ND
2,4-DINITROPHENOL	120000	ND	ND	ND	ND	ND	ND

Table 4-11
Study Area 5 - Industrial Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MYLOSS01(0-0.5)	MYLOSS06(0-0.5)	MYLOSS02(0-0.5)	MYLOSS03(0-0.5)	MYLOSS04(0-0.5)	MYLOSS05(0-0.5)
Duplicates			**Dup. of MYLOSS01(0-0.5)**				
Date Collected		**5/1/2002**	**5/1/2002**	**5/1/2002**	**5/1/2002**	**5/1/2002**	**5/1/2002**
Sample Delivery Group		**MY108**	**MY108**	**MY108**	**MY108**	**MY108**	**MY108**
2-CHLOROPHENOL	63000	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND
2-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND
4-NITROPHENOL	490000	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	3700000	ND	ND	ND	ND	ND	ND
ANTHRACENE	2200000	190 J	ND	240 J	ND	ND	ND
BENZO(A)ANTHRACENE	620	420	190 J	540	ND	ND	330 J
BENZO(A)PYRENE	62	**320 J**	ND	**360**	ND	ND	**260 J**
BENZO(B)FLUORANTHENE	620	410	200 J	500	ND	ND	340 J
BENZO(K)FLUORANTHENE	6200	ND	ND	200 J	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND	ND	590
BUTYL BENZYL PHTHALATE	12000000	ND	ND	ND	ND	ND	ND
CARBAZOLE	24000	300 J	260 J	300 J	230 J	240 J	270 J
CHRYSENE	62000	400	190 J	480	ND	ND	320 J
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	290000	ND	ND	ND	ND	ND	ND
FLUORANTHENE	2300000	970	460	1100	ND	ND	820
FLUORENE	2600000	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	200 J	ND	ND	ND	ND	ND
NAPHTHALENE	56000	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	3000	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	790	340 J	1100	ND	ND	620 J
PHENOL	37000000	ND	ND	ND	ND	ND	ND
PYRENE	2300000	820	400	1000	ND	ND	650
VOCs (ug/kg)							
2-BUTANONE	7300000	12 R	11 R	12 R	16 R	17 R	13 R
4-METHYL-2-PENTANONE	790000	8 J	11 R	12 R	16 R	17 R	ND
ACETONE	1600000	18 J	9 J	ND	ND	ND	62 J
M-,P-XYLENE	210000	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	ND	ND	ND	ND
Other Compounds							
TOTAL SOLIDS (%)	*	89	90	93	95	93	92

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-12
Study Area 5 - Industrial Area Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW01	MY05GW01-1C	MY05GW153-1C	MY05GW02	MY05GW02-1C	MY05GW04	MY05GW04-1C
Well Number		MW-306	MW-306	MW-306	MW-307	MW-307	B-201	B-201
Duplicates				MY05GW01-1C				
Date Collected		6/11/2002	10/7/2002	10/7/2002	6/13/2002	10/7/2002	6/13/2002	10/7/2002
Sample Delivery Group		MYR102	MY123	MY123	MYR102	MY123	MYR102	MY123
Anions (mg/l)**								
ALKALINITY AS CACO3	*	73.7	NA	NA	115	NA	63.9	NA
BICARBONATE AS CACO3	*	73.7	NA	NA	112	NA	63.9	NA
BROMIDE	*	ND	NA	NA	ND	NA	1.84	NA
CARBONATE AS CACO3	*	ND	NA	NA	3.40	NA	ND	NA
CHLORIDE	*	80.9	NA	NA	70.8	NA	639	NA
NITRATE AS N [EPA 300A]	10	1.21	NA	NA	0.101	NA	ND	NA
SULFATE	*	106	NA	NA	72.5	NA	153	NA
EPH/DRO (ug/l)								
DIESEL RANGE ORGANICS (ug/l)	50	**149 J**	ND	ND	**612 J**	**580**	**156 J**	ND
EPH (ug/l)	50	NA	NA	NA	NA	NA	NA	NA
Metals (ug/l)								
ALUMINUM	1430	69.9 J	ND	ND	331 J	ND	86.9 J	ND
ARSENIC	10	ND	ND	ND	ND	3.1 J	ND	ND
BARIUM	2000	36.9	33.9	37.3	60.4	100	184	191
BERYLLIUM	73	ND	0.46 J	ND	ND	ND	ND	ND
BORON	630	70.5	66.4	71.9	35.9 J	53.5	156	147
CADMIUM	3.5	ND	0.09 J	0.08 J	ND	0.42	0.24 J	1.7
CALCIUM	*	57200	57900	60700	48800	62200	100000	106000
CHROMIUM	40	ND	ND	ND	ND	ND	ND	ND
COBALT	2200	9.2 J	7.4 J	ND	ND	ND	ND	8.2 J
COPPER	1300	ND	ND	ND	ND	ND	ND	ND
IRON	11000	139 J	58.1	95.5	63.3 J	166	288 J	3770
LEAD	10	ND	ND	ND	ND	ND	ND	ND
MAGNESIUM	*	16800	18900	19600	5570	8090	44500	46500
MANGANESE	500	80.6 J	127	134	**880 J**	**1520**	**2740 J**	**3340**
MERCURY	2	ND	ND	0.07 J	ND	0.04 J	ND	0.08 J
MOLYBDENUM	35	ND	ND	ND	12.7	12.7	ND	ND
NICKEL	140	5.3 J	ND	ND	6.2 J	21.3 J	10.9 J	ND
POTASSIUM	*	8120	8910	8460	13500	17200	17200	17800
SELENIUM	35	ND	ND	ND	ND	ND	4.6	ND
SILVER	35	ND	ND	ND	ND	ND	ND	ND
SODIUM	20000	**35800**	**37500**	**36500**	**50700**	**66800**	**305000**	**324000**
THALLIUM	2.4	ND	ND	0.69	ND	ND	ND	ND
ZINC	2000	34.7 J	42	47.3	6 J	4.9	21 J	16.5
PCB (ug/l)								
		ND	NA	NA	ND	NA	ND	NA
Pesticides (ug/kg)								
		ND	NA	NA	ND	NA	ND	NA
SVOCs (ug/l)								
2,4,5-TRICHLOROPHENOL	*	ND	NA	NA	ND	NA	5 R	NA
2,4,6-TRICHLOROPHENOL	32	ND	NA	NA	ND	NA	5 R	NA
2,4-DICHLOROPHENOL	21	ND	NA	NA	ND	NA	5 R	NA
2,4-DIMETHYLPHENOL	730	ND	NA	NA	ND	NA	5 R	NA
2,4-DINITROPHENOL	14	ND	NA	NA	ND	NA	5 R	NA
2-CHLOROPHENOL	35	ND	NA	NA	ND	NA	5 R	NA
2-METHYLPHENOL	1800	ND	NA	NA	ND	NA	5 R	NA
2-NITROPHENOL	60	ND	NA	NA	ND	NA	5 R	NA
3-NITROANILINE	*	ND	NA	NA	ND	NA	ND	NA
4,6-DINITRO-2-METHYLPHENOL	*	ND	NA	NA	ND	NA	5 R	NA
4-CHLORO-3-METHYLPHENOL	*	ND	NA	NA	ND	NA	5 R	NA
4-METHYLPHENOL	3.5	ND	NA	NA	ND	NA	**5 R**	NA
4-NITROPHENOL	60	ND	NA	NA	ND	NA	5 R	NA
PENTACHLOROPHENOL	3	ND	NA	NA	ND	NA	**5 R**	NA
PHENOL	4000	ND	NA	NA	ND	NA	5 R	NA
VOCs (ug/l)								
ACETONE	700	ND	5 R	5 R	ND	NA	ND	NA
CHLOROFORM	57	ND	ND	ND	ND	NA	ND	NA
Other Compounds								
NITRATE (mg/l) [EPA 353.2]	10	NA	NA	NA	NA	NA	NA	NA

Notes:
PAL = Project Action Limit
* PAL Not Available
** Data results are not validated
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-12
Study Area 5 - Industrial Area Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW10
Well Number		MW-308
Duplicates		
Date Collected		12/12/2001
Sample Delivery Group		MY023
Anions (mg/l)**		
ALKALINITY AS CACO3	*	NA
BICARBONATE AS CACO3	*	NA
BROMIDE	*	NA
CARBONATE AS CACO3	*	NA
CHLORIDE	*	NA
NITRATE AS N [EPA 300A]	10	NA
SULFATE	*	NA
EPH/DRO (ug/l)		
DIESEL RANGE ORGANICS (ug/l)	50	NA
EPH (ug/l)	50	ND
Metals (ug/l)		
ALUMINUM	1430	ND
ARSENIC	10	ND
BARIUM	2000	40.2
BERYLLIUM	73	ND
BORON	630	25.8
CADMIUM	3.5	ND
CALCIUM	*	38000
CHROMIUM	40	ND
COBALT	2200	ND
COPPER	1300	ND
IRON	11000	ND
LEAD	10	ND
MAGNESIUM	*	9420
MANGANESE	500	**1120**
MERCURY	2	ND
MOLYBDENUM	35	**56.4**
NICKEL	140	19
POTASSIUM	*	5630
SELENIUM	35	ND
SILVER	35	ND
SODIUM	20000	11600
THALLIUM	2.4	ND
ZINC	2000	9
PCB (ug/l)		
		ND
Pesticides (ug/kg)		
		ND
SVOCs (ug/l)		
2,4,5-TRICHLOROPHENOL	*	ND
2,4,6-TRICHLOROPHENOL	32	ND
2,4-DICHLOROPHENOL	21	ND
2,4-DIMETHYLPHENOL	730	ND
2,4-DINITROPHENOL	14	ND
2-CHLOROPHENOL	35	ND
2-METHYLPHENOL	1800	ND
2-NITROPHENOL	60	ND
3-NITROANILINE	*	ND
4,6-DINITRO-2-METHYLPHENOL	*	ND
4-CHLORO-3-METHYLPHENOL	*	ND
4-METHYLPHENOL	3.5	ND
4-NITROPHENOL	60	ND
PENTACHLOROPHENOL	3	ND
PHENOL	4000	ND
VOCs (ug/l)		
ACETONE	700	ND
CHLOROFORM	57	2
Other Compounds		
NITRATE (mg/l) [EPA 353.2]	10	0.1

Notes:
PAL = Project Action Limit
* PAL Not Available
** Data results are not validated
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-12
Study Area 5 - Industrial Area Groundwater Analytical Results
Detected Compounds

Analyte Well Number Duplicates Date Collected Sample Delivery Group	PAL	MY05GW30 MW-308 MY05GW10 12/12/2001 MY023	MY05GW10-1B MW-308 6/11/2002 MYR102	MY05GW104 MW-403 6/10/2002 MYR102	MY05GW104-1C MW-403 10/7/2002 MY123	MY05GW24 MW-317 12/5/2001 MY021	MY05GW25 MW-318 6/13/2002 MY111	MY05GW25-1C MW-318 10/7/2002 MY123
Anions (mg/l)*								
ALKALINITY AS CACO3	*	NA	88.1	50.1	NA	NA	NA	NA
BICARBONATE AS CACO3	*	NA	88.1	50.1	NA	NA	NA	NA
BROMIDE	*	NA	ND	ND	NA	NA	NA	NA
CARBONATE AS CACO3	*	NA	ND	ND	NA	NA	NA	NA
CHLORIDE	*	NA	34.6	97.7	NA	NA	NA	NA
NITRATE AS N [EPA 300A]	10	NA	0.215	2.82	NA	NA	NA	NA
SULFATE	*	NA	58.9	134	NA	NA	NA	NA
EPH/DRO (ug/l)								
DIESEL RANGE ORGANICS (ug/l)	50	NA	**75 J**	**344 J**	**350**	NA	**440**	**930**
EPH (ug/l)	50	ND	NA	NA	NA	**200**	NA	NA
Metals (ug/l)								
ALUMINUM	1430	ND	ND	64.3 J	ND	107	281	ND
ARSENIC	10	ND	ND	ND	ND	1.2 J	ND	ND
BARIUM	2000	40.9	36.7	65.4	36.5	78.2	85	84.9
BERYLLIUM	73	ND	ND	ND	ND	ND	ND	ND
BORON	630	25.7	ND	57.4	64.6	14.1	20.2	42.9
CADMIUM	3.5	ND	ND	0.5	0.06 J	ND	ND	0.06 J
CALCIUM	*	38400	42600	101000	52100	30300	31900	39400
CHROMIUM	40	ND	ND	ND	ND	1.8	ND	ND
COBALT	2200	ND	ND	ND	ND	ND	ND	ND
COPPER	1300	ND	ND	ND	ND	3.5	ND	ND
IRON	11000	ND	148 J	60.3 J	ND	745	533	1710
LEAD	10	ND	ND	ND	ND	2.9	ND	ND
MAGNESIUM	*	9340	12100	36600	19200	13600	11600	14800
MANGANESE	500	**1140**	**783 J**	328 J	168	**672**	**509**	**640**
MERCURY	2	ND	ND	ND	0.05 J	ND	ND	0.05 J
MOLYBDENUM	35	**59.8**	**54**	ND	ND	19.4	ND	ND
NICKEL	140	12.2	ND	42.2	11.5 J	15.2	15.8 J	ND
POTASSIUM	*	5420	5010	20400	17000	4640	5630	8620
SELENIUM	35	ND	ND	3.2	ND	3.2 J	ND	ND
SILVER	35	ND	ND	ND	ND	0.06 J	ND	ND
SODIUM	20000	11400	15400	**87300**	**65700**	16700	**24600**	**37300**
THALLIUM	2.4	ND	ND	ND	ND	0.56	0.32	ND
ZINC	2000	6.6	ND	28.4 J	15.6	ND	13	11.6
PCB (ug/l)								
		ND	ND	ND	NA	ND	ND	NA
Pesticides (ug/kg)								
		ND	ND	ND	NA	ND	ND	NA
SVOCs (ug/l)								
2,4,5-TRICHLOROPHENOL	*	ND	ND	ND	NA	ND	ND	NA
2,4,6-TRICHLOROPHENOL	32	ND	ND	ND	NA	ND	ND	NA
2,4-DICHLOROPHENOL	21	ND	ND	ND	NA	ND	ND	NA
2,4-DIMETHYLPHENOL	730	ND	ND	ND	NA	ND	ND	NA
2,4-DINITROPHENOL	14	ND	ND	ND	NA	ND	ND	NA
2-CHLOROPHENOL	35	ND	ND	ND	NA	ND	ND	NA
2-METHYLPHENOL	1800	ND	ND	ND	NA	ND	ND	NA
2-NITROPHENOL	60	ND	ND	ND	NA	ND	ND	NA
3-NITROANILINE	*	ND	ND	ND	NA	ND	25 R	NA
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	NA	ND	ND	NA
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	NA	ND	ND	NA
4-METHYLPHENOL	3.5	ND	ND	ND	NA	ND	ND	NA
4-NITROPHENOL	60	ND	ND	ND	NA	ND	ND	NA
PENTACHLOROPHENOL	3	ND	ND	ND	NA	ND	ND	NA
PHENOL	4000	ND	ND	ND	NA	ND	ND	NA
VOCs (ug/l)								
ACETONE	700	ND	ND	ND	NA	ND	ND	NA
CHLOROFORM	57	2	ND	ND	NA	18	9	NA
Other Compounds								
NITRATE (mg/l) [EPA 353.2]	10	0.2	NA	NA	NA	0.5	0.24	NA

Notes:
PAL = Project Action Limit
* PAL Not Available
** Data results are not validated
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-13
Study Area 5 - Forebay Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05HA01	MY05HA02	MY05HA03	MY05HA04	MY05HA05	MY05HA06	MY05HA10
Duplicates								Dup of MY05HA06
Date Collected		10/23/2001	10/23/2001	10/23/2001	10/4/2001	10/4/2001	10/4/2001	10/4/2001
Sample Delivery Group		MYR002	MYR002	MYR002	MYR001	MYR001	MYR001	MYR001
EPH (mg/kg)								
UNADJUSTED C11-C22	100	ND	27.9	ND	ND	ND	ND	ND
UNADJUSTED C19-C36	100	ND	7.5	ND	ND	ND	ND	ND
Metals (mg/kg)								
ALUMINUM	76000	16100	13600	14300	12900	12500	11100	15800
ANTIMONY	31	1.2 R	1.3 R	1.3 R	1.4 R	1.3 R	1.3 R	1.3 R
ARSENIC	22	15.7	9.8	7.8	12.8	12.1	12.3	14.4
BARIUM	5400	60.4	75.7	55	60.8 J	55.8 J	45.4 J	69.9 J
BERYLLIUM	150	0.44 J	ND	ND	ND	ND	ND	ND
BORON	5500	9.3	6.1	7.3	6.1	11.8	9.6	11.5
CALCIUM	*	2140 J	1970 J	1630 J	1970 J	2590 J	2610 J	2730 J
CHROMIUM	210	41.2	41.7	33.5	32.6 J	29.9 J	27.9 J	43.7 J
COBALT	4700	10.2	8.2	8.6	7.9	7.5	7.7	10.5
COPPER	2900	40.5	20.2	28.7	17.8	32.6	23.7	29.9
IRON	23000	**24600**	21400	**24200**	21000	22800	21700	**28600**
LEAD	400	14.4	11.3	12	10.1	16.8	16.9	16.1
MAGNESIUM	*	7900	8190	7300	7630	6670	6390	9000
MANGANESE	1800	320	330	309	321 J	355 J	458 J	633 J
MERCURY	6.1	0.06 J	ND	0.05 J	ND	0.07 J	ND	ND
MOLYBDENUM	390	1.2 J	ND	ND	ND	ND	1.2 J	1.5 J
NICKEL	*	28.2	26.4	22.3	24	20.4	20.8	28.2
POTASSIUM	*	6260 J	4830 J	2860 J	5310	3300	3620	5580
SODIUM	*	1620 J	2910 J	212 J	1950	3250	2700	3510
VANADIUM	550	41.2	38.5	39.7	34.4	32.9	32.7	46.2
ZINC	23000	66.5 J	88.8 J	68.9 J	66.9	80.4	80.1	106
PCBs (ug/kg)								
		ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)								
		ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)								
		ND	ND	ND	ND	ND	ND	ND
VOCs (ug/kg)								
2-BUTANONE	7300000	ND	ND	ND	ND	ND	5.6 J	ND
Other Compounds								
Total Solids (%)	*	69.9	91.1	77.6	83.9	77.3	77.2	66.6

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value

R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB101(0-0.5)	MY05SB101(10-11.3)	MY05SB102(8-10)	MY05SB103(0.3-6)	MY05SB103(4-6)	MY05SB103(6-8)	MY05SB104(0.3-6)
Duplicates								
Date Collected		4/25/2002	4/25/2002	4/30/2002	5/2/2002	5/2/2002	5/2/2002	5/7/2002
Sample Delivery Group		MY106	MY106	MY105	MY106	MY106	MY106	MY106
EPH (mg/kg)								
C11-C22 AROMATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)								
ALUMINUM	76,000	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	31	NA	NA	NA	NA	NA	NA	NA
ARSENIC	22	NA	NA	NA	NA	NA	NA	NA
BARIUM	5,400	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	150	NA	NA	NA	NA	NA	NA	NA
BORON	5,500	NA	NA	NA	NA	NA	NA	NA
CADMIUM	37	NA	NA	NA	NA	NA	NA	NA
CALCIUM	*	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	210	NA	NA	NA	NA	NA	NA	NA
COBALT	4,700	NA	NA	NA	NA	NA	NA	NA
COPPER	2,900	NA	NA	NA	NA	NA	NA	NA
IRON	23,000	NA	NA	NA	NA	NA	NA	NA
LEAD	400	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	*	NA	NA	NA	NA	NA	NA	NA
MANGANESE	1,800	NA	NA	NA	NA	NA	NA	NA
MERCURY	6	NA	NA	NA	NA	NA	NA	NA
MOLYBDENUM	390	NA	NA	NA	NA	NA	NA	NA
NICKEL	*	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	*	NA	NA	NA	NA	NA	NA	NA
SILVER	390	NA	NA	NA	NA	NA	NA	NA
SODIUM	*	NA	NA	NA	NA	NA	NA	NA
THALLIUM	520	NA	NA	NA	NA	NA	NA	NA
VANADIUM	550	NA	NA	NA	NA	NA	NA	NA
ZINC	23,000	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)								
AROCLOR-1254	220	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1260	220	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)								
DIELDRIN	30	NA	NA	NA	NA	NA	NA	NA
ENDRIN	18,000	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)								
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	ND	NA	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	NA	ND
ANTHRACENE	2,200,000	ND	ND	ND	ND	ND	NA	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND	ND	ND	NA	ND
BENZO(A)PYRENE	62	ND	ND	ND	ND	ND	NA	ND
BENZO(B)FLUORANTHENE	620	ND	ND	ND	ND	ND	NA	ND

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB101(0-0.5)	MY05SB101(10-11.3)	MY05SB102(8-10)	MY05SB103(0.3-6)	MY05SB103(4-6)	MY05SB103(6-8)	MY05SB104(0.3-6)
Duplicates								
Date Collected		4/25/2002	4/25/2002	4/30/2002	5/2/2002	5/2/2002	5/2/2002	5/7/2002
Sample Delivery Group		MY106	MY106	MY105	MY106	MY106	MY106	MY106
BENZO(K)FLUORANTHENE	6,200	ND	ND	ND	ND	ND	NA	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	ND	NA	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	ND	ND	ND	ND	ND	NA	ND
CARBAZOLE	24,000	ND	ND	ND	ND	ND	NA	ND
CHRYSENE	62,000	ND	ND	ND	ND	ND	NA	ND
DI-N-BUTYL PHTHALATE	*	ND	ND	ND	ND	ND	NA	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	ND	NA	ND
FLUORANTHENE	2,300,000	ND	ND	ND	ND	ND	NA	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	ND	ND	NA	ND
NAPHTHALENE	56,000	ND	ND	ND	ND	ND	NA	ND
PHENANTHRENE	*	ND	ND	ND	ND	ND	NA	ND
PYRENE	2,300,000	ND	ND	ND	ND	ND	NA	ND
VOCs (ug/kg)								
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND	NA	ND	ND	NA
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	NA	ND	ND	NA
2-BUTANONE	7,300,000	12 R	11 R	48 J	NA	11 R	12 R	NA
2-HEXANONE	3,100,000	ND	ND	ND	NA	ND	ND	NA
4-METHYL-2-PENTANONE	790,000	ND	ND	170 J	NA	ND	ND	NA
ACETONE	1,600,000	ND	ND	120 J	NA	ND	ND	NA
BENZENE	650	ND	ND	ND	NA	ND	ND	NA
ETHYLBENZENE	230,000	ND	ND	280	NA	ND	ND	NA
M-,P-XYLENE	210,000	ND	ND	820 J	NA	ND	ND	NA
METHYLENE CHLORIDE	8,900	ND	ND	ND	NA	ND	ND	NA
O-XYLENE	210,000	ND	ND	340 J	NA	ND	ND	NA
TOLUENE	520,000	ND	ND	6	NA	ND	ND	NA
TRICHLOROETHENE	2,800	ND	ND	ND	NA	ND	ND	NA
Other Compounds								
TOTAL SOLIDS (%)	*	87	82	84	81	79	74	93

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB104(4-6)	MY05SB104(6-8)	MY05SB105(0-2.0)	MY05SB105(4-5.0)	MY05SB77(4-5.0)	MY05SB106(10.5-12.5)
Duplicates						Dup. of MY05SB105(4-5.0)	
Date Collected		5/7/2002	5/7/2002	4/29/2002	4/29/2002	4/29/2002	5/20/2002
Sample Delivery Group		MY106	MY106	MY106	MY106	MY106	MY109
EPH (mg/kg)							
C11-C22 AROMATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA
Metals (mg/kg)							
ALUMINUM	76,000	NA	NA	NA	NA	NA	NA
ANTIMONY	31	NA	NA	NA	NA	NA	NA
ARSENIC	22	NA	NA	NA	NA	NA	NA
BARIUM	5,400	NA	NA	NA	NA	NA	NA
BERYLLIUM	150	NA	NA	NA	NA	NA	NA
BORON	5,500	NA	NA	NA	NA	NA	NA
CADMIUM	37	NA	NA	NA	NA	NA	NA
CALCIUM	*	NA	NA	NA	NA	NA	NA
CHROMIUM	210	NA	NA	NA	NA	NA	NA
COBALT	4,700	NA	NA	NA	NA	NA	NA
COPPER	2,900	NA	NA	NA	NA	NA	NA
IRON	23,000	NA	NA	NA	NA	NA	NA
LEAD	400	NA	NA	NA	NA	NA	NA
MAGNESIUM	*	NA	NA	NA	NA	NA	NA
MANGANESE	1,800	NA	NA	NA	NA	NA	NA
MERCURY	6	NA	NA	NA	NA	NA	NA
MOLYBDENUM	390	NA	NA	NA	NA	NA	NA
NICKEL	*	NA	NA	NA	NA	NA	NA
POTASSIUM	*	NA	NA	NA	NA	NA	NA
SILVER	390	NA	NA	NA	NA	NA	NA
SODIUM	*	NA	NA	NA	NA	NA	NA
THALLIUM	520	NA	NA	NA	NA	NA	NA
VANADIUM	550	NA	NA	NA	NA	NA	NA
ZINC	23,000	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)							
AROCLOR-1254	220	NA	NA	NA	NA	NA	NA
AROCLOR-1260	220	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
DIELDRIN	30	NA	NA	NA	NA	NA	NA
ENDRIN	18,000	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)							
2-METHYLNAPHTHALENE	*	NA	ND	ND	ND	ND	ND
3-NITROANILINE	*	NA	ND	ND	ND	ND	1000 R
ANTHRACENE	2,200,000	NA	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	620	NA	ND	ND	ND	ND	ND
BENZO(A)PYRENE	62	NA	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	620	NA	ND	ND	ND	ND	ND

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05SB104(4-6) 5/7/2002 MY106	MY05SB104(6-8) 5/7/2002 MY106	MY05SB105(0-2.0) 4/29/2002 MY106	MY05SB105(4-5.0) 4/29/2002 MY106	MY05SB77(4-5.0) Dup. of MY05SB105(4-5.0) 4/29/2002 MY106	MY05SB106(10.5-12.5) 5/20/2002 MY109
BENZO(K)FLUORANTHENE	6,200	NA	ND	ND	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	NA	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	NA	ND	ND	ND	ND	ND
CARBAZOLE	24,000	NA	ND	ND	ND	ND	ND
CHRYSENE	62,000	NA	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE	*	NA	ND	510	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	NA	ND	ND	ND	ND	ND
FLUORANTHENE	2,300,000	NA	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	NA	ND	ND	ND	ND	ND
NAPHTHALENE	56,000	NA	ND	ND	ND	ND	ND
PHENANTHRENE	*	NA	ND	ND	ND	ND	ND
PYRENE	2,300,000	NA	ND	ND	ND	ND	ND
VOCs (ug/kg)							
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	ND	ND
2-BUTANONE	7,300,000	14 R	12 R	14 R	11 R	10 R	11 R
2-HEXANONE	3,100,000	ND	ND	ND	ND	ND	ND
4-METHYL-2-PENTANONE	790,000	ND	ND	ND	ND	10 R	ND
ACETONE	1,600,000	ND	ND	ND	ND	ND	11 R
BENZENE	650	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	230,000	ND	ND	ND	ND	ND	ND
M-,P-XYLENE	210,000	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	ND	ND
O-XYLENE	210,000	ND	ND	ND	ND	ND	ND
TOLUENE	520,000	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	2,800	ND	ND	ND	ND	ND	ND
Other Compounds							
TOTAL SOLIDS (%)	*	74	77	87	87	91	79

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05SB106(4.5-6.5) 5/20/2002 MY109	MY05SB36(4.5-6.5) 10/24/2001 MY013	MY05SB36(6.5-8.5) 10/24/2001 MY013	MY05SB37(2-4) 10/23/2001 MY011	MY05SB37(2-6) 10/23/2001 MY011	MY05SB37(6-7.5) 10/23/2001 MY011	MY05SB38(2-2.9) 10/23/2001 MY011
EPH (mg/kg)								
C11-C22 AROMATICS (mg/kg)	100	NA	ND	NA	NA	ND	NA	ND
C19-C36 ALIPHATICS (mg/kg)	100	NA	ND	NA	NA	ND	NA	13
C9-C18 ALIPHATICS (mg/kg)	100	NA	ND	NA	NA	ND	NA	ND
Metals (mg/kg)								
ALUMINUM	76,000	NA	NA	29800	NA	NA	12200	8640
ANTIMONY	31	NA	NA	0.14 J	NA	NA	0.01 R	0.01 R
ARSENIC	22	NA	NA	10.7	NA	NA	5.3	7.4
BARIUM	5,400	NA	NA	104	NA	NA	42.7	42.5
BERYLLIUM	150	NA	NA	0.81	NA	NA	0.51	0.32
BORON	5,500	NA	NA	5.5	NA	NA	ND	ND
CADMIUM	37	NA	NA	ND	NA	NA	0.05	0.13
CALCIUM	*	NA	NA	5740 J	NA	NA	4210	1920
CHROMIUM	210	NA	NA	61.2 J	NA	NA	29.1 J	21 J
COBALT	4,700	NA	NA	16.1	NA	NA	6.8	5.6
COPPER	2,900	NA	NA	26.6	NA	NA	27.1	13.5
IRON	23,000	NA	NA	**39100**	NA	NA	13600	12300
LEAD	400	NA	NA	13.8	NA	NA	5.4	9.4
MAGNESIUM	*	NA	NA	11300	NA	NA	4670	3930
MANGANESE	1,800	NA	NA	836	NA	NA	223	226
MERCURY	6	NA	NA	ND	NA	NA	ND	ND
MOLYBDENUM	390	NA	NA	ND	NA	NA	0.9	0.75
NICKEL	*	NA	NA	50.2	NA	NA	17.2	16.1
POTASSIUM	*	NA	NA	6860 J	NA	NA	2320	2090
SILVER	390	NA	NA	ND	NA	NA	0.05	0.05
SODIUM	*	NA	NA	352	NA	NA	295 J	149 J
THALLIUM	520	NA	NA	ND	NA	NA	ND	ND
VANADIUM	550	NA	NA	58.4	NA	NA	23.9	19
ZINC	23,000	NA	NA	85.5	NA	NA	45.2	46.2
PCBs (ug/kg)								
AROCLOR-1254	220	NA	NA	ND	NA	NA	ND	52
AROCLOR-1260	220	NA	NA	ND	NA	NA	ND	31 J
Pesticides (ug/kg)								
DIELDRIN	30	NA	NA	ND	NA	NA	ND	ND
ENDRIN	18,000	NA	NA	ND	NA	NA	ND	ND
SVOCs (ug/kg)								
2-METHYLNAPHTHALENE	*	ND	NA	ND	NA	NA	ND	ND
3-NITROANILINE	*	950 R	NA	ND	NA	NA	ND	ND
ANTHRACENE	2,200,000	ND	NA	ND	NA	NA	ND	ND
BENZO(A)ANTHRACENE	620	ND	NA	ND	NA	NA	ND	ND
BENZO(A)PYRENE	62	ND	NA	ND	NA	NA	ND	ND
BENZO(B)FLUORANTHENE	620	ND	NA	ND	NA	NA	ND	ND

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB106(4.5-6.5)	MY05SB36(4.5-6.5)	MY05SB36(6.5-8.5)	MY05SB37(2-4)	MY05SB37(2-6)	MY05SB37(6-7.5)	MY05SB38(2-2.9)
Duplicates								
Date Collected		5/20/2002	10/24/2001	10/24/2001	10/23/2001	10/23/2001	10/23/2001	10/23/2001
Sample Delivery Group		MY109	MY013	MY013	MY011	MY011	MY011	MY011
BENZO(K)FLUORANTHENE	6,200	ND	NA	ND	NA	NA	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	NA	ND	NA	NA	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	ND	NA	ND	NA	NA	ND	ND
CARBAZOLE	24,000	ND	NA	ND	NA	NA	ND	ND
CHRYSENE	62,000	ND	NA	ND	NA	NA	ND	ND
DI-N-BUTYL PHTHALATE	*	ND	NA	ND	NA	NA	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	NA	ND	NA	NA	ND	ND
FLUORANTHENE	2,300,000	ND	NA	ND	NA	NA	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	NA	ND	NA	NA	ND	ND
NAPHTHALENE	56,000	ND	NA	ND	NA	NA	ND	ND
PHENANTHRENE	*	ND	NA	ND	NA	NA	ND	ND
PYRENE	2,300,000	ND	NA	ND	NA	NA	ND	ND
VOCs (ug/kg)								
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND	6	NA	6	ND
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	NA	ND	ND
2-BUTANONE	7,300,000	10 R	ND	ND	ND	NA	ND	ND
2-HEXANONE	3,100,000	ND	ND	ND	ND	NA	ND	ND
4-METHYL-2-PENTANONE	790,000	ND	ND	ND	ND	NA	ND	ND
ACETONE	1,600,000	10 R	ND	ND	6 J	NA	10	6 J
BENZENE	650	ND	ND	ND	ND	NA	ND	ND
ETHYLBENZENE	230,000	ND	ND	ND	ND	NA	ND	ND
M-,P-XYLENE	210,000	ND	ND	ND	ND	NA	ND	ND
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	NA	ND	ND
O-XYLENE	210,000	ND	ND	ND	ND	NA	ND	ND
TOLUENE	520,000	ND	ND	ND	ND	NA	ND	ND
TRICHLOROETHENE	2,800	ND	ND	ND	ND	NA	ND	ND
Other Compounds								
TOTAL SOLIDS (%)	*	86	77	74	90	87	97	95

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SB39(2-4) 10/25/2001 MY015	MY05SB39(4-6) 10/25/2001 MY015	MY05SB40(2-3) 10/23/2001 MY011	MY05SB41(2-2.4) 10/22/2001 MY011	MY05SS10(0-0.5) 9/25/2001 MY004	MY05SS14(0-0.5) Dup. of MY05SS10(0-0.5) 9/25/2001 MY004	MY05SS101 4/10/2002 MY101	MY05SS102 4/10/2002 MY101
EPH (mg/kg)									
C11-C22 AROMATICS (mg/kg)	100	ND	NA	ND	ND	ND	22 J	NA	NA
C19-C36 ALIPHATICS (mg/kg)	100	ND	NA	ND	7.1	ND	ND	NA	NA
C9-C18 ALIPHATICS (mg/kg)	100	ND	NA	ND	ND	ND	ND	NA	NA
Metals (mg/kg)									
ALUMINUM	76,000	NA	7700	6230	15500	21100	23300	NA	NA
ANTIMONY	31	NA	ND	0.01 R	0.01 R	0.12 J	0.12 J	NA	NA
ARSENIC	22	NA	7.7	4.9	8.8	12.2	14.5	NA	NA
BARIUM	5,400	NA	44	25.5	61.3	81.6	94.4	NA	NA
BERYLLIUM	150	NA	0.37	0.5	0.56	0.66	0.78	NA	NA
BORON	5,500	NA	ND	ND	0.57 J	ND	3.9	NA	NA
CADMIUM	37	NA	ND	0.04	0.07	ND	ND	NA	NA
CALCIUM	*	NA	1320	1380	1430	2380	2540	NA	NA
CHROMIUM	210	NA	18.8	14.1 J	30.5 J	47.3 J	49.4 J	NA	NA
COBALT	4,700	NA	4.9	4.2	11.3	15.2	15.9	NA	NA
COPPER	2,900	NA	13.7	9.4	17.2	24.7	27.1	NA	NA
IRON	23,000	NA	12600	10900	21500	**31700**	**33800**	NA	NA
LEAD	400	NA	6.1	4.8	8.2	21	24.2	NA	NA
MAGNESIUM	*	NA	3860	2180	5160	8440	9040	NA	NA
MANGANESE	1,800	NA	209	244	853	602	637	NA	NA
MERCURY	6	NA	ND	ND	ND	ND	ND	NA	NA
MOLYBDENUM	390	NA	ND	0.6	0.9	1.1	ND	NA	NA
NICKEL	*	NA	14	10.7	28.3	38.6	42	NA	NA
POTASSIUM	*	NA	7.9	1560	3140	3940	4520	NA	NA
SILVER	390	NA	ND	0.04	0.01 J	ND	ND	NA	NA
SODIUM	*	NA	ND	225 J	112 J	162 J	179 J	NA	NA
THALLIUM	520	NA	ND	ND	0.24	ND	ND	NA	NA
VANADIUM	550	NA	17.6	14.6	33.6	47	50.6	NA	NA
ZINC	23,000	NA	37.6	32.1	45.3	108 J	98.2 J	NA	NA
PCBs (ug/kg)									
AROCLOR-1254	220	NA	ND	ND	ND	ND	ND	NA	NA
AROCLOR-1260	220	NA	ND	ND	ND	ND	ND	NA	NA
Pesticides (ug/kg)									
DIELDRIN	30	NA	ND	ND	ND	ND	ND	NA	NA
ENDRIN	18,000	NA	ND	ND	ND	ND	ND	NA	NA
SVOCs (ug/kg)									
2-METHYLNAPHTHALENE	*	NA	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	NA	ND	ND	ND	980 R	980 R	ND	ND
ANTHRACENE	2,200,000	NA	ND	ND	ND	ND	ND	1000	870
BENZO(A)ANTHRACENE	620	NA	ND	ND	ND	ND	ND	**4200**	**2600**
BENZO(A)PYRENE	62	NA	ND	ND	ND	ND	ND	**3400**	**2100**
BENZO(B)FLUORANTHENE	620	NA	ND	ND	ND	ND	ND	**5300**	**3200**

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB39(2-4)	MY05SB39(4-6)	MY05SB40(2-3)	MY05SB41(2-2.4)	MY05SS10(0-0.5)	MY05SS14(0-0.5)	MY05SS101	MY05SS102
Duplicates							Dup. of MY05SS10(0-0.5)		
Date Collected		10/25/2001	10/25/2001	10/23/2001	10/22/2001	9/25/2001	9/25/2001	4/10/2002	4/10/2002
Sample Delivery Group		MY015	MY015	MY011	MY011	MY004	MY004	MY101	MY101
BENZO(K)FLUORANTHENE	6,200	NA	ND	ND	ND	ND	ND	2400	1400
BENZO[G,H,I]PERYLENE	*	NA	ND	ND	ND	ND	ND	1800	910
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	NA	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	24,000	NA	ND	ND	ND	ND	ND	380	ND
CHRYSENE	62,000	NA	ND	ND	ND	ND	ND	4600	2900
DI-N-BUTYL PHTHALATE	*	NA	ND	ND	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	NA	ND	ND	ND	ND	ND	**430**	**280 J**
FLUORANTHENE	2,300,000	NA	ND	ND	ND	ND	ND	8400	4400
INDENO(1,2,3-CD)PYRENE	620	NA	ND	ND	ND	ND	ND	**2300**	**1100**
NAPHTHALENE	56,000	NA	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	NA	ND	ND	ND	ND	ND	2800	910
PYRENE	2,300,000	NA	ND	ND	ND	ND	ND	8100	4800 J
VOCs (ug/kg)									
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND	ND	ND	ND	NA	NA
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	ND	ND	NA	NA
2-BUTANONE	7,300,000	ND	ND	ND	ND	ND	ND	NA	NA
2-HEXANONE	3,100,000	ND	ND	ND	ND	ND	ND	NA	NA
4-METHYL-2-PENTANONE	790,000	ND	ND	ND	ND	ND	ND	NA	NA
ACETONE	1,600,000	ND	ND	9 J	10 J	ND	ND	NA	NA
BENZENE	650	ND	ND	ND	ND	ND	ND	NA	NA
ETHYLBENZENE	230,000	ND	ND	ND	ND	ND	ND	NA	NA
M-,P-XYLENE	210,000	ND	ND	ND	ND	ND	ND	NA	NA
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	ND	ND	NA	NA
O-XYLENE	210,000	ND	ND	ND	ND	ND	ND	NA	NA
TOLUENE	520,000	ND	ND	ND	ND	ND	ND	NA	NA
TRICHLOROETHENE	2,800	ND	ND	ND	ND	ND	ND	NA	NA
Other Compounds									
TOTAL SOLIDS (%)	*	96	94	95	89	84	83	90	91

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SS103	MY05SS115	MY05SS71	MY05SS72	MY05SS73	MY05SS74	MY05TP01(0-0.5)	MY05TP01(3-3.5)	MY05TP01(9.5-10)
Duplicates			Dup. of MY05SS103							
Date Collected		4/10/2002	4/10/2002	9/25/2001	9/25/2001	9/25/2001	9/25/2001	10/23/2001	10/23/2001	10/23/2001
Sample Delivery Group		MY101	MY101	MY004	MY004	MY004	MY004	MY013	MY013	MY013
EPH (mg/kg)										
C11-C22 AROMATICS (mg/kg)	100	NA	NA	ND	ND	ND	ND	NA	NA	**25**
C19-C36 ALIPHATICS (mg/kg)	100	NA	NA	ND	ND	ND	ND	NA	NA	**ND**
C9-C18 ALIPHATICS (mg/kg)	100	NA	NA	ND	ND	ND	ND	NA	NA	**160**
Metals (mg/kg)										
ALUMINUM	76,000	NA	NA	7780	7390	9850	10600	30700	30300	9500
ANTIMONY	31	NA	NA	0.02 R	0.02 R	0.03 R	0.02 R	0.11 J	0.11 J	0.01 R
ARSENIC	22	NA	NA	7.8	5.1	6.8	11.1	16.6	16.8	6
BARIUM	5,400	NA	NA	37.2	24.6	44.5	42.9	102	99.5	32.5
BERYLLIUM	150	NA	NA	0.22	0.2	0.26	0.32	0.93	0.91	0.37
BORON	5,500	NA	NA	ND	ND	ND	ND	4.5	3.8	ND
CADMIUM	37	NA	NA	ND	0.3 J	ND	0.37 J	ND	ND	ND
CALCIUM	*	NA	NA	1920	1510	1920	1610	1310 J	2330 J	1330 J
CHROMIUM	210	NA	NA	20.5 J	15.1 J	24.6 J	24 J	58 J	62.7 J	18.5 J
COBALT	4,700	NA	NA	5.9	4.5	7.7	8.1	18.3	15.6	5.7
COPPER	2,900	NA	NA	21.6	124	47.5	25.3	25.8	27.7	12.7
IRON	23,000	NA	NA	11100	12200	15000	16200	**36500**	**41800**	13600
LEAD	400	NA	NA	5.2	3.9	6.1	5.9	32	22.7	4.7
MAGNESIUM	*	NA	NA	3660	3430	5090	4760	8660	10100	3450
MANGANESE	1,800	NA	NA	196	186	258	275	698	715	234
MERCURY	6	NA	NA	ND	ND	ND	ND	0.47	0.03	ND
MOLYBDENUM	390	NA	NA	ND	ND	ND	ND	ND	ND	3.5
NICKEL	*	NA	NA	16.8	12.3	20.2	21.4	47.6	50.4	15.8
POTASSIUM	*	NA	NA	2070	1110	2420	2110	4650 J	5540 J	2240 J
SILVER	390	NA	NA	0.1	1.2	0.06	0.61	ND	ND	ND
SODIUM	*	NA	NA	122 J	99.8 J	116 J	118 J	194	195	125
THALLIUM	520	NA	NA	ND	ND	ND	ND	ND	ND	ND
VANADIUM	550	NA	NA	18.5	15.9	26.7	25.7	55.5	61.8	19.1
ZINC	23,000	NA	NA	34.7 J	43.5 J	47.9 J	44.7 J	100	80.8	36.7
PCBs (ug/kg)										
AROCLOR-1254	220	NA	NA	ND	ND	ND	ND	**1400**	**370**	**270**
AROCLOR-1260	220	NA	NA	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)										
DIELDRIN	30	NA	NA	NA	NA	NA	NA	ND	ND	ND
ENDRIN	18,000	NA	NA	NA	NA	NA	NA	ND	ND	ND
SVOCs (ug/kg)										
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	ND	ND	ND	2600	710
3-NITROANILINE	*	ND	ND	900 R	900 R	900 R	900 R	ND	ND	ND
ANTHRACENE	2,200,000	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	620	220 J	220 J	ND	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE	62	**190 J**	**210 J**	ND	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	620	320 J	340 J	ND	ND	ND	ND	ND	ND	ND

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SS103	MY05SS115	MY05SS71	MY05SS72	MY05SS73	MY05SS74	MY05TP01(0-0.5)	MY05TP01(3-3.5)	MY05TP01(9.5-10)
Duplicates			Dup. of MY05SS103							
Date Collected		4/10/2002	4/10/2002	9/25/2001	9/25/2001	9/25/2001	9/25/2001	10/23/2001	10/23/2001	10/23/2001
Sample Delivery Group		MY101	MY101	MY004	MY004	MY004	MY004	MY013	MY013	MY013
BENZO(K)FLUORANTHENE	6,200	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	190 J	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	24,000	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	62,000	250 J	260 J	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	2,300,000	350 J	410	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE	56,000	ND	ND	ND	ND	ND	ND	ND	1200	ND
PHENANTHRENE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE	2,300,000	380	500	ND	ND	ND	ND	ND	ND	ND
VOCs (ug/kg)										
1,1,1-TRICHLOROETHANE	630,000	NA	NA	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	380	NA	NA	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	7,300,000	NA	NA	ND	ND	ND	ND	ND	93 J	22 J
2-HEXANONE	3,100,000	NA	NA	ND	ND	ND	ND	ND	41 J	ND
4-METHYL-2-PENTANONE	790,000	NA	NA	ND	ND	ND	ND	ND	2900	ND
ACETONE	1,600,000	NA	NA	ND	ND	ND	ND	ND	ND	ND
BENZENE	650	NA	NA	ND	ND	ND	ND	ND	16 J	ND
ETHYLBENZENE	230,000	NA	NA	ND	ND	ND	ND	ND	22000	61000 J
M-,P-XYLENE	210,000	NA	NA	ND	ND	ND	ND	ND	74000	200000 J
METHYLENE CHLORIDE	8,900	NA	NA	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	210,000	NA	NA	ND	ND	ND	ND	ND	25000	79000 J
TOLUENE	520,000	NA	NA	ND	ND	ND	ND	ND	490 J	220 J
TRICHLOROETHENE	2,800	NA	NA	ND	ND	3 J	4 J	ND	4 J	ND
Other Compounds										
TOTAL SOLIDS (%)	*	90	90	93	94	92	94	79	79	83

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05TP02(0-0.5)	MY05TP02(4-4.5)	MY05TP22(4-4.5)	MY05TP03(0-0.5)	MY05TP03(0.5-7.0)	MY05TP03(4.5-5.0)	MY05TP03(7.0-7.5)
Duplicates				Dup. of MY05TP02(4-4.5)				
Date Collected		10/24/2001	10/24/2001	10/24/2001	10/23/2001	10/23/2001	10/23/2001	10/23/2001
Sample Delivery Group		MY013	MY013	MY013	MY013	MY013	MY013	MY013
EPH (mg/kg)								
C11-C22 AROMATICS (mg/kg)	100	NA	ND	ND	NA	NA	NA	ND
C19-C36 ALIPHATICS (mg/kg)	100	NA	ND	ND	NA	NA	NA	ND
C9-C18 ALIPHATICS (mg/kg)	100	NA	6.6	ND	NA	NA	NA	11
Metals (mg/kg)								
ALUMINUM	76,000	2670	13100	12600	24300	26200	NA	16300
ANTIMONY	31	0.05 J	0.01 R	0.01 R	ND	0.03 J	NA	0.01 R
ARSENIC	22	2.1	6.5	7.4	11.9	11.4	NA	4.9
BARIUM	5,400	17	47.3	50.3	77.3	87.5	NA	45.5
BERYLLIUM	150	0.14	0.58	0.59	0.72	0.86	NA	0.49
BORON	5,500	3.9	ND	ND	ND	2.3	NA	ND
CADMIUM	37	ND	ND	ND	ND	ND	NA	ND
CALCIUM	*	474 J	685 J	645 J	1610 J	1550 J	NA	1180 J
CHROMIUM	210	17.5 J	22.9 J	26.2 J	45.2 J	50.4 J	NA	19.4 J
COBALT	4,700	1.8	6.5	7.8	12.6	13.3	NA	6.5
COPPER	2,900	93.6	28.5	39.5	22.1	23.8	NA	15.6
IRON	23,000	9040	16100	18700	**29100**	**32300**	NA	15400
LEAD	400	397	14.1 J	24.1 J	14.8	9.9	NA	4.6
MAGNESIUM	*	645	3840	4420	7440	8050	NA	3720
MANGANESE	1,800	76.5	264	324	744	910	NA	281
MERCURY	6	0.02 J	ND	ND	0.02 J	0.01 J	NA	ND
MOLYBDENUM	390	1.2	ND	ND	ND	ND	NA	ND
NICKEL	*	21.7	17.2	20	35.6	37.8	NA	15.6
POTASSIUM	*	341 J	2310 J	2430 J	3700 J	4270 J	NA	2560 J
SILVER	390	ND	ND	ND	ND	ND	NA	ND
SODIUM	*	93.2	92	90.7	198	194	NA	113
THALLIUM	520	ND	ND	ND	ND	ND	NA	ND
VANADIUM	550	5.1	25.8	27.5	44.3	50.4	NA	23.4
ZINC	23,000	25.8	36.4	42.1	82.5	61.1	NA	37.8
PCBs (ug/kg)								
AROCLOR-1254	220	ND	ND	ND	ND	ND	NA	ND
AROCLOR-1260	220	**440 J**	ND	ND	ND	ND	NA	ND
Pesticides (ug/kg)								
DIELDRIN	30	12 J	ND	ND	ND	ND	NA	ND
ENDRIN	18,000	9.6 J	ND	ND	ND	ND	NA	ND
SVOCs (ug/kg)								
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	ND	NA	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	NA	ND
ANTHRACENE	2,200,000	630	ND	ND	ND	ND	NA	ND
BENZO(A)ANTHRACENE	620	**2700**	ND	ND	ND	ND	NA	ND
BENZO(A)PYRENE	62	**2100**	ND	ND	ND	ND	NA	ND
BENZO(B)FLUORANTHENE	620	**3900**	180 J	ND	ND	ND	NA	ND

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05TP02(0-0.5) 10/24/2001 MY013	MY05TP02(4-4.5) 10/24/2001 MY013	MY05TP22(4-4.5) Dup. of MY05TP02(4-4.5) 10/24/2001 MY013	MY05TP03(0-0.5) 10/23/2001 MY013	MY05TP03(0.5-7.0) 10/23/2001 MY013	MY05TP03(4.5-5.0) 10/23/2001 MY013	MY05TP03(7.0-7.5) 10/23/2001 MY013
BENZO(K)FLUORANTHENE	6,200	1000	ND	ND	ND	ND	NA	ND
BENZO[G,H,I]PERYLENE	*	1200	ND	ND	ND	ND	NA	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	ND	ND	ND	ND	ND	NA	ND
CARBAZOLE	24,000	ND	ND	ND	ND	ND	NA	ND
CHRYSENE	62,000	2700	ND	ND	ND	ND	NA	ND
DI-N-BUTYL PHTHALATE	*	ND	ND	ND	ND	ND	NA	ND
DIBENZO(A,H)ANTHRACENE	62	**250 J**	ND	ND	ND	ND	NA	ND
FLUORANTHENE	2,300,000	5100	250 J	ND	ND	ND	NA	ND
INDENO(1,2,3-CD)PYRENE	620	**1600**	ND	ND	ND	ND	NA	ND
NAPHTHALENE	56,000	ND	ND	ND	ND	ND	NA	ND
PHENANTHRENE	*	1000	ND	ND	ND	ND	NA	ND
PYRENE	2,300,000	5400	220 J	ND	ND	ND	NA	ND
VOCs (ug/kg)								
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND	ND	NA	ND	ND
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	NA	ND	ND
2-BUTANONE	7,300,000	ND	ND	ND	ND	NA	ND	ND
2-HEXANONE	3,100,000	ND	ND	ND	ND	NA	ND	ND
4-METHYL-2-PENTANONE	790,000	ND	ND	ND	ND	NA	ND	ND
ACETONE	1,600,000	ND	ND	ND	ND	NA	ND	ND
BENZENE	650	ND	ND	ND	ND	NA	ND	ND
ETHYLBENZENE	230,000	ND	ND	ND	ND	NA	ND	ND
M-,P-XYLENE	210,000	ND	ND	ND	ND	NA	ND	ND
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	NA	ND	ND
O-XYLENE	210,000	ND	ND	ND	ND	NA	ND	ND
TOLUENE	520,000	ND	ND	ND	ND	NA	ND	ND
TRICHLOROETHENE	2,800	ND	ND	ND	ND	NA	ND	ND
Other Compounds								
TOTAL SOLIDS (%)	*	97	93	92	86	84	84	88

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05TP10(9.5-10)	MY05TP12(6-7)	MY05TP23(6-7)	MY05TP13(7-8.3)	MY05TP24(7-8.3)	MY05TP15(4-6)	MY05TP25(4-6)
Duplicates				Dup. of MY05TP12(6-7)		Dup. of MY05TP13(7-8.3)		Dup. of MY05TP15(4-6)
Date Collected		11/27/2001	11/27/2001	11/27/2001	11/27/2001	11/27/2001	11/27/2001	11/27/2001
Sample Delivery Group		MY020	MY020	MY020	MY020	MY020	MY020	MY020
EPH (mg/kg)								
C11-C22 AROMATICS (mg/kg)	100	ND	ND	ND	ND	ND	**35**	**21**
C19-C36 ALIPHATICS (mg/kg)	100	ND	ND	ND	ND	ND	**ND**	**ND**
C9-C18 ALIPHATICS (mg/kg)	100	ND	ND	ND	ND	ND	**170**	**110**
Metals (mg/kg)								
ALUMINUM	76,000	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	31	NA	NA	NA	NA	NA	NA	NA
ARSENIC	22	NA	NA	NA	NA	NA	NA	NA
BARIUM	5,400	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	150	NA	NA	NA	NA	NA	NA	NA
BORON	5,500	NA	NA	NA	NA	NA	NA	NA
CADMIUM	37	NA	NA	NA	NA	NA	NA	NA
CALCIUM	*	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	210	NA	NA	NA	NA	NA	NA	NA
COBALT	4,700	NA	NA	NA	NA	NA	NA	NA
COPPER	2,900	NA	NA	NA	NA	NA	NA	NA
IRON	23,000	NA	NA	NA	NA	NA	NA	NA
LEAD	400	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	*	NA	NA	NA	NA	NA	NA	NA
MANGANESE	1,800	NA	NA	NA	NA	NA	NA	NA
MERCURY	6	NA	NA	NA	NA	NA	NA	NA
MOLYBDENUM	390	NA	NA	NA	NA	NA	NA	NA
NICKEL	*	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	*	NA	NA	NA	NA	NA	NA	NA
SILVER	390	NA	NA	NA	NA	NA	NA	NA
SODIUM	*	NA	NA	NA	NA	NA	NA	NA
THALLIUM	520	NA	NA	NA	NA	NA	NA	NA
VANADIUM	550	NA	NA	NA	NA	NA	NA	NA
ZINC	23,000	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)								
AROCLOR-1254	220	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1260	220	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)								
DIELDRIN	30	NA	NA	NA	NA	NA	NA	NA
ENDRIN	18,000	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)								
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	ND	5300 J	320 J
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	2,200,000	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE	62	ND	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	620	ND	ND	ND	ND	ND	ND	ND

Table 4-14A

Study Area 5 - Warehouse 2/3 Area Soil Analytical Results

Detected Compounds

Analyte	PAL	MY05TP10(9.5-10)	MY05TP12(6-7)	MY05TP23(6-7)	MY05TP13(7-8.3)	MY05TP24(7-8.3)	MY05TP15(4-6)	MY05TP25(4-6)
Duplicates				Dup. of MY05TP12(6-7)		Dup. of MY05TP13(7-8.3)		Dup. of MY05TP15(4-6)
Date Collected		11/27/2001	11/27/2001	11/27/2001	11/27/2001	11/27/2001	11/27/2001	11/27/2001
Sample Delivery Group		MY020	MY020	MY020	MY020	MY020	MY020	MY020
BENZO(K)FLUORANTHENE	6,200	ND	ND	ND	ND	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	24,000	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	62,000	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	2,300,000	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	ND	ND	ND	ND
NAPHTHALENE	56,000	ND	ND	ND	ND	ND	2300 J	ND
PHENANTHRENE	*	ND	ND	ND	ND	ND	ND	ND
PYRENE	2,300,000	ND	ND	ND	ND	ND	ND	ND
VOCs (ug/kg)								
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	7,300,000	ND	17 J	ND	ND	ND	ND	24 J
2-HEXANONE	3,100,000	ND	ND	ND	ND	ND	ND	ND
4-METHYL-2-PENTANONE	790,000	ND	ND	ND	ND	ND	ND	370
ACETONE	1,600,000	32 J	72 J	20 J	15 J	7 J	67 J	140 J
BENZENE	650	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	230,000	93	1800 J	ND	ND	ND	1500 J	750 J
M-,P-XYLENE	210,000	240	3200 J	4 J	ND	ND	7200 J	3800 J
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	210,000	92	920 J	ND	ND	ND	2900 J	1500 J
TOLUENE	520,000	ND	9 J	ND	ND	ND	14 J	23 J
TRICHLOROETHENE	2,800	ND	ND	ND	ND	ND	ND	ND
Other Compounds								
TOTAL SOLIDS (%)	*	82	81	83	82	80	83	82

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05TP16(8-8.5)	MY05TP26(8-8.5)	MY05TP19(12-13.3)
Duplicates			Dup. of MY05TP16(8-8.5)	
Date Collected		11/27/2001	11/27/2001	11/26/2001
Sample Delivery Group		MY020	MY020	MY020
EPH (mg/kg)				
C11-C22 AROMATICS (mg/kg)	100	ND	ND	ND
C19-C36 ALIPHATICS (mg/kg)	100	ND	ND	ND
C9-C18 ALIPHATICS (mg/kg)	100	ND	ND	ND
Metals (mg/kg)				
ALUMINUM	76,000	NA	NA	NA
ANTIMONY	31	NA	NA	NA
ARSENIC	22	NA	NA	NA
BARIUM	5,400	NA	NA	NA
BERYLLIUM	150	NA	NA	NA
BORON	5,500	NA	NA	NA
CADMIUM	37	NA	NA	NA
CALCIUM	*	NA	NA	NA
CHROMIUM	210	NA	NA	NA
COBALT	4,700	NA	NA	NA
COPPER	2,900	NA	NA	NA
IRON	23,000	NA	NA	NA
LEAD	400	NA	NA	NA
MAGNESIUM	*	NA	NA	NA
MANGANESE	1,800	NA	NA	NA
MERCURY	6	NA	NA	NA
MOLYBDENUM	390	NA	NA	NA
NICKEL	*	NA	NA	NA
POTASSIUM	*	NA	NA	NA
SILVER	390	NA	NA	NA
SODIUM	*	NA	NA	NA
THALLIUM	520	NA	NA	NA
VANADIUM	550	NA	NA	NA
ZINC	23,000	NA	NA	NA
PCBs (ug/kg)				
AROCLOR-1254	220	NA	NA	NA
AROCLOR-1260	220	NA	NA	NA
Pesticides (ug/kg)				
DIELDRIN	30	NA	NA	NA
ENDRIN	18,000	NA	NA	NA
SVOCs (ug/kg)				
2-METHYLNAPHTHALENE	*	ND	ND	ND
3-NITROANILINE	*	ND	ND	ND
ANTHRACENE	2,200,000	ND	ND	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND
BENZO(A)PYRENE	62	ND	ND	ND
BENZO(B)FLUORANTHENE	620	ND	ND	ND

Table 4-14A
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05TP16(8-8.5)	MY05TP26(8-8.5)	MY05TP19(12-13.3)
Duplicates			Dup. of MY05TP16(8-8.5)	
Date Collected		11/27/2001	11/27/2001	11/26/2001
Sample Delivery Group		MY020	MY020	MY020
BENZO(K)FLUORANTHENE	6,200	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35,000	ND	ND	ND
CARBAZOLE	24,000	ND	ND	ND
CHRYSENE	62,000	ND	ND	ND
DI-N-BUTYL PHTHALATE	*	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND
FLUORANTHENE	2,300,000	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND
NAPHTHALENE	56,000	ND	ND	ND
PHENANTHRENE	*	ND	ND	ND
PYRENE	2,300,000	ND	ND	ND
VOCs (ug/kg)				
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND
2-BUTANONE	7,300,000	ND	ND	ND
2-HEXANONE	3,100,000	ND	ND	ND
4-METHYL-2-PENTANONE	790,000	ND	ND	ND
ACETONE	1,600,000	8 J	20 J	ND
BENZENE	650	ND	ND	ND
ETHYLBENZENE	230,000	ND	ND	ND
M-,P-XYLENE	210,000	ND	ND	ND
METHYLENE CHLORIDE	8,900	ND	ND	ND
O-XYLENE	210,000	ND	ND	ND
TOLUENE	520,000	ND	ND	ND
TRICHLOROETHENE	2,800	ND	ND	ND
Other Compounds				
TOTAL SOLIDS (%)	*	82	81	82

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-14B
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results (Geoprobes)
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05GP101(2-4)	MY05GP102(0-2)	MY05GP103(8-11.3)	MY05GP115(8-11.3)	MY05GP104(6-8)	MY05GP105(0-3)	MY05GP116(0-3)	MY05GP106(0-2)
Duplicates					Dup. of MY05GP103(8-11.3)			Dup. of MY05GP105(0-3)	
Date Collected		8/26/2002	8/26/2002	8/26/2002	8/26/2002	8/26/2002	8/26/2002	8/26/2002	8/26/2002
Sample Delivery Group		MY117	MY117	MY117	MY117	MY117	MY117	MY117	MY117
VOCs (ug/kg)									
1,1,1-TRICHLOROETHANE	630,000	ND	ND	10	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	7,300,000	11 R	26 J	12 R	10 R	10 R	11 R	10 R	10 R
2-HEXANONE	3,100,000	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYL-2-PENTANONE	790,000	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	1,600,000	11 R	630 J	12 R	10 R	10 R	11 R	10 R	10 R
BENZENE	650	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	230,000	ND	ND	ND	ND	ND	ND	ND	ND
M-,P-XYLENE	210,000	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	210,000	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	520,000	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	2,800	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds									
TOTAL SOLIDS (%)	*	94	94	85	NA	90	92	NA	92

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-14B
Study Area 5 - Warehouse 2/3 Area Soil Analytical Results (Geoprobes)
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05GP107(0-2.8) 8/26/2002 MY117	MY05GP108(0-2) 8/26/2002 MY117	MY05GP109(2-4) 8/26/2002 MY117	MY05GP110(0-2) 8/27/2002 MY117	MY05GP111(8-10) 8/27/2002 MY117	MY05GP112(8-8.6) 8/27/2002 MY117	MY05GP113(4-6) 8/27/2002 MY117	MY05GP114(8-12) 8/26/2002 MY117
VOCs (ug/kg)									
1,1,1-TRICHLOROETHANE	630,000	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	7,300,000	18 R	10 R	11 R	10 R	11 R	22 R	11 R	12 R
2-HEXANONE	3,100,000	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYL-2-PENTANONE	790,000	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	1,600,000	18 R	10 R	11 R	10 R	11 R	22 R	11 R	12 R
BENZENE	650	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	230,000	ND	ND	ND	ND	ND	ND	ND	ND
M-,P-XYLENE	210,000	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	210,000	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	520,000	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	2,800	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds									
TOTAL SOLIDS (%)	*	96	96	97	97	79	88	94	92

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-15
Study Area 5 - Warehouse 2/3 Area Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW106	MY05GW106-1C	MY05GW107	MY05GW107-1C	MY05GW108	MY05GW108-1C	MY05GW109	MY05GW109-1C
Well Number		**MW-404**	**MW-404**	**MW-405**	**MW-405**	**MW-406A**	**MW-406A**	**MW-406B**	**MW-406B**
Duplicates									**(**
Date Collected		**6/18/2002**	**10/2/2002**	**6/18/2002**	**10/2/2002**	**6/18/2002**	**10/3/2002**	**6/18/2002**	**10/3/2002**
Sample Delivery Group		**MY111**	**MY122**	**MY111**	**MY123**	**MY111**	**MY123**	**MY111**	**MY122**
EPH (ug/l)									
		NA	NA	NA	NA	NA	NA	NA	NA
Metals (ug/l)									
ALUMINUM	1430	ND	31.2	**3850**	ND	959	ND	**2110**	92.8
ARSENIC	10	**16.6**	**23.3**	ND	ND	ND	ND	3 J	2.1 J
BARIUM	2000	12.4	19.5	55.5	48	37.8	21.1	31.2	21.8
BERYLLIUM	73	ND	ND	0.45 J	ND	ND	0.46 J	ND	ND
BORON	630	14.3	21.8 J	10.4	13.1	54.4	46.1	54.9	46.6 J
CADMIUM	3.5	ND	0.31	ND	0.56	ND	0.06 J	ND	0.13
CALCIUM	*	21000	22300	20000	21800	17900	21000	41500	37300
CHROMIUM	40	ND	7.6	10.2	ND	ND	ND	5.4	ND
COBALT	2200	ND	ND	14.6	14.8	ND	ND	ND	ND
COPPER	1300	ND	ND	296	91.8	ND	ND	ND	1.1 J
IRON	11000	**32300**	**43500**	4640	ND	783	119	2430	153
LEAD	10	ND	ND	3.1	ND	ND	ND	4.1	ND
MAGNESIUM	*	12500	11800	14400	16000	6100	10300	16800	19400
MANGANESE	500	**5250**	**5700**	**1080**	**1090**	404	292	**653**	395
MERCURY	2	ND	ND	0.05	ND	0.01 J	ND	0.02 J	ND
MOLYBDENUM	35	ND	19.3	**3170**	**467**	ND	15.4	ND	1.8 J
NICKEL	140	ND	12.3 J	139	76.5	ND	ND	ND	ND
POTASSIUM	*	1370	1800	5640	4550	6720	5010	4960	4290
SELENIUM	35	ND	ND	ND	4.4 J	ND	ND	ND	ND
SILVER	35	ND	ND	**49.9**	4.5	0.12	ND	ND	ND
SODIUM	20000	15100	15400	**20300**	18200	**33800**	**43800**	18200	18000
THALLIUM	2.4	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	260	ND	ND	10.4	ND	ND	ND	ND	ND
ZINC	2000	13.4	16.3	16.1	ND	3	4.1	10.6	2.2 J
PCBs (ug/l)									
		NA	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/l)									
		NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/l)									
NAPHTHALENE	14	9 J	NA	ND	NA	ND	NA	ND	NA
VOCs (ug/l)									
1,1,1-TRICHLOROETHANE	200	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	6	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	70	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHENE	0.6	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	4	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	1440	ND	5 R	ND	ND	ND	5 R	ND	5 R
ACETONE	700	ND	5 R	3 J	5 J	5	5 R	ND	5 R
BENZENE	12	0.6 J	1 J	0.6 J	ND	ND	ND	ND	ND
BROMODICHLOROMETHAN	6	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	57	ND	ND	ND	ND	8	3	2	ND
CHLOROMETHANE	3	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	70	**120**	**160**	1	ND	ND	ND	ND	ND
M-,P-XYLENE	14000	340	220	1	ND	ND	ND	ND	ND
O-XYLENE	14000	170	130	0.8 J	ND	ND	ND	ND	0.1 J
TOLUENE	1400	2	1B	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	32	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	0.2	ND	ND	ND	**0.26**	ND	**0.51**	ND	ND

Notes:

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* PAL Not Available

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J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-15
Study Area 5 - Warehouse 2/3 Area Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW152-1C	MY05GW110	MY05GW110-1C	MY05GW111	MY05GW111-1C	MY05GW112	MY05GW120(dup)
Well Number		MW-406B	MW-407A	MW-407A	MW-407B	MW-407B	MW-408	MW-408
Duplicates		Dup. of MY05GW109-1C)						Dup. of MY05GW112
Date Collected			6/17/2002	10/2/2002	6/18/2002	10/2/2002	6/17/2002	6/17/2002
Sample Delivery Group			MY111	MY122	MY111	MY122	MY111	MY111
EPH (ug/l)								
		NA	NA	NA	NA	NA	NA	NA
Metals (ug/l)								
ALUMINUM	1430	111	ND	30.8	**1520**	83.4	ND	ND
ARSENIC	10	2.7 J	2.5 J	ND	ND	ND	ND	ND
BARIUM	2000	22.1	62.7	58.2	51	42.2	37	38.3
BERYLLIUM	73	ND	0.34 J	ND	ND	ND	ND	0.32 J
BORON	630	50.7 J	22.8	19.8 J	59.4	79.8 J	19.7	20.5
CADMIUM	3.5	ND	ND	ND	ND	ND	1.3	1.3
CALCIUM	*	36000	27800	24900	20500	26500	35400	34700
CHROMIUM	40	ND	ND	ND	ND	ND	ND	ND
COBALT	2200	ND	ND	ND	ND	ND	ND	4 J
COPPER	1300	1.6 J	ND	ND	16.5	ND	9.5	12.1
IRON	11000	168	3580	2980	1760	79.8	ND	ND
LEAD	10	ND	ND	ND	6.6	ND	ND	ND
MAGNESIUM	*	19100	11600	9910	8420	9840	7800	7660
MANGANESE	500	367	304	280	388	29.6	**954**	**1050**
MERCURY	2	ND	ND	ND	0.04	ND	ND	ND
MOLYBDENUM	35	1.8 J	ND	2.6	**43.9**	10.8	ND	ND
NICKEL	140	ND	ND	12.5 J	ND	ND	ND	ND
POTASSIUM	*	4520	4470	4130	5140	5890	3600	4040
SELENIUM	35	ND	ND	ND	ND	ND	ND	ND
SILVER	35	ND	ND	ND	ND	ND	ND	ND
SODIUM	20000	18100	12900	11500	17000	19800	**48600**	**48600**
THALLIUM	2.4	ND	ND	ND	ND	ND	ND	ND
VANADIUM	260	ND	ND	ND	ND	ND	ND	ND
ZINC	2000	1.6 J	3.9	3.2	18.4	ND	478	490
PCBs (ug/l)								
		NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/l)								
		NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/l)								
NAPHTHALENE	14	NA	ND	NA	ND	NA	ND	ND
VOCs (ug/l)								
1,1,1-TRICHLOROETHANE	200	ND	ND	ND	ND	ND	**670 J**	**400 J**
1,1,2-TRICHLOROETHANE	6	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	70	ND	ND	4	ND	ND	42	31
1,1-DICHLOROETHENE	0.6	ND	ND	**1**	ND	ND	**22 J**	**10 J**
1,2-DICHLOROETHANE	4	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	1440	5 R	ND	5 R	ND	5 R	ND	ND
ACETONE	700	5 R	ND	5 R	4 J	5 R	ND	ND
BENZENE	12	ND	ND	ND	ND	ND	1 R	1 R
BROMODICHLOROMETHANE	6	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	57	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	3	**4**	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	70	ND	ND	ND	ND	ND	ND	ND
M-,P-XYLENE	14000	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	14000	0.2 J	ND	ND	ND	ND	ND	ND
TOLUENE	1400	ND	ND	ND	ND	ND	1 R	1 R
TRICHLOROETHENE	32	ND	ND	ND	ND	ND	1 R	1 R
VINYL CHLORIDE	0.2	ND	ND	ND	ND	ND	**0.3 J**	**0.3 J**

Notes:

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* PAL Not Available

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ND = Compound(s) Not Detected

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Table 4-15
Study Area 5 - Warehouse 2/3 Area Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW112-1C	MY05GW113	MY05GW113-1C	MY05GW114	MY05GW114-1C	MY05GW120	MY05GW121
Well Number		MW-408	MW-409A	MW-409A	MW-409B	MW-409B	MW-420	MW-421
Duplicates								
Date Collected		10/2/2002	6/17/2002	10/2/2002	6/17/2002	10/2/2002	10/1/2002	10/1/2002
Sample Delivery Group		MY123	MY111	MY122	MY111	MY122	MY122	MY122
EPH (ug/l)								
		NA	NA	NA	NA	NA	NA	NA
Metals (ug/l)								
ALUMINUM	1430	ND	ND	42.9	412	61.8	186	ND
ARSENIC	10	ND	ND	ND	ND	ND	ND	6.7
BARIUM	2000	38.4	33.2	33.7	35.1	22.6	35.6	82.7
BERYLLIUM	73	ND	ND	ND	ND	ND	ND	ND
BORON	630	23	30.9	37.8 J	85.6	87.5 J	18 J	58.5 J
CADMIUM	3.5	1.5	ND	ND	ND	ND	0.19	0.09 J
CALCIUM	*	35700	18200	21000	25200	29100	33800	38600
CHROMIUM	40	ND	ND	ND	ND	ND	ND	ND
COBALT	2200	ND	ND	ND	ND	ND	ND	ND
COPPER	1300	11.9	ND	ND	ND	ND	2.5	ND
IRON	11000	ND	93.1	152	508	ND	80.8	3480
LEAD	10	ND	ND	ND	ND	ND	ND	ND
MAGNESIUM	*	8940	7890	9380	11700	13700	8300	15200
MANGANESE	500	**1180**	258	310	407	49.6	91.2	465
MERCURY	2	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM	35	ND	ND	2.4	ND	2.4	2.1	1.1 J
NICKEL	140	20.5 J	ND	17 J	ND	ND	15.2 J	ND
POTASSIUM	*	4580	2670	2880	3630	4850	4990	7970
SELENIUM	35	ND	ND	ND	ND	ND	ND	ND
SILVER	35	ND	ND	ND	ND	ND	0.06	ND
SODIUM	20000	**39900**	17200	17700	15300	15300	**21600**	**26500**
THALLIUM	2.4	0.41	ND	ND	ND	ND	ND	ND
VANADIUM	260	ND	ND	ND	ND	6.4 J	5.4 J	ND
ZINC	2000	491	3.3	4.9	10	6.3	39.2	1.8 J
PCBs (ug/l)								
		NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/l)								
		NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/l)								
NAPHTHALENE	14	NA	ND	NA	ND	NA	NA	NA
VOCs (ug/l)								
1,1,1-TRICHLOROETHANE	200	**400**	**210**	110	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	6	ND	ND	0.4 J	ND	ND	ND	ND
1,1-DICHLOROETHANE	70	18	**240**	**160**	ND	ND	ND	7
1,1-DICHLOROETHENE	0.6	**24**	**150**	**190**	ND	ND	ND	**4**
1,2-DICHLOROETHANE	4	ND	ND	2	ND	ND	ND	ND
2-BUTANONE	1440	ND	ND	ND	ND	5 R	5 R	ND
ACETONE	700	5 R	ND	5 R	ND	5 R	5 R	ND
BENZENE	12	ND	ND	ND	ND	ND	ND	ND
BROMODICHLOROMETHANE	6	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	57	1	ND	0.7 J	ND	ND	6 J	ND
CHLOROMETHANE	3	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	70	ND	ND	ND	ND	ND	ND	ND
M-,P-XYLENE	14000	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	14000	ND	ND	ND	ND	ND	ND	ND
TOLUENE	1400	ND	ND	0.6 J	ND	ND	ND	ND
TRICHLOROETHENE	32	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	0.2	ND	**2 J**	**2**	ND	ND	ND	ND

Notes:

PAL = Project Action Limit

* PAL Not Available

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Table 4-15
Study Area 5 - Warehouse 2/3 Area Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW151	MY05GW122	MY05GW123	MY05GW124	MY05GW129	MY05GW201	MY05GW13	MY05GW13-1C
Well Number		MW-421	MW-422A	MW-422B	MW-423A	MW-423B	MW-129	MW-311	MW-311
Duplicates		Dup. of MY05GW121							
Date Collected		10/1/2002	10/1/2002	10/1/2002	10/3/2002	10/3/2002	9/29/2003	11/12/2001	9/30/2002
Sample Delivery Group		MY122	MY122	MY122	MY122	MY123		MY017	MY122
EPH (ug/l)									
		NA	NA	NA	NA	NA	NA	ND	NA
Metals (ug/l)									
ALUMINUM	1430	39.6	64.8	1130	67.7	ND	NA	1350	ND
ARSENIC	10	6.3	ND	ND	ND	ND	NA	ND	ND
BARIUM	2000	78.5	27.3	29	62	20.3	NA	41.4	65.2
BERYLLIUM	73	ND	ND	ND	ND	ND	NA	0.41 J	ND
BORON	630	63.4 J	36.1 J	11.2 J	85 J	62.8	NA	29.4	27.2 J
CADMIUM	3.5	0.21	ND	0.08 J	ND	ND	NA	ND	ND
CALCIUM	*	37700	29300	14800	25800	18800	NA	18900	29100
CHROMIUM	40	ND	ND	ND	ND	ND	NA	ND	ND
COBALT	2200	ND	ND	ND	ND	ND	NA	3.3	ND
COPPER	1300	1 J	6	6.1	ND	ND	NA	12.3	1.5 J
IRON	11000	3380	62.3	1470	2770	ND	NA	4790	3720
LEAD	10	ND	1.9	0.45	ND	ND	NA	ND	ND
MAGNESIUM	*	14800	13400	5940	12900	11100	NA	8560	11900
MANGANESE	500	424	130	445	317	67.5	NA	**803**	**562**
MERCURY	2	ND	ND	ND	ND	ND	NA	ND	ND
MOLYBDENUM	35	1.2 J	2.2	2.2	ND	ND	NA	**314**	18.1
NICKEL	140	11.7 J	13.7 J	14 J	14 J	ND	NA	13.9	10.8 J
POTASSIUM	*	7600	2630	3300	3440	2940	NA	4930	5000
SELENIUM	35	ND	ND	ND	ND	ND	NA	3.04 R	ND
SILVER	35	ND	0.26	ND	ND	ND	NA	3.6	0.2
SODIUM	20000	**24400**	13700	13600	12000	13500	NA	10600	9670
THALLIUM	2.4	ND	0.68	0.41	ND	ND	NA	ND	ND
VANADIUM	260	ND	ND	6.5 J	ND	ND	NA	ND	ND
ZINC	2000	4	5.4	8.7	ND	2.7 J	NA	ND	ND
PCBs (ug/l)									
		NA	NA	NA	NA	NA	NA	ND	NA
Pesticides (ug/l)									
		NA	NA	NA	NA	NA	NA	ND	NA
SVOCs (ug/l)									
NAPHTHALENE	14	NA	NA	NA	NA	NA	NA	ND	ND
VOCs (ug/l)									
1,1,1-TRICHLOROETHANE	200	ND	6	ND	ND	ND		150	170
1,1,2-TRICHLOROETHANE	6	ND	ND	ND	ND	ND		ND	ND
1,1-DICHLOROETHANE	70	8	1	ND	0.9 J	ND		47	35
1,1-DICHLOROETHENE	0.6	**4**	0.5 J	ND	ND	ND		**16**	**19**
1,2-DICHLOROETHANE	4	ND	ND	ND	ND	ND		ND	ND
2-BUTANONE	1440	5 R	ND	ND	ND	ND		ND	5 R
ACETONE	700	5 R	ND	ND	ND	ND		ND	5 R
BENZENE	12	ND	ND	ND	ND	ND		ND	ND
BROMODICHLOROMETHANE	6	ND	ND	2	ND	ND		ND	ND
CHLOROFORM	57	ND	6	38	ND	4		ND	ND
CHLOROMETHANE	3	ND	ND	ND	ND	ND		ND	ND
ETHYLBENZENE	70	ND	ND	ND	ND	ND		ND	ND
M-,P-XYLENE	14000	ND	ND	ND	ND	ND		ND	ND
O-XYLENE	14000	ND	ND	ND	ND	ND		ND	ND
TOLUENE	1400	ND	ND	ND	ND	ND		ND	ND
TRICHLOROETHENE	32	ND	ND	ND	1	4		ND	ND
VINYL CHLORIDE	0.2	ND	ND	ND	ND	ND		**0.2**	0.13 J

Notes:

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* PAL Not Available

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J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-16A
Study Area 5 - 115kV Switchyard Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05TP06(0.5-6.5)	MY05TP06(6.5-6.8)	MY05TP07(0.5-5.0)	MY05TP07(5.5-5.8)	MY05TP08(0.5-6.5)	MY05TP08(6.5-6.8)
Duplicates							
Date Collected		10/22/2001	10/22/2001	10/22/2001	10/22/2001	10/22/2001	10/22/2001
Sample Delivery Group		MY013	MY013	MY013	MY013	MY013	MY013
EPH (mg/kg)							
C11-C22 AROMATICS (mg/kg)	100	ND	ND	ND	ND	ND	ND
C19-C36 ALIPHATICS (mg/kg)	100	56 J	ND	6.8 J	ND	ND	ND
C9-C18 ALIPHATICS (mg/kg)	100	19 J	ND	ND	ND	ND	ND
Metals (mg/kg)							
ALUMINUM	76,000	NA	16700	NA	9600	NA	23900
ANTIMONY	31	NA	0.04	NA	ND	NA	0.07
ARSENIC	22	NA	11.1	NA	8.4	NA	8.5
BARIUM	5,400	NA	70.5	NA	47.1	NA	86.5
BERYLLIUM	150	NA	0.54	NA	0.4	NA	0.7
BORON	5,500	NA	1.2	NA	ND	NA	3.4
CADMIUM	37	NA	ND	NA	0.12	NA	ND
CALCIUM	*	NA	2220	NA	1450	NA	2980
CHROMIUM	210	NA	37.6	NA	20.5	NA	56.2
COBALT	4,700	NA	13.5	NA	6.4	NA	12.6
COPPER	2,900	NA	18.6	NA	17.7	NA	25.1
IRON	23,000	NA	**24900**	NA	15500	NA	**33200**
LEAD	400	NA	8	NA	12.2	NA	11.8
MAGNESIUM	*	NA	6570	NA	4840	NA	9480
MANGANESE	1,800	NA	660	NA	304	NA	457
MERCURY	6	NA	ND	NA	0.03	NA	ND
MOLYBDENUM	390	NA	1.1	NA	0.92	NA	0.86
NICKEL	*	NA	33.6	NA	17.3	NA	45.8
POTASSIUM	*	NA	4300	NA	2110	NA	5890
SILVER	390	NA	ND	NA	ND	NA	ND
SODIUM	*	NA	208	NA	106	NA	238
THALLIUM	520	NA	0.22	NA	ND	NA	0.26
VANADIUM	550	NA	40.1	NA	23.1	NA	50.6
ZINC	23,000	NA	53.8	NA	71.6	NA	74.4
PCBs (ug/kg)							
		ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)							
		NA	ND	NA	ND	NA	ND
SVOCs (ug/kg)							
ANTHRACENE	2,200,000	NA	ND	NA	260 J	NA	ND
BENZO(A)ANTHRACENE	620	NA	ND	NA	430	NA	ND
BENZO(A)PYRENE	62	NA	ND	NA	**380**	NA	ND
BENZO(B)FLUORANTHENE	620	NA	ND	NA	470	NA	ND
BENZO[G,H,I]PERYLENE	*	NA	ND	NA	210 J	NA	ND
CHRYSENE	62,000	NA	ND	NA	430	NA	ND
FLUORANTHENE	2,300,000	NA	ND	NA	1000	NA	ND
INDENO(1,2,3-CD)PYRENE	620	NA	ND	NA	230 J	NA	ND

Table 4-16A
Study Area 5 - 115kV Switchyard Area Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05TP06(0.5-6.5)	MY05TP06(6.5-6.8)	MY05TP07(0.5-5.0)	MY05TP07(5.5-5.8)	MY05TP08(0.5-6.5)	MY05TP08(6.5-6.8)
Duplicates							
Date Collected		**10/22/2001**	**10/22/2001**	**10/22/2001**	**10/22/2001**	**10/22/2001**	**10/22/2001**
Sample Delivery Group		**MY013**	**MY013**	**MY013**	**MY013**	**MY013**	**MY013**
PHENANTHRENE	*	NA	ND	NA	990	NA	ND
PYRENE	2,300,000	NA	ND	NA	720 J	NA	ND
VOCs (ug/kg)							
ACETONE	1,600,000	NA	13	NA	ND	NA	ND
METHYLENE CHLORIDE	8,900	NA	90 J	NA	ND	NA	ND
Other Compounds							
TOTAL SOLIDS (%)	*	87	77	93	92	95	77

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-16B
Study Area 5 - 115 kV Switchyard Area Soil Analytical Results (Construction Transformer)
Detected Compounds

Analyte	PAL	MY05HA07(0-0.5)	MY05HA07(2.0-2.5)	MY05HA08(0-0.5)	MY05HA08(2.0-2.5)	MY05HA09(0-0.5)	MY05HA09(2.0-2.5)
Duplicates							
Date Collected		**10/30/2001**	**10/31/2001**	**10/30/2001**	**10/31/2001**	**10/30/2001**	**10/31/2001**
Sample Delivery Group		**MY015**	**MY015**	**MY015**	**MY015**	**MY015**	**MY015**
Location Description		**Constr. Transformer**	**Constr. Transformer**	**Constr. Transformer**	**Constr. Transformer**	**Constr. Transformer**	**Constr. Transformer**
EPH (mg/kg)							
C11-C22 AROMATICS (mg/kg)	100	17	ND	17	ND	**2300 J**	17
C19-C36 ALIPHATICS (mg/kg)	100	90 J	12 J	ND	ND	**12000 J**	ND
C9-C18 ALIPHATICS (mg/kg)	100	ND	6.4	ND	7.2	**8800**	6.3
PCBs (ug/kg)							
AROCLOR-1260	220	150 J	ND	ND	ND	**600 J**	ND
VOCs (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	ND	5 R	ND
ACETONE	1,600,000	ND	ND	ND	ND	180 J	ND
METHYLENE CHLORIDE	8,900	ND	ND	ND	ND	90 J	ND
Other Compounds							
TOTAL SOLIDS (%)	*	93	94	95	83	94	95

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-16B
Study Area 5 - 115 kV Switchyard Area Soil Analytical Results (Construction Transformer)
Detected Compounds

Analyte	PAL	MY05HA11(0-0.5)	MY05HA11(2.0-2.5)	MY05HA12(2.0-2.5)	MY05HA101(0-0.5)	MY05HA115(0-0.5)	MY05HA101(2-2.5)
Duplicates				Dup. of MY05HA11(2.0-2.5)		Dup. of MY05HA101(0-0.5)	
Date Collected		10/30/2001	10/31/2001	10/31/2001	6/13/2002	6/13/2002	6/13/2002
Sample Delivery Group		MY015	MY015	MY015	MY110	MY110	MY110
Location Description		Constr. Transformer	Constr. Transformer	Constr. Transformer	Constr. Transformer	Constr. Transformer	Constr. Transformer
EPH (mg/kg)							
C11-C22 AROMATICS (mg/kg)	100	ND	ND	ND	ND	19	ND
C19-C36 ALIPHATICS (mg/kg)	100	ND	**110 J**	90 J	11 J	9.4 J	ND
C9-C18 ALIPHATICS (mg/kg)	100	6.5	50	37	ND	ND	ND
PCBs (ug/kg)							
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND
VOCs (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	380	ND	ND	ND	NA	NA	NA
ACETONE	1,600,000	ND	ND	ND	NA	NA	NA
METHYLENE CHLORIDE	8,900	ND	ND	ND	NA	NA	NA
Other Compounds							
TOTAL SOLIDS (%)	*	92	94	94	91	90	81

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-16B
Study Area 5 - 115 kV Switchyard Area Soil Analytical Results (Construction Transformer)
Detected Compounds

Analyte	PAL	MY05HA102(0-0.5)	MY05HA102(2-2.5)	MY05HA103(0-0.5)	MY05HA103(2-2.5)	MY05HA104(0-0.5)	MY05HA104(2-2.5)
Duplicates							
Date Collected		6/13/2002	6/13/2002	6/13/2002	6/13/2002	6/13/2002	6/13/2002
Sample Delivery Group		MY110	MY110	MY110	MY110	MY110	MY110
Location Description		Constr. Transformer	Constr. Transformer	Constr. Transformer	Constr. Transformer	Constr. Transformer	Constr. Transformer
EPH (mg/kg)							
C11-C22 AROMATICS (mg/kg)	100	18	ND	23	22	ND	36
C19-C36 ALIPHATICS (mg/kg)	100	9.2 J	ND	7.4 J	ND	ND	11 J
C9-C18 ALIPHATICS (mg/kg)	100	ND	ND	ND	ND	ND	ND
PCBs (ug/kg)							
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND
VOCs (ug/kg)							
1,1,2,2-TETRACHLOROETHANE	380	NA	NA	NA	NA	NA	NA
ACETONE	1,600,000	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	8,900	NA	NA	NA	NA	NA	NA
Other Compounds							
TOTAL SOLIDS (%)	*	92	89	92	79	92	77

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-17
Study Area 5 - Personnel Building and Parking Lot Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SB17(0-0.5)	MY05SB17(2-4)	MY05SB17(4-5)	MY05SB18(6-8)	MY05SB19(10-12)	MY05SB20(6-8)	MY05SB21(4-5.2)	MY05SB22(8-8.4)	MY05SB60(8-8.4)	MY05SS67	MY05SS69	MY05SS70	MY05SS75(0-0.5)
Duplicates										Dup. of MY05SB22(8-8.4)				
Date Collected		10/18/2002	10/22/2002	10/22/2002	10/11/2001	10/10/2001	10/11/2001	10/11/2001	10/25/2001	10/25/2001	10/23/2001	10/22/2001	10/10/2001	7/1/2002
Sample Delivery Group		MY011	MY011	MY011	MY010	MY010	MY010	MY010	MY015	MY015	MY011	MY011	MY010	MY114
EPH/VPH (mg/kg)														
C11-C22 AROMATICS (mg/kg)	100	**150 J**	37	26	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND
C19-C36 ALIPHATICS (mg/kg)	100	**440**	38	22	ND	ND	ND	ND	ND	NA	ND	9.4	19 J	ND
C9-C18 ALIPHATICS (mg/kg)	100	**ND**	ND	7.3	7 R	7.8 R	6.9 R	7.7 R	ND	NA	ND	ND	6.8 R	ND
VPH	*	ND	ND	ND	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA
Metals (mg/kg)														
ALUMINUM	76000	11400	NA	8330	12000	30500	12200	18500	NA	NA	9620	NA	8500	10500
ANTIMONY	31	0.01 R	NA	0.01 R	ND	ND	ND	ND	NA	NA	0.01 R	NA	ND	1.5 J
ARSENIC	22	7.8	NA	7.4	8.8	9.9	8.1	11.5	NA	NA	12	NA	5.4	9.8
BARIUM	5400	43.4	NA	43.1	48.5	119	43.9	74.3	NA	NA	52.2	NA	35.9	47.1
BERYLLIUM	150	0.37	NA	0.33	0.51	0.84	0.44	0.59	NA	NA	0.41	NA	0.25	0.41
BORON	5500	0.65	NA	0.63	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
CADMIUM	37	0.12	NA	0.12	0.05	0.04	0.02 J	0.06	NA	NA	0.17	NA	0.21	ND
CALCIUM	*	3120	NA	9220	1470	4500	1080	2630	NA	NA	1530	NA	2020	1610
CHROMIUM	210	19.9 J	NA	20.4 J	23.3	64.2	19.8	40.4	NA	NA	23.9 J	NA	14.3	44 J
COBALT	4700	7	NA	5	6.9	17	6.2	11.6	NA	NA	6.7	NA	4.4	7.9
COPPER	2900	16.7	NA	15.1	15.9	27.9	12.5	20.5	NA	NA	25.3	NA	52.2	17.8
IRON	23000	15800	NA	12900	16400	**39600**	13900	**25400**	NA	NA	16100	NA	11500	17000
LEAD	400	11.9	NA	9.3	7.2	14.9	5.9	9.2	NA	NA	13.4	NA	6.7	**969**
MAGNESIUM	*	5270	NA	4140	4380	14100	3640	7660	NA	NA	5460	NA	4150	5620
MANGANESE	1800	301	NA	296	402	732	345	448	NA	NA	323	NA	232	362
MOLYBDENUM	390	0.48	NA	1.2	0.76	0.97	0.43	0.87	NA	NA	0.77	NA	0.38	ND
NICKEL	*	20.6	NA	14.5	20.5	52.5	17	33.8	NA	NA	17.8	NA	11.2	21
POTASSIUM	*	2540	NA	2010	2620	8670	2230	4910	NA	NA	2440	NA	1780	2520
SELENIUM	390	ND	NA	ND	ND	0.53 J	0.52 J	ND	NA	NA	ND	NA	ND	ND
SILVER	390	0.04	NA	0.04	ND	0.06	0.07	0.05	NA	NA	1.9	NA	ND	ND
SODIUM	*	415 J	NA	182 J	ND	452	ND	238	NA	NA	106 J	NA	278	132
THALLIUM	520	0.29	NA	ND	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
VANADIUM	550	40.8	NA	19.8	23.8	61.1	21.8	39.3	NA	NA	24.7	NA	19.2	22.8
ZINC	23000	63.1	NA	50.7	45.6	85.1	32.9	58.4	NA	NA	74.8	NA	1060	69.5 J
PCBs (ug/kg)														
		ND	NA	ND	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
Pesticides (ug/kg)														
		ND	NA	ND	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
SVOCs (ug/kg)														
BENZO(A)ANTHRACENE	620	ND	NA	330 J	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
BENZO(A)PYRENE	62	ND	NA	**300 J**	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
BENZO(B)FLUORANTHENE	620	ND	NA	370	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	NA	200 J	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
CHRYSENE	62000	ND	NA	310 J	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
FLUORANTHENE	2300000	ND	NA	940	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	NA	240 J	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
PHENANTHRENE	*	ND	NA	520	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
PYRENE	2300000	ND	NA	520	ND	ND	ND	ND	NA	NA	ND	NA	ND	ND
VOCs (ug/kg)														
2-BUTANONE	7300000	ND	10 R	13 R	ND	ND	ND	ND	NA	NA	ND	NA	ND	13 R
ACETONE	1600000	22 J	ND	ND	ND	ND	ND	ND	NA	NA	7 J	NA	ND	ND
TRICHLOROETHENE	2800	ND	ND	ND	ND	58	ND	ND	NA	NA	ND	NA	ND	ND
Other Compounds														
SULFATE (mg/kg)	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL SOLIDS (%)	*	96	93	91	86	77	86	77	92	93	81	88	88	93

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-17
Study Area 5 - Personnel Building and Parking Lot Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05GP201(0-0.5)	MY05GP206(0-0.5)	MY05GP201(1.8-2)	MY05GP237(1.8-2)	MY05GP201(3.8-4)	MY05GP202(0-0.5)	MY05GP202(1.8-2)	MY05GP202(3.8-4)	MY05GP203(0-0.5)	MY05GP203(1.8-2)	MY05GP203(3.8-4)
Duplicates			Dup. of MY05GP201(0-0.5)		Dup. of MY05GP201(1.8-2.0)							
Date Collected		10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003
Sample Delivery Group		MY141	MY141	MY141	MY141	MY141	MY141	MY141	MY141	MY141	MY141	MY141
EPH/VPH (mg/kg)												
C11-C22 AROMATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VPH	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)												
ALUMINUM	76000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	5400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	150	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BORON	5500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	210	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	4700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	2900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRON	23000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	400	14.4	16.2	16.9	16.4	15.9	14.4	15.3	16.8	22.2	15.5	16.2
MAGNESIUM	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MOLYBDENUM	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
THALLIUM	520	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	550	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	23000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)												
		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)												
		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)												
BENZO(A)ANTHRACENE	620	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	62	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	620	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO[G,H,I]PERYLENE	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	62000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	2300000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	620	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	2300000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (ug/kg)												
2-BUTANONE	7300000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACETONE	1600000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	2800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other Compounds												
SULFATE (mg/kg)	*	10U	10U	20U	28U	25U	23U	120	25U	20U	22U	32U
TOTAL SOLIDS (%)	*	93	94	80	80	80	80	79	79	92	81	80

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-17
Study Area 5 - Personnel Building and Parking Lot Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05GP204(0-0.5)	MY05GP204(1.8-2)	MY05GP204(3.8-4)	MY05GP205(0-0.5)	MY05GP205(1.8-2)	MY05GP205(3.8-4)
Duplicates							
Date Collected		10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003	10/2/2003
Sample Delivery Group		MY141	MY141	MY141	MY141	MY141	MY141
EPH/VPH (mg/kg)							
C11-C22 AROMATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS (mg/kg)	100	NA	NA	NA	NA	NA	NA
VPH	*	NA	NA	NA	NA	NA	NA
Metals (mg/kg)							
ALUMINUM	76000	NA	NA	NA	NA	NA	NA
ANTIMONY	31	NA	NA	NA	NA	NA	NA
ARSENIC	22	NA	NA	NA	NA	NA	NA
BARIUM	5400	NA	NA	NA	NA	NA	NA
BERYLLIUM	150	NA	NA	NA	NA	NA	NA
BORON	5500	NA	NA	NA	NA	NA	NA
CADMIUM	37	NA	NA	NA	NA	NA	NA
CALCIUM	*	NA	NA	NA	NA	NA	NA
CHROMIUM	210	NA	NA	NA	NA	NA	NA
COBALT	4700	NA	NA	NA	NA	NA	NA
COPPER	2900	NA	NA	NA	NA	NA	NA
IRON	23000	NA	NA	NA	NA	NA	NA
LEAD	400	14.9	18.3	16.0	15.3	15.5	16.2
MAGNESIUM	*	NA	NA	NA	NA	NA	NA
MANGANESE	1800	NA	NA	NA	NA	NA	NA
MOLYBDENUM	390	NA	NA	NA	NA	NA	NA
NICKEL	*	NA	NA	NA	NA	NA	NA
POTASSIUM	*	NA	NA	NA	NA	NA	NA
SELENIUM	390	NA	NA	NA	NA	NA	NA
SILVER	390	NA	NA	NA	NA	NA	NA
SODIUM	*	NA	NA	NA	NA	NA	NA
THALLIUM	520	NA	NA	NA	NA	NA	NA
VANADIUM	550	NA	NA	NA	NA	NA	NA
ZINC	23000	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)							
		NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)							
		NA	NA	NA	NA	NA	NA
SVOCs (ug/kg)							
BENZO(A)ANTHRACENE	620	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	62	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	620	NA	NA	NA	NA	NA	NA
BENZO[G,H,I]PERYLENE	*	NA	NA	NA	NA	NA	NA
CHRYSENE	62000	NA	NA	NA	NA	NA	NA
FLUORANTHENE	2300000	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	620	NA	NA	NA	NA	NA	NA
PHENANTHRENE	*	NA	NA	NA	NA	NA	NA
PYRENE	2300000	NA	NA	NA	NA	NA	NA
VOCs (ug/kg)							
2-BUTANONE	7300000	NA	NA	NA	NA	NA	NA
ACETONE	1600000	NA	NA	NA	NA	NA	NA
TRICHLOROETHENE	2800	NA	NA	NA	NA	NA	NA
Other Compounds							
SULFATE (mg/kg)	*	50U	29U	27U	61U	39U	50U
TOTAL SOLIDS (%)	*	93	79	78	94	81	78

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05SB23(0-0.5)	MY05SB23(2-12)	MY05SB23(6-8)	MY05SB23(12-14)	MY05SB24(0-0.5)	MY05SB24(6-8)	MY05SB24(8-10)	MY05SB48(0-0.5)	MY05SB48(6-8)
Duplicates										
Date Collected		10/4/2001	10/4/2001	10/4/2001	10/8/2001	10/9/2001	10/10/2001	10/10/2001	10/8/2001	10/9/2001
Sample Delivery Group		MY010	MY010	MY010	MY010	MY010	MY010	MY010	MY010	MY010
EPH (mg/kg)										
C11-C22 AROMATICS	100	NA	ND	NA	ND	NA	19 J	ND	NA	ND
C19-C36 ALIPHATICS	100	NA	8.2	NA	10 J	NA	ND	57 J	NA	ND
C9-C18 ALIPHATICS	100	NA	12 J	NA	7.3 R	NA	7 R	20 J	NA	7.4 R
Metals (mg/kg)										
ALUMINUM	76000	11400	NA	NA	26100	17900	NA	20800	15300	NA
ANTIMONY	31	ND	NA	NA	ND	ND	NA	ND	ND	NA
ARSENIC	22	6.4	NA	NA	14.8	11.3	NA	11.3	8.5	NA
BARIUM	5400	48.2	NA	NA	96	75	NA	80.2	76.8	NA
BERYLLIUM	150	0.39	NA	NA	0.86	0.65	NA	0.77	0.54	NA
BORON	5500	ND	NA	NA	ND	ND	NA	ND	ND	NA
CADMIUM	37	0.09	NA	NA	0.09	0.08	NA	0.04	0.08	NA
CALCIUM	*	1780	NA	NA	2220	2910	NA	2020	3050	NA
CHROMIUM	210	22.4	NA	NA	55.7	37	NA	39.5	33.9	NA
COBALT	4700	7.2	NA	NA	15.8	10.4	NA	11.8	8.6	NA
COPPER	2900	17.8	NA	NA	25.5	20	NA	20.3	16.2	NA
IRON	23000	17400	NA	NA	**37000**	**25000**	NA	**26800**	20400	NA
LEAD	400	9.3	NA	NA	14	11.6	NA	9.4	10.1	NA
MAGNESIUM	*	5290	NA	NA	8960	7280	NA	7740	5870	NA
MANGANESE	1800	334	NA	NA	731	436	NA	448	360	NA
MERCURY	6.1	0.06	NA	NA	ND	ND	NA	ND	ND	NA
MOLYBDENUM	390	0.76	NA	NA	1.1	1	NA	0.77	0.93	NA
NICkEL	*	17.6	NA	NA	46.2	29.2	NA	31.8	27.5	NA
POTASSIUM	*	2670	NA	NA	5120	4340	NA	4860	3380	NA
SELENIUM	390	ND	NA	NA	ND	ND	NA	ND	ND	NA
SILVER	390	0.1	NA	NA	0.17	0.06	NA	0.05	0.06	NA
SODIUM	*	ND	NA	NA	ND	ND	NA	290	ND	NA
THALLIUM	520	ND	NA	NA	ND	ND	NA	ND	ND	NA
VANADIUM	550	27.6	NA	NA	54.4	38.7	NA	41.2	32.4	NA
ZINC	23000	56.1	NA	NA	75.9	77.2	NA	59.2	60.3	NA
PCBs (ug/kg)										
AROCLOR-1242	220	ND	NA	NA	ND	ND	NA	ND	ND	NA
AROCLOR-1254	220	ND	NA	NA	ND	ND	NA	ND	ND	NA
AROCLOR-1260	220	ND	NA	NA	ND	ND	NA	ND	ND	NA
Pesticides (ug/kg)										
ALDRIN	29	ND	NA	NA	ND	ND	NA	ND	ND	NA
DIELDRIN	30	ND	NA	NA	ND	ND	NA	ND	ND	NA
SVOCs (ug/kg)										
3,3'-DICHLOROBENZIDINE	1100	ND	NA	NA	ND	ND	NA	ND	ND	NA
3-NITROANILINE	*	ND	NA	NA	ND	ND	NA	ND	ND	NA
4-METHYLPHENOL	3100000	ND	NA	NA	ND	ND	NA	ND	ND	NA
4-NITROANILINE	*	ND	NA	NA	ND	ND	NA	ND	ND	NA
ANTHRACENE	2200000	ND	NA	NA	ND	ND	NA	ND	ND	NA
BENZO(A)ANTHRACENE	620	ND	NA	NA	ND	ND	NA	ND	ND	NA
BENZO(A)PYRENE	62	ND	NA	NA	ND	ND	NA	ND	ND	NA

Table 4-18A

Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)

Detected Compounds

Analyte	PAL	MY05SB23(0-0.5)	MY05SB23(2-12)	MY05SB23(6-8)	MY05SB23(12-14)	MY05SB24(0-0.5)	MY05SB24(6-8)	MY05SB24(8-10)	MY05SB48(0-0.5)	MY05SB48(6-8)
Duplicates										
Date Collected		10/4/2001	10/4/2001	10/4/2001	10/8/2001	10/9/2001	10/10/2001	10/10/2001	10/8/2001	10/9/2001
Sample Delivery Group		MY010	MY010	MY010	MY010	MY010	MY010	MY010	MY010	MY010
BENZO(B)FLUORANTHENE	620	ND	NA	NA	ND	ND	NA	ND	ND	NA
BENZO(k)FLUORANTHENE	6200	ND	NA	NA	ND	ND	NA	ND	ND	NA
BENZO[G,H,I]PERYLENE	*	ND	NA	NA	ND	ND	NA	ND	ND	NA
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	NA	NA	ND	ND	NA	ND	ND	NA
CARBAZOLE	24000	ND	NA	NA	ND	ND	NA	ND	ND	NA
CHRYSENE	62000	ND	NA	NA	ND	ND	NA	ND	ND	NA
DIBENZO(A,H)ANTHRACENE	62	ND	NA	NA	ND	ND	NA	ND	ND	NA
FLUORANTHENE	2300000	ND	NA	NA	ND	ND	NA	ND	ND	NA
FLUORENE	2600000	ND	NA	NA	ND	ND	NA	ND	ND	NA
INDENO(1,2,3-CD)PYRENE	620	ND	NA	NA	ND	ND	NA	ND	ND	NA
PHENANTHRENE	*	ND	NA	NA	ND	ND	NA	ND	ND	NA
PYRENE	2300000	ND	NA	NA	ND	ND	NA	ND	ND	NA
VOCs (ug/kg)										
2-BUTANONE	7300000	ND	NA	ND	ND	ND	ND	ND	ND	ND
ACETONE	1600000	ND	NA	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	240	ND	NA	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	230000	ND	NA	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	NA	ND	ND	ND	ND	ND	ND	ND
TOLUENE	520000	ND	NA	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	2800	ND	NA	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	150	ND	NA	ND	ND	ND	ND	ND	ND	ND
Other Compounds										
TOTAL SOLIDS (%)	*	91	86	83	82	93	85	84	93	81
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05SB48(8-10) 10/9/2001 MY010	MY05SB49(0-0.5) 10/16/2001 MY010	MY05SB49(26-28) Dup. of MY05SB49(0-0.5) 10/16/2001 MY010	MY05SB49(12-14) 10/16/2001 MY010	MY05SB49(2-12) 10/17/2001 MY010	MY05SB49(6-8) 10/16/2001 MY010	MY05SB50(0-0.5) 11/14/2001 MY016	MY05SB58(0-0.5) Dup. of MY05SB50(0-0.5) 11/14/2001 MY016
EPH (mg/kg)									
C11-C22 AROMATICS	100	ND	NA	NA	ND	ND	NA	ND	ND
C19-C36 ALIPHATICS	100	10 J	NA	NA	ND	23	NA	ND	ND
C9-C18 ALIPHATICS	100	6.7 R	NA	NA	ND	ND	NA	ND	ND
Metals (mg/kg)									
ALUMINUM	76000	11100	16600	14200	20300	NA	NA	27300	27200
ANTIMONY	31	ND	0.05 R	0.03 R	ND	NA	NA	ND	ND
ARSENIC	22	8.8	9.1	8.1	11.5	NA	NA	12.1	15.7
BARIUM	5400	46.5	62.8	61.9	85.9	NA	NA	94.7	117
BERYLLIUM	150	0.38	0.59	0.56	0.67	NA	NA	1	1
BORON	5500	ND	ND	ND	ND	NA	NA	ND	5.8
CADMIUM	37	0.05	0.1	0.11	0.07	NA	NA	ND	ND
CALCIUM	*	1620	2150	2070	2510	NA	NA	2190 J	3960 J
CHROMIUM	210	21.2	35.9	30.1	47.1	NA	NA	55.3	56.4
COBALT	4700	7	9.6	8.3	13.1	NA	NA	16.9	19.8
COPPER	2900	12	17.4	16.5	22.3	NA	NA	20.4	25.7
IRON	23000	19900	**23000**	20600	**29000**	NA	NA	**35400**	**38200**
LEAD	400	5.6	10.7	10	10.2	NA	NA	15	20.4
MAGNESIUM	*	5260	6410	5120	7780	NA	NA	8350	8540
MANGANESE	1800	266	477	402	637	NA	NA	710 J	**1890 J**
MERCURY	6.1	ND	ND	ND	ND	NA	NA	0.03	0.04
MOLYBDENUM	390	0.69	0.92	0.74	0.87	NA	NA	ND	ND
NICkEL	*	15.9	26.9	22.7	37.8	NA	NA	41.1	46.5
POTASSIUM	*	3290	3410	3130	5980	NA	NA	4380	4710
SELENIUM	390	ND	ND	ND	ND	NA	NA	ND	ND
SILVER	390	ND	0.06	0.05	0.05	NA	NA	0.32 J	0.58 J
SODIUM	*	ND	ND	ND	300	NA	NA	ND	210
THALLIUM	520	ND	ND	ND	ND	NA	NA	ND	ND
VANADIUM	550	26.2	34.5	33.7	46	NA	NA	61.8	63.5
ZINC	23000	56.3	61.4	58.3	62.3	NA	NA	87.7 J	214 J
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	ND	ND	NA	NA	ND	ND
AROCLOR-1254	220	ND	ND	ND	ND	NA	NA	ND	ND
AROCLOR-1260	220	ND	ND	ND	ND	NA	NA	ND	ND
Pesticides (ug/kg)									
ALDRIN	29	ND	NA	NA	ND	NA	NA	ND	ND
DIELDRIN	30	ND	NA	NA	ND	NA	NA	ND	ND
SVOCs (ug/kg)									
3,3'-DICHLOROBENZIDINE	1100	ND	ND	ND	ND	NA	NA	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	NA	NA	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	NA	NA	ND	ND
4-NITROANILINE	*	ND	ND	ND	ND	NA	NA	ND	ND
ANTHRACENE	2200000	ND	ND	ND	ND	NA	NA	ND	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND	ND	NA	NA	ND	ND
BENZO(A)PYRENE	62	ND	ND	ND	ND	NA	NA	ND	ND

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05SB48(8-10)	MY05SB49(0-0.5)	MY05SB49(26-28)	MY05SB49(12-14)	MY05SB49(2-12)	MY05SB49(6-8)	MY05SB50(0-0.5)	MY05SB58(0-0.5)
Duplicates				Dup. of MY05SB49(0-0.5)					Dup. of MY05SB50(0-0.5)
Date Collected		10/9/2001	10/16/2001	10/16/2001	10/16/2001	10/17/2001	10/16/2001	11/14/2001	11/14/2001
Sample Delivery Group		MY010	MY010	MY010	MY010	MY010	MY010	MY016	MY016
BENZO(B)FLUORANTHENE	620	ND	ND	ND	ND	NA	NA	ND	ND
BENZO(k)FLUORANTHENE	6200	ND	ND	ND	ND	NA	NA	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	NA	NA	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND	NA	NA	ND	ND
CARBAZOLE	24000	ND	ND	ND	ND	NA	NA	ND	ND
CHRYSENE	62000	ND	ND	ND	ND	NA	NA	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	NA	NA	ND	ND
FLUORANTHENE	2300000	ND	200 J	ND	ND	NA	NA	ND	ND
FLUORENE	2600000	ND	ND	ND	ND	NA	NA	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	ND	NA	NA	ND	ND
PHENANTHRENE	*	ND	ND	ND	ND	NA	NA	ND	ND
PYRENE	2300000	ND	ND	ND	ND	NA	NA	ND	ND
VOCs (ug/kg)									
2-BUTANONE	7300000	ND	ND	ND	ND	NA	ND	ND	ND
ACETONE	1600000	ND	ND	ND	ND	NA	ND	ND	45
CHLOROFORM	240	3 J	ND	ND	ND	NA	ND	ND	ND
ETHYLBENZENE	230000	ND	ND	ND	ND	NA	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	ND	ND	NA	ND	ND	ND
TOLUENE	520000	ND	ND	ND	ND	NA	ND	ND	ND
TRICHLOROETHENE	2800	ND	ND	ND	ND	NA	ND	ND	ND
VINYL CHLORIDE	150	ND	ND	ND	ND	NA	ND	ND	ND
Other Compounds									
TOTAL SOLIDS (%)	*	89	89	91	83	84	88	68	65
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	79	NA	NA	NA	NA

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SB51(0-0.5)	MY05SB56(0-0.5)	MY05SB52(0-0.5)	MY05SB52(14-16)	MY05SB52(2-14)	MY05SB52(6-8)	MY05SS104(0-0.5)	MY05SS98(0-0.5)
Duplicates			Dup. of MY05SB51(0-0.5)						Dup. of MY05SS104(0-0.5)
Date Collected		11/14/2001	11/14/2001	10/17/2001	10/18/2001	10/18/2001	10/18/2001	5/13/2002	
Sample Delivery Group		MY016	MY016	MY011	MY011	MY011	MY011	MY106	
EPH (mg/kg)									
C11-C22 AROMATICS	100	ND	ND	ND	ND	ND	NA	ND	ND
C19-C36 ALIPHATICS	100	ND	ND	16 J	ND	ND	NA	ND	7.8
C9-C18 ALIPHATICS	100	ND	ND	7 R	ND	ND	NA	ND	ND
Metals (mg/kg)									
ALUMINUM	76000	15400	14600	22100	17400	NA	NA	10900	10900
ANTIMONY	31	ND	ND	0.01 R	0.01 R	NA	NA	ND	ND
ARSENIC	22	7.9	7.2	12.5	8.9	NA	NA	9.4	9.6
BARIUM	5400	44.3	40.6	75.4	82.7	NA	NA	60.3	59.4
BERYLLIUM	150	0.63	0.6	0.86	0.79	NA	NA	0.65	0.54
BORON	5500	ND	1	5.4	5	NA	NA	ND	ND
CADMIUM	37	ND	ND	0.1	0.08	NA	NA	0.04 J	0.1
CALCIUM	*	1910	1890	2460	2030	NA	NA	1800	2260
CHROMIUM	210	26	24.2	47.3	40.3 J	NA	NA	19.7	22.5
COBALT	4700	7.6	7.2	14	11.4	NA	NA	5.6	6.4
COPPER	2900	11.4	11	25	25.6	NA	NA	17.4	18.5
IRON	23000	16300	15000	**30100**	**27500**	NA	NA	15900	22000
LEAD	400	14.9	14.1	14.6	10	NA	NA	12	16.3
MAGNESIUM	*	3450	3260	8260	7140	NA	NA	5490	5010
MANGANESE	1800	233	237	623	454	NA	NA	326	351
MERCURY	6.1	0.05	0.04	0.06	ND	NA	NA	ND	ND
MOLYBDENUM	390	ND	ND	1.1	0.7	NA	NA	ND	ND
NICkEL	*	18.1	17.1	38	31	NA	NA	15.9	22.8
POTASSIUM	*	1740	1550	5400	6120	NA	NA	2470 J	2400 J
SELENIUM	390	0.28 J	ND	ND	ND	NA	NA	ND	ND
SILVER	390	0.16 J	0.19 J	0.08	0.04	NA	NA	0.12 J	ND
SODIUM	*	ND	122	221 J	1480 J	NA	NA	128	155
THALLIUM	520	ND	ND	0.32	0.88	NA	NA	0.6 J	0.82 J
VANADIUM	550	33	30.3	47.4	43.7	NA	NA	21.2	19.8
ZINC	23000	44.2	41.8	73.9	68.4	NA	NA	69.5	85.4
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	ND	ND	NA	NA	ND	ND
AROCLOR-1254	220	ND	ND	ND	ND	NA	NA	ND	ND
AROCLOR-1260	220	ND	ND	ND	ND	NA	NA	ND	ND
Pesticides (ug/kg)									
ALDRIN	29	ND	ND	ND	ND	NA	NA	ND	ND
DIELDRIN	30	ND	ND	ND	ND	NA	NA	ND	ND
SVOCs (ug/kg)									
3,3'-DICHLOROBENZIDINE	1100	ND	ND	ND	ND	NA	NA	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	NA	NA	ND	880 R
4-METHYLPHENOL	3100000	ND	ND	ND	ND	NA	NA	ND	ND
4-NITROANILINE	*	ND	ND	ND	ND	NA	NA	ND	ND
ANTHRACENE	2200000	ND	ND	ND	ND	NA	NA	ND	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND	ND	NA	NA	ND	ND
BENZO(A)PYRENE	62	ND	ND	ND	ND	NA	NA	ND	ND

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05SB51(0-0.5) 11/14/2001 MY016	MY05SB56(0-0.5) Dup. of MY05SB51(0-0.5) 11/14/2001 MY016	MY05SB52(0-0.5) 10/17/2001 MY011	MY05SB52(14-16) 10/18/2001 MY011	MY05SB52(2-14) 10/18/2001 MY011	MY05SB52(6-8) 10/18/2001 MY011	MY05SS104(0-0.5) 5/13/2002 MY106	MY05SS98(0-0.5) Dup. of MY05SS104(0-0.5)
BENZO(B)FLUORANTHENE	620	ND	ND	ND	ND	NA	NA	ND	ND
BENZO(k)FLUORANTHENE	6200	ND	ND	ND	ND	NA	NA	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	NA	NA	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	250 J	ND	ND	NA	NA	ND	ND
CARBAZOLE	24000	ND	ND	ND	ND	NA	NA	ND	ND
CHRYSENE	62000	ND	ND	ND	ND	NA	NA	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	NA	NA	ND	ND
FLUORANTHENE	2300000	ND	ND	ND	ND	NA	NA	ND	ND
FLUORENE	2600000	ND	ND	ND	ND	NA	NA	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	ND	NA	NA	ND	ND
PHENANTHRENE	*	ND	ND	ND	ND	NA	NA	ND	ND
PYRENE	2300000	230 J	ND	ND	ND	NA	NA	ND	ND
VOCs (ug/kg)									
2-BUTANONE	7300000	ND	ND	ND	17 R	NA	23 R	10 R	10 R
ACETONE	1600000	ND	ND	21	ND	NA	ND	ND	ND
CHLOROFORM	240	ND	ND	ND	ND	NA	ND	ND	ND
ETHYLBENZENE	230000	ND	ND	ND	ND	NA	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	ND	ND	NA	ND	ND	ND
TOLUENE	520000	ND	ND	ND	ND	NA	ND	ND	ND
TRICHLOROETHENE	2800	ND	ND	ND	ND	NA	ND	ND	ND
VINYL CHLORIDE	150	ND	ND	ND	ND	NA	ND	ND	ND
Other Compounds									
TOTAL SOLIDS (%)	*	75	76	86	87	68	75	93	93
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05SS105(0-0.5)	MY05SS106(0-0.5)	MY05SS107(0-0.5)	MY05SS108(0-0.5)	MY05SS109(0-0.5)	MY05SS110(0-0.5)	MY05SS111(0-0.5)	MY05SS150(0-0.5)
Duplicates									Dup. of MY05SS111(0-0.5)
Date Collected		6/27/2002	6/27/2002	6/27/2002	6/27/2002	6/27/2002	6/27/2002	6/26/2002	6/26/2002
Sample Delivery Group		MY112	MY112	MY112	MY112	MY112	MY112	MY112	MY112
EPH (mg/kg)									
C11-C22 AROMATICS	100	ND	ND	ND	ND	ND	ND	ND	ND
C19-C36 ALIPHATICS	100	12 J	ND	16 J	ND	10 J	11 J	ND	ND
C9-C18 ALIPHATICS	100	ND	ND	ND	ND	ND	ND	ND	ND
Metals (mg/kg)									
ALUMINUM	76000	14000	16800	19600	16700	15200	12500	14700	16000
ANTIMONY	31	0.5 R	0.93 R	0.97 R	0.81 R	0.66 R	0.42 R	0.75 R	0.78 R
ARSENIC	22	12.9	11.5	12.3	11.6	15.1	8.7	10.8	11.1
BARIUM	5400	34.5	58.7	62.4	62.1	68.8	59.2	58.9	66
BERYLLIUM	150	ND	ND	1.1	0.86	0.78	ND	0.76	0.87
BORON	5500	15.4	10.7	21.7	5.9	3	2.3	5.1	9.1
CADMIUM	37	0.31	0.36	0.52	0.46	0.45	0.39	0.41	0.43
CALCIUM	*	9170 J	3250 J	4660 J	2230 J	1740 J	1690 J	2370 J	22500 J
CHROMIUM	210	37.3 J	47 J	48.8 J	40.8 J	34.8 J	30.5 J	36.5 J	39.1 J
COBALT	4700	6.3	8.3	10.4	10.9	9.6	7.8	9.6	9.4
COPPER	2900	13 J	18 J	19.9 J	17.9 J	18 J	24.5 J	19.1 J	42.2 J
IRON	23000	**23200**	**28500**	**37200**	**27400**	**24200**	19500	**25200**	**29000**
LEAD	400	10.4	12.4	15.9	10.7	12.2	20.4	9	13.9
MAGNESIUM	*	5740	8100	8120	7710	7250	5700	6940	6930
MANGANESE	1800	220	275	436	476	423	338	384	386
MERCURY	6.1	0.02 J	ND	0.03	0.06	ND	ND	0.02 J	0.03
MOLYBDENUM	390	ND	ND	ND	ND	ND	ND	ND	1.6
NICkEL	*	22.2	28.4	32.2	31.3	26.6	23	27.9	28.9
POTASSIUM	*	3320	4240	5170	4150	3690	3060	4460	4150
SELENIUM	390	0.59 J	ND	ND	ND	ND	ND	ND	ND
SILVER	390	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM	*	261 J	311 J	340 J	257 J	144 J	140 J	266 J	538 J
THALLIUM	520	ND	ND	ND	1 J	0.98 J	ND	0.95 J	1.3 J
VANADIUM	550	38.2	41.8	49.1	38.9	36	27.8	35.5	40.1
ZINC	23000	47.6	62.3	83.7	63.1	68.2	58.5	56.2	66.1
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1254	220	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)									
ALDRIN	29	ND	ND	ND	ND	ND	ND	ND	ND
DIELDRIN	30	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)									
3,3'-DICHLOROBENZIDINE	1100	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	2200000	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND	ND	ND	ND	ND	220 J
BENZO(A)PYRENE	62	ND	ND	ND	ND	ND	ND	ND	**240 J**

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05SS105(0-0.5)	MY05SS106(0-0.5)	MY05SS107(0-0.5)	MY05SS108(0-0.5)	MY05SS109(0-0.5)	MY05SS110(0-0.5)	MY05SS111(0-0.5)	MY05SS150(0-0.5)
Duplicates									**Dup. of MY05SS111(0-0.5)**
Date Collected		**6/27/2002**	**6/27/2002**	**6/27/2002**	**6/27/2002**	**6/27/2002**	**6/27/2002**	**6/26/2002**	**6/26/2002**
Sample Delivery Group		**MY112**	**MY112**	**MY112**	**MY112**	**MY112**	**MY112**	**MY112**	**MY112**
BENZO(B)FLUORANTHENE	620	ND	ND	ND	ND	ND	ND	ND	210 J
BENZO(k)FLUORANTHENE	6200	ND	ND	ND	ND	ND	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	24000	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	62000	ND	ND	ND	ND	ND	ND	ND	230 J
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	2300000	ND	ND	ND	ND	ND	ND	ND	320 J
FLUORENE	2600000	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	ND	ND	ND	ND	ND	ND	ND	210 J
PYRENE	2300000	ND	ND	ND	ND	ND	ND	ND	380 J
VOCs (ug/kg)									
2-BUTANONE	7300000	14 R	13 R	19 R	13 R	10 R	14 R	10 R	39 J
ACETONE	1600000	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	240	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	230000	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	520000	ND	ND	ND	ND	ND	ND	3 J	ND
TRICHLOROETHENE	2800	ND	ND	ND	ND	ND	ND	ND	ND
VINYL CHLORIDE	150	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds									
TOTAL SOLIDS (%)	*	70	75	66	82	96	84	84	84
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05SS112(0-0.5)	MY05SS113(0-0.5)	MY05SS151(0-0.5)	MY05SS114(0-0.5)	MY05SS115(0-0.5)	MY05SS116(0-0.5)	MY05SS117(0-0.5)	MY05SS118(0-0.5)
Duplicates				Dup. of MY05SS113(0-0.5)					
Date Collected		6/27/2002	6/27/2002	6/27/2002	6/26/2002	6/26/2002	6/26/2002	6/26/2002	6/26/2002
Sample Delivery Group		MY114	MY114	MY114	MY112	MY112	MY112	MY112	MY112
EPH (mg/kg)									
C11-C22 AROMATICS	100	ND	20	ND	ND	ND	ND	ND	ND
C19-C36 ALIPHATICS	100	7.4 J	12 J	13 J	ND	ND	ND	12	ND
C9-C18 ALIPHATICS	100	ND	ND	ND	ND	ND	ND	ND	ND
Metals (mg/kg)									
ALUMINUM	76000	20400	17900	18500	20400	17200	16300	17500	18100
ANTIMONY	31	0.8 R	0.85 R	0.79 R	0.79 R	0.79 R	0.75 R	0.77 R	0.71 R
ARSENIC	22	11.7	9.6	9.8	13	11.4	10.4	12.6	10.9
BARIUM	5400	71.2	72.9	75.9	76.2	67.7	63.8	78.1	59.7
BERYLLIUM	150	0.65	0.63	0.64	ND	ND	ND	0.77	0.9
BORON	5500	4.3 J	ND	4.4 J	3.7	4.1	6.1	4.3	9.3
CADMIUM	37	ND	ND	ND	0.48	0.43	0.43	0.42	0.47
CALCIUM	*	3530	2640	2940	1850 J	1980 J	2280 J	2310 J	2490 J
CHROMIUM	210	46.3 J	37.7 J	42.5 J	46.7 J	40.3 J	38.9 J	42.1 J	42.4 J
COBALT	4700	14.7	12.6	13.2	13.4	10.5	9.5	11.1	10.9
COPPER	2900	25.3	32.2	28.4	20 J	19.6 J	18.1 J	26 J	19.6 J
IRON	23000	**31700**	**29000**	**28800**	**30400**	**27200**	**26500**	**28000**	**28400**
LEAD	400	11.9	10.5	11.7	13.4	10.9	9.1	10.6	11.2
MAGNESIUM	*	8650	7190	7340	8100	7310	7490	8080	7900
MANGANESE	1800	571	443	452	657	465	400	511	385
MERCURY	6.1	ND	ND	ND	ND	ND	ND	ND	0.03
MOLYBDENUM	390	ND	ND	ND	ND	ND	ND	ND	ND
NICkEL	*	40.7	32.1	32.9	35.5	30.6	28.7	32.4	35.2
POTASSIUM	*	5360	4720	5320	3980	3940	4740	4880	4800
SELENIUM	390	ND	ND	ND	ND	ND	ND	ND	0.77 J
SILVER	390	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM	*	207	196	226	163 J	155 J	177 J	249 J	303 J
THALLIUM	520	ND	ND	ND	1.3 J	ND	ND	ND	ND
VANADIUM	550	44.9	43.1	44.9	44.2	38.8	38.4	39.8	41.4
ZINC	23000	69.9 J	67.1 J	69 J	70.1	62.2	60.7	65.1	75.9
PCBs (ug/kg)									
AROCLOR-1242	220	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1254	220	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1260	220	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)									
ALDRIN	29	ND	ND	ND	ND	ND	ND	ND	ND
DIELDRIN	30	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)									
3,3'-DICHLOROBENZIDINE	1100	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND
4-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	2200000	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE	62	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SS112(0-0.5)	MY05SS113(0-0.5)	MY05SS151(0-0.5)	MY05SS114(0-0.5)	MY05SS115(0-0.5)	MY05SS116(0-0.5)	MY05SS117(0-0.5)	MY05SS118(0-0.5)
Duplicates				Dup. of MY05SS113(0-0.5)					
Date Collected		6/27/2002	6/27/2002	6/27/2002	6/26/2002	6/26/2002	6/26/2002	6/26/2002	6/26/2002
Sample Delivery Group		MY114	MY114	MY114	MY112	MY112	MY112	MY112	MY112
BENZO(B)FLUORANTHENE	620	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(k)FLUORANTHENE	6200	ND	ND	ND	ND	ND	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	ND	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	270 J	ND	ND	ND	ND	ND	ND
CARBAZOLE	24000	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	62000	ND	ND	ND	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	2300000	ND	240 J	ND	ND	ND	ND	ND	ND
FLUORENE	2600000	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	ND	ND	ND	ND	ND	ND	ND	ND
PYRENE	2300000	ND	250 J	220 J	ND	ND	ND	ND	ND
VOCs (ug/kg)									
2-BUTANONE	7300000	11 R	10 R	11 R	NA	NA	NA	NA	NA
ACETONE	1600000	ND	ND	ND	NA	NA	NA	NA	NA
CHLOROFORM	240	ND	ND	ND	NA	NA	NA	NA	NA
ETHYLBENZENE	230000	ND	ND	ND	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	8900	ND	ND	ND	NA	NA	NA	NA	NA
TOLUENE	520000	ND	ND	ND	NA	NA	NA	NA	NA
TRICHLOROETHENE	2800	ND	ND	ND	NA	NA	NA	NA	NA
VINYL CHLORIDE	150	ND	ND	ND	NA	NA	NA	NA	NA
Other Compounds									
TOTAL SOLIDS (%)	*	82	80	80	85	84	86	84	80
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SS119(0-0.5)	MY05SS12(0-0.5)	MY05SS13(0-0.5)	MY05TP107A(9-11)	MY05TP110A(7-9)	MY05TP111A(9-11)	MY05TP113(7-9)	MY05TP115(7-9)	MY05TP136(7-9)
Duplicates										Dup. of MY05TP115(7-9)
Date Collected		6/26/2002	9/25/2001	9/25/2001	6/3/2002	6/4/2002	6/4/2002	6/5/2002	6/5/2002	6/5/2002
Sample Delivery Group		MY112	MY004	MY004	MY110	MY110	MY110	MY110	MY110	MY110
EPH (mg/kg)										
C11-C22 AROMATICS	100	ND	NA	NA	**190**	**64**	**73**	**60**	ND	ND
C19-C36 ALIPHATICS	100	ND	NA	NA	**450 J**	**200 J**	**310 J**	**560**	26	25
C9-C18 ALIPHATICS	100	ND	NA	NA	**33 J**	**120 J**	**ND**	**32**	ND	ND
Metals (mg/kg)										
ALUMINUM	76000	14700	15800	15000	12000	14800	14000	12800	13700	14000
ANTIMONY	31	0.79 R	0.06 R	0.04 R	1.2 J	ND	1.9 J	2.2 J	ND	ND
ARSENIC	22	9.7	9.6	7	8.6	10.9	9.1	10.4	10.6	8.8
BARIUM	5400	49.1	66.1	48	118	113	88.6	71.7	61.6	66.2
BERYLLIUM	150	0.9	0.64	0.62	ND	ND	ND	ND	ND	ND
BORON	5500	8	ND	4.6	23.4	8.1	5.6	9.1	ND	ND
CADMIUM	37	0.38	0.5 J	ND	1.4	ND	1.6	0.64	ND	ND
CALCIUM	*	2640 J	2180	2520	32100	8230	8680	2420	1750	2310
CHROMIUM	210	36.4 J	36.3 J	33.6 J	162 J	45.2 J	46.5 J	36.7 J	31.5 J	34.5 J
COBALT	4700	8.6	11.8	12.1	8.6	9.2	8.6	9.8	11	12.5
COPPER	2900	14.6 J	19.3	20.1	62.7	65.6	69.1	92.7	18.2	22.9
IRON	23000	**26000**	**24500**	**26100**	**42600**	**38500**	**25400**	**37400**	**24700**	**31300**
LEAD	400	8.7	11.1	8.8	396	51.1	36.5	24.2	15.2	9.5
MAGNESIUM	*	6810	6600	6650	5680	5960	6320	5610	5970	6820
MANGANESE	1800	323	448	426	550	771	451	485	453	737
MERCURY	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM	390	ND	ND	1	ND	ND	ND	ND	ND	ND
NICkEL	*	24.4	30.3	28.9	122	62.1	35.8	64.2	27	32.3
POTASSIUM	*	4480	3920	3530	2790	3790	3860	3460	3650	3940
SELENIUM	390	ND	ND	ND	ND	ND	ND	ND	ND	ND
SILVER	390	ND	ND	ND	0.31 J	0.85	ND	ND	ND	ND
SODIUM	*	290 J	126 J	128 J	822	601	464	488	463	519
THALLIUM	520	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	550	36.3	35.8	35.4	43.4	32.9	34.2	30.8	33.6	37
ZINC	23000	57.6	74.4 J	74.7 J	176 J	208 J	179 J	302 J	69.7 J	74.8 J
PCBs (ug/kg)										
AROCLOR-1242	220	ND	ND	ND	ND	ND	98	24	ND	ND
AROCLOR-1254	220	ND	ND	ND	ND	27	130	48	ND	ND
AROCLOR-1260	220	ND	ND	ND	52	ND	75 J	ND	ND	ND
Pesticides (ug/kg)										
ALDRIN	29	ND	ND	ND	ND	ND	ND	4.1	ND	ND
DIELDRIN	30	ND	ND	ND	7	4.5	ND	ND	ND	ND
SVOCs (ug/kg)										
3,3'-DICHLOROBENZIDINE	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	ND	980 R	900 R	ND	980 R	1000 R	1000 R	ND	960 R
4-METHYLPHENOL	3100000	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	2200000	ND	440	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	620	ND	**1100**	ND	380 J	ND	210 J	ND	ND	ND
BENZO(A)PYRENE	62	ND	**860**	ND	**620**	ND	**470**	ND	ND	ND

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05SS119(0-0.5)	MY05SS12(0-0.5)	MY05SS13(0-0.5)	MY05TP107A(9-11)	MY05TP110A(7-9)	MY05TP111A(9-11)	MY05TP113(7-9)	MY05TP115(7-9)	MY05TP136(7-9)
Duplicates										Dup. of MY05TP115(7-9)
Date Collected		6/26/2002	9/25/2001	9/25/2001	6/3/2002	6/4/2002	6/4/2002	6/5/2002	6/5/2002	6/5/2002
Sample Delivery Group		MY112	MY004	MY004	MY110	MY110	MY110	MY110	MY110	MY110
BENZO(B)FLUORANTHENE	620	ND	**1100**	ND	**740**	ND	480	ND	ND	ND
BENZO(k)FLUORANTHENE	6200	ND	350 J	ND	560	ND	420	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	ND	360 J	ND	490	ND	350 J	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND	ND	1100	ND	ND	ND
CARBAZOLE	24000	ND	350 J	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	62000	ND	1000	ND	360 J	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND	ND	**420**	ND	ND	ND
FLUORANTHENE	2300000	ND	2400	ND	680	ND	580	ND	ND	ND
FLUORENE	2600000	ND	200 J	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	440	ND	560	ND	410	ND	ND	ND
PHENANTHRENE	*	ND	1800	ND	380 J	ND	510	ND	ND	ND
PYRENE	2300000	ND	2200	ND	540	ND	420	ND	ND	ND
VOCs (ug/kg)										
2-BUTANONE	7300000	NA	ND	ND	12 R	10 R	11 R	11 R	10 R	10 R
ACETONE	1600000	NA	ND	ND	20	5 J	ND	11 J	ND	20
CHLOROFORM	240	NA	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	230000	NA	ND	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	8900	NA	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	520000	NA	ND	ND	ND	ND	6	ND	5 J	ND
TRICHLOROETHENE	2800	NA	ND	ND	ND	ND	ND	ND	4 J	6 J
VINYL CHLORIDE	150	NA	ND	ND	ND	ND	ND	10 J	24	29
Other Compounds										
TOTAL SOLIDS (%)	*	84	86	87	74	83	80	81	85	85
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05TP116(6-8)	MY05TP118(13-15)	MY05TP125(6-8)	MY05TP129(7-9)
Duplicates					
Date Collected		6/6/2002	6/6/2002	6/10/2002	6/10/2002
Sample Delivery Group		MY110	MY110	MY110	MY110
EPH (mg/kg)					
C11-C22 AROMATICS	100	ND	ND	ND	ND
C19-C36 ALIPHATICS	100	24	8.6 J	59	55
C9-C18 ALIPHATICS	100	11	ND	ND	13
Metals (mg/kg)					
ALUMINUM	76000	19000	21300	18800	14100
ANTIMONY	31	ND	ND	ND	ND
ARSENIC	22	10.4	10.3	13.1	11.8
BARIUM	5400	69.6	78.9	73.6	58
BERYLLIUM	150	ND	ND	ND	ND
BORON	5500	ND	ND	ND	8.7
CADMIUM	37	ND	ND	ND	ND
CALCIUM	*	2050	1400	2490	3370
CHROMIUM	210	43.1 J	45.8 J	44.9 J	42.1 J
COBALT	4700	12.3	12.8	12.3	10.4
COPPER	2900	17	17.7	15.7	19.2
IRON	23000	**28400**	**29800**	**30900**	21700
LEAD	400	11.6	11.2	11.6	14.7
MAGNESIUM	*	6920	7010	6830	6020
MANGANESE	1800	463	550	534	348
MERCURY	6.1	ND	ND	ND	ND
MOLYBDENUM	390	ND	ND	ND	ND
NICkEL	*	29.9	34	32.7	153
POTASSIUM	*	3910	3900	4320	3770
SELENIUM	390	1.3 J	ND	0.9 J	0.86 J
SILVER	390	ND	ND	ND	ND
SODIUM	*	449	ND	898	692
THALLIUM	520	ND	ND	ND	ND
VANADIUM	550	43.3	45.6	44.5	35.3
ZINC	23000	63.4 J	62.2 J	196 J	70.7 J
PCBs (ug/kg)					
AROCLOR-1242	220	ND	ND	ND	ND
AROCLOR-1254	220	ND	ND	ND	ND
AROCLOR-1260	220	ND	ND	ND	ND
Pesticides (ug/kg)					
ALDRIN	29	ND	ND	ND	ND
DIELDRIN	30	ND	ND	ND	ND
SVOCs (ug/kg)					
3,3'-DICHLOROBENZIDINE	1100	420 R	ND	390 R	ND
3-NITROANILINE	*	1000 R	1000 R	970 R	960 R
4-METHYLPHENOL	3100000	ND	470	ND	ND
4-NITROANILINE	*	ND	ND	970 R	ND
ANTHRACENE	2200000	ND	ND	ND	ND
BENZO(A)ANTHRACENE	620	ND	ND	ND	ND
BENZO(A)PYRENE	62	ND	ND	ND	**410**

Table 4-18A
Study Area 5 - Northern Bailey Point Soil Analytical Results (345 kV Area)
Detected Compounds

Analyte	PAL	MY05TP116(6-8)	MY05TP118(13-15)	MY05TP125(6-8)	MY05TP129(7-9)
Duplicates					
Date Collected		**6/6/2002**	**6/6/2002**	**6/10/2002**	**6/10/2002**
Sample Delivery Group		**MY110**	**MY110**	**MY110**	**MY110**
BENZO(B)FLUORANTHENE	620	ND	ND	ND	410
BENZO(k)FLUORANTHENE	6200	ND	ND	ND	380 J
BENZO[G,H,I]PERYLENE	*	ND	ND	ND	310 J
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	ND	ND	ND
CARBAZOLE	24000	ND	ND	ND	ND
CHRYSENE	62000	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	62	ND	ND	ND	ND
FLUORANTHENE	2300000	ND	ND	ND	460
FLUORENE	2600000	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	620	ND	ND	ND	360 J
PHENANTHRENE	*	ND	ND	ND	250 J
PYRENE	2300000	ND	ND	ND	250 J
VOCs (ug/kg)					
2-BUTANONE	7300000	12 R	35 J	10 R	10 R
ACETONE	1600000	30	93	27	31
CHLOROFORM	240	ND	ND	ND	ND
ETHYLBENZENE	230000	ND	3 J	ND	ND
METHYLENE CHLORIDE	8900	ND	4 J	ND	ND
TOLUENE	520000	10	76	3 J	5 J
TRICHLOROETHENE	2800	ND	ND	ND	ND
VINYL CHLORIDE	150	10 J	ND	ND	ND
Other Compounds					
TOTAL SOLIDS (%)	*	78	78	84	86
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	NA

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-18B
Study Area 5 - Northern Bailey Point Soil Analytical Results (Pre-Op Basin)
Detected Compounds

Analyte	PAL	MY05SB42(0-0.5)	MY05SB42(2-4)	MY05SB42(4-6)	MY05SB43(0-0.5)	MY05SB43(2-4)	MY05SB43(6-8)	MY05SB53(8-10)	MY05SB44(4.7-6.7)	MY05SB44(10-12)	MY05SB44(14-16)	MY05SB44(6.7-14)
Duplicates								**Dup. of MY05SB43(6-8)**				
Date Collected		**10/1/2001**	**10/1/2001**	**10/1/2001**	**10/1/2001**	**10/1/2001**	**10/1/2001**	**10/1/2001**	**9/27/2001**	**9/27/2001**	**9/27/2001**	**9/27/2001**
Sample Delivery Group		**MY009**	**MY009**	**MY009**	**MY009**	**MY009**	**MY009**	**MY009**	**MY007**	**MY007**	**MY007**	**MY007**
EPH (mg/kg)												
C11-C22 AROMATICS	100	ND	ND	ND	24	ND	ND	ND	NA	NA	ND	**110**
C19-C36 ALIPHATICS	100	7.4	7.5	12	8	ND	ND	ND	NA	NA	ND	**ND**
C9-C18 ALIPHATICS	100	ND	ND	7.3 R	ND	ND	7.6 R	7.6 R	NA	NA	7.8 R	**7.6 R**
Metals (mg/kg)												
ALUMINUM	76000	NA	NA	28200	NA	NA	27100	27700	29000	NA	26500	NA
ANTIMONY	31	NA	NA	0.1	NA	NA	0.08	0.08	0.16 J	NA	0.11 J	NA
ARSENIC	22	NA	NA	15.3	NA	NA	14.6	16.6	16	NA	12.4	NA
BARIUM	5400	NA	NA	92.1	NA	NA	97.2	96.5	97.5	NA	107	NA
BERYLLIUM	150	NA	NA	0.89	NA	NA	0.79	0.84	1	NA	0.77	NA
BORON	5500	NA	NA	5.4	NA	NA	3.1	3.2	ND	NA	ND	NA
CADMIUM	37	NA	NA	ND	NA	NA	ND	ND	0.03	NA	0.1	NA
CALCIUM	*	NA	NA	1910	NA	NA	2310	2230	2170	NA	3730	NA
CHROMIUM	210	NA	NA	55.3 J	NA	NA	62.1 J	63.2 J	60.8	NA	62.2	NA
COBALT	4700	NA	NA	17.9	NA	NA	18.8	17.6	17.8	NA	15	NA
COPPER	2900	NA	NA	24 J	NA	NA	26.9 J	29.1 J	29.4	NA	25.6	NA
IRON	23000	NA	NA	**39300**	NA	NA	**38400**	**40000**	**40500**	NA	**36900**	NA
LEAD	400	NA	NA	14.1	NA	NA	14.5	15.2	13.9	NA	12.8	NA
MAGNESIUM	*	NA	NA	9120	NA	NA	9760	9940	9100	NA	12000	NA
MANGANESE	1800	NA	NA	745	NA	NA	737	825	802	NA	582	NA
MERCURY	6.1	NA	NA	ND	NA	NA	ND	ND	0.01 J	NA	0.01 J	NA
MOLYBDENUM	390	NA	NA	ND	NA	NA	ND	ND	1.2	NA	0.67	NA
NICkEL	*	NA	NA	48.7	NA	NA	48.5	53.4	49.8	NA	48.4	NA
POTASSIUM	*	NA	NA	4580	NA	NA	5880	5760	5870	NA	8470	NA
SELENIUM	390	NA	NA	ND	NA	NA	ND	ND	ND	NA	ND	NA
SILVER	390	NA	NA	ND	NA	NA	ND	ND	0.06	NA	0.07	NA
SODIUM	*	NA	NA	390	NA	NA	204	192	441	NA	332	NA
THALLIUM	520	NA	NA	ND	NA	NA	ND	ND	ND	NA	ND	NA
VANADIUM	550	NA	NA	54.1	NA	NA	57.9	58.2	59.6	NA	56.3	NA
ZINC	23000	NA	NA	73.4	NA	NA	78	82.4	78.2	NA	80.9	NA
PCBs (ug/kg)												
		NA	NA	ND	NA	NA	ND	ND	ND	NA	ND	NA
Pesticides (ug/kg)												
		NA	NA	ND	NA	NA	ND	ND	ND	NA	ND	NA
SVOCs (ug/kg)												
		NA	NA	ND	NA	NA	ND	ND	ND	NA	ND	NA
VOCs (ug/kg)												
2-BUTANONE	7300000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
TRICHLOROETHENE	2800	5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Other Compounds												
TOTAL SOLIDS (%)	*	82	81	82	78	81	78	79	80	78	77	79

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-18B
Study Area 5 - Northern Bailey Point Soil Analytical Results (Pre-Op Basin)
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05SB45(0-0.5) 10/1/2001 MY009	MY05SB45(2-4) 10/1/2001 MY009	MY05SB45(4-6) 10/1/2001 MY009	MY05SB46(0-0.5) 10/2/2001 MY009	MY05SB46(2-4) 10/2/2001 MY009	MY05SB46(4-6) 10/2/2001 MY009	MY05SB47(0-0.5) 10/3/2001 MY009	MY05SB47(2-4) 10/3/2001 MY009	MY05SB47(4-6) 10/3/2001 MY009
EPH (mg/kg)										
C11-C22 AROMATICS	100	32	ND	ND	ND	ND	ND	NA	ND	ND
C19-C36 ALIPHATICS	100	11	7.9	ND	ND	ND	ND	NA	ND	ND
C9-C18 ALIPHATICS	100	ND	7.2 R	7.6 R	ND	ND	ND	NA	ND	ND
Metals (mg/kg)										
ALUMINUM	76000	NA	22400	28100	NA	NA	28400	22200	NA	9580
ANTIMONY	31	NA	0.02 J	0.05	NA	NA	0.05	0.02 J	NA	ND
ARSENIC	22	NA	10.8	15.3	NA	NA	16.2	8.4	NA	7.9
BARIUM	5400	NA	74.9	93.7	NA	NA	106	75.7	NA	35.7
BERYLLIUM	150	NA	0.75	0.86	NA	NA	0.86	0.78	NA	0.39
BORON	5500	NA	3.5	4.4	NA	NA	3.1	ND	NA	ND
CADMIUM	37	NA	ND	ND	NA	NA	ND	0.3	NA	ND
CALCIUM	*	NA	1500	2020	NA	NA	2190	1450	NA	685
CHROMIUM	210	NA	43.5 J	58.5 J	NA	NA	63.2 J	39.2 J	NA	15.9 J
COBALT	4700	NA	11.9	17.7	NA	NA	16.8	10.5	NA	5
COPPER	2900	NA	16.9 J	25.3 J	NA	NA	27 J	14.2 J	NA	11.1 J
IRON	23000	NA	**28200**	**38900**	NA	NA	**39400**	**24700**	NA	12100
LEAD	400	NA	15.4	14.5	NA	NA	14	29.4	NA	4.4
MAGNESIUM	*	NA	6400	9160	NA	NA	9700	5740	NA	2790
MANGANESE	1800	NA	590	796	NA	NA	807	740	NA	260
MERCURY	6.1	NA	ND	ND	NA	NA	ND	0.08	NA	ND
MOLYBDENUM	390	NA	ND	ND	NA	NA	ND	ND	NA	ND
NICkEL	*	NA	32.4	49.3	NA	NA	50.1	31.8	NA	14
POTASSIUM	*	NA	3410	5060	NA	NA	5760	2050	NA	1360
SELENIUM	390	NA	ND	ND	NA	NA	ND	ND	NA	ND
SILVER	390	NA	ND	ND	NA	NA	ND	ND	NA	ND
SODIUM	*	NA	123	193	NA	NA	362	93.5	NA	67.6
THALLIUM	520	NA	ND	ND	NA	NA	ND	ND	NA	ND
VANADIUM	550	NA	44.8	56.4	NA	NA	59.8	39.8	NA	17.8
ZINC	23000	NA	68.3	76	NA	NA	76.9	466	NA	24.2
PCBs (ug/kg)										
		NA	ND	ND	NA	NA	ND	ND	NA	ND
Pesticides (ug/kg)										
		NA	ND	ND	NA	NA	ND	ND	NA	ND
SVOCs (ug/kg)										
		NA	ND	ND	NA	NA	ND	ND	NA	ND
VOCs (ug/kg)										
2-BUTANONE	7300000	ND	ND	ND	160	ND	ND	ND	ND	ND
TRICHLOROETHENE	2800	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds										
TOTAL SOLIDS (%)	*	79	83	79	74	80	80	77	82	82

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-18C
Study Area 5 - Northern Bailey Point Soil Analytical Results
(Former Truck Maintenance Garage)
Detected Compounds

Analyte	PAL	MY05TP104(7-9)	MY05TP106(7-9)	MY05TP104(9-10)
Duplicates			Dup. of MY05TP104(7-9)	
Date Collected		6/18/2002	6/18/2002	6/18/2002
Sample Delivery Group		MY112	MY112	MY112
EPH (mg/kg)				
C11-C22 AROMATICS	100	**130**	**160**	ND
C19-C36 ALIPHATICS	100	**300**	**240**	ND
C9-C18 ALIPHATICS	100	**2400**	**2000**	ND
Metals (mg/kg)				
ALUMINUM	76000	15700	14100	5000
ANTIMONY	31	0.41 R	0.38 R	0.38 R
ARSENIC	22	10	9.8	4.9
BARIUM	5400	61	51.1	19.7
BERYLLIUM	150	ND	ND	ND
BORON	5500	ND	ND	ND
CADMIUM	37	0.12	0.13	0.07
CALCIUM	*	932 J	581 J	761 J
CHROMIUM	210	31.3 J	25.9 J	11.9 J
COBALT	4700	8.9	6.7	3.9
COPPER	2900	16.5	15.1	6.6
IRON	23000	20000	17700	8610
LEAD	400	7.8	6.7	3.4
MAGNESIUM	*	5760	4550	2430
MANGANESE	1800	408	304	153
MERCURY	6.1	ND	ND	ND
MOLYBDENUM	390	ND	ND	ND
NICkEL	*	25.5	20.7	8.7
POTASSIUM	*	2870 J	2310 J	1370 J
SELENIUM	390	ND	ND	ND
SILVER	390	ND	ND	ND
SODIUM	*	99	81.5	57.8
THALLIUM	520	0.84 J	0.56 J	ND
VANADIUM	550	31.1	26.8	12.7
ZINC	23000	37.6	31	15.8
PCBs (ug/kg)				
		ND	ND	ND
Pesticides (ug/kg)				
		ND	ND	ND
SVOCs (ug/kg)				
BIS(2-ETHYLHEXYL) PHTHALATE	35000	ND	370 J	ND
VOCs (ug/kg)				
2-BUTANONE	7300000	11 R	11 R	13 R
METHYLENE CHLORIDE	8900	10 J	7 J	10 J
Other Compounds				
TOTAL SOLIDS (%)	*	83	83	82

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL

J = Estimated Value
R = Rejected Value

ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-19
Study Area 5 - Northern Bailey Point Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW115	MY05GW115-1C	MY05GW150	MY05GW116	MY05GW116-1C	MY05GW117
Well Number		MW-413	MW-413	MW-413	MW-414	MW-414	MW-415
Duplicates				Dup. of MY05GW115-1C			
Date Collected		6/19/2002	9/25/2002	9/25/2002	6/19/2002	9/26/2002	6/24/2002
Sample Delivery Group		MY111	MY120	MY120	MY111	MY120	MY111
EPH/DRO (ug/l)							
DIESEL RANGE ORGANICS	50	**2000 J**	**2100 J**	**1300 J**	**450**	**940**	**410 J**
EPH	50	NA	NA	NA	NA	NA	NA
Metals (ug/l)							
ALUMINUM	1430	333	152	137	204	749	79 J
ARSENIC	10	4.7	7.4	5.9	ND	ND	5.8
BARIUM	2000	45.1	65.7	64.4	139	174	48.7
BERYLLIUM	73	ND	ND	ND	ND	ND	ND
BORON	630	48.9	74.8 J	78 J	50.1	70.7 J	**2450**
CADMIUM	3.5	ND	ND	ND	ND	0.17	ND
CALCIUM	*	50600	61200	60200	140000	192000	677000
CHROMIUM	40	ND	ND	ND	ND	ND	2.4
COBALT	2200	14.9	ND	ND	31.2	27.5	60.8 J
COPPER	1300	ND	1.1 J	1.4 J	ND	3.6 J	ND
IRON	11000	**35000**	**53500 J**	**53100 J**	1900	**20800 J**	**241000**
LEAD	10	ND	ND	ND	ND	0.36 J	ND
MAGNESIUM	*	15900	16900	16600	85500	123000	516000
MANGANESE	500	**4180**	**3530**	**3440**	**17200**	**18400**	**27200**
MERCURY	2	0.02 J	ND	ND	0.06	ND	ND
MOLYBDENUM	35	ND	ND	ND	ND	ND	ND
NICKEL	140	16.1 J	12.7 J	11.3 J	19.9 J	19.2 J	ND
POTASSIUM	*	6460	6440	6920	5140	5840	115000
SELENIUM	35	ND	ND	ND	ND	ND	ND
SILVER	35	ND	ND	ND	ND	ND	ND
SODIUM	20000	**36200**	**30800 J**	**30900 J**	**87400**	**109000 J**	**2340000**
THALLIUM	2.4	ND	ND	ND	ND	ND	ND
VANADIUM	260	ND	ND	ND	ND	ND	ND
ZINC	2000	12.2	2.7 J	3.4	5.1	8.2	27.8
PCBs (ug/l)							
		NA	NA	NA	NA	NA	NA
Pesticides (ug/l)							
HEPTACHLOR	0.08	NA	NA	NA	NA	NA	NA
SVOCs (ug/l)							
2,4,5-TRICHLOROPHENOL	*	NA	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	32	NA	NA	NA	NA	NA	NA
2,4-DICHLOROPHENOL	21	NA	NA	NA	NA	NA	NA
2,4-DIMETHYLPHENOL	730	NA	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	14	NA	NA	NA	NA	NA	NA
2-CHLOROPHENOL	35	NA	NA	NA	NA	NA	NA
2-METHYLPHENOL	1800	NA	NA	NA	NA	NA	NA
2-NITROPHENOL	60	NA	NA	NA	NA	NA	NA
4,6-DINITRO-2-METHYLPHENOL	*	NA	NA	NA	NA	NA	NA
4-CHLORO-3-METHYLPHENOL	*	NA	NA	NA	NA	NA	NA
4-METHYLPHENOL	3.5	NA	NA	NA	NA	NA	NA
4-NITROPHENOL	60	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL) PHTHALATE	25	NA	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	3	NA	NA	NA	NA	NA	NA
PHENOL	4000	NA	NA	NA	NA	NA	NA
VOCs (ug/l)							
1,1-DICHLOROETHANE	70	NA	NA	NA	NA	NA	NA
ACETONE	700	NA	NA	NA	NA	NA	NA
CHLOROMETHANE	3	NA	NA	NA	NA	NA	NA
TOLUENE	1400	NA	NA	NA	NA	NA	NA
Other Compounds							
NITRATE (mg/l)	10	NA	NA	NA	NA	NA	NA

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-19
Study Area 5 - Northern Bailey Point Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW117-1C	MY05GW118	MY05GW118-1C	MY05GW126	MY05GW127	MY05GW128	MY05GW15
Well Number		MW-415	MW-416	MW-416	MW-424A	MW-424B	MW-425	MW-313
Duplicates								
Date Collected		9/30/2002	6/20/2002	9/26/2002	9/26/2002	9/25/2002	9/24/2002	12/10/2001
Sample Delivery Group		MY122	MY111	MY120	MY120	MY120	MY120	MY023
EPH/DRO (ug/l)								
DIESEL RANGE ORGANICS	50	**96**	**100**	**140**	**51**	**65**	**150**	NA
EPH	50	NA	NA	NA	NA	NA	NA	ND
Metals (ug/l)								
ALUMINUM	1430	76.5	176 J	165	NA	NA	NA	ND
ARSENIC	10	ND	ND	7.7 J	NA	NA	NA	ND
BARIUM	2000	38.4	56.6 J	72.5	NA	NA	NA	29.7
BERYLLIUM	73	0.44 J	ND	ND	NA	NA	NA	ND
BORON	630	**2050**	464 J	523	NA	NA	NA	62.8
CADMIUM	3.5	1.2	ND	ND	NA	NA	NA	0.32
CALCIUM	*	580000	114000 J	192000	NA	NA	NA	43500
CHROMIUM	40	ND	ND	ND	NA	NA	NA	1.8
COBALT	2200	31.5	3.1 J	15.2	NA	NA	NA	1.7
COPPER	1300	8	ND	1.9 J	NA	NA	NA	1.6
IRON	11000	**25900**	**16700 J**	**69700 J**	NA	NA	NA	ND
LEAD	10	0.17 J	ND	ND	NA	NA	NA	ND
MAGNESIUM	*	255000	34700 J	76800	NA	NA	NA	27000
MANGANESE	500	**10500**	**4360 J**	**16200**	NA	NA	NA	**1240**
MERCURY	2	ND	ND	ND	NA	NA	NA	0.03 J
MOLYBDENUM	35	ND	ND	3.5 J	NA	NA	NA	1.6
NICKEL	140	68.7	ND	13.6 J	NA	NA	NA	4.3
POTASSIUM	*	74700	16200 J	17500	NA	NA	NA	5060
SELENIUM	35	ND	ND	ND	NA	NA	NA	ND
SILVER	35	ND	ND	ND	NA	NA	NA	ND
SODIUM	20000	**1130000**	**143000 J**	**195000 J**	NA	NA	NA	**71000**
THALLIUM	2.4	0.61	ND	ND	NA	NA	NA	**2.9**
VANADIUM	260	ND	ND	ND	NA	NA	NA	1
ZINC	2000	41.4	5.4 J	6	NA	NA	NA	ND
PCBs (ug/l)								
		NA	NA	NA	NA	NA	NA	ND
Pesticides (ug/l)								
HEPTACHLOR	0.08	NA	NA	NA	NA	NA	NA	ND
SVOCs (ug/l)								
2,4,5-TRICHLOROPHENOL	*	NA	NA	NA	NA	NA	NA	ND
2,4,6-TRICHLOROPHENOL	32	NA	NA	NA	NA	NA	NA	ND
2,4-DICHLOROPHENOL	21	NA	NA	NA	NA	NA	NA	ND
2,4-DIMETHYLPHENOL	730	NA	NA	NA	NA	NA	NA	ND
2,4-DINITROPHENOL	14	NA	NA	NA	NA	NA	NA	ND
2-CHLOROPHENOL	35	NA	NA	NA	NA	NA	NA	ND
2-METHYLPHENOL	1800	NA	NA	NA	NA	NA	NA	ND
2-NITROPHENOL	60	NA	NA	NA	NA	NA	NA	ND
4,6-DINITRO-2-METHYLPHENOL	*	NA	NA	NA	NA	NA	NA	ND
4-CHLORO-3-METHYLPHENOL	*	NA	NA	NA	NA	NA	NA	ND
4-METHYLPHENOL	3.5	NA	NA	NA	NA	NA	NA	ND
4-NITROPHENOL	60	NA	NA	NA	NA	NA	NA	ND
BIS(2-ETHYLHEXYL) PHTHALATE	25	NA	NA	NA	NA	NA	NA	ND
PENTACHLOROPHENOL	3	NA	NA	NA	NA	NA	NA	ND
PHENOL	4000	NA	NA	NA	NA	NA	NA	ND
VOCs (ug/l)								
1,1-DICHLOROETHANE	70	NA	NA	NA	NA	NA	NA	ND
ACETONE	700	NA	NA	NA	NA	NA	NA	ND
CHLOROMETHANE	3	NA	NA	NA	NA	NA	NA	ND
TOLUENE	1400	NA	NA	NA	NA	NA	NA	ND
Other Compounds								
NITRATE (mg/l)	10	NA	NA	NA	NA	NA	NA	0.37

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-19
Study Area 5 - Northern Bailey Point Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW15-1B	MY05GW15-1C	MY05GW16	MY05GW26	MY05GW16-1B	MY05GW17
Well Number		MW-313	MW-313	MW-314	MW-314	MW-314	MW-315
Duplicates					Dup. of MY05GW16		
Date Collected		7/3/02 & 7/11/02	7/8/2002	12/3/2001	12/3/2001	7/8/2002	11/19/2001
Sample Delivery Group		MY113	MY115	MY021	MY021	MY115	MY017
EPH/DRO (ug/l)							
DIESEL RANGE ORGANICS	50	**4500**	**78**	NA	NA	**130**	NA
EPH	50	NA	NA	**180**	**210**	NA	**270**
Metals (ug/l)							
ALUMINUM	1430	NA	NA	29.8 J	22.8 J	NA	40.7 J
ARSENIC	10	NA	NA	3.2 J	ND	NA	ND
BARIUM	2000	NA	NA	159	162	NA	222
BERYLLIUM	73	NA	NA	ND	ND	NA	ND
BORON	630	NA	NA	ND	ND	NA	60.8
CADMIUM	3.5	NA	NA	ND	ND	NA	ND
CALCIUM	*	NA	NA	59500	59800	NA	115000
CHROMIUM	40	NA	NA	1.9	1.8	NA	ND
COBALT	2200	NA	NA	7.2 J	9.1	NA	13.9
COPPER	1300	NA	NA	ND	2.4 J	NA	2 J
IRON	11000	NA	NA	130	112	NA	87.6
LEAD	10	NA	NA	ND	ND	NA	ND
MAGNESIUM	*	NA	NA	41600	41800	NA	86200
MANGANESE	500	NA	NA	**5610**	**5730**	NA	**8160**
MERCURY	2	NA	NA	ND	ND	NA	ND
MOLYBDENUM	35	NA	NA	ND	ND	NA	ND
NICKEL	140	NA	NA	10.7 J	9.9 J	NA	ND
POTASSIUM	*	NA	NA	5260	5170	NA	6800
SELENIUM	35	NA	NA	ND	ND	NA	3.04 R
SILVER	35	NA	NA	ND	0.05	NA	ND
SODIUM	20000	NA	NA	**40000**	**40000**	NA	**73000**
THALLIUM	2.4	NA	NA	ND	ND	NA	ND
VANADIUM	260	NA	NA	ND	ND	NA	ND
ZINC	2000	NA	NA	ND	ND	NA	ND
PCBs (ug/l)							
		NA	NA	ND	ND	NA	ND
Pesticides (ug/l)							
HEPTACHLOR	0.08	ND	ND	ND	ND	ND	**0.52**
SVOCs (ug/l)							
2,4,5-TRICHLOROPHENOL	*	NA	NA	ND	ND	NA	ND
2,4,6-TRICHLOROPHENOL	32	NA	NA	ND	ND	NA	ND
2,4-DICHLOROPHENOL	21	NA	NA	ND	ND	NA	ND
2,4-DIMETHYLPHENOL	730	NA	NA	ND	ND	NA	ND
2,4-DINITROPHENOL	14	NA	NA	ND	ND	NA	ND
2-CHLOROPHENOL	35	NA	NA	ND	ND	NA	ND
2-METHYLPHENOL	1800	NA	NA	ND	ND	NA	ND
2-NITROPHENOL	60	NA	NA	ND	ND	NA	ND
4,6-DINITRO-2-METHYLPHENOL	*	NA	NA	ND	ND	NA	ND
4-CHLORO-3-METHYLPHENOL	*	NA	NA	ND	ND	NA	ND
4-METHYLPHENOL	3.5	NA	NA	ND	ND	NA	ND
4-NITROPHENOL	60	NA	NA	ND	ND	NA	ND
BIS(2-ETHYLHEXYL) PHTHALATE	25	NA	NA	ND	ND	NA	ND
PENTACHLOROPHENOL	3	NA	NA	ND	ND	NA	ND
PHENOL	4000	NA	NA	ND	ND	NA	ND
VOCs (ug/l)							
1,1-DICHLOROETHANE	70	NA	NA	ND	ND	NA	ND
ACETONE	700	NA	NA	ND	ND	NA	3 J
CHLOROMETHANE	3	NA	NA	ND	ND	NA	ND
TOLUENE	1400	NA	NA	0.5 J	ND	NA	2
Other Compounds							
NITRATE (mg/l)	10	NA	NA	ND	ND	NA	ND

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-19
Study Area 5 - Northern Bailey Point Groundwater Analytical Results
Detected Compounds

Analyte / Well Number / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05GW17-1B	MY05GW18	MY05GW18-1B	MY05GW53-1B	MY05GW18-1C	MY05GW11
Well Number		MW-315	MW-316	MW-316	MW-316	MW-316	MW-309
Duplicates					Dup. of MY05GW18-1B		
Date Collected		7/8/2002	12/6/2001	7/17/2002	7/17/2002	9/25/2002	11/28/2001
Sample Delivery Group		MY115	MY021	MY115	MY115	MY120	MY021
EPH/DRO (ug/l)							
DIESEL RANGE ORGANICS	50	**300**	NA	**220**	**190**	**200**	NA
EPH	50	NA	**400**	NA	NA	NA	**420 J**
Metals (ug/l)							
ALUMINUM	1430	NA	ND	NA	NA	NA	70.5
ARSENIC	10	NA	ND	NA	NA	NA	9.3
BARIUM	2000	NA	6	NA	NA	NA	165
BERYLLIUM	73	NA	ND	NA	NA	NA	ND
BORON	630	NA	15.7	NA	NA	NA	308
CADMIUM	3.5	NA	ND	NA	NA	NA	ND
CALCIUM	*	NA	8790	NA	NA	NA	305000
CHROMIUM	40	NA	1.4	NA	NA	NA	4
COBALT	2200	NA	ND	NA	NA	NA	ND
COPPER	1300	NA	ND	NA	NA	NA	ND
IRON	11000	NA	ND	NA	NA	NA	**39100**
LEAD	10	NA	ND	NA	NA	NA	ND
MAGNESIUM	*	NA	6080	NA	NA	NA	170000
MANGANESE	500	NA	ND	NA	NA	NA	**13500**
MERCURY	2	NA	0.03 J	NA	NA	NA	0.04 J
MOLYBDENUM	35	NA	ND	NA	NA	NA	ND
NICKEL	140	NA	ND	NA	NA	NA	ND
POTASSIUM	*	NA	984	NA	NA	NA	11900
SELENIUM	35	NA	ND	NA	NA	NA	ND
SILVER	35	NA	ND	NA	NA	NA	ND
SODIUM	20000	NA	8730	NA	NA	NA	**346000**
THALLIUM	2.4	NA	ND	NA	NA	NA	ND
VANADIUM	260	NA	ND	NA	NA	NA	ND
ZINC	2000	NA	ND	NA	NA	NA	ND
PCBs (ug/l)							
		NA	ND	NA	NA	NA	ND
Pesticides (ug/l)							
HEPTACHLOR	0.08	ND	ND	ND	ND	NA	ND
SVOCs (ug/l)							
2,4,5-TRICHLOROPHENOL	*	NA	ND	25 R	25 R	ND	ND
2,4,6-TRICHLOROPHENOL	32	NA	ND	10 R	10 R	ND	ND
2,4-DICHLOROPHENOL	21	NA	ND	10 R	10 R	ND	ND
2,4-DIMETHYLPHENOL	730	NA	ND	10 R	10 R	ND	ND
2,4-DINITROPHENOL	14	NA	ND	**25 R**	**25 R**	ND	ND
2-CHLOROPHENOL	35	NA	ND	10 R	10 R	ND	ND
2-METHYLPHENOL	1800	NA	ND	10 R	10 R	ND	ND
2-NITROPHENOL	60	NA	ND	10 R	10 R	ND	ND
4,6-DINITRO-2-METHYLPHENOL	*	NA	ND	25 R	25 R	ND	ND
4-CHLORO-3-METHYLPHENOL	*	NA	ND	10 R	10 R	ND	ND
4-METHYLPHENOL	3.5	NA	ND	**10 R**	**10 R**	ND	ND
4-NITROPHENOL	60	NA	ND	25 R	25 R	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	25	NA	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	3	NA	ND	**25 R**	**25 R**	ND	ND
PHENOL	4000	NA	ND	10 R	10 R	ND	ND
VOCs (ug/l)							
1,1-DICHLOROETHANE	70	NA	ND	ND	ND	ND	ND
ACETONE	700	NA	2 J	ND	ND	ND	ND
CHLOROMETHANE	3	NA	ND	ND	ND	ND	ND
TOLUENE	1400	NA	ND	ND	ND	ND	ND
Other Compounds							
NITRATE (mg/l)	10	NA	1.3	2.6	2.6	NA	ND

Notes:
PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-19
Study Area 5 - Northern Bailey Point Groundwater Analytical Results
Detected Compounds

Analyte	PAL	MY05GW11-1B	MY05GW19	MY05GW19-1B	MY05GW20	MY05GW20-1B	MY05GW23	MY05GW23-1B
Well Number		MW-309	MW-319	MW-319	MW-320	MW-320	MW-323	MW-323
Duplicates								
Date Collected		7/2/2002	11/27/2001	7/2/2002	11/28/2001	7/2/2002	12/11/2001	7/9/2002
Sample Delivery Group		MY113	MY021	MY113	MY021	MY113	MY023	MY113
EPH/DRO (ug/l)								
DIESEL RANGE ORGANICS	50	**230**	NA	**120**	NA	**220**	NA	**350**
EPH	50	NA	**240**	NA	**590**	NA	**540**	NA
Metals (ug/l)								
ALUMINUM	1430	70.3	25 J		96.3	166	98.1	86.4
ARSENIC	10	3.2 J	3.5 J	**15.3**	5.7	ND	**12.5 J**	ND
BARIUM	2000	194	25.2	16.9	266	119	145	49.7
BERYLLIUM	73	ND	ND	ND	ND	ND	1.2 J	ND
BORON	630	294	188	103	144	56.2	**1280**	**1530**
CADMIUM	3.5	ND	ND	ND	0.26 J	ND	ND	ND
CALCIUM	*	379000	104000	70000	86800	147000	681000	677000
CHROMIUM	40	3.3	1.6	ND	7.4	ND	12.9	5.3
COBALT	2200	ND	ND	ND	40	32.3	49	17.9 J
COPPER	1300	ND	ND	ND	2 J	ND	ND	ND
IRON	11000	**49300**	4630	8190	8190	1380	**34600**	**543000**
LEAD	10	2.4	ND	ND	ND	ND	ND	ND
MAGNESIUM	*	299000	21000	14900	74500	134000	592000	718000
MANGANESE	500	**13900**	**1580**	**952**	**14200**	**16700**	**41300**	**41800**
MERCURY	2	ND	0.04 J	ND	0.04 J	ND	ND	ND
MOLYBDENUM	35	ND	ND	ND	ND	ND	11.1	ND
NICKEL	140	ND	ND	ND	21.8	20.6 J	23 J	49.8 J
POTASSIUM	*	12500	6830	6870	13500	7900	90000	109000
SELENIUM	35	ND	ND	ND	ND	ND	21.6 J	ND
SILVER	35	ND	ND	ND	ND	ND	ND	ND
SODIUM	20000	**524000**	**66700**	**29100**	**205000**	**238000**	**3440000**	**4280000**
THALLIUM	2.4	ND	ND	ND	ND	ND	ND	ND
VANADIUM	260	ND	ND	ND	ND	ND	ND	ND
ZINC	2000	ND	ND	ND	ND	ND	6.4 J	21.7
PCBs (ug/l)								
		NA	ND	NA	ND	NA	ND	NA
Pesticides (ug/l)								
HEPTACHLOR	0.08	NA	ND	NA	ND	NA	ND	NA
SVOCs (ug/l)								
2,4,5-TRICHLOROPHENOL	*	NA	ND	NA	ND	NA	ND	NA
2,4,6-TRICHLOROPHENOL	32	NA	ND	NA	ND	NA	ND	NA
2,4-DICHLOROPHENOL	21	NA	ND	NA	ND	NA	ND	NA
2,4-DIMETHYLPHENOL	730	NA	ND	NA	ND	NA	ND	NA
2,4-DINITROPHENOL	14	NA	ND	NA	ND	NA	ND	NA
2-CHLOROPHENOL	35	NA	ND	NA	ND	NA	ND	NA
2-METHYLPHENOL	1800	NA	ND	NA	ND	NA	ND	NA
2-NITROPHENOL	60	NA	ND	NA	ND	NA	ND	NA
4,6-DINITRO-2-METHYLPHENOL	*	NA	ND	NA	ND	NA	ND	NA
4-CHLORO-3-METHYLPHENOL	*	NA	ND	NA	ND	NA	ND	NA
4-METHYLPHENOL	3.5	NA	ND	NA	ND	NA	ND	NA
4-NITROPHENOL	60	NA	ND	NA	ND	NA	ND	NA
BIS(2-ETHYLHEXYL) PHTHALATE	25	NA	ND	NA	ND	NA	ND	NA
PENTACHLOROPHENOL	3	NA	ND	NA	ND	NA	ND	NA
PHENOL	4000	NA	ND	NA	ND	NA	ND	NA
VOCs (ug/l)								
1,1-DICHLOROETHANE	70	NA	ND	NA	ND	NA	0.9 J	NA
ACETONE	700	NA	ND	NA	ND	NA	4 J	NA
CHLOROMETHANE	3	NA	2 J	NA	ND	NA	ND	NA
TOLUENE	1400	NA	ND	NA	0.6 J	NA	ND	NA
Other Compounds								
NITRATE (mg/l)	10	NA	0.1	NA	ND	NA	0.1	NA

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-19
Study Area 5 - Northern Bailey Point Groundwater Analytical Results
Detected Compounds

Analyte / Well Number / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05GW52-1B MW-323 Dup. of MY05GW23-1B	MY05GW21 MW-321 11/27/2001 MY021	MY05GW21-1B MW-321 7/8/2002 MY115	MY05GW22 MW-322 12/4/2001 MY021	MY05GW22-1B MW-322 7/8/2002 MY115
EPH/DRO (ug/l)						
DIESEL RANGE ORGANICS	50	320	NA	63	NA	**620**
EPH	50	NA	**310**	NA	**760**	NA
Metals (ug/l)						
ALUMINUM	1430	NA	298	NA	295	NA
ARSENIC	10	NA	ND	NA	ND	NA
BARIUM	2000	NA	39.5	NA	129	NA
BERYLLIUM	73	NA	ND	NA	ND	NA
BORON	630	NA	11.6	NA	12.4	NA
CADMIUM	3.5	NA	ND	NA	ND	NA
CALCIUM	*	NA	28900	NA	115000	NA
CHROMIUM	40	NA	ND	NA	1.7	NA
COBALT	2200	NA	ND	NA	13	NA
COPPER	1300	NA	ND	NA	2.9 J	NA
IRON	11000	NA	309	NA	4110	NA
LEAD	10	NA	ND	NA	3.8	NA
MAGNESIUM	*	NA	10400	NA	66300	NA
MANGANESE	500	NA	**609**	NA	**11500**	NA
MERCURY	2	NA	ND	NA	ND	NA
MOLYBDENUM	35	NA	ND	NA	1.6	NA
NICKEL	140	NA	6.5 J	NA	ND	NA
POTASSIUM	*	NA	1720	NA	5810	NA
SELENIUM	35	NA	ND	NA	ND	NA
SILVER	35	NA	ND	NA	ND	NA
SODIUM	20000	NA	**41000**	NA	**78300**	NA
THALLIUM	2.4	NA	ND	NA	**3.3**	NA
VANADIUM	260	NA	ND	NA	ND	NA
ZINC	2000	NA	ND	NA	ND	NA
PCBs (ug/l)						
		NA	ND	NA	ND	NA
Pesticides (ug/l)						
HEPTACHLOR	0.08	NA	ND	NA	ND	NA
SVOCs (ug/l)						
2,4,5-TRICHLOROPHENOL	*	NA	ND	NA	ND	NA
2,4,6-TRICHLOROPHENOL	32	NA	ND	NA	ND	NA
2,4-DICHLOROPHENOL	21	NA	ND	NA	ND	NA
2,4-DIMETHYLPHENOL	730	NA	ND	NA	ND	NA
2,4-DINITROPHENOL	14	NA	ND	NA	ND	NA
2-CHLOROPHENOL	35	NA	ND	NA	ND	NA
2-METHYLPHENOL	1800	NA	ND	NA	ND	NA
2-NITROPHENOL	60	NA	ND	NA	ND	NA
4,6-DINITRO-2-METHYLPHENOL	*	NA	ND	NA	ND	NA
4-CHLORO-3-METHYLPHENOL	*	NA	ND	NA	ND	NA
4-METHYLPHENOL	3.5	NA	ND	NA	ND	NA
4-NITROPHENOL	60	NA	ND	NA	ND	NA
BIS(2-ETHYLHEXYL) PHTHALATE	25	NA	7 J	NA	ND	NA
PENTACHLOROPHENOL	3	NA	ND	NA	ND	NA
PHENOL	4000	NA	ND	NA	ND	NA
VOCs (ug/l)						
1,1-DICHLOROETHANE	70	NA	ND	NA	ND	NA
ACETONE	700	NA	ND	NA	ND	NA
CHLOROMETHANE	3	NA	2	NA	ND	NA
TOLUENE	1400	NA	ND	NA	0.7 J	NA
Other Compounds						
NITRATE (mg/l)	10	NA	3	ND	2.6	ND

Notes:
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R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-20
Study Area 5 - Bailey Farm House Soil Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY05SB25(0-0.5) 10/2/2001 MY009	MY05SB25(2-8) 10/4/2001 MY009	MY05SB25(4-6) 10/2/2001 MY009	MY05SB25(8-10) 10/3/2001 MY009	MY05SB54(0-0.5) 11/5/2001 MY016
EPH (mg/kg)						
C11-C22 AROMATICS	100	NA	ND	NA	ND	NA
C19-C36 ALIPHATICS	100	NA	ND	NA	ND	NA
C9-C18 ALIPHATICS	100	NA	ND	NA	ND	NA
Metals (mg/kg)						
ALUMINUM	76000	23200	12300	NA	8320	6930
ANTIMONY	31	0.08	ND	NA	ND	0.02 J
ARSENIC	22	7.2	8.2	NA	6.4	3.1
BARIUM	5400	100	45	NA	30.9	28.4
BERYLLIUM	150	0.75	0.5	NA	0.4	0.24
BORON	5500	ND	ND	NA	ND	0.52 J
CADMIUM	37	0.24	ND	NA	ND	ND
CALCIUM	*	2290	750	NA	615	945
CHROMIUM	210	40.5 J	21.5 J	NA	13.9 J	ND
COBALT	4700	10.6	6.4	NA	4.9	4
COPPER	2900	48.9 J	14.9 J	NA	10.2 J	11.3
IRON	23000	**24300**	14600	NA	10900	8780
LEAD	400	62.2	9	NA	4.2	4
MAGNESIUM	*	5610	3580	NA	2610	2380
MANGANESE	1800	522	276	NA	246	169
MERCURY	6.1	0.51	0.06	NA	ND	ND
NICkEL	*	28.7	16.7	NA	11.7	9.7
POTASSIUM	*	2270	2060	NA	1490	1840
SILVER	390	ND	ND	NA	ND	ND
SODIUM	*	141	107	NA	109	ND
THALLIUM	520	ND	ND	NA	ND	0.1
VANADIUM	550	39.1	23.1	NA	16.4	15.1
ZINC	23000	154	36.4	NA	23.4	22.7
PCBs (ug/kg)						
AROCLOR-1260	220	ND	ND	NA	ND	ND
Pesticides (ug/kg)						
4,4'-DDD	2400	ND	ND	NA	ND	ND
4,4'-DDE	1700	ND	ND	NA	ND	ND
4,4'-DDT	1700	ND	ND	NA	ND	ND
ALDRIN	29	ND	ND	NA	ND	ND
ALPHA BHC	*	ND	ND	NA	ND	ND
ALPHA-CHLORDANE	1600	ND	ND	NA	ND	ND
BETA BHC	*	ND	ND	NA	ND	ND
DELTA BHC	*	ND	ND	NA	ND	ND
DIELDRIN	30	ND	ND	NA	ND	ND
ENDOSULFAN I	370000	ND	ND	NA	ND	ND
ENDOSULFAN II	370000	ND	ND	NA	ND	ND
ENDOSULFAN SULFATE	370000	ND	ND	NA	ND	ND
ENDRIN	18000	ND	ND	NA	ND	ND
ENDRIN ALDEHYDE	18000	ND	ND	NA	ND	ND
ENDRIN kETONE	18000	ND	ND	NA	ND	ND
GAMMA BHC	*	ND	ND	NA	ND	ND
GAMMA-CHLORDANE	1600	ND	ND	NA	ND	ND
HEPTACHLOR	110	ND	ND	NA	ND	ND
HEPTACHLOR EPOXIDE	53	ND	ND	NA	ND	ND
METHOXYCHLOR	310000	ND	ND	NA	ND	ND
TOXAPHENE	440	ND	ND	NA	ND	ND
SVOCs (ug/kg)						
FLUORANTHENE	2300000	ND	ND	NA	ND	ND
PYRENE	2300000	ND	ND	NA	ND	ND
VOCs (ug/kg)						
2-BUTANONE	7300000	ND	NA	ND	ND	ND
ACETONE	1600000	ND	NA	ND	ND	10 R
METHYLENE CHLORIDE	8900	ND	NA	ND	ND	ND
Other Compounds						
TOTAL SOLIDS (%)	*	85	94	91	91	86

Notes:
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* PAL Not Available
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J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-20
Study Area 5 - Bailey Farm House Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05SB55(0-0.5)	MY05SB54(2-4)	MY05SB54(6-8)	MY05SS76	MY05TP101(4-4.5)	MY05TP102(4-5)
Duplicates		**Dup. of MY05SB54(0-0.5)**					
Date Collected		**11/5/2001**	**11/5/2001**	**11/5/2001**	**9/26/2001**	**6/19/2002**	**6/19/2002**
Sample Delivery Group		**MY016**	**MY016**	**MY016**	**MY006**	**MY112**	**MY112**
EPH (mg/kg)							
C11-C22 AROMATICS	100	NA	**29 J**	ND	**190**	ND	ND
C19-C36 ALIPHATICS	100	NA	**400 J**	ND	**190**	ND	10 J
C9-C18 ALIPHATICS	100	NA	**48 J**	ND	**490 J**	ND	11 J
Metals (mg/kg)							
ALUMINUM	76000	9120	15200	26000	NA	NA	NA
ANTIMONY	31	0.02 J	ND	0.09	NA	NA	NA
ARSENIC	22	3.9	4	13.4	NA	NA	NA
BARIUM	5400	35.3	109	91.5	NA	NA	NA
BERYLLIUM	150	0.31	0.35	0.76	NA	NA	NA
BORON	5500	0.4 J	ND	2.5	NA	NA	NA
CADMIUM	37	ND	0.08	ND	NA	NA	NA
CALCIUM	*	1440	7520 J	2830 J	NA	NA	NA
CHROMIUM	210	ND	ND	ND	NA	NA	NA
COBALT	4700	5.5	18.2	15.6	NA	NA	NA
COPPER	2900	13.8	70.4	26	NA	NA	NA
IRON	23000	12300	**31400**	**36800**	NA	NA	NA
LEAD	400	5.4	5.3	12	NA	NA	NA
MAGNESIUM	*	3710	5660	9790	NA	NA	NA
MANGANESE	1800	219	333 J	616 J	NA	NA	NA
MERCURY	6.1	0.01 J	ND	ND	NA	NA	NA
NICkEL	*	13.2	42.7	46.5	NA	NA	NA
POTASSIUM	*	2130	6220	6180	NA	NA	NA
SILVER	390	ND	0.07	ND	NA	NA	NA
SODIUM	*	ND	ND	ND	NA	NA	NA
THALLIUM	520	0.11	0.26	0.3	NA	NA	NA
VANADIUM	550	19.6	43	55.6	NA	NA	NA
ZINC	23000	29.9	61.6 J	78.4 J	NA	NA	NA
PCBs (ug/kg)							
AROCLOR-1260	220	ND	49 J	ND	NA	37	59
Pesticides (ug/kg)							
4,4'-DDD	2400	3.8 R	ND	ND	NA	NA	NA
4,4'-DDE	1700	3.8 R	ND	ND	NA	NA	NA
4,4'-DDT	1700	3.8 R	ND	ND	NA	NA	NA
ALDRIN	29	2 R	ND	ND	NA	NA	NA
ALPHA BHC	*	2 R	ND	ND	NA	NA	NA
ALPHA-CHLORDANE	1600	2 R	ND	ND	NA	NA	NA
BETA BHC	*	2 R	ND	ND	NA	NA	NA
DELTA BHC	*	2 R	ND	ND	NA	NA	NA
DIELDRIN	30	3.8 R	ND	ND	NA	NA	NA
ENDOSULFAN I	370000	2 R	ND	ND	NA	NA	NA
ENDOSULFAN II	370000	3.8 R	ND	ND	NA	NA	NA
ENDOSULFAN SULFATE	370000	3.8 R	ND	ND	NA	NA	NA
ENDRIN	18000	3.8 R	ND	ND	NA	NA	NA
ENDRIN ALDEHYDE	18000	3.8 R	ND	ND	NA	NA	NA
ENDRIN kETONE	18000	3.8 R	ND	ND	NA	NA	NA
GAMMA BHC	*	2 R	ND	ND	NA	NA	NA
GAMMA-CHLORDANE	1600	2 R	ND	ND	NA	NA	NA
HEPTACHLOR	110	2 R	ND	ND	NA	NA	NA
HEPTACHLOR EPOXIDE	53	2 R	ND	ND	NA	NA	NA
METHOXYCHLOR	310000	20 R	ND	ND	NA	NA	NA
TOXAPHENE	440	38 R	ND	ND	NA	NA	NA
SVOCs (ug/kg)							
FLUORANTHENE	2300000	200 J	ND	ND	NA	NA	NA
PYRENE	2300000	220 J	ND	ND	NA	NA	NA
VOCs (ug/kg)							
2-BUTANONE	7300000	ND	ND	ND	NA	43 J	24 R
ACETONE	1600000	11 R	33 R	10 R	NA	140 J	
METHYLENE CHLORIDE	8900	ND	ND	ND	NA	22 J	23 J
Other Compounds							
TOTAL SOLIDS (%)	*	87	86	77	90	76	76

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-20
Study Area 5 - Bailey Farm House Soil Analytical Results
Detected Compounds

Analyte	PAL	MY05TP103(4-5)
Duplicates		
Date Collected		6/19/2002
Sample Delivery Group		MY112
EPH (mg/kg)		
C11-C22 AROMATICS	100	ND
C19-C36 ALIPHATICS	100	18
C9-C18 ALIPHATICS	100	ND
Metals (mg/kg)		
ALUMINUM	76000	NA
ANTIMONY	31	NA
ARSENIC	22	NA
BARIUM	5400	NA
BERYLLIUM	150	NA
BORON	5500	NA
CADMIUM	37	NA
CALCIUM	*	NA
CHROMIUM	210	NA
COBALT	4700	NA
COPPER	2900	NA
IRON	23000	NA
LEAD	400	NA
MAGNESIUM	*	NA
MANGANESE	1800	NA
MERCURY	6.1	NA
NICkEL	*	NA
POTASSIUM	*	NA
SILVER	390	NA
SODIUM	*	NA
THALLIUM	520	NA
VANADIUM	550	NA
ZINC	23000	NA
PCBs (ug/kg)		
AROCLOR-1260	220	40
Pesticides (ug/kg)		
4,4'-DDD	2400	NA
4,4'-DDE	1700	NA
4,4'-DDT	1700	NA
ALDRIN	29	NA
ALPHA BHC	*	NA
ALPHA-CHLORDANE	1600	NA
BETA BHC	*	NA
DELTA BHC	*	NA
DIELDRIN	30	NA
ENDOSULFAN I	370000	NA
ENDOSULFAN II	370000	NA
ENDOSULFAN SULFATE	370000	NA
ENDRIN	18000	NA
ENDRIN ALDEHYDE	18000	NA
ENDRIN kETONE	18000	NA
GAMMA BHC	*	NA
GAMMA-CHLORDANE	1600	NA
HEPTACHLOR	110	NA
HEPTACHLOR EPOXIDE	53	NA
METHOXYCHLOR	310000	NA
TOXAPHENE	440	NA
SVOCs (ug/kg)		
FLUORANTHENE	2300000	NA
PYRENE	2300000	NA
VOCs (ug/kg)		
2-BUTANONE	7300000	19 R
ACETONE	1600000	
METHYLENE CHLORIDE	8900	16 J
Other Compounds		
TOTAL SOLIDS (%)	*	73

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-21
Study Area 5 - Bailey Farm House Groundwater Analytical Results
Detected Compounds

Analyte Well Number Date Collected Sample Delivery Group	PAL	MY05GW12 MW-310 11/26/2001 MY021	MY05GW28 MW-324 12/10/2001 MY023
EPH (ug/l)			
EPH	50	**130**	ND
Metals (ug/l)			
ALUMINUM	1430	24.2 J	409
BARIUM	2000	34.2	24.4
BORON	630	66.1	ND
CALCIUM	*	13200	20600
CHROMIUM	40	ND	1.5
COBALT	2200	ND	0.78
COPPER	1300	ND	0.58 J
IRON	11000	538	5180
MAGNESIUM	*	4490	8740
MANGANESE	500	230	**1110**
MERCURY	2	ND	0.04 J
MOLYBDENUM	35	ND	1
NICKEL	140	11.7	1.6
POTASSIUM	*	2220	3620
SODIUM	20000	13900	14800
THALLIUM	2.4	ND	0.98
VANADIUM	260	ND	1.2
PCBs (ug/l)			
		ND	ND
Pesticides (ug/l)			
		ND	ND
SVOCs (ug/l)			
		ND	ND
VOCs (ug/l)			
ACETONE	700	3 J	ND
Other Compounds			
NITRATE (mg/l)	10	0.67	0.05

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-22A
Study Area 5 - Marine Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY05SD01**	MY05SD32**	MY05SD03**	MY05SD09	MY05SD10	MY05SD11	MY05SD31	MY05SD12	MY05SD13	MY05SD14	MY05SD16
Duplicates			Dup. of MY05SD01					Dup. of MY05SD11				
Date Collected		11/29/2001	11/29/2001	10/24/2001	10/25/2001	10/25/2001	10/25/2001	10/25/2001	10/24/2001	10/24/2001	10/24/2001	10/16/2001
Sample Delivery Group		MYR003	MYR003	MYR003	MY014	MY014	MY014	MY014	MY014	MY014	MY014	MY014
EPH (mg/kg)												
C11-C22 AROMATICS	*	ND	ND	ND	84 J	ND	ND	89 J	44 J	ND	ND	72
C19-C36 ALIPHATICS	*	ND	ND	ND	64 J	62 J	53 J	90 J	27 J	42 J	43 J	ND
C9-C18 ALIPHATICS	*	ND	ND	ND	ND	ND	ND	ND	ND	20 J	ND	ND
Metals (mg/kg)												
ALUMINUM	*	10700	12300	27300	17700	19700	21300	17600	13000	21400	20700	16700
ANTIMONY	2	0.08 J	0.09 R	0.09 R	ND	ND	ND	ND	0.03	0.02	0.04	ND
ARSENIC	8.2	7.5 J	**8.3 J**	**14.4 J**	**10.6**	**11.5**	**11.7**	**10.8**	**10.3**	**11.2**	**18.8**	**10.5**
BARIUM	*	60.2	61.7	63.3	44.5	46.6	55.5	43.7	26.3	48.4	48.7	40
BERYLLIUM	*	0.67	0.69	1.8	0.83 J	0.87 J	0.94 J	0.83 J	0.46	0.76	0.77	0.83
BORON	*	22.8	22.8	81.9	35.1	34.4	37.7	33.6	60.2	43.4	41.6	26.6
CADMIUM	1.2	0.11	0.16	0.59	0.2	0.19	0.18	0.16	0.19	0.17	0.17	ND
CALCIUM	*	5780 J	25800 J	10500 J	5250	4040	3320	2790	2540	2700	2780	2400
CHROMIUM	81	39.3 J	38.8 J	68.7 J	55.2	57.1	61	54.5	33.3	58.8	67.2	50
COBALT	*	7.5	8.4	14.1	8.5	8.8	8.9	8.2	5.1	8.6	9	9.2
COPPER	34	**209 J**	**88.1 J**	**61.1 J**	18.8	18.7	19.3	17.6	15	23	**35**	18.7
IRON	*	59200 J	51700 J	40900 J	25200	26600	27600	24700	17400	27100	27900	27100
LEAD	46.7	20.1	22	**47**	27	27.7	28.8	26	18.6	29.7	29.8	23.8
MAGNESIUM	*	4980	5630	17400	9220	9140	9550	8530	7030	8940	9000	8320
MANGANESE	*	250	263	354	246	266	277	238	209	290	277	291
MERCURY	0.15	**0.28 J**	**1.6 J**	**0.21 J**	**0.26**	**0.23**	**0.23**	**0.22**	**0.15**	**0.22**	**0.23**	**0.23**
MOLYBDENUM	*	2.8 J	2.2 J	7 J	ND	1.5	1.2	1.6	2.2	1.1	1.3	ND
NICKEL	20.9	**25.5**	**23.5**	**43.5**	**28.3**	**29.2**	**29.7**	**27.4**	17.7	**29**	**29.8**	**28.4**
POTASSIUM	*	3260 J	3890 J	7070 J	4230 J	4190 J	4760 J	3960 J	3200	4790	4760	4590
SELENIUM	*	ND	0.4	0.49	ND	ND	ND	ND	ND	ND	0.63 J	0.73 J
SILVER	1	0.09	0.1	0.3	0.34	0.27	0.28	0.28	0.27	0.22	0.23	0.19 J
SODIUM	*	2940 J	3990 J	34300 J	13200 J	9670 J	11400 J	9530 J	16700 J	13800 J	11100 J	9470 J
THALLIUM	*	ND	0.8	0.97	ND	ND	0.23	0.18	ND	ND	ND	0.18
VANADIUM	*	40.1	40.5	73	45.2	47.2	51.6	45.6	34	51.5	53.2	45
ZINC	150	**213**	**230**	**300**	78.1 J	80.7 J	80.4 J	74.1 J	61.4	88	92.3	81.2
PCBs (ug/kg)												
PCB-1254	22.7	22.5	**32.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260	22.7	ND	ND	**40.6 J**	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)												
4,4'-DDE	2.2	ND	ND	**6.9 J**	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	1.58	ND	ND	**7.28 J**	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA BHC	*	ND	ND	ND	ND	6.1 J	ND	ND	ND	ND	ND	ND

Table 4-22A
Study Area 5 - Marine Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY05SD01**	MY05SD32**	MY05SD03**	MY05SD09	MY05SD10	MY05SD11	MY05SD31	MY05SD12	MY05SD13	MY05SD14	MY05SD16
Duplicates			Dup. of MY05SD01					Dup. of MY05SD11				
Date Collected		11/29/2001	11/29/2001	10/24/2001	10/25/2001	10/25/2001	10/25/2001	10/25/2001	10/24/2001	10/24/2001	10/24/2001	10/16/2001
Sample Delivery Group		MYR003	MYR003	MYR003	MY014	MY014	MY014	MY014	MY014	MY014	MY014	MY014
SVOCs (ug/kg)												
2-METHYLNAPHTHALENE	70	ND	4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	ND	ND	ND	2000 R	1800 R	2000 R	1600 R	ND	ND	ND	ND
4-METHYLPHENOL	*	ND	ND	450	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	16	**16 J**	**23 J**	7 J	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	44	4 J	3 J	8 J	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	85	57 J	28 J	14 J	ND	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	261	**500**	**350 J**	93 J	110	96	100	120	140	180	140	100
BENZO(A)PYRENE	430	370 J	340 J	110 J	110	110	100	120	100	190	140	140
BENZO(B)FLUORANTHENE	*	380 J	410 J	170 J	170	ND	ND	170	150	250	230	190
BENZO(K)FLUORANTHENE	*	330 J	290 J	110 J	35 J	55	41 J	41	53 J	60	61 J	46
BENZO[G,H,I]PERYLENE	*	230 J	220 J	100 J	69	75	63	65	54	120	92	80
BIS(2-ETHYLHEXYL) PHTHALATE	*	340	290	1200	ND	ND	ND	ND	ND	ND	ND	ND
CHRYSENE	384	**450 J**	**470 J**	140 J	110	94	90	110	90	170	140	92
DIBENZO(A,H)ANTHRACENE	63	24 J	38 J	15 J	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	600	**1100 J**	**1000 J**	100 J	170	210	200	180	150	270	310	160
FLUORENE	19	18 J	**50 J**	**23 J**	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	*	260 J	250 J	120 J	100	95	84	100	76	170	140	110
NAPHTHALENE	160	3 J	11 J	3 J	ND	ND	ND	ND	ND	ND	ND	ND
NITROBENZENE	*	ND	ND	100 J	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	240	**340 J**	**400 J**	140 J	66	48 J	78 J	90 J	45 J	88	99	48
PYRENE	665	**840 J**	**800 J**	91 J	170 J	130	120	160	190	300	200 J	160
VOCs (ug/kg)												
ACETONE	*	620 J	ND	2600	1000 J	1100 J	980 J	1000 J	ND	ND	ND	ND
BROMOMETHANE	*	ND	ND	ND	480 J	470 J	420 J	ND	ND	ND	ND	ND
M-,P-XYLENE	*	ND	ND	ND	ND	ND	ND	ND	380 J	600 J	550 J	ND
METHYLENE CHLORIDE	*	ND	ND	ND	ND	ND	ND	ND	370 J	360 J	ND	ND
Other Compounds												
TOTAL SOLIDS (%)	*	ND	ND	ND	40	46	42	49	37	41	44	49
TOTAL SOLIDS (VOA) (%)	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	48

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

** Sediment removed and disposed offsite

Table 4-22B
Study Area 5 - Freshwater Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY05SD15	MY05SD17	MY05SD18	MY05SD19	MY05SD30	MY05SD20	MY05SS09	MY05SS15
Duplicates						Dup. of MY05SD19			Dup. of MY05SS09
Date Collected		10/16/2001	10/29/2001	10/29/2001	10/25/2001	10/25/2001	10/25/2001	11/8/2001	11/8/2001
Sample Delivery Group		MY014	MY014	MY014	MY014	MY014	MY014	MY016	MY016
EPH (mg/kg)									
C11-C22 AROMATICS	*	ND	ND	210	ND	ND	ND	NA	NA
C19-C36 ALIPHATICS	*	ND	ND	ND	ND	ND	29 J	NA	NA
C9-C18 ALIPHATICS	*	ND	ND	ND	ND	ND	ND	NA	NA
Metals (mg/kg)									
ALUMINUM	*	18900	21500	24400	29600	33400	28800	34700 J	36600 J
ANTIMONY	*	0.16	ND	ND	ND	ND	ND	0.16 R	0.18 R
ARSENIC	*	14.9	13.3	14.1	14.3	14.4	16.5	30.5 J	32.7 J
BARIUM	*	110	83.7	110	122	141	126	173 J	180 J
BERYLLIUM	*	1.2	0.89	1.3	1.2 J	1.3 J	1.1 J	1.7 J	1.8 J
BORON	*	5.5	4.8	4	7.4	8.9	5.2	3.5 J	3.2 R
CADMIUM	*	0.15	ND	0.35	0.09	0.08	ND	0.56 R	0.56 R
CALCIUM	*	2660	2600	2740	3540	3610	5010	3350 J	3640 J
CHROMIUM	*	41.4	46.8	46.6	58.9	65.6	62.8	63.5 J	67.1 J
COBALT	*	16.6	14.5	16.3	17.4	18	18.3	30.8 J	32.8 J
COPPER	*	19.8	18.8	23.9	22.2	24.3	27.3	41.3 J	40.6 J
IRON	*	39800	31500	29900	38200	39800	40600	102000 J	119000 J
LEAD	*	12.9	12.2	22.9	16.2	16.6	16.8	45.2 J	48.3 J
MAGNESIUM	*	7120	7900	7160	9710	10500	10800	8900 J	9450 J
MANGANESE	*	1130	868	544	764	746	815	1150 J	1230 J
MERCURY	*	ND	ND	0.09	0.02	0.03	0.02	0.18 J	0.17 J
MOLYBDENUM	*	0.79	0.71	1.3	ND	ND	ND	1.3 R	1.5 J
NICKEL	*	42.2	39.4	42	48.2	50	54.3	52.2 J	55.1 J
POTASSIUM	*	4110	4450	3650	4860 J	5510 J	5710 J	4240 J	4310 J
SELENIUM	*	0.68 J	ND	0.95 J	ND	ND	ND	1.2 J	1.3 J
SILVER	*	0.25	0.27	0.2	0.25	0.18	0.23	0.53 J	0.62 J
SODIUM	*	264 J	185 J	318 J	ND	228 J	269 J	202 R	204 R
THALLIUM	*	0.2	0.19	0.24	0.62	0.38	ND	0.31 R	0.32 R
VANADIUM	*	50.4	50	52.4	62.4	69.7	61.2	92.9 J	97.3 J
ZINC	*	214	122	162	116 J	114 J	170 J	177 J	195 J
PCBs (ug/kg)									
PCB-1016	*	ND	ND	ND	ND	ND	ND	18 R	18 R
PCB-1221	*	ND	ND	ND	ND	ND	ND	18 R	18 R
PCB-1232	*	ND	ND	ND	ND	ND	ND	18 R	18 R
PCB-1242	*	ND	ND	ND	ND	ND	ND	18 R	18 R
PCB-1248	*	ND	ND	ND	ND	ND	ND	18 R	18 R
PCB-1254	*	ND	ND	ND	ND	ND	ND	18 R	18 R
PCB-1260	*	ND	ND	ND	ND	ND	ND	18 R	18 R
Pesticides (ug/kg)									
4,4'-DDD	*	ND	ND	ND	ND	ND	ND	18 R	18 R
4,4'-DDE	*	ND	ND	ND	ND	ND	ND	18 R	18 R
4,4'-DDT	*	ND	ND	ND	ND	ND	ND	18 R	18 R
ALDRIN	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
ALPHA BHC	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
ALPHA-CHLORDANE	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
BETA BHC	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R

Table 4-22B
Study Area 5 - Freshwater Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY05SD15	MY05SD17	MY05SD18	MY05SD19	MY05SD30	MY05SD20	MY05SS09	MY05SS15
Duplicates						Dup. of MY05SD19			Dup. of MY05SS09
Date Collected		10/16/2001	10/29/2001	10/29/2001	10/25/2001	10/25/2001	10/25/2001	11/8/2001	11/8/2001
Sample Delivery Group		MY014	MY014	MY014	MY014	MY014	MY014	MY016	MY016
DELTA BHC	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
DIELDRIN	*	ND	ND	ND	ND	ND	ND	18 R	18 R
ENDOSULFAN I	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
ENDOSULFAN II	*	ND	ND	ND	ND	ND	ND	18 R	18 R
ENDOSULFAN SULFATE	*	ND	ND	ND	ND	ND	ND	18 R	18 R
ENDRIN	*	ND	ND	ND	ND	ND	ND	18 R	18 R
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	ND	ND	18 R	18 R
ENDRIN KETONE	*	ND	ND	ND	ND	ND	ND	18 R	18 R
GAMMA BHC	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
GAMMA-CHLORDANE	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
HEPTACHLOR	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
HEPTACHLOR EPOXIDE	*	ND	ND	ND	ND	ND	ND	9 R	9.3 R
METHOXYCHLOR	*	ND	ND	ND	ND	ND	ND	90 R	93 R
TOXAPHENE	*	ND	ND	ND	ND	ND	ND	180 R	180 R
SVOCs (ug/kg)									
1,2,4-TRICHLOROBENZENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
1,2-DICHLOROBENZENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
1,3-DICHLOROBENZENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
1,4-DICHLOROBENZENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2,2'-OXYBIS(1-CHLOROPROPANE)	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2,4,5-TRICHLOROPHENOL	*	ND	ND	ND	ND	ND	ND	1100 R	1200 R
2,4,6-TRICHLOROPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2,4-DICHLOROPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2,4-DIMETHYLPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2,4-DINITROPHENOL	*	ND	ND	ND	ND	ND	ND	1100 R	1200 R
2,4-DINITROTOLUENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2,6-DINITROTOLUENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2-CHLORONAPHTHALENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2-CHLOROPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2-METHYLNAPHTHALENE	*	ND	ND	ND	ND	ND	ND	150 R	150 R
2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
2-NITROANILINE	*	ND	ND	ND	ND	ND	ND	1100 R	1200 R
2-NITROPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
3,3'-DICHLOROBENZIDINE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
3-NITROANILINE	*	ND	ND	ND	1300 R	1300 R	1400 R	1100 R	1200 R
4,6-DINITRO-2-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	1100 R	1200 R
4-BROMOPHENYL PHENYL ETHER	*	ND	ND	ND	ND	ND	ND	460 R	500 R
4-CHLORO-3-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
4-CHLOROANILINE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
4-CHLOROPHENYL PHENYL ETHER	*	ND	ND	ND	ND	ND	ND	460 R	500 R
4-METHYLPHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
4-NITROANILINE	*	ND	ND	ND	ND	ND	ND	1100 R	1200 R
4-NITROPHENOL	*	ND	ND	ND	ND	ND	ND	1100 R	1200 R
ACENAPHTHENE	*	ND	ND	ND	ND	ND	ND	150 R	150 R
ACENAPHTHYLENE	*	ND	ND	ND	ND	ND	ND	150 R	150 R
ANTHRACENE	*	ND	ND	ND	ND	ND	ND	150 R	150 R

Table 4-22B
Study Area 5 - Freshwater Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY05SD15	MY05SD17	MY05SD18	MY05SD19	MY05SD30	MY05SD20	MY05SS09	MY05SS15
Duplicates						Dup. of MY05SD19			Dup. of MY05SS09
Date Collected		10/16/2001	10/29/2001	10/29/2001	10/25/2001	10/25/2001	10/25/2001	11/8/2001	11/8/2001
Sample Delivery Group		MY014	MY014	MY014	MY014	MY014	MY014	MY016	MY016
BENZO(A)ANTHRACENE	*	43	17 J	70 J	ND	22 J	62	82 J	150 J
BENZO(A)PYRENE	*	40	16 J	120	ND	19 J	50	94 J	170 J
BENZO(B)FLUORANTHENE	*	58	26 J	200	29 J	28 J	85	150 J	260 J
BENZO(K)FLUORANTHENE	*	ND	ND	ND	ND	ND	19 J	150 R	150 R
BENZO[G,H,I]PERYLENE	*	32	ND	70 J	ND	ND	30 J	92 J	140 J
BIS(2-CHLOROETHOXY) METHANE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
BIS(2-CHLOROETHYL) ETHER	*	ND	ND	ND	ND	ND	ND	460 R	500 R
BIS(2-ETHYLHEXYL) PHTHALATE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
BUTYL BENZYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
CHRYSENE	*	36	16 J	88 J	17 J	16 J	55	92 J	150 J
DI-N-BUTYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
DI-N-OCTYLPHTHALATE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
DIBENZO(A,H)ANTHRACENE	*	ND	ND	ND	ND	ND	ND	150 R	150 R
DIBENZOFURAN	*	ND	ND	ND	ND	ND	ND	460 R	500 R
DIETHYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
DIMETHYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
FLUORANTHENE	*	65	35	140 J	37	31 J	140 J	190 J	270 J
FLUORENE	*	ND	ND	ND	ND	ND	ND	150 R	150 R
HEXACHLOROBENZENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
HEXACHLOROBUTADIENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
HEXACHLOROCYCLOPENTADIENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
HEXACHLOROETHANE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
INDENO(1,2,3-CD)PYRENE	*	44	15 J	110	20 J	20 J	50	110 J	180 J
ISOPHORONE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
N-NITROSO-DI-N-PROPYLAMINE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
N-NITROSODIPHENYLAMINE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
NAPHTHALENE	*	ND	ND	ND	ND	ND	ND	150 R	150 R
NITROBENZENE	*	ND	ND	ND	ND	ND	ND	460 R	500 R
PENTACHLOROPHENOL	*	ND	ND	ND	ND	ND	ND	1100 R	1200 R
PHENANTHRENE	*	ND	ND	ND	ND	ND	54 J	150 R	150 R
PHENOL	*	ND	ND	ND	ND	ND	ND	460 R	500 R
PYRENE	*	52	27 J	160 J	26 J	27 J	69 J	210 J	480 J
VOCs (ug/kg)									
1,1,1-TRICHLOROETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
1,1,2,2-TETRACHLOROETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
1,1,2-TRICHLOROETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
1,1-DICHLOROETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
1,1-DICHLOROETHENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
1,2-DICHLOROETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
1,2-DICHLOROPROPANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
2-BUTANONE	*	ND	ND	ND	ND	ND	ND	3400 R	3500 R
2-HEXANONE	*	ND	ND	ND	ND	ND	ND	3400 R	3500 R
4-METHYL-2-PENTANONE	*	ND	ND	ND	ND	ND	ND	3400 R	3500 R
ACETONE	*	ND	ND	ND	910 J	770 J	810 J	4600 R	3400 R
BENZENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R

Table 4-22B

Study Area 5 - Freshwater Sediment Analytical Results

Detected Compounds

Analyte	PAL	MY05SD15	MY05SD17	MY05SD18	MY05SD19	MY05SD30	MY05SD20	MY05SS09	MY05SS15
Duplicates						Dup. of MY05SD19			Dup. of MY05SS09
Date Collected		10/16/2001	10/29/2001	10/29/2001	10/25/2001	10/25/2001	10/25/2001	11/8/2001	11/8/2001
Sample Delivery Group		MY014	MY014	MY014	MY014	MY014	MY014	MY016	MY016
BROMODICHLOROMETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
BROMOFORM	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
BROMOMETHANE	*	ND	ND	ND	ND	280 J	360 J	1700 J	1600 J
CARBON DISULFIDE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
CARBON TETRACHLORIDE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
CHLOROBENZENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
CHLOROETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
CHLOROFORM	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
CHLOROMETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
CIS-1,2-DICHLOROETHENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
CIS-1,3-DICHLOROPROPENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
DIBROMOCHLOROMETHANE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
ETHYLBENZENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
M-,P-XYLENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
METHYLENE CHLORIDE	*	ND	ND	ND	ND	ND	ND	3700 R	4100 R
O-XYLENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
STYRENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
TETRACHLOROETHENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
TOLUENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
TRANS-1,2-DICHLOROETHENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
TRANS-1,3-DICHLOROPROPENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
TRICHLOROETHENE	*	ND	ND	ND	ND	ND	ND	1700 R	1800 R
VINYL CHLORIDE	*	ND	ND	ND	ND	ND	ND	3400 R	3500 R
Other Compounds									
TOTAL SOLIDS (%)	*	61	69	20	63	64	60	19	18
TOTAL SOLIDS (VOA) (%)	*	63	67	20	NA	NA	NA	15	15

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-23
Study Area 5 - Concrete Analytical Results
Detected Compounds

Analyte	PAL	MY05CS01	MY05CS02	MY05CS03	MY05CS04	MY05CS05	MY05CS06	MY05CS07	MY05CS08	MY05CS105	MY05CS09	MY05CS10	MY05CS104
Duplicates										Dup. of MY05CS08			Dup. of MY05CS10
Date Collected		9/18/2001	9/18/2001	10/21/2002	10/21/2002	10/21/2002	10/21/2002	10/22/2002	10/23/2002	10/23/2002	10/21/2002	10/22/2002	10/22/2002
Sample Delivery Group		MY003	MY003	MYR104	MYR104	MYR104	MYR104	MYR104	MYR104	MYR104	MYR104	MYR104	MYR104
EPH (mg/kg)													
C11-C22 AROMATICS	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C9-C18 ALIPHATICS	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C19-C36 ALIPHATICS	100	**140**	63	6.2	34.6	8.8	8.5	12.4	9.1	8.2	6.8	19.9 J	31.8 J
PCBs (ug/kg)													
AROCLOR-1016	290000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1221	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1232	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1242	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1248	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1254	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AROCLOR-1260	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds													
TOTAL SOLIDS (%)	*	97	94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

* Concrete was removed and disposed offsite following receipt of analytical results from these samples.

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-23
Study Area 5 - Concrete Analytical Results
Detected Compounds

Analyte	PAL	MY05CS101*	MY05CS102*	MY05CS103(0-0.9)*	MY05CS107*	MY05CS108*	MY05CS109	MY05CS110	MY05CS11	MY05CS12	MY05CS13
Duplicates			Dup. of MY05CS101			Dup. of MY05CS107		Dup. of MY05CS109			
Date Collected		9/26/2002	9/26/2002	9/26/2002	10/28/2002	10/28/2002	11/14/2002	11/14/2002	10/23/2002	10/22/2002	10/22/2002
Sample Delivery Group		MY121	MY121	MY121	MY126	MY126	MY128	MY128	MYR104	MYR104	MYR104
EPH (mg/kg)											
C11-C22 AROMATICS	100	**3000 J**	**4000 J**	**1000 J**	35 J	56 J	ND	ND	ND	ND	ND
C9-C18 ALIPHATICS	100	**5800**	**6300**	**2800**	**230 J**	**290 J**	14 J	12 J	ND	ND	ND
C19-C36 ALIPHATICS	100	**2800**	**2900**	**950**	86 J	**110 J**	14 J	16 J	7.6	14.3	27.8
PCBs (ug/kg)											
AROCLOR-1016	290000	NA	NA	NA	NA	ND	NA	NA	ND	ND	ND
AROCLOR-1221	1000	NA	NA	NA	NA	ND	NA	NA	ND	ND	ND
AROCLOR-1232	1000	NA	NA	NA	NA	ND	NA	NA	ND	ND	ND
AROCLOR-1242	1000	NA	NA	NA	NA	ND	NA	NA	ND	ND	ND
AROCLOR-1248	1000	NA	NA	NA	NA	ND	NA	NA	ND	ND	ND
AROCLOR-1254	1000	NA	NA	NA	NA	ND	NA	NA	ND	ND	ND
AROCLOR-1260	1000	NA	NA	NA	NA	ND	NA	NA	ND	ND	ND
Other Compounds											
TOTAL SOLIDS (%)	*	96	96	96	90	88	89	88	NA	NA	NA

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

* Concrete was removed and disposed offsite following receipt of analytical results from these samples.

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-23
Study Area 5 - Concrete Analytical Results
Detected Compounds

Analyte	PAL	MY05CS14	MY05CS21	MY05CS30	MY05CS22
Duplicates				Dup. of MY05CS21	
Date Collected		10/22/2002	9/18/2001	9/18/2001	10/31/2002
Sample Delivery Group		MYR104	MY003	MY003	MYR104
EPH (mg/kg)					
C11-C22 AROMATICS	100	ND	ND	ND	ND
C9-C18 ALIPHATICS	100	ND	ND	ND	6 R
C19-C36 ALIPHATICS	100	**152**	ND	ND	37.3 R
PCBs (ug/kg)					
AROCLOR-1016	290000	ND	ND	ND	14.6 R
AROCLOR-1221	1000	ND	ND	ND	14.6 R
AROCLOR-1232	1000	ND	ND	ND	14.6 R
AROCLOR-1242	1000	ND	ND	ND	14.6 R
AROCLOR-1248	1000	ND	ND	ND	14.6 R
AROCLOR-1254	1000	ND	ND	ND	14.6 R
AROCLOR-1260	1000	ND	ND	ND	14.6 R
Other Compounds					
TOTAL SOLIDS (%)	*	NA	95	NA	NA

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

* Concrete was removed and disposed offsite following receipt of analytical results from these samples.

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-24
Study Area 5 - Surface Water Analytical Results
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY05SW01 10/2/2001 MY008	MY05SW02 10/3/2001 MY008	MY05SW03 10/1/2001 MY008	MY05SW10 Dup. of MY05SW03 10/1/2001 MY008	MY05SW04 10/15/2001 MY008	MY05SW05 11/7/2001 MY017
EPH (ug/l)							
EPH	*	130	ND	130	150	60	ND
Metals (ug/l)							
ALUMINUM	87	ND	ND	28.2 J	ND	**149**	**217**
ARSENIC	150	ND	2.3 J	ND	ND	ND	ND
BARIUM	*	52.4	27.6	2.9	2.6	13.5	22.3
BERYLLIUM	*	0.75 J	ND	ND	ND	0.87	ND
BORON	*	2200	139	12.6	13.9	3650	32.5
CADMIUM	2.2	ND	ND	ND	ND	0.4	0.2 J
CALCIUM	*	260000	45000	12700	13200	295000	13800
CHROMIUM	11	ND	ND	ND	ND	ND	2.6
COPPER	12	ND	4.2	ND	ND	ND	3.2 J
IRON	*	2180	2030	ND	ND	ND	340
LEAD	3.2	**14.2**	ND	ND	ND	**10.8**	ND
MAGNESIUM	*	633000	17400	3240	3350	962000	3830
MANGANESE	*	650	1290	31.3	30.2	12.5	51.7
MOLYBDENUM	*	ND	ND	ND	ND	ND	4.4
NICKEL	160	3.9 J	ND	ND	ND	1.6	ND
POTASSIUM	*	188000	5380	1390	1420	315000	3540
SODIUM	*	4460000	46700	12200	12800	7910000	7820
ZINC	120	ND	ND	ND	ND	ND	**163**
PCBs (ug/l)							
		ND	ND	ND	ND	ND	ND
Pesticides (ug/l)							
		ND	ND	ND	ND	ND	ND
SVOCs (ug/l)							
BIS(2-ETHYLHEXYL) PHTHALATE	360	67	ND	ND	25 J	ND	ND
VOCs (ug/l)							
ACETONE	*	3 J	ND	ND	ND	3 R	ND

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-25A
Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD01	MY06SD02	MY06SD03	MY06SD04	MY06SD40	MY06SD04A	MY06SD05	MY06SD06	MY06SD07
Duplicates						Dup. of MY06SD04				
Date Collected		9/26/2001	9/26/2001	9/26/2001	9/26/2001	9/26/2001	11/19/2001	9/26/2001	9/26/2001	9/24/2001
Sample Delivery Group		MY006	MY006	MY006	MY006	MY006	MY019	MY006	MY006	MY005
EPH (mg/kg)										
C11-C22 AROMATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)										
ALUMINUM	*	15800	14100	20600	20900	19400	16700	18400	17300	13100
ANTIMONY	2	0.04 J	0.04 J	0.05 J	0.06 J	0.05 J	0.06 R	0.06 J	0.05 J	0.04 J
ARSENIC	8.2	**10.6**	**8.4**	**10.8**	**12.9**	**11.2**	**12.6**	**15.6**	**13.1**	**8.3**
BARIUM	*	44.4	35.7	45	49.8	49.4	45	37.9	39	39.7
BERYLLIUM	*	0.72	0.59	0.89	0.86	0.82	0.72	0.83	0.76	0.48
BORON	*	25.2	14.6	31.5	34.5	33	31.9	38.3	32	20.6
CADMIUM	1.2	0.16	0.1	0.15	0.21	0.18	ND	0.29	0.22	0.17
CALCIUM	*	3620	10300	4400	3330	2710	2530 J	3450	3420	1940 J
CHROMIUM	81	42.2	34.5	58.1	57.2	53.1	53	54.6	53.8	33.1
COBALT	*	9.4	9.1	8.9	9.4	8.6	9	8.3	7.9	6.7
COPPER	34	19	14.7	20.8	22.2	20.4	21.4	19.6	19.8	10.4
IRON	*	24100	20000	28800	31500	27600	28000	29700	27800	18800
LEAD	46.7	21.1	14.8	32.6	27.9	25.1	26.2	28.2	28.2	16
MAGNESIUM	*	7760	5980	8300	8700	8060	8100	7920	7880	6310
MANGANESE	*	279	230	280	330	276	302	274	258	217
MERCURY	0.15	**0.15 J**	0.07 J	**0.27 J**	**0.23 J**	**0.24 J**	**0.17**	**0.34 J**	**0.34 J**	0.1 J
MOLYBDENUM	*	1.3	1.1	0.9	2.1	1.4	ND	1.6	1	1.1
NICKEL	20.9	**25.1**	**22**	**29.6**	**30.9**	**28.2**	**29.7**	**27.4**	**26**	16
POTASSIUM	*	4150	3690	4940	5180	4950	4330	4590	4350	3880
SELENIUM	*	ND	ND	0.63 J	0.76 J	0.63 J	ND	0.73 J	ND	ND
SILVER	1	0.13	0.12	0.18	0.18	0.16	ND	0.17	0.18	0.08
SODIUM	*	7500	4510	10800	10100	10200	11200	12000	11900	8080
THALLIUM	*	ND	ND	ND	ND	ND	ND	ND	ND	0.3
VANADIUM	*	43.4	35.1	50.2	51.2	47	47.4	47.2	46.6	35.2
ZINC	150	96.7	63	90	101	89.6	97.2	79.8	87.1	52.8
PCB Congener (ug/kg)										
101 - 2,2',4,5,5'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA	1.1	NA	NA	NA
105 - 2,3,3',4,4'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA
118 - 2,3',4,4',5-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA	1.4	NA	NA	NA
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	22.7	NA	NA	NA	NA	NA	1.1	NA	NA	NA
153/132/168 - Hexachlorobiphenyl	22.7	NA	NA	NA	NA	NA	1.7 J	NA	NA	NA

Table 4-25A

Study Area 6 - Sediment Analytical Results

Detected Compounds

Analyte	PAL	MY06SD01	MY06SD02	MY06SD03	MY06SD04	MY06SD40	MY06SD04A	MY06SD05	MY06SD06	MY06SD07
Duplicates						Dup. of MY06SD04				
Date Collected		9/26/2001	9/26/2001	9/26/2001	9/26/2001	9/26/2001	11/19/2001	9/26/2001	9/26/2001	9/24/2001
Sample Delivery Group		MY006	MY006	MY006	MY006	MY006	MY019	MY006	MY006	MY005
170/190 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.37 J	NA	NA	NA
180/172 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.54 J	NA	NA	NA
182/187 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.54 J	NA	NA	NA
206 - Nonachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.2 J	NA	NA	NA
209 - Decachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.095 J	NA	NA	NA
43/52 - Tetrachlorobiphenyl/Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.8 J	NA	NA	NA
44 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.7	NA	NA	NA
66 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.53 J	NA	NA	NA
Dichlorobiphenyls	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA
Heptachlorobiphenyls	22.7	NA	NA	NA	NA	NA	4.2	NA	NA	NA
Hexachlorobiphenyls	22.7	NA	NA	NA	NA	NA	8.2	NA	NA	NA
Nonachlorobiphenyls	22.7	NA	NA	NA	NA	NA	0.22 J	NA	NA	NA
Octachlorobiphenyls	22.7	NA	NA	NA	NA	NA	0.67	NA	NA	NA
Pentachlorobiphenyls	22.7	NA	NA	NA	NA	NA	13	NA	NA	NA
Tetrachlorobiphenyls	22.7	NA	NA	NA	NA	NA	10	NA	NA	NA
Trichlorobiphenyls	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA
PCBs (ug/kg)										
		ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)										
4,4'-DDT	1.58	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)										
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	70	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	1600 R	1100 R	1700 R	1800 R	1800 R	ND	1900 R	1900 R	ND
ACENAPHTHENE	16	ND	ND	ND	78 J	ND	ND	ND	ND	ND
ACENAPHTHYLENE	44	ND	ND	22 J	ND	ND	ND	ND	ND	ND
ANTHRACENE	85	**92 J**	ND	33 J	**170 J**	30 J	ND	ND	30 J	ND
BENZO(A)ANTHRACENE	261	**320 J**	82	220 J	**620 J**	200 J	140	130 J	190 J	90
BENZO(A)PYRENE	430	230	65 J	180	400	180 J	130	120	180	65
BENZO(B)FLUORANTHENE	*	310 J	120 J	300 J	530 J	190 J	180	220 J	250 J	94
BENZO(K)FLUORANTHENE	*	140 J	31 J	92 J	160 J	48 J	51 J	46 J	58 J	39
BENZO[G,H,I]PERYLENE	*	140 J	44 J	120	220	110 J	84 J	86	150 J	36
BIS(2-ETHYLHEXYL) PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD01	MY06SD02	MY06SD03	MY06SD04	MY06SD40	MY06SD04A	MY06SD05	MY06SD06	MY06SD07
Duplicates						Dup. of MY06SD04				
Date Collected		9/26/2001	9/26/2001	9/26/2001	9/26/2001	9/26/2001	11/19/2001	9/26/2001	9/26/2001	9/24/2001
Sample Delivery Group		MY006	MY006	MY006	MY006	MY006	MY019	MY006	MY006	MY005
CHRYSENE	384	210	48	150	340	120 J	110 J	94	170	62
DIBENZO(A,H)ANTHRACENE	63	ND	ND	34 J	61 J	31 J	ND	ND	42 J	ND
DIBENZOFURAN	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	600	450	70	240	**750**	200 J	240 J	130	170	100
FLUORENE	19	ND	ND	**23 J**	**110 J**	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	*	200 J	65 J	210 J	330 J	170 J	120	120 J	220 J	43
NAPHTHALENE	160	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	240	120 J	28	140	**290 J**	63 J	140 J	40 J	86 J	39
PYRENE	665	300	100	210	600	170 J	190 J	170 J	200	99 J
VOCs (ug/kg)										
METHYLENE CHLORIDE	*	ND	ND	ND	ND	ND	ND	ND	ND	380 J
Other Compounds										
TOTAL ORGANIC CARBON(mg/kg)	*	25200 J	14000 J	25900	22400	25000	24100 J	30300	33200	17200
TOTAL SOLIDS (%)	*	54	72	47	46	46	46	43	43	56
TOTAL SOLIDS-VOA (%)	*	54	69	44	47	52	43	44	46	64

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD08	MY06SD38	MY06SD09	MY06SD10	MY06SD11	MY06SD12	MY06SD16	MY06SD16A	MY06SD17
Duplicates			Dup. of MY06SD08							
Date Collected		9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	11/20/2001	9/24/2001
Sample Delivery Group		MY005	MY005	MY005	MY005	MY005	MY005	MY005	MY019	MY005
EPH (mg/kg)										
C11-C22 AROMATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)										
ALUMINUM	*	11700	13000	9080	14900	15500	16300	9010	10200	18000
ANTIMONY	2	0.05 J	0.02 J	0.02 J	0.03 J	0.04 J	0.04 J	0.08 J	0.05 R	0.04 J
ARSENIC	8.2	**8.2**	**8.2**	7.6	**9.2**	**8.5**	**9**	5.6	5.9	**12.2**
BARIUM	*	33.4	41.8	27.1	33.7	40.1	37.6	41.8	40.9	53.2
BERYLLIUM	*	0.43	0.49	0.36	0.56	0.56	0.59	0.38	0.45	0.67
BORON	*	19.3	18.6	21.2	26.8	28.7	29.1	10.8	10.3	34.8
CADMIUM	1.2	0.17	0.17	0.19	0.17	0.18	0.17	0.18	0.16	0.2
CALCIUM	*	2020 J	10800 J	1700 J	2480 J	2640 J	3320 J	1850 J	2870 J	3220 J
CHROMIUM	81	29.9	30	23.3	42.5	41.9	44.9	38.5	29.3	49.2
COBALT	*	6.8	6.4	5.4	8	8.3	8.3	6.4	6.2	10.1
COPPER	34	9.3	9.5	7.2	14.2	13.2	14.1	24.7	22.9	18.6
IRON	*	18300	18900	14800	22600	22300	23000	26200	16700	28300
LEAD	46.7	15.2	16.6	12.6	22.7	21.3	23.6	15.8	16.5	23.8
MAGNESIUM	*	5820	6250	4680	7740	7380	8040	4770	4900	9430
MANGANESE	*	203	219	156	233	245	244	218	221	286
MERCURY	0.15	0.11 J	0.1 J	0.1 J	**0.18 J**	0.14 J	0.14 J	0.09 J	0.08	0.14 J
MOLYBDENUM	*	1.4	1.2	1.1	1.1	0.88	0.96	1.6	ND	1.3
NICKEL	20.9	16.4	14.9	12.6	**22.9**	**21.9**	**23.6**	20.8	16.4	**25.9**
POTASSIUM	*	3320	4070	2710	3810	4130	4140	3220	3260	5950
SELENIUM	*	ND	ND	ND	ND	ND	ND	ND	ND	0.57 J
SILVER	1	0.06	0.07	0.06	0.12	0.12	0.12	0.07	0.14	0.12
SODIUM	*	6250	6790	5590	10700	8820	11000	3190	3780	15300
THALLIUM	*	0.21	0.2	0.2	0.18	0.19	0.19	0.14	0.16	0.23
VANADIUM	*	31.6	33.3	25	39.4	40.5	41.8	27.3	29.8	51.8
ZINC	150	51.3	53	44.5	68.1	66	69.9	**195**	113	86.1
PCB Congener (ug/kg)										
101 - 2,2',4,5,5'-Pentachlorobiphenyl	22.7	ND	NA	NA	NA	NA	NA	NA	ND	NA
105 - 2,3,3',4,4'-Pentachlorobiphenyl	22.7	0.32 J	NA	NA	NA	NA	NA	NA	0.67	NA
118 - 2,3',4,4',5-Pentachlorobiphenyl	22.7	0.84	NA	NA	NA	NA	NA	NA	ND	NA
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	22.7	0.64	NA	NA	NA	NA	NA	NA	1	NA
153/132/168 - Hexachlorobiphenyl	22.7	0.85 J	NA	NA	NA	NA	NA	NA	1.5 J	NA

Table 4-25A
Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD08	MY06SD38	MY06SD09	MY06SD10	MY06SD11	MY06SD12	MY06SD16	MY06SD16A	MY06SD17
Duplicates			Dup. of MY06SD08							
Date Collected		9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	11/20/2001	9/24/2001
Sample Delivery Group		MY005	MY005	MY005	MY005	MY005	MY005	MY005	MY019	MY005
170/190 - Heptachlorobiphenyl	22.7	ND	NA	NA	NA	NA	NA	NA	0.21 J	NA
180/172 - Heptachlorobiphenyl	22.7	0.16 J	NA	NA	NA	NA	NA	NA	0.47 J	NA
182/187 - Heptachlorobiphenyl	22.7	0.13 J	NA	NA	NA	NA	NA	NA	0.32 J	NA
206 - Nonachlorobiphenyl	22.7	ND	NA	NA	NA	NA	NA	NA	ND	NA
209 - Decachlorobiphenyl	22.7	0.069 J	NA	NA	NA	NA	NA	NA	ND	NA
43/52 - Tetrachlorobiphenyl/Tetrachlorobiphenyl	22.7	ND	NA	NA	NA	NA	NA	NA	ND	NA
44 - Tetrachlorobiphenyl	22.7	0.37 J	NA	NA	NA	NA	NA	NA	ND	NA
66 - Tetrachlorobiphenyl	22.7	0.32 J	NA	NA	NA	NA	NA	NA	ND	NA
Dichlorobiphenyls	22.7	2.2	NA	NA	NA	NA	NA	NA	ND	NA
Heptachlorobiphenyls	22.7	1.5	NA	NA	NA	NA	NA	NA	3.5	NA
Hexachlorobiphenyls	22.7	4.2	NA	NA	NA	NA	NA	NA	9.2	NA
Nonachlorobiphenyls	22.7	ND	NA	NA	NA	NA	NA	NA	ND	NA
Octachlorobiphenyls	22.7	ND	NA	NA	NA	NA	NA	NA	ND	NA
Pentachlorobiphenyls	22.7	8.7	NA	NA	NA	NA	NA	NA	17	NA
Tetrachlorobiphenyls	22.7	5.8	NA	NA	NA	NA	NA	NA	ND	NA
Trichlorobiphenyls	22.7	0.96 J	NA	NA	NA	NA	NA	NA	ND	NA
PCBs (ug/kg)										
		ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)										
4,4'-DDT	1.58	ND	ND	ND	ND	ND	ND	ND	**12**	ND
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)										
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	70	ND	ND	ND	ND	ND	ND	**620**	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	16	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	44	ND	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	85	ND	ND	ND	ND	ND	ND	**3800 J**	**5300**	ND
BENZO(A)ANTHRACENE	261	52 J	95 J	55 J	120	74 J	ND	**6900**	**14000 J**	160 J
BENZO(A)PYRENE	430	53	74	57	130	71 J	ND	**6100**	**8600 J**	100 J
BENZO(B)FLUORANTHENE	*	81	110	87	200	93 J	ND	7800	11000 J	170 J
BENZO(K)FLUORANTHENE	*	20 J	29 J	20 J	33 J	34 J	ND	3600 J	4200 J	54 J
BENZO[G,H,I]PERYLENE	*	37	48	36	82	48 J	ND	3000 J	4100 J	75 J
BIS(2-ETHYLHEXYL) PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	3800	1400	ND

Table 4-25A

Study Area 6 - Sediment Analytical Results

Detected Compounds

Analyte	PAL	MY06SD08	MY06SD38	MY06SD09	MY06SD10	MY06SD11	MY06SD12	MY06SD16	MY06SD16A	MY06SD17
Duplicates			Dup. of MY06SD08							
Date Collected		9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	9/24/2001	11/20/2001	9/24/2001
Sample Delivery Group		MY005	MY005	MY005	MY005	MY005	MY005	MY005	MY019	MY005
CHRYSENE	384	47	54	45	77	78 J	87 J	**8400**	**8100 J**	90 J
DIBENZO(A,H)ANTHRACENE	63	ND	ND	ND	22 J	ND	ND	ND	ND	ND
DIBENZOFURAN	*	ND	ND	ND	ND	ND	ND	1900	550	ND
DIMETHYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	520	ND
FLUORANTHENE	600	69	38	75	140	140 J	ND	**24000**	**25000 J**	300 J
FLUORENE	19	ND	ND	ND	ND	ND	ND	ND	**2600 J**	ND
INDENO(1,2,3-CD)PYRENE	*	43	62	47	100	63 J	ND	4000 J	6400 J	96 J
NAPHTHALENE	160	ND	ND	ND	ND	ND	ND	**800**	ND	ND
PHENANTHRENE	240	29 J	25 J	32	47	55 J	ND	**18000**	**22000 J**	120 J
PYRENE	665	67	99	71	140 J	120 J	ND	**16000**	**18000 J**	160 J
VOCs (ug/kg)										
METHYLENE CHLORIDE	*	350 J	ND	210 J	390 J	ND	ND	ND	ND	ND
Other Compounds										
TOTAL ORGANIC CARBON(mg/kg)	*	18500	27500	11800	26000	23600	24000	14300	8710 J	35500
TOTAL SOLIDS (%)	*	59	58	61	48	50	47	79	77	37
TOTAL SOLIDS-VOA (%)	*	61	59	61	48	49	47	74	74	34

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD18	MY06SD19	MY06SD20	MY06SD37	MY06SD20A	MY06SD41	MY06SD21	MY06SD25	MY06SD26
Duplicates					Dup. of MY06SD20		Dup. of MY06SD20A			
Date Collected		9/24/2001	9/20/2001	9/20/2001	9/20/2001	11/19/2001	11/19/2001	9/20/2001	9/20/2001	9/20/2001
Sample Delivery Group		MY005	MY005	MY005	MY005	MY019	MY019	MY005	MY005	MY005
EPH (mg/kg)										
C11-C22 AROMATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)										
ALUMINUM	*	17500	4870	9340	8810	8200	7460	9100	6540	7340
ANTIMONY	2	0.04 J	0.02 J	0.03 J	0.02 J	0.03 R	0.04 R	0.02 J	0.02 J	0.01 J
ARSENIC	8.2	**11.7**	2.9	5.2	5.4	5.1	5.4	7.2	6	5.9
BARIUM	*	45.5	16.4	30.1	26.6	28.5	26.4	40.6	19.4	27.2
BERYLLIUM	*	0.65	0.18	0.36	0.35	0.39	0.39	0.46	0.25	0.28
BORON	*	37.8	5	12.6	11	12	8.2	8.1	10	11.9
CADMIUM	1.2	0.22	0.09	0.12	0.1	0.11	0.09	0.08	0.1	0.05
CALCIUM	*	3240 J	2080 J	2860 J	1510 J	1600 J	1510 J	7480 J	2290 J	1500 J
CHROMIUM	81	50	12.4	24.4	21.6	22.5	16.7	22	18.6	19
COBALT	*	9.5	3.1	6.4	5.8	5.2	6.2	6.2	4.3	4.6
COPPER	34	18.5	4.4	17.8	12.5	14.2	17.9	17.1	6.4	7.7
IRON	*	27500	7600	14400	14900	13200	13200	15900	9890	12000
LEAD	46.7	24.2	4.6	10.7	9.3	8.2	6.6	6.3	8.7	9.5
MAGNESIUM	*	9100	2690	4590	4410	4360	3810	4490	3490	3830
MANGANESE	*	276	113	184	169	183	172	180	126	152
MERCURY	0.15	0.14 J	ND	ND	0.12 J	0.05	0.06	ND	ND	ND
MOLYBDENUM	*	1.2	0.27	0.63	0.75	ND	ND	0.98	0.7	0.76
NICKEL	20.9	**27.2**	6.7	13.5	12.7	12.6	13.7	11.2	9.3	10.1
POTASSIUM	*	5020	1610	2900	2560	2560	2500	3570	1910	2080
SELENIUM	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
SILVER	1	0.13	0.04	0.06	0.05	0.07	0.08	0.03	0.04	0.03
SODIUM	*	13900	3150	4420	4020	4450	3140	3620	4420	4290
THALLIUM	*	0.22	0.2	0.15	0.12	ND	ND	0.2	0.1	0.09
VANADIUM	*	51.3	13.4	26.5	23.6	25.8	24	26.8	18.5	21.4
ZINC	150	81.9	22.2	59.2	55.5	54.2	45.6	41	32	38.6
PCB Congener (ug/kg)										
101 - 2,2',4,5,5'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	ND
105 - 2,3,3',4,4'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	ND
118 - 2,3',4,4',5-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	ND
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	0.37 J
153/132/168 - Hexachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	0.76 J

Table 4-25A

Study Area 6 - Sediment Analytical Results

Detected Compounds

Analyte	PAL	MY06SD18	MY06SD19	MY06SD20	MY06SD37	MY06SD20A	MY06SD41	MY06SD21	MY06SD25	MY06SD26
Duplicates					Dup. of MY06SD20		Dup. of MY06SD20A			
Date Collected		9/24/2001	9/20/2001	9/20/2001	9/20/2001	11/19/2001	11/19/2001	9/20/2001	9/20/2001	9/20/2001
Sample Delivery Group		MY005	MY005	MY005	MY005	MY019	MY019	MY005	MY005	MY005
170/190 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	0.14 J
180/172 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	0.26 J
182/187 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	0.16 J
206 - Nonachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	0.07 J
209 - Decachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	ND
43/52 - Tetrachlorobiphenyl/Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	ND	NA	NA	NA	ND
44 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	0.62 J	NA	NA	NA	0.29 J
66 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	0.99	NA	NA	NA	0.25 J
Dichlorobiphenyls	22.7	NA	NA	NA	NA	ND	NA	NA	NA	1.1
Heptachlorobiphenyls	22.7	NA	NA	NA	NA	ND	NA	NA	NA	2.1
Hexachlorobiphenyls	22.7	NA	NA	NA	NA	3	NA	NA	NA	3.6
Nonachlorobiphenyls	22.7	NA	NA	NA	NA	ND	NA	NA	NA	ND
Octachlorobiphenyls	22.7	NA	NA	NA	NA	1.9	NA	NA	NA	ND
Pentachlorobiphenyls	22.7	NA	NA	NA	NA	8.9	NA	NA	NA	ND
Tetrachlorobiphenyls	22.7	NA	NA	NA	NA	10	NA	NA	NA	2.6
Trichlorobiphenyls	22.7	NA	NA	NA	NA	2.5	NA	NA	NA	ND
PCBs (ug/kg)										
		ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)										
4,4'-DDT	1.58	ND	ND	ND	ND	**5.7 J**	**11 J**	ND	ND	ND
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	ND	12 J	ND	ND	ND
HEPTACHLOR	*	ND	ND	ND	ND	3.1 J	ND	ND	ND	ND
METHOXYCHLOR	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)										
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	460 R
2-METHYLNAPHTHALENE	70	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	ND	ND	ND	ND	ND	ND	ND	ND	1100 R
ACENAPHTHENE	16	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	44	ND	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	85	38 J	21 J	**1500 J**	ND	ND	**1400 J**	23 J	ND	59
BENZO(A)ANTHRACENE	261	**350 J**	80	**3900**	**3100**	**2900**	**4500**	91	93	**380**
BENZO(A)PYRENE	430	240 J	56	**3500**	**2900**	**2000 J**	**3400**	70	75	300
BENZO(B)FLUORANTHENE	*	380 J	86	4300	3700	3100	5000	100	120	460
BENZO(K)FLUORANTHENE	*	100 J	20 J	2100 J	2000 J	ND	1500 J	25 J	24 J	66
BENZO[G,H,I]PERYLENE	*	130 J	35	2300 J	2000 J	ND	1800 J	42	52	180
BIS(2-ETHYLHEXYL) PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	280 J
CARBAZOLE	*	ND	ND	920	460	1200	960	ND	420 J	ND

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY06SD18 9/24/2001 MY005	MY06SD19 9/20/2001 MY005	MY06SD20 9/20/2001 MY005	MY06SD37 Dup. of MY06SD20 9/20/2001 MY005	MY06SD20A 11/19/2001 MY019	MY06SD41 Dup. of MY06SD20A 11/19/2001 MY019	MY06SD21 9/20/2001 MY005	MY06SD25 9/20/2001 MY005	MY06SD26 9/20/2001 MY005
CHRYSENE	384	230 J	47	**3300**	**2800**	**2400 J**	**3800 J**	55	59	230
DIBENZO(A,H)ANTHRACENE	63	30 J	ND	ND	ND	ND	ND	ND	ND	43
DIBENZOFURAN	*	ND	ND	330 J	ND	760 J	440 J	ND	ND	ND
DIMETHYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	600	96 J	120	**8000**	**7500**	**7600 J**	**12000 J**	120	110	500
FLUORENE	19	ND	ND	ND	ND	ND	ND	ND	ND	15 J
INDENO(1,2,3-CD)PYRENE	*	180 J	45	2900 J	2700 J	1600 J	2600 J	58	65	240
NAPHTHALENE	160	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	240	87 J	69	**5600**	**4400**	**6600 J**	**9400 J**	85	48	190 J
PYRENE	665	530 J	86	**6500**	**5000**	**4500 J**	**8600 J**	100	110	380 J
VOCs (ug/kg)										
METHYLENE CHLORIDE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds										
TOTAL ORGANIC CARBON(mg/kg)	*	39600	2360 J	12700	13500	13200 J	5960 J	4070	7150	11200
TOTAL SOLIDS (%)	*	39	81	66	72	73	77	77	72	69
TOTAL SOLIDS-VOA (%)	*	36	77	70	73	75	80	71	69	63

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte / Duplicates / Date Collected / Sample Delivery Group	PAL	MY06SD27	MY06SD28	MY06SD29	MY06SD30	MY06SD31	MY06SD32	MY06SD39	MY06SD33	MY06SD34	MY06SD35
Duplicates								Dup. of MY06SD32			
Date Collected		9/20/2001	9/20/2001	9/20/2001	9/20/2001	9/25/2001	9/25/2001	9/25/2001	9/25/2001	9/25/2001	9/25/2001
Sample Delivery Group		MY005	MY005	MY005	MY005	MY006	MY006	MY006	MY006	MY006	MY006
EPH (mg/kg)											
C11-C22 AROMATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C19-C36 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C18 ALIPHATICS	*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)											
ALUMINUM	*	7630	16600	5290	8800	9950	8270	8630	9760	8300	7850
ANTIMONY	2	0.02 J	0.04 J	0.01 J	0.03 J	0.03 J	0.02 J	0.04 J	0.02 J	ND	0.02 J
ARSENIC	8.2	4.5	5.8	3.1	5.2	7	5.9	5.6	6.2	4.8	5.6
BARIUM	*	22.3	57.8	15.9	43.5	25.9	21	22.8	26.5	23.2	21
BERYLLIUM	*	0.3	0.49	0.2	0.28	0.36	0.32	0.34	0.35	0.29	0.28 J
BORON	*	8.9	13.3	5.7	5.9	14.9	12.4	12.8	13.9	10.3	10.8
CADMIUM	1.2	0.07	0.04	0.07	0.06	0.15	0.1	0.09	0.1	0.09	0.11
CALCIUM	*	1400 J	2720 J	1340 J	16500 J	2170	1780	1950	1910	1490	1560
CHROMIUM	81	19.4	38.4	13.4	20.7	27.6	23.2	24.1	25.8	22	21.4
COBALT	*	4.7	10.7	3.5	6.5	5.8	5.2	5.2	5.4	5	4.8
COPPER	34	7.1	13.7	5	11.3	9	8	8.5	8.6	7	7.6
IRON	*	11700	23100	8240	13600	15000	12700	13200	14100	12300	11900
LEAD	46.7	8.6	8.1	6	5.5	12.8	11	11	12.1	9.6	10.8
MAGNESIUM	*	3910	7510	2780	4480	4860	4120	4310	4650	3980	3880
MANGANESE	*	151	306	113	179	179	148	154	174	150	143
MERCURY	0.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM	*	0.54	0.26	0.45	0.4	0.83	0.67	0.54	0.54	0.64	0.55
NICKEL	20.9	9.9	**27.4**	8.2	15.4	16.9	14.1	14.6	14.4	12.5	12.8
POTASSIUM	*	2210	5540	1670	3070	2580	2120	2220	2680	2220	2140
SELENIUM	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SILVER	1	0.04	ND	0.02 J	0.02 J	0.08	0.06	0.05	0.07	0.04	0.05
SODIUM	*	4260	2990	3300	2800	5720	4990	5220	5830	4220	4700
THALLIUM	*	0.1	0.18	0.09	0.14	ND	ND	ND	ND	ND	ND
VANADIUM	*	21	34.2	13.6	21.1	28.5	23.3	24.3	25.7	22.3	20.9
ZINC	150	35.5	52.7	29.3	33.9	47.7	40.7	40.3	43.5	37.7	39.1
PCB Congener (ug/kg)											
101 - 2,2',4,5,5'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
105 - 2,3,3',4,4'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
118 - 2,3',4,4',5-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.7	NA	NA	NA	NA
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.51	NA	NA	NA	NA
153/132/168 - Hexachlorobiphenyl	22.7	NA	NA	NA	NA	NA	1.1 J	NA	NA	NA	NA

Table 4-25A

Study Area 6 - Sediment Analytical Results

Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY06SD27 9/20/2001 MY005	MY06SD28 9/20/2001 MY005	MY06SD29 9/20/2001 MY005	MY06SD30 9/20/2001 MY005	MY06SD31 9/25/2001 MY006	MY06SD32 9/25/2001 MY006	MY06SD39 Dup. of MY06SD32 9/25/2001 MY006	MY06SD33 9/25/2001 MY006	MY06SD34 9/25/2001 MY006	MY06SD35 9/25/2001 MY006
170/190 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.21 J	NA	NA	NA	NA
180/172 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.29 J	NA	NA	NA	NA
182/187 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.23 J	NA	NA	NA	NA
206 - Nonachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.14 J	NA	NA	NA	NA
209 - Decachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.093 J	NA	NA	NA	NA
43/52 - Tetrachlorobiphenyl/Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
44 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
66 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA	0.32 J	NA	NA	NA	NA
Dichlorobiphenyls	22.7	NA	NA	NA	NA	NA	1.6	NA	NA	NA	NA
Heptachlorobiphenyls	22.7	NA	NA	NA	NA	NA	1.6	NA	NA	NA	NA
Hexachlorobiphenyls	22.7	NA	NA	NA	NA	NA	4.4	NA	NA	NA	NA
Nonachlorobiphenyls	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
Octachlorobiphenyls	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
Pentachlorobiphenyls	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
Tetrachlorobiphenyls	22.7	NA	NA	NA	NA	NA	1.7	NA	NA	NA	NA
Trichlorobiphenyls	22.7	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
PCBs (ug/kg)											
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides (ug/kg)											
4,4'-DDT	1.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ug/kg)											
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-NITROANILINE	*	1100 R	ND	1100 R	ND	1300 R	1200 R	1200 R	1200 R	1100 R	1200 R
ACENAPHTHENE	16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	44	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ANTHRACENE	85	15 J	ND	27 J	ND	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	261	99	ND	120	ND	130	90	110	83	74 J	110
BENZO(A)PYRENE	430	87	ND	95	ND	110 J	93 J	94	87 J	68 J	96 J
BENZO(B)FLUORANTHENE	*	130	ND	150	ND	150	ND	140	110 J	110 J	120 J
BENZO(K)FLUORANTHENE	*	25 J	ND	31 J	ND	53 J	40 J	42 J	39 J	26 J	50 J
BENZO[G,H,I]PERYLENE	*	52	ND	60	ND	67 J	57 J	61	52 J	48 J	60 J
BIS(2-ETHYLHEXYL) PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD27	MY06SD28	MY06SD29	MY06SD30	MY06SD31	MY06SD32	MY06SD39	MY06SD33	MY06SD34	MY06SD35
Duplicates								Dup. of MY06SD32			
Date Collected		9/20/2001	9/20/2001	9/20/2001	9/20/2001	9/25/2001	9/25/2001	9/25/2001	9/25/2001	9/25/2001	9/25/2001
Sample Delivery Group		MY005	MY005	MY005	MY005	MY006	MY006	MY006	MY006	MY006	MY006
CHRYSENE	384	67	ND	70	ND	110	91	75	82	60 J	100
DIBENZO(A,H)ANTHRACENE	63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FLUORANTHENE	600	120	ND	190	ND	220	52 J	150 J	78	230	240
FLUORENE	19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	*	68	ND	78	ND	98 J	82 J	86	75 J	75 J	86 J
NAPHTHALENE	160	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	240	46	ND	89	ND	90	53	74	49	90	100
PYRENE	665	120	ND	140	ND	210	150	150	150	98 J	170
VOCs (ug/kg)											
METHYLENE CHLORIDE	*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds											
TOTAL ORGANIC CARBON(mg/kg)	*	6750	850 J	5420 J	1380 J	15900	9410	10200	12700	8110	13600
TOTAL SOLIDS (%)	*	72	78	77	78	62	67	65	66	71	68
TOTAL SOLIDS-VOA (%)	*	72	76	75	79	66	66	64	62	70	69

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD36	MY06SD50	MY06SD51	MY06SD52	MY06SD53
Duplicates						Dup. of MY06SD52
Date Collected		09/25/01	10/10/2002	10/10/2002	10/10/2002	10/10/2002
Sample Delivery Group		MY006	MY124	MY124	MY124	MY124
EPH (mg/kg)						
C11-C22 AROMATICS	*	NA	ND	ND	ND	ND
C19-C36 ALIPHATICS	*	NA	42 J	85	67	39
C9-C18 ALIPHATICS	*	NA	19 J	26	ND	ND
Metals (mg/kg)						
ALUMINUM	*	7180	20400	23200	25000	25500
ANTIMONY	2	0.02 J	0.48 J	0.1 J	0.1 J	0.11 J
ARSENIC	8.2	5	**14.4**	**14.4**	**14.9**	**16.6**
BARIUM	*	20.6	48.8	56.3	66.5	62.1
BERYLLIUM	*	0.25	0.91	1	0.96	1
BORON	*	10.3	37.5	37	19.7	24.1
CADMIUM	1.2	0.11	0.52	0.18	0.2	0.16
CALCIUM	*	1840	2760 J	3260 J	2400 J	2640 J
CHROMIUM	81	18.9	58	64.7	62.5	67.7
COBALT	*	4.6	11.2	12	15.8	16.8
COPPER	34	6.5	20.5	22.5	21.2	24.4
IRON	*	11000	29100	31500	40400	41700
LEAD	46.7	8.9	28.4 J	33.5 J	**49 J**	29.5 J
MAGNESIUM	*	3580	9730	10700	9990	11000
MANGANESE	*	142	320	320	635	610
MERCURY	0.15	ND	**0.21 J**	**0.34 J**	0.11 J	**0.22 J**
MOLYBDENUM	*	0.51	2.2	2.6	3.5	4.5
NICKEL	20.9	11.8	**28.3**	**36.2**	**40.8**	**40.8**
POTASSIUM	*	2000	5480 J	6090 J	6040 J	6100 J
SELENIUM	*	ND	0.98 J	0.99 J	0.67 J	0.77 J
SILVER	1	0.05	0.2	0.21	0.1	0.15
SODIUM	*	3990	15500	18000	6430	8680
THALLIUM	*	ND	ND	ND	ND	ND
VANADIUM	*	18.8	52	55.6	57.6	62.5
ZINC	150	35.1	96.4	100	112	123
PCB Congener (ug/kg)						
101 - 2,2',4,5,5'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA
105 - 2,3,3',4,4'-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA
118 - 2,3',4,4',5-Pentachlorobiphenyl	22.7	NA	NA	NA	NA	NA
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	22.7	NA	NA	NA	NA	NA
153/132/168 - Hexachlorobiphenyl	22.7	NA	NA	NA	NA	NA

Table 4-25A
Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD36	MY06SD50	MY06SD51	MY06SD52	MY06SD53
Duplicates						Dup. of MY06SD52
Date Collected		09/25/01	10/10/2002	10/10/2002	10/10/2002	10/10/2002
Sample Delivery Group		MY006	MY124	MY124	MY124	MY124
170/190 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA
180/172 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA
182/187 - Heptachlorobiphenyl	22.7	NA	NA	NA	NA	NA
206 - Nonachlorobiphenyl	22.7	NA	NA	NA	NA	NA
209 - Decachlorobiphenyl	22.7	NA	NA	NA	NA	NA
43/52 - Tetrachlorobiphenyl/Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA
44 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA
66 - Tetrachlorobiphenyl	22.7	NA	NA	NA	NA	NA
Dichlorobiphenyls	22.7	NA	NA	NA	NA	NA
Heptachlorobiphenyls	22.7	NA	NA	NA	NA	NA
Hexachlorobiphenyls	22.7	NA	NA	NA	NA	NA
Nonachlorobiphenyls	22.7	NA	NA	NA	NA	NA
Octachlorobiphenyls	22.7	NA	NA	NA	NA	NA
Pentachlorobiphenyls	22.7	NA	NA	NA	NA	NA
Tetrachlorobiphenyls	22.7	NA	NA	NA	NA	NA
Trichlorobiphenyls	22.7	NA	NA	NA	NA	NA
PCBs (ug/kg)						
		ND	ND	ND	ND	ND
Pesticides (ug/kg)						
4,4'-DDT	1.58	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	ND
HEPTACHLOR	*	ND	ND	ND	ND	ND
METHOXYCHLOR	*	ND	47 R	ND	ND	ND
SVOCs (ug/kg)						
1,4-DICHLOROBENZENE		ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	70	ND	ND	ND	ND	ND
3-NITROANILINE	*	1100 R	ND	ND	ND	ND
ACENAPHTHENE	16	ND	ND	ND	**350 J**	ND
ACENAPHTHYLENE	44	ND	ND	ND	ND	ND
ANTHRACENE	85	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	261	84 J	ND	ND	ND	ND
BENZO(A)PYRENE	430	68 J	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	*	100 J	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	*	30 J	ND	ND	ND	ND
BENZO[G,H,I]PERYLENE	*	42 J	ND	ND	ND	ND
BIS(2-ETHYLHEXYL) PHTHALATE	*	ND	ND	ND	ND	ND
CARBAZOLE	*	ND	ND	ND	ND	ND

Table 4-25A

Study Area 6 - Sediment Analytical Results
Detected Compounds

Analyte	PAL	MY06SD36	MY06SD50	MY06SD51	MY06SD52	MY06SD53
Duplicates						Dup. of MY06SD52
Date Collected		09/25/01	10/10/2002	10/10/2002	10/10/2002	10/10/2002
Sample Delivery Group		MY006	MY124	MY124	MY124	MY124
CHRYSENE	384	45 J	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	63	ND	ND	ND	ND	ND
DIBENZOFURAN	*	ND	ND	ND	ND	ND
DIMETHYL PHTHALATE	*	ND	ND	ND	ND	ND
FLUORANTHENE	600	230	ND	ND	ND	ND
FLUORENE	19	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	*	69 J	ND	ND	ND	ND
NAPHTHALENE	160	ND	ND	ND	ND	ND
PHENANTHRENE	240	99	ND	ND	ND	ND
PYRENE	665	89 J	ND	ND	ND	ND
VOCs (ug/kg)						
METHYLENE CHLORIDE	*	ND	NA	NA	NA	NA
Other Compounds						
TOTAL ORGANIC CARBON(mg/kg)	*	8340	NA	NA	NA	NA
TOTAL SOLIDS (%)	*	69	36	33	51	41
TOTAL SOLIDS-VOA (%)	*	67	NA	NA	NA	NA

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-25B
Study Area 6 - Outfall 009 PAH Analytical Results
Detected Compounds

Analyte	PAL	MY06SD101A(0-3.5)	MY06SD101A(3.5-7)	MY06SD101B(0-3.5)	MY06SD101B(3.5-9)	MY06SD101B(9-12)	MY06SD102(0-3.5)	MY06SD102(3.5-9)	MY06SD102(9-12)
Duplicates									
Date Collected		**8/26/2002**	**8/26/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**
Sample Delivery Group		**MY118**	**MY118**	**MY118**	**MY119**	**MY118**	**MY118**	**MY118**	**MY118**
PAHs (ug/kg)									
2-METHYLNAPHTHALENE	70	**2300 J**	**290**	**2200 J**	**540 J**	0.8 J	29 J	5 J	ND
ACENAPHTHENE	16	**2500 J**	**1000**	**2100 J**	**720**	5 J	**270 J**	**28**	ND
ANTHRACENE	85	**5800**	**2100**	**4800**	**1800 J**	24	**620**	**110 J**	ND
BENZO(A)ANTHRACENE	261	**12000**	**3900**	**9000**	**4000 J**	100 J	**1600**	**370 J**	ND
BENZO(A)PYRENE	430	**10000**	**3300**	**8100**	**3500 J**	64	**1600**	170	ND
BENZO(B)FLUORANTHENE	*	14000	4500	9900	4900 J	74	1900	180	ND
BENZO(K)FLUORANTHENE	*	5100	1700	4000 J	2000 J	32	850	95 J	ND
BENZO[G,H,I]PERYLENE	*	6000	1700	5100 J	1700 J	29	840	93 J	ND
CHRYSENE	384	**12000**	**3700**	**8800 J**	**4000 J**	81 J	**1700**	240 J	ND
DIBENZO(A,H)ANTHRACENE	63	**3400**	**560**	**3400 J**	**900 J**	7 J	**270 J**	32 J	ND
FLUORANTHENE	600	**26000**	**9100**	**20000**	**8400**	52	**3700**	420	ND
FLUORENE	19	**2900**	**1500**	**2600 J**	**930**	14 J	**270 J**	**35**	ND
INDENO(1,2,3-CD)PYRENE	*	6700	2200	ND	2000 J	50	1000	160 J	ND
NAPHTHALENE	160	**770 J**	**290**	**650 J**	**240 J**	1 J	36 J	8 J	ND
PHENANTHRENE	240	**28000**	**8200**	**20000 J**	**8300**	53	**2500**	**390 J**	ND
PYRENE	665	**36000 J**	**5900**	**25000 J**	**9100**	130	**2700**	380	ND
Other Compounds									
TOTAL SOLIDS (%)	*	81	75	78	68	70	77	80	81

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-25B
Study Area 6 - Outfall 009 PAH Analytical Results
Detected Compounds

Analyte	PAL	MY06SD103(0-3.5)	MY06SD103(3.5-9)	MY06SD104(0-3.5)	MY06SD104(3.5-9)	MY06SD104(9-12)	MY06SD105(0-3.5)	MY06SD105(3.5-9)	MY06SD106(0-3.5)
Duplicates									
Date Collected		**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**	**8/27/2002**
Sample Delivery Group		**MY118**	**MY118**	**MY118**	**MY118**	**MY119**	**MY118**	**MY118**	**MY118**
PAHs (ug/kg)									
2-METHYLNAPHTHALENE	70	**230 J**	6 J	**2400 J**	**800 J**	1 J	**460**	**410 J**	**430**
ACENAPHTHENE	16	**420**	14 J	**1800 J**	**860**	7 J	**1200**	**420 J**	**950**
ANTHRACENE	85	**720**	40	**5100**	**1700**	27 J	**2800**	**900**	**3400**
BENZO(A)ANTHRACENE	261	**1500**	170 J	**10000 J**	**3400**	93 J	**5700**	**2100**	**7400**
BENZO(A)PYRENE	430	**1400**	83 J	**9700**	**2900**	57	**5300**	**1800**	**6600**
BENZO(B)FLUORANTHENE	*	1700	100 J	12000	4300	76 J	6500	2400	8700
BENZO(K)FLUORANTHENE	*	770	49 J	4700	1500	26 J	2400	900	3200
BENZO[G,H,I]PERYLENE	*	670	48 J	6000	1700	25	3400	1100	4200
CHRYSENE	384	**1400**	110 J	**10000**	**3400**	50	**5700**	**2000**	**7600**
DIBENZO(A,H)ANTHRACENE	63	**220 J**	13 J	**3900**	**1200 J**	7 J	**2200**	**650 J**	**2500**
FLUORANTHENE	600	**3400**	260 J	**24000**	**7100**	78	**12000**	**5000**	**18000**
FLUORENE	19	**520**	**19 J**	**2300 J**	**1000**	8 J	**1800**	**430 J**	**1200**
INDENO(1,2,3-CD)PYRENE	*	880	72 J	6600	1900	44	3600	1200	4500
NAPHTHALENE	160	100 J	3 J	**830 J**	**440**	1 J	**640**	150 J	**620 J**
PHENANTHRENE	240	**3100**	160 J	**22000**	**8400**	83 J	**13000**	**4300**	**17000**
PYRENE	665	**2400**	200	**28000**	**9400**	83	**15000**	**5800 J**	**20000**
Other Compounds									
TOTAL SOLIDS (%)	*	58	79	66	79	87	60	84	52

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-25B
Study Area 6 - Outfall 009 PAH Analytical Results
Detected Compounds

Analyte	PAL	MY06SD106(3.5-9)	MY06SD106(9-12)	MY06SD107A(0-3.5)	MY06SD107B(0-3.5)	MY06SD107B(3.5-5)	MY06SD107B(3.5-9)	MY06SD109(0-3.5)	MY06SD109(3.5-9)
Duplicates									
Date Collected		8/27/2002	8/27/2002	8/27/2002	8/28/2002	8/28/2002	8/28/2002	8/27/2002	8/27/2002
Sample Delivery Group		MY118	MY118	MY119	MY119	MY119	MY119	MY118	MY118
PAHs (ug/kg)									
2-METHYLNAPHTHALENE	70	**220 J**	ND	**420**	**360**	**200 J**	**220 J**	**590**	**360**
ACENAPHTHENE	16	**94 J**	3 J	**1100**	**760**	**150 J**	**210 J**	**2000**	**860**
ANTHRACENE	85	**350**	8 J	**2300**	**2100**	**490**	**590**	**3900**	**1800**
BENZO(A)ANTHRACENE	261	**650**	54 J	**4300**	**4100**	**880**	**1000 J**	**9000 J**	**3800**
BENZO(A)PYRENE	430	**670 J**	24	**3800**	**3500 J**	**790**	**890 J**	**7500**	**3400**
BENZO(B)FLUORANTHENE	*	710	28	3600	5000 J	920	1100 J	10000	4400
BENZO(K)FLUORANTHENE	*	250 J	12 J	1800	1700 J	340	410 J	3700	2100
BENZO[G,H,I]PERYLENE	*	470 J	10 J	1900	2200 J	500 J	520 J	4300	2100
CHRYSENE	384	**630**	32 J	**4300**	**4200**	**800**	**960 J**	**9100**	**3600**
DIBENZO(A,H)ANTHRACENE	63	**360 J**	3 J	**1400**	**1600 J**	**320 J**	**320 J**	**2300**	**1300**
FLUORANTHENE	600	**1700**	29	**7400**	**9300**	**2000**	**2500**	**18000**	**8400**
FLUORENE	19	**110 J**	5 J	**1600**	**1000**	**170 J**	**270**	**2600**	**1100**
INDENO(1,2,3-CD)PYRENE	*	500 J	17 J	2200	2400 J	530 J	570 J	4800	2300
NAPHTHALENE	160	20 J	ND	**460**	**240 J**	50 J	86 J	**1100**	**310 J**
PHENANTHRENE	240	**1100**	30 J	**8800**	**8900**	**1600**	**2200**	**21000**	**7400**
PYRENE	665	**1600 J**	60	**9500**	**9800**	**2000**	**2500 J**	**26000**	**8900**
Other Compounds									
TOTAL SOLIDS (%)	*	66	76	73	64	80	81	65	79

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-25B
Study Area 6 - Outfall 009 PAH Analytical Results
Detected Compounds

Analyte	PAL	MY06SD109(9-12)	MY06SD110(0-3.5)	MY06SD111(0-3.5)	MY06SD111(3.5-9)	MY06SD111(9-11)	MY06SD112(0-3.5)	MY06SD112(3.5-9)	MY06SD113(0-3.5)
Duplicates									
Date Collected		8/27/2002	10/8/2002	10/8/2002	10/8/2002	10/8/2002	10/8/2002	10/8/2002	10/8/2002
Sample Delivery Group		MY119	MY124	MY124	MY124	MY124	MY124	MY124	MY124
PAHs (ug/kg)									
2-METHYLNAPHTHALENE	70	3 J	**1000**	6.8 J	1.9 J	1.4 J	11 J	18 J	**110 J**
ACENAPHTHENE	16	**16 J**	**3000**	**17 J**	4 J	7 J	**62 J**	**65 J**	**420**
ANTHRACENE	85	49	**5700**	62 J	13 J	17 J	**220 J**	**130 J**	**980**
BENZO(A)ANTHRACENE	261	150 J	**8600**	240 J	47	54 J	**500 J**	**410 J**	**1900**
BENZO(A)PYRENE	430	120 J	**7900**	190	36 J	43 J	**460**	370 J	**1900**
BENZO(B)FLUORANTHENE	*	160 J	8900	300 J	40 J	44 J	570	460	2200
BENZO(K)FLUORANTHENE	*	43 J	4100	88	20 J	21 J	270 J	210 J	990
BENZO[G,H,I]PERYLENE	*	50 J	3900	94	21 J	23 J	270 J	210 J	760
CHRYSENE	384	100 J	**9100**	210 J	35	44 J	**510**	**440**	**1900**
DIBENZO(A,H)ANTHRACENE	63	14 J	**1100**	32 J	6.5 J	7.4 J	**100 J**	60 J	**270 J**
FLUORANTHENE	600	460	**20000**	180	88	140 J	**1400**	**960**	**4200**
FLUORENE	19	**22**	**3300**	**26 J**	5.7 J	8 J	**97 J**	**100 J**	**560**
INDENO(1,2,3-CD)PYRENE	*	97 J	4900	160	32 J	38 J	370	330	910
NAPHTHALENE	160	4 J	**780**	10 J	2 J	1.4 J	ND	32 J	89 J
PHENANTHRENE	240	220 J	**22000**	160	58	74 J	**800**	**730**	**3900**
PYRENE	665	200	**16000**	340 J	52	79 J	**830**	**840**	**4500**
Other Compounds									
TOTAL SOLIDS (%)	*	84	56	48	81	82	74	80	82

Notes:

PAL = Project Action Limit
* PAL Not Available
Bold values indicate an exceedence of the PAL
J = Estimated Value
R = Rejected Value
ND = Compound(s) Not Detected
NA = Compound(s) Not Analyzed

Table 4-25B
Study Area 6 - Outfall 009 PAH Analytical Results
Detected Compounds

Analyte	PAL	MY06SD114(0-3.5)	MY06SD114(3.5-6)	MY06SD115(0-3.5)	MY06SD116	MY06SD117
Duplicates						
Date Collected		10/9/2002	10/9/2002	10/9/2002	10/9/2002	10/9/2002
Sample Delivery Group		MY124	MY124	MY124	MY124	MY124
PAHs (ug/kg)						
2-METHYLNAPHTHALENE	70	**180 J**	ND	**93 J**	27 J	6.3 J
ACENAPHTHENE	16	**720**	**20 J**	**470 J**	**52 J**	8.7 J
ANTHRACENE	85	**1500**	66 J	**990**	**94 J**	33 J
BENZO(A)ANTHRACENE	261	**3000**	120	**2000**	**310 J**	210 J
BENZO(A)PYRENE	430	**2800**	100 J	**1800**	260 J	140 J
BENZO(B)FLUORANTHENE	*	3200	94 J	2400	340 J	170 J
BENZO(K)FLUORANTHENE	*	1700	58 J	930	140 J	70
BENZO[G,H,I]PERYLENE	*	1400	44 J	960	180 J	92 J
CHRYSENE	384	**3000**	100 J	**2200**	290 J	150 J
DIBENZO(A,H)ANTHRACENE	63	**420 J**	16 J	**330 J**	45 J	26 J
FLUORANTHENE	600	**6500**	270	**4900**	540 J	210 J
FLUORENE	19	**960**	**33 J**	**590**	**65 J**	17 J
INDENO(1,2,3-CD)PYRENE	*	1800	74 J	1200	210 J	120 J
NAPHTHALENE	160	**250 J**	ND	140 J	25 J	7.8 J
PHENANTHRENE	240	**6000**	**240**	**4600**	**430 J**	100 J
PYRENE	665	**5500**	180 J	**4000**	480 J	200 J
Other Compounds						
TOTAL SOLIDS (%)	*	65	80	57	41	41

Notes:
- PAL = Project Action Limit
- * PAL Not Available
- Bold values indicate an exceedence of the PAL
- J = Estimated Value
- R = Rejected Value
- ND = Compound(s) Not Detected
- NA = Compound(s) Not Analyzed

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte	PAL	MY06BC01	MY06BC02	MY06BC03	MY06BC04	MY06BC05	MY06BC06	MY06BC07	MY06BC08
Duplicates									
Date Collected		10/8/2001	10/8/2001	10/8/2001	10/8/2001	10/8/2001	10/8/2001	10/10/2001	10/10/2001
Sample Delivery Group		MYT002	MYT002	MYT002	MYT002	MYT002	MYT002	MYT002	MYT002
Metals (mg/kg)									
ALUMINUM	1400	654 J	502 J	320 J	556 J	363 J	326 J	360 J	408 J
ANTIMONY	0.54	0.03	0.015	0.007 J	0.01 J	0.014	0.007 J	0.013	0.011
ARSENIC	0.014	**7.11**	**4.39**	**2.39**	**4.41**	**4.73**	**3.21**	**1.92**	**2.44**
BARIUM	95000	4.49	3.11	1.93	3.44	2.44	2.4	2.04	2.25
BERYLLIUM	2.7	0.043	0.029	0.018	0.026	0.023	0.02	0.019	0.022
BORON	120000	3.84	3.28	2.66	3.22	3.44	3.15	2.57	3.11
CADMIUM	2.2	0.063	0.056	0.032	0.034	0.028	0.038	0.039	0.041
CALCIUM	*	5970	4450	1900	2580	2410	2470	2570	1560
CHROMIUM	7	1.67	1.12	1.44	1.33	0.96	0.83	1.09	0.88
COBALT	81	1.12	0.447	0.161	0.333	0.177	0.196	0.28	0.292
COPPER	54	2.51 J	26.4 J	2.41 J	1.6 J	1.36 J	5.33 J	1.99 J	4.53 J
IRON	410	**2850**	**1740 J**	**1080**	**2110**	**2090**	**1630**	**738**	**991**
LEAD	*	1.8 J	1.96 J	0.846 J	1.07 J	0.984 J	1.22 J	0.559 J	0.832 J
MAGNESIUM	*	874	862	879	925	924	795	723	850
MANGANESE	302	179 J	24.5 J	6.74 J	35.2 J	6.5 J	6.69 J	11.2 J	14.6 J
MERCURY	0.2	0.04	0.04	0.02	0.03	0.03	0.03	0.05	0.05
MOLYBDENUM	6.8	0.45	0.33	0.22	0.22	0.21	0.29	0.34	0.31
NICKEL	4.3	1.58 J	1.81 J	0.47 J	0.68 J	0.43 J	0.89 J	0.49 J	0.69 J
POTASSIUM	*	1850	1790	1310	1660	1490	2210	1610	1770
SELENIUM	6.8	0.5 J	0.45 J	0.25 J	0.33 J	0.31 J	0.38 J	0.35 J	0.4 J
SILVER	11	ND	ND	ND	ND	ND	ND	ND	ND
SODIUM	*	3930	4740	5480	4970	5450	4330	4070	4880
THALLIUM	0.095	0.006 J	0.005 J	ND	0.005 J	ND	ND	0.005 J	0.005 J
VANADIUM	6	4.77	2.37	1.33	2.5	1.62	1.42	1.39	1.67
ZINC	648	18.2	28.1	9.38	14.5	9.76	17	11.9	14.9
PCBs (ug/kg)									
Total Aroclor 1016	45	ND	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1221	1.6	ND	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1232	1.6	ND	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1242	1.6	ND	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1248	1.6	ND	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1254	1.6	**2.9 J**	**3 J**	**1.8 J**	**2.4 J**	**1.6 J**	**2.9 J**	**2 J**	**2.3 J**
Total Aroclor 1260	1.6	**2.7 J**	**3 J**	**3.4**	**2.5 J**	**1.7 J**	**3 J**	**1.8 J**	**2.1 J**
Pesticides (ug/kg)									
4,4'-DDD	13	0.1 J	0.097 J	0.05 J	0.055 J	0.032 J	0.076 J	0.052 J	0.058 J
4,4'-DDE	9.3	0.28 J	0.31 J	0.22 J	0.25 J	0.15 J	0.32 J	0.18 J	0.19 J
4,4'-DDT	64	0.01 J	0.019 J	ND	ND	ND	ND	0.016 J	0.019 J
ALDRIN	1.3	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA-CHLORDANE	17	0.14 J	0.15 J	0.069 J	0.081 J	ND	0.15 J	0.085 J	0.088 J
DIELDRIN	1.4	0.39 J	0.13 J	0.094 J	0.15 J	0.071 J	0.12 J	0.038 J	0.037 J
ENDOSULFAN I	*	ND	ND	0.03 J	ND	ND	ND	ND	ND
ENDOSULFAN II	*	ND	ND	ND	ND	ND	0.16 J	ND	ND
ENDOSULFAN SULFATE	*	0.04 J	ND	0.035 J	0.047 J	0.034 J	0.052 J	0.036 J	0.033 J
ENDRIN	410	ND	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE	*	ND	0.17 J	0.11 J	0.13 J	0.089 J	0.18 J	ND	ND
ENDRIN KETONE	*	ND	ND	ND	ND	ND	ND	0.33	ND
GAMMA-CHLORDANE	17	0.05 J	0.031 J	0.021 J	0.04 J	0.0087 J	0.052 J	0.12 J	0.092 J
HEPTACHLOR	5	ND	ND	ND	ND	0.031 J	ND	ND	ND
HEPTACHLOR EPOXIDE	2.4	0.01 J	ND	ND	ND	ND	ND	0.014 J	0.015 J
LINDANE	17	0.042 J	0.04 J	0.031 J	0.031 J	0.029 J	0.045 J	0.036 J	0.034 J
METHOXYCHLOR	6800	ND	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	20	ND	ND	ND	ND	ND	ND	ND	ND
ALPHA-BHC	0.5	ND	ND	ND	ND	ND	ND	0.025 J	ND
BETA-BHC	1.8	ND	ND	ND	ND	ND	ND	ND	ND
DELTA-BHC	*	ND	ND	ND	ND	ND	ND	ND	ND
SIM PAHs (ug/kg)									
ACENAPHTHENE	81000	ND	ND	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	*	0.29 J	0.42 J	0.4 J	0.39 J	0.38 J	0.5 J	0.2 J	0.21 J
ANTHRACENE	410000	0.31 J	0.42 J	0.34 J	0.91 J	0.39 J	0.49 J	0.23 J	0.24 J
BENZO(A)ANTHRACENE	4.3	2.8	2.3	2	3.6	2.1	2.5	1.7	1.8
BENZO(A)PYRENE	0.43	**2.9**	**2.3**	**2.2**	**3.5**	**2.2**	**2.5**	**1.6**	**1.7**
BENZO(B)FLUORANTHENE	4.3	**5.6 J**	**4.3**	4	**6**	3.7	**4.6**	2.9 J	3.3 J
BENZO(K)FLUORANTHENE	4.3	2	1.6 J	1.3 J	2	1.4 J	1.6	1.1 J	1.1 J
BENZO[G,H,I]PERYLENE	*	4.3	3.6	2.7	3.8	3.1	4	3.5	2.9
DIBENZO(A,H)ANTHRACENE	0.43	0.35 J	0.26 J	0.25 J	0.37 J	0.25 J	0.3 J	0.17 J	0.2 J
CHRYSENE	430	4.5	3.6	3.2	ND	2.8	4	2.8	2.9
FLUORANTHENE	54000	6.7	5.4	4.8	8.6	5	6.5	4.5	4.7

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte	PAL	MY06BC01	MY06BC02	MY06BC03	MY06BC04	MY06BC05	MY06BC06	MY06BC07	MY06BC08
Duplicates									
Date Collected		10/8/2001	10/8/2001	10/8/2001	10/8/2001	10/8/2001	10/8/2001	10/10/2001	10/10/2001
Sample Delivery Group		MYT002	MYT002	MYT002	MYT002	MYT002	MYT002	MYT002	MYT002
FLUORENE	54000	0.24 J	ND	ND	ND	ND	ND	0.15 J	0.17 J
INDENO(1,2,3-CD)PYRENE	43	2.6	1.8	1.7	2.7	1.8	2	1.3 J	1.4 J
NAPHTHALENE	27000	ND	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	1.6 J	1.4 J	1.4 J	4	1.6 J	1.5 J	1.1 J	1.2 J
PYRENE	41000	6.9	5.6	5.1	8.1	5.2	6.8	4.5	4.7
SVOCs (mg/kg)									
1,2,4-TRICHLOROBENZENE	14	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLOROPHENOL	14	ND	0.11 J	ND	ND	ND	0.088 J	ND	ND
2,4,6-TRICHLOROPHENOL	0.29	ND	0.045 J	ND	ND	ND	0.039 J	ND	ND
2,4-DICHLOROPHENOL	4.1	ND	0.054 J	0.015 J	0.007 J	ND	0.038 J	ND	ND
2,4-DIMETHYLPHENOL	27	ND	0.061 J	0.027 J	0.02 J	0.011 J	0.057 J	0.0071 J	ND
2,6-DINITROTOLUENE	1.4	ND	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	6.8	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	27	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	62	0.0076 J	0.037 J	0.015 J	0.014 J	0.0093 J	0.033 J	0.013 J	0.011 J
4-CHLORO-3-METHYLPHENOL	*	ND	0.22 J	0.089 J	0.064 J	0.034 J	0.12 J	0.06 J	0.037 J
4-METHYLPHENOL	6.8	0.0052 J	0.07 J	0.03 J	0.022 J	0.021 J	0.06 J	0.0055 J	0.0055 J
4-NITROPHENOL	11	1.3 R	0.35 R	0.12 R	1.6 R	1.6 R	0.24 R	1.6 R	1.3 R
BIS(2-ETHYLHEXYL) PHTHALATE	0.23	ND	ND	ND	ND	ND	ND	0.0054 J	0.0039 J
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE	140	ND	ND	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	5.4	ND	ND	ND	ND	ND	ND	ND	ND
ISOPHORONE	3.3	ND	ND	ND	ND	ND	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	0.00045	ND	ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	0.026	ND	ND	ND	ND	ND	**0.32 J**	ND	ND
PHENOL	81	ND	ND	ND	ND	ND	ND	ND	ND
Other Compounds									
PERCENT SOLIDS	*	15.3	13.4	11.8	11.3	10.5	14.2	12	13.2
PERCENT LIPIDS	*	0.78	0.596	0.393	0.464	0.446	0.822	0.596	0.717

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte	PAL	MY06BC09	MY06BC10	MY06BC11	MY06BC12	MY06BC13	MY06BC14	MY06BC15
Duplicates								
Date Collected		10/10/2001	10/9/2002	10/9/2002	10/9/2002	10/8/2001	10/8/2001	10/8/2001
Sample Delivery Group		MYT002	MYT002	MYT002	MYT002	MYT002	MYT002	MYT002
Metals (mg/kg)								
ALUMINUM	1400	311 J	192 J	381 J	365 J	253 J	222 J	268 J
ANTIMONY	0.54	0.01 J	0.007 J	0.017	0.009 J	0.008 J	0.007 J	0.007 J
ARSENIC	0.014	**2.02**	**1.88**	**3.17**	**1.78**	**3.16**	**2.13**	**2.32**
BARIUM	95000	1.74	1.07	2.31	1.96	1.72	1.25	1.53
BERYLLIUM	2.7	0.017	0.01 J	0.021	0.021	0.012	0.015	0.018
BORON	120000	2.85	2.24	3.33	2.75	2.72	2.91	3
CADMIUM	2.2	0.049	0.046	0.052	0.047	0.051	0.045	0.043
CALCIUM	*	2410	1940	1920	1470	2740	1790	2330 J
CHROMIUM	7	0.72	0.48	0.93	0.79	0.73	0.51	0.6
COBALT	81	0.259	0.228	0.325	0.274	0.339	0.274	0.38
COPPER	54	2.7 J	2.36 J	11.9 J	3.76 J	1.86 J	7.97 J	10.2 J
IRON	410	**702**	**482**	**1340**	**697**	**619**	**635**	**682**
LEAD	*	0.619 J	0.431 J	0.992 J	0.521 J	0.381 J	0.64 J	0.852 J
MAGNESIUM	*	773	623	879	801	751	861	891
MANGANESE	302	11.6 J	20 J	15.3 J	20.4 J	22 J	26 J	42.9 J
MERCURY	0.2	0.05	0.03	0.06	0.04	0.04	0.04	0.04
MOLYBDENUM	6.8	0.34	0.26	0.34	0.31	0.3	0.27	0.31
NICKEL	4.3	0.74 J	0.42 J	3.14 J	0.65 J	0.44 J	2.11 J	0.75 J
POTASSIUM	*	1780	1520	1930	1910	1750	1560	1450
SELENIUM	6.8	0.41 J	0.36 J	0.43 J	0.4 J	0.34 J	0.36 J	0.32 J
SILVER	11	ND	ND	ND	ND	ND	ND	ND
SODIUM	*	4570	3760	5040	4560	4620	5450	5720
THALLIUM	0.095	ND	ND	0.006 J	0.006 J	ND	ND	ND
VANADIUM	6	1.25	0.89	1.66	1.4	1.12	1.12	1.33
ZINC	648	13.7	12.2	19.7	14.5	11.9	17.7	19.9
PCBs (ug/kg)								
Total Aroclor 1016	45	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1221	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1232	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1242	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1248	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1254	1.6	**2.8 J**	**2.3 J**	**2.3 J**	**2.7 J**	**1.7 J**	**1.5 J**	1.1 J
Total Aroclor 1260	1.6	**2.4 J**	**2.2 J**	**2 J**	**2.6 J**	**2.2 J**	**1.7 J**	**1.6 J**
Pesticides (ug/kg)								
4,4'-DDD	13	0.074 J	0.073 J	0.072 J	0.076 J	0.081 J	0.05 J	0.046 J
4,4'-DDE	9.3	0.25 J	0.24 J	0.19 J	0.25 J	0.23 J	0.16 J	0.1 J
4,4'-DDT	64	0.017 J	0.047 J	0.072 J	0.085 J	0.11 J	0.11 J	0.03 J
ALDRIN	1.3	ND	ND	ND	ND	ND	ND	ND
ALPHA-CHLORDANE	17	0.12 J	0.098 J	0.083 J	0.096 J	0.071 J	0.055 J	0.048 J
DIELDRIN	1.4	0.047 J	0.053 J	0.059 J	0.052 J	0.074 J	0.066 J	0.064 J
ENDOSULFAN I	*	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN II	*	ND	ND	ND	ND	ND	0.039 J	0.042 J
ENDOSULFAN SULFATE	*	0.039 J	0.036 J	0.034 J	0.029 J	0.048 J	0.03 J	0.022 J
ENDRIN	410	ND	0.03 J	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE	*	ND	ND	ND	ND	0.1 J	0.07 J	0.065 J
ENDRIN KETONE	*	0.34 J	0.32 J	ND	0.34	ND	ND	ND
GAMMA-CHLORDANE	17	0.1 J	0.041 J	0.066 J	0.08 J	0.016 J	ND	ND
HEPTACHLOR	5	ND	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	2.4	0.016 J	0.024 J	ND	0.0091 J	0.01 J	0.022 J	0.02 J
LINDANE	17	0.034 J	0.035 J	0.043 J	0.036 J	0.033 J	0.024 J	0.027 J
METHOXYCHLOR	6800	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	20	ND	ND	ND	ND	ND	ND	ND
ALPHA-BHC	0.5	0.022 J	0.016 J	0.024 J	0.029 J	0.025 J	0.014 J	0.01 J
BETA-BHC	1.8	ND	0.19 J	0.16 J	0.4	ND	0.17 J	0.031 J
DELTA-BHC	*	ND	ND	ND	ND	ND	ND	ND
SIM PAHs (ug/kg)								
ACENAPHTHENE	81000	ND	ND	0.96 J	ND	ND	ND	ND
ACENAPHTHYLENE	*	0.26 J	0.18 J	0.19 J	0.2 J	0.27 J	0.24 J	0.38 J
ANTHRACENE	410000	0.35 J	0.21 J	0.73 J	0.2 J	0.42 J	0.4 J	0.39 J
BENZO(A)ANTHRACENE	4.3	2.3	1.5 J	3.7	2	1.8	1.8	2.2
BENZO(A)PYRENE	0.43	**1.8 J**	**1.2 J**	**3.1 J**	**1.6**	**1.5 J**	**1.5 J**	**2**
BENZO(B)FLUORANTHENE	4.3	3.5 J	2.3 J	**5.9 J**	3.4 J	2.8	2.6	3.1
BENZO(K)FLUORANTHENE	4.3	1.2 J	0.97 J	2.1 J	1.1 J	1.1 J	0.96 J	1.1 J
BENZO[G,H,I]PERYLENE	*	3.4	2.5	5.4	3.3	2.4	2.7	2.5
DIBENZO(A,H)ANTHRACENE	0.43	0.21 J	0.14 J	0.37 J	0.2 J	0.17 J	0.16 J	0.2 J
CHRYSENE	430	3.4	2.5	5.1	3.1	2.7	2.4	2.9
FLUORANTHENE	54000	5.8	4.1	9.5	4.8	5.4	4.3 J	5.2

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte	PAL	MY06BC09	MY06BC10	MY06BC11	MY06BC12	MY06BC13	MY06BC14	MY06BC15
Duplicates								
Date Collected		10/10/2001	10/9/2002	10/9/2002	10/9/2002	10/8/2001	10/8/2001	10/8/2001
Sample Delivery Group		MYT002	MYT002	MYT002	MYT002	MYT002	MYT002	MYT002
FLUORENE	54000	0.18 J	0.13 J	0.35 J	0.14 J	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	43	1.5 J	0.99 J	2.4 J	1.3 J	1.2 J	1.1 J	1.3 J
NAPHTHALENE	27000	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	1.2 J	0.9 J	3.3 J	1 J	1.8	2	1.9
PYRENE	41000	5.8	4	9.3	4.9	5.1	4.1	5.2
SVOCs (mg/kg)								
1,2,4-TRICHLOROBENZENE	14	ND	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLOROPHENOL	14	ND	ND	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	0.29	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	4.1	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	27	ND	0.011 J	0.016 J	0.0099 J	0.015 J	0.0068 J	ND
2,6-DINITROTOLUENE	1.4	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	6.8	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	27	ND	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	62	0.011 J	0.012 J	0.017 J	0.012 J	0.01 J	0.0074 J	0.006 J
4-CHLORO-3-METHYLPHENOL	*	0.035 J	0.043 J	0.34 J	0.14 J	0.036 J	0.018 J	ND
4-METHYLPHENOL	6.8	0.0065 J	0.023 J	0.04 J	0.028 J	0.027 J	ND	0.016 J
4-NITROPHENOL	11	1.3 R	ND	0.21 R	1.4 R	1.7 R	1.6 R	1.7 R
BIS(2-ETHYLHEXYL) PHTHALATE	0.23	0.0036 J	ND	ND	ND	ND	ND	ND
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE	140	ND	ND	ND	ND	ND	ND	ND
DIBENZOFURAN	5.4	ND	ND	ND	ND	ND	ND	ND
ISOPHORONE	3.3	ND	ND	ND	ND	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	0.00045	ND	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	0.026	ND	ND	**0.14 J**	**0.033 J**	ND	ND	ND
PHENOL	81	ND	ND	ND	ND	ND	ND	ND
Other Compounds								
PERCENT SOLIDS	*	13.6	11.5	14	14.9	13.7	11.5	10.8
PERCENT LIPIDS	*	0.866	0.69	0.733	0.744	0.65	0.48	0.509

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte	PAL	MY06BC19	MY06BC16	MY06BC17	MY06BC18	MY06BL01	MY06BL02	MY06BL03
Duplicates		Dup. of MY06BC15						
Date Collected		10/8/2001	10/8/2001	10/8/2001	10/8/2001	10/10/2001	10/10/2001	10/10/2001
Sample Delivery Group		MYT002	MYT002	MYT002	MYT002	MYT004	MYT004	MYT004
Metals (mg/kg)								
ALUMINUM	1400	179 J	192 J	189 J	167	ND	ND	ND
ANTIMONY	0.54	0.009 J	0.014	0.011	0.017	ND	ND	ND
ARSENIC	0.014	**2**	**1.33**	**1.26**	**1.21**	**2.72**	**2.82**	**2.77**
BARIUM	95000	1	1.12	1.1	0.97	0.12	ND	0.17
BERYLLIUM	2.7	0.011	0.011	0.043	0.012	ND	ND	ND
BORON	120000	3.09	2.9	2.58	2.86	1.16	1.05	1.09
CADMIUM	2.2	0.038 J	0.041	0.04	0.046	ND	ND	ND
CALCIUM	*	1550 J	2870	2440	1950 J	1630 J	763 J	989 J
CHROMIUM	7	0.44	0.63	0.52	0.42	ND	ND	0.06 J
COBALT	81	0.223	0.215	0.263	0.245	0.009 J	0.01 J	0.006 J
COPPER	54	2.32 J	26.6 J	6.24 J	5.76 J	8.54	8.03	6.71
IRON	410	**580**	400	342	310	ND	ND	ND
LEAD	*	0.416 J	1.25 J	0.514 J	0.4 J	0.03	0.015	0.035
MAGNESIUM	*	916	878	807	874	412	382	376
MANGANESE	302	16.8 J	6 J	9.07 J	8.63 J	1.28	0.66	0.82
MERCURY	0.2	0.03	0.05	0.05	0.05	**0.2**	0.18	**0.21**
MOLYBDENUM	6.8	0.24	0.32	0.3	0.29	0.01 J	0.01 J	0.03
NICKEL	4.3	0.34 J	1.63 J	0.73 J	0.61 J	0.06 J	0.07 J	0.05 J
POTASSIUM	*	1330	1420	1500	1520	2590	2560	2660
SELENIUM	6.8	0.31 J	0.38 J	0.34 J	0.34 J	0.47	0.46	0.41
SILVER	11	ND	ND	ND	ND	0.21 J	0.239 J	0.171 J
SODIUM	*	6130	5880	5220	5840	4040	4030	3560
THALLIUM	0.095	ND	ND	ND	ND	ND	ND	ND
VANADIUM	6	0.96	0.82	0.87	0.73	ND	ND	ND
ZINC	648	12.4	27.7	16.2	13.7	19.3	23.3	19.6
PCBs (ug/kg)								
Total Aroclor 1016	45	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1221	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1232	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1242	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1248	1.6	ND	ND	ND	ND	ND	ND	ND
Total Aroclor 1254	1.6	0.85 J	1.1 J	**1.8 J**	1.1 J	ND	ND	ND
Total Aroclor 1260	1.6	**1.7 J**	1.1 J	**1.8 J**	1.2 J	ND	ND	ND
Pesticides (ug/kg)								
4,4'-DDD	13	0.036 J	0.035 J	0.066 J	0.042 J	ND	ND	ND
4,4'-DDE	9.3	0.088 J	0.11 J	0.2 J	0.14 J	0.48 J	0.39 J	0.58 J
4,4'-DDT	64	ND	ND	ND	ND	ND	ND	ND
ALDRIN	1.3	ND	ND	ND	ND	ND	ND	ND
ALPHA-CHLORDANE	17	0.024 J	0.085 J	0.12 J	0.063 J	0.025 J	0.024 J	0.025 J
DIELDRIN	1.4	0.038 J	0.047 J	0.06 J	0.06 J	0.21 J	0.18 J	0.22 J
ENDOSULFAN I	*	ND	ND	ND	ND	ND	ND	ND
ENDOSULFAN II	*	0.028 J	ND	ND	0.039 J	ND	ND	ND
ENDOSULFAN SULFATE	*	0.026 J	0.031 J	0.029 J	0.032 J	0.017 J	ND	ND
ENDRIN	410	ND	ND	ND	ND	ND	ND	ND
ENDRIN ALDEHYDE	*	0.041 J	0.048 J	0.099 J	0.063 J	ND	ND	ND
ENDRIN KETONE	*	ND	ND	ND	ND	ND	ND	ND
GAMMA-CHLORDANE	17	ND	0.014 J	0.014 J	0.013 J	ND	ND	ND
HEPTACHLOR	5	0.015 J	ND	ND	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	2.4	ND	0.015 J	0.0093 J	ND	0.012 J	0.0091 J	0.0098 J
LINDANE	17	0.11 J	0.027 J	0.029 J	0.025 J	ND	ND	ND
METHOXYCHLOR	6800	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	20	ND	ND	ND	ND	ND	ND	ND
ALPHA-BHC	0.5	ND	0.012 J	0.019 J	0.012 J	ND	ND	0.021 J
BETA-BHC	1.8	0.087 J	0.056 J	0.035 J	0.1 J	ND	ND	ND
DELTA-BHC	*	ND	ND	ND	ND	ND	ND	ND
SIM PAHs (ug/kg)								
ACENAPHTHENE	81000	ND	ND	ND	ND	0.057 J	0.041 J	0.049 J
ACENAPHTHYLENE	*	ND	ND	0.26 J	0.26 J	0.19 J	0.2 J	0.14 J
ANTHRACENE	410000	ND	0.22 J	1.2 J	0.31 J	0.095 J	0.08 J	0.072 J
BENZO(A)ANTHRACENE	4.3	0.84 J	1 J	3.6	1.3 J	ND	ND	ND
BENZO(A)PYRENE	0.43	**0.74 J**	**0.88 J**	**2.8**	**1.2 J**	0.16 J	0.16 J	0.26 J
BENZO(B)FLUORANTHENE	4.3	1.3 J	1.6 J	**4.4**	2.1 J	0.4 J	0.32 J	0.55 J
BENZO(K)FLUORANTHENE	4.3	0.56 J	0.68 J	1.7	0.83 J	0.16 J	0.11 J	0.25 J
BENZO[G,H,I]PERYLENE	*	1.4 J	1.7	3.6	2.4	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	0.43	0.13 J	0.11 J	0.26 J	0.16 J	0.025 J	0.017 J	0.028 J
CHRYSENE	430	1.2 J	1.5 J	4.1	2.3	0.74 J	0.68 J	0.9 J
FLUORANTHENE	54000	2 J	2.7	9.6	3.8 J	2 J	1.6 J	2.1 J

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte	PAL	MY06BC19	MY06BC16	MY06BC17	MY06BC18	MY06BL01	MY06BL02	MY06BL03
Duplicates		**Dup. of MY06BC15**						
Date Collected		**10/8/2001**	**10/8/2001**	**10/8/2001**	**10/8/2001**	**10/10/2001**	**10/10/2001**	**10/10/2001**
Sample Delivery Group		**MYT002**	**MYT002**	**MYT002**	**MYT002**	**MYT004**	**MYT004**	**MYT004**
FLUORENE	54000	ND	ND	ND	ND	ND	0.11 J	0.11 J
INDENO(1,2,3-CD)PYRENE	43	0.57 J	0.66 J	1.8	0.86 J	0.14 J	0.11 J	0.22 J
NAPHTHALENE	27000	ND	ND	ND	ND	ND	ND	ND
PHENANTHRENE	*	0.71 J	ND	5.6	1.4 J	ND	ND	ND
PYRENE	41000	2 J	2.7	8.4	3.7	1.4 J	1 J	1.5 J
SVOCs (mg/kg)								
1,2,4-TRICHLOROBENZENE	14	ND	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLOROPHENOL	14	ND	ND	ND	ND	0.11 J	0.023 J	0.02 J
2,4,6-TRICHLOROPHENOL	0.29	ND	ND	ND	ND	0.04 J	ND	ND
2,4-DICHLOROPHENOL	4.1	ND	ND	ND	ND	0.036 J	ND	ND
2,4-DIMETHYLPHENOL	27	ND	ND	ND	ND	0.051 J	0.019 J	0.02 J
2,6-DINITROTOLUENE	1.4	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	6.8	ND	ND	ND	ND	0.014 J	ND	ND
2-METHYLNAPHTHALENE	27	ND	ND	ND	ND	ND	ND	ND
2-METHYLPHENOL	62	0.0057 J	0.0047 J	0.0052 J	0.0043 J	0.026 J	0.01 J	0.012 J
4-CHLORO-3-METHYLPHENOL	*	0.088 J	ND	ND	ND	0.1 J	0.035 J	0.037 J
4-METHYLPHENOL	6.8	ND	0.022 J	ND	0.02 J	0.033 J	0.015 J	0.013 J
4-NITROPHENOL	11	0.12 R	1.7 R	1.3 R	1.5 R	0.14 R	2.8 R	0.038 R
BIS(2-ETHYLHEXYL) PHTHALATE	0.23	ND	ND	ND	ND	ND	0.018 J	ND
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	ND
DI-N-BUTYL PHTHALATE	140	ND	ND	ND	ND	ND	0.01 J	0.0099 J
DIBENZOFURAN	5.4	ND	ND	ND	ND	ND	ND	ND
ISOPHORONE	3.3	ND	ND	ND	ND	ND	ND	ND
N-NITROSO-DI-N-PROPYLAMINE	0.00045	ND	ND	ND	ND	**2.9 R**	**2.8 R**	**2.8 R**
PENTACHLOROPHENOL	0.026	ND	ND	ND	ND	**0.34 J**	**0.061 J**	ND
PHENOL	81	ND	ND	ND	ND	ND	ND	ND
Other Compounds								
PERCENT SOLIDS	*	9.66	10.6	12	12	15.4	14.8	16.7
PERCENT LIPIDS	*	0.412	0.431	0.552	0.463	1.14	0.896	1.24

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte	PAL	MY06BL04	MY06BL05	MY06BL06	MY06BM01	MY06BM02	MY06BM03	MY06BM04
Duplicates			**Dup. of MY05BL04**					
Date Collected		**10/10/2001**	**10/10/2001**	**10/10/2001**	**10/10/2001**	**10/10/2001**	**10/10/2001**	**10/10/2001**
Sample Delivery Group		**MYT004**	**MYT004**	**MYT004**	**MYT003**	**MYT003**	**MYT003**	**MYT003**
Metals (mg/kg)								
ALUMINUM	1400	ND	ND	ND	55.1 J	53.4 J	90 J	144 J
ANTIMONY	0.54	ND	ND	ND	ND	ND	ND	ND
ARSENIC	0.014	**2.46**	**2.86**	**4.29**	**0.99**	**0.72**	**1.39**	**1.01**
BARIUM	95000	ND	0.09 J	0.06 J	0.31 J	0.32 J	0.56 J	0.63 J
BERYLLIUM	2.7	ND	ND	ND	ND	ND	0.005 J	0.008 J
BORON	120000	0.99	1.06	1.24	4.09	3.77	4.32	4.41
CADMIUM	2.2	ND	ND	0.85	0.181	0.164	0.317	0.238
CALCIUM	*	422 J	902 J	557	537 J	639 J	631 J	698 J
CHROMIUM	7	ND	0.05 J	0.18	0.34	0.97	0.46	0.54
COBALT	81	0.005 J	0.006 J	0.12	0.074	0.072	0.13	0.126
COPPER	54	15.2 J	10.5	49.9	2.19 J	1.05 J	2.63 J	1.59 J
IRON	410	ND	ND	25	86 J	68 J	128 J	184 J
LEAD	*	0.074	0.089	0.04	0.202	0.168	0.323	0.268
MAGNESIUM	*	341	371	232	730 J	749	653	818
MANGANESE	302	0.45	0.68	2.65	3.86	3.88 J	4.37 J	9 J
MERCURY	0.2	0.15	0.19	0.09	0.04	0.04	0.06	0.05
MOLYBDENUM	6.8	0.01 J	0.02	0.36	0.1	0.09 J	0.22	0.11
NICKEL	4.3	0.14	0.32	0.24	0.27	0.19	0.5	0.34
POTASSIUM	*	2690	2700	2130	1270	1050	1620	1350
SELENIUM	6.8	0.38	0.49	1.04	0.31 J	0.28 J	0.52 J	0.39 J
SILVER	11	0.163 J	0.228	0.708	ND	ND	0.008 J	0.006 J
SODIUM	*	3130	3040	3160	5130	5310	4490	5570
THALLIUM	0.095	ND	ND	ND	ND	ND	ND	ND
VANADIUM	6	ND	ND	0.2	0.26 J	0.22 J	0.42 J	0.5 J
ZINC	648	14.3	22.5	16.1	8.95	7.3	13	10.8
PCBs (ug/kg)								
Total Aroclor 1016	45	ND	3.3 R	7 R	ND	ND	ND	ND
Total Aroclor 1221	1.6	ND	**3.3 R**	**7 R**	ND	ND	ND	ND
Total Aroclor 1232	1.6	ND	**3.3 R**	**7 R**	ND	ND	ND	ND
Total Aroclor 1242	1.6	ND	**3.3 R**	**7 R**	ND	ND	ND	ND
Total Aroclor 1248	1.6	ND	**3.3 R**	**7 R**	ND	ND	ND	ND
Total Aroclor 1254	1.6	ND	**3.3 R**	**7 R**	ND	ND	ND	ND
Total Aroclor 1260	1.6	ND	**2.2 J**	**130 J**	ND	ND	ND	ND
Pesticides (ug/kg)								
4,4'-DDD	13	ND	0.1 J	2.6 J	0.15 J	0.16 J	0.2 J	0.13 J
4,4'-DDE	9.3	0.4 J	0.54 J	**38 J**	0.5	0.42	0.62	0.36 J
4,4'-DDT	64	ND	0.056 J	1.1 J	0.033 J	0.033 J	0.044 J	0.021 J
ALDRIN	1.3	ND	0.33 R	0.7 R	ND	ND	ND	ND
ALPHA-CHLORDANE	17	0.018 J	0.024 J	0.91 J	0.15 J	0.14 J	0.22 J	0.13 J
DIELDRIN	1.4	0.18 J	0.22 J	2.6 J	0.045 J	0.059 J	0.06 J	0.061 J
ENDOSULFAN I	*	ND	0.33 R	0.7 R	ND	ND	ND	ND
ENDOSULFAN II	*	ND	0.33 R	0.7 R	ND	0.12 J	ND	0.12 J
ENDOSULFAN SULFATE	*	ND	0.33 R	0.7 R	0.052 J	0.04 J	0.052 J	0.039 J
ENDRIN	410	ND	0.33 R	0.7 R	ND	ND	ND	ND
ENDRIN ALDEHYDE	*	ND	0.33 R	3.8 J	ND	ND	ND	ND
ENDRIN KETONE	*	ND	0.3 J	0.63 J	0.4	ND	0.37	0.48
GAMMA-CHLORDANE	17	ND	0.033 J	0.2 J	0.052 J	0.062 J	0.076 J	ND
HEPTACHLOR	5	ND	0.33 R	0.7 R	ND	ND	ND	ND
HEPTACHLOR EPOXIDE	2.4	0.0086 J	0.33 R	0.47 J	ND	ND	0.014 J	ND
LINDANE	17	ND	0.4 J	0.26 J	0.031 J	0.024 J	0.034 J	0.028 J
METHOXYCHLOR	6800	ND	0.33 R	0.7 R	ND	ND	ND	ND
TOXAPHENE	20	ND	**33 R**	**70 R**	ND	ND	ND	ND
ALPHA-BHC	0.5	ND	0.33 R	**1.1 J**	0.019 J	0.02 J	0.03 J	0.017 J
BETA-BHC	1.8	ND	0.33 R	0.7 R	ND	ND	ND	ND
DELTA-BHC	*	ND	0.33 R	0.7 R	ND	ND	ND	ND
SIM PAHs (ug/kg)								
ACENAPHTHENE	81000	0.047 J	0.063 R	0.82 J	ND	ND	ND	1.1 J
ACENAPHTHYLENE	*	0.19 J	0.19 J	1.9 J	0.33 J	0.22 J	0.34 J	0.25 J
ANTHRACENE	410000	0.077 J	0.2 J	1.3 J	0.43 J	0.3 J	0.42 J	2.4 J
BENZO(A)ANTHRACENE	4.3	ND	0.37 J	**5.6 J**	1.5 J	1 J	1.5 J	**6.7**
BENZO(A)PYRENE	0.43	0.16 J	0.24 J	**2.7 J**	**0.88 J**	**0.64 J**	**0.9 J**	**6**
BENZO(B)FLUORANTHENE	4.3	0.34 J	0.53 J	**8.8 J**	2.8	1.8	2.8	**9.5**
BENZO(K)FLUORANTHENE	4.3	0.16 J	0.2 J	2.7 J	1 J	0.73 J	0.99 J	3.2
BENZO[G,H,I]PERYLENE	*	ND	0.23 R	3.3 J	ND	ND	ND	4.2
DIBENZO(A,H)ANTHRACENE	0.43	0.023 J	0.032 J	**0.49 J**	0.15 J	0.087 J	0.12 J	0.7 J
CHRYSENE	430	0.77 J	0.85 J	20 J	2.2	1.6	2.3	8.5
FLUORANTHENE	54000	1.6 J	1.9	55 J	4.3	3.2	4.7	18

Table 4-26
Study Area 6 - Tissue Analytical Results
Detected Compounds

Analyte Duplicates Date Collected Sample Delivery Group	PAL	MY06BL04 10/10/2001 MYT004	MY06BL05 Dup. of MY05BL04 10/10/2001 MYT004	MY06BL06 10/10/2001 MYT004	MY06BM01 10/10/2001 MYT003	MY06BM02 10/10/2001 MYT003	MY06BM03 10/10/2001 MYT003	MY06BM04 10/10/2001 MYT003
FLUORENE	54000	0.17 J	0.12 R	1.9 J	ND	ND	ND	1.2 J
INDENO(1,2,3-CD)PYRENE	43	0.12 J	0.17 J	2.6 J	0.76 J	0.56 J	0.84 J	4.2
NAPHTHALENE	27000	ND	1.2 R	4.8 J	ND	ND	ND	ND
PHENANTHRENE	*	ND	0.39 R	6.7 J	ND	ND	ND	11
PYRENE	41000	1 J	1.4 J	43 J	4.5	3.4	4.8	15
SVOCs (mg/kg)								
1,2,4-TRICHLOROBENZENE	14	ND	ND	ND	ND	ND	ND	ND
2,4,5-TRICHLOROPHENOL	14	0.013 J	0.016 J	ND	ND	ND	ND	ND
2,4,6-TRICHLOROPHENOL	0.29	ND	ND	ND	ND	ND	ND	ND
2,4-DICHLOROPHENOL	4.1	ND	ND	ND	ND	ND	ND	ND
2,4-DIMETHYLPHENOL	27	0.018 J	0.021 J	0.069 J	ND	ND	ND	ND
2,6-DINITROTOLUENE	1.4	ND	ND	ND	ND	ND	ND	ND
2-CHLOROPHENOL	6.8	ND	ND	ND	ND	ND	ND	ND
2-METHYLNAPHTHALENE	27	ND	ND	ND	ND	ND	ND	0.0025 J
2-METHYLPHENOL	62	0.0088 J	0.01 J	0.082 J	ND	ND	ND	ND
4-CHLORO-3-METHYLPHENOL	*	0.03 J	0.041 J	0.44 J	ND	ND	ND	ND
4-METHYLPHENOL	6.8	0.012 J	0.016 J	0.074 J	ND	ND	ND	ND
4-NITROPHENOL	11	2.9 R	ND	7.1 R	1.3 R	1.4 R	1.3 R	1.4 R
BIS(2-ETHYLHEXYL) PHTHALATE	0.23	ND	ND	0.11 J	ND	ND	ND	ND
CARBAZOLE	*	ND	ND	ND	ND	ND	ND	0.017 J
DI-N-BUTYL PHTHALATE	140	0.011 J	0.026 J	ND	ND	ND	ND	ND
DIBENZOFURAN	5.4	ND	ND	ND	ND	ND	ND	0.0054 J
ISOPHORONE	3.3	ND	ND	ND	0.015 J	0.0091 J	0.018 J	0.0093 J
N-NITROSO-DI-N-PROPYLAMINE	0.00045	**2.9 R**	ND	ND	ND	ND	ND	ND
PENTACHLOROPHENOL	0.026	**0.033 J**	**0.035 J**	**0.11 J**	ND	ND	ND	ND
PHENOL	81	ND	ND	ND	ND	ND	ND	ND
Other Compounds								
PERCENT SOLIDS	*	16	16.7	25.5	9.06	8.62	12.2	9.47
PERCENT LIPIDS	*	1.23	0.422	12.2	0.719	0.67	0.927	0.52

Notes:

PAL = Project Action Limit

* PAL Not Available

Bold values indicate an exceedence of the PAL

J = Estimated Value

R = Rejected Value

ND = Compound(s) Not Detected

NA = Compound(s) Not Analyzed

Table 4-28
Soil PAL Exceedence Summary
Bailey Point

Location	Sample Identification	Compound Exceeding PAL	Table Reference
Foxbird Island	MY03SS01(0-0.5)	Iron*	4-6
ISFSI	MY04SS01	EPH, PAHs	4-7
RA Area	MY05SB04(12-13.2)	PAHs	4-9
	MY05SB05(12-13.5)	Iron*	4-9
	MY05SB07(4-6)	Iron*	4-9
	MY05SB08(6-7.5)	Iron*	4-9
	MY05SB10(14-16)	Iron*	4-9
	MY05SB11(0-0.5)	Iron*, PAHs	4-9
	MY05SB11(12-13.5)	PAHs	4-9
	MY05SS01(0-0.5)	EPH	4-9
Industrial Area	MY05SB01(0-0.5)	PAHs	4-11
	MY05SB02(4.5-6.5)	Iron*	4-11
	MY05SB15(0-0.5)	PAHs	4-11
	MY05SB16(0-0.5)	Iron*	4-11
	MY05SS06	PAHs	4-11
	MY05SS08	PAHs	4-11
	MY05SS24(0-0.5)	PAHs	4-11
	MY05SS26(0-0.5)	PAHs	4-11
	MY05SS28(0-0.5)	PAHs	4-11
	MY05SS29(0-0.5)	PAHs	4-11
	MY05SS30(0-0.5)	PAHs	4-11
	MY05SS31(0-0.5)	PAHs	4-11
	MY05SS32(0-0.5)	PAHs	4-11
	MY05SS34(0-0.5)	EPH	4-11
	MY05SS35(0-0.5)	EPH	4-11
	MY05SS36(0-0.5)	EPH, PCBs	4-11
	MY05SS37(0-0.5)	PAHs	4-11
	MY05SS38(0-0.5)	PAHs, EPH	4-11
	MY05SS39(0-0.5)	PAHs	4-11
	MY05SS40(0-0.5)	PAHs	4-11
	MY05SS41(0-0.5)	PAHs	4-11
	MY05SS42(0-0.5)	PAHs	4-11
	MY05SS43(0-0.5)	PAHs	4-11
	MY05SS44(0-0.5)	PAHs	4-11
	MY05SS49(0-0.5)	PAHs	4-11
	MY05SS53(0-0.5)	PAHs	4-11
	MY05SS54(0-0.5)	EPH	4-11
	MY05SS79(0-0.5)	PAHs	4-11
	MY05SS80(0-0.5)	EPH, PAHs	4-11
	MYLOSS01(0-0.5)	PAHs	4-11
	MYLOSS02(0-0.5)	DRO, PAHs	4-11
	MYLOSS05(0-0.5)	DRO, PAHs	4-11
Forebay	MY05HA01	Iron*	4-13
	MY05HA03	Iron*	4-13
Warehouse 2/3	MY05SB36(6.5-8.5)	Iron*	4-14A
	MY05SS101	PAHs	4-14A
	MY05SS102	PAHs	4-14A
	MY05SS103	PAHs	4-14A

Table 4-28
Soil PAL Exceedence Summary
Bailey Point

Location	Sample Identification	Compound Exceeding PAL	Table Reference
Warehouse 2/3, continued	MY05TP01(0-0.5)	Iron*, PCBs	4-14A
	MY05TP01(3-3.5)	Iron*, PCBs	4-14A
	MY05TP01(9.5-10)	EPH, PCBs	4-14A
	MY05TP02(0-0.5)	PCBs, PAHs	4-14A
	MY05TP03(0-0.5)	Iron*	4-14A
	MY05TP03(0.5-7.0)	Iron*	4-14A
	MY05TP15(4-6)	EPH	4-14A
115 kV Switchyard	MY05TP06(6.5-6.8)	Iron*	4-16A
	MY05TP07(5.5-5.8)	PAH	4-16A
	MY05TP08(6.5-6.8)	Iron*	4-16A
	MY05SS10(0-0.5)	Iron*	4-16A
Construction Transformer	MY05HA09(0-0.5)	EPH, PCBs	4-16B
	MY05HA11(2.0-2.5)	EPH	4-16B
Parking Lot C	MY05SB17(0-0.5)	EPH	4-17
	MY05SB17(4-5)	PAH	4-17
Parking Lot D	MY05SB19(10-12)	Iron*	4-17
	MY05SB21(4-5.2)	Iron*	4-17
Information Center	MY05SS75(0-0.5)	Lead	4-17
345 kV Transmission Line Area	MY05SB23(12-14)	Iron*	4-18A
	MY05SB24(0-0.5)	Iron*	4-18A
	MY05SB24(8-10)	Iron*	4-18A
	MY05SB49(0-0.5)	Iron*	4-18A
	MY05SB49(12-14)	Iron*	4-18A
	MY05SB50(0-0.5)	Iron*	4-18A
	MY05SB52(0-0.5)	Iron*	4-18A
	MY05SB52(14-16)	Iron*	4-18A
	MY05SS105(0-0.5)	Iron*	4-18A
	MY05SS106(0-0.5)	Iron*	4-18A
	MY05SS107(0-0.5)	Iron*	4-18A
	MY05SS108(0-0.5)	Iron*	4-18A
	MY05SS109(0-0.5)	Iron*	4-18A
	MY05SS111(0-0.5)	Iron*	4-18A
	MY05SS112(0-0.5)	Iron*	4-18A
	MY05SS113(0-0.5)	Iron*	4-18A
	MY05SS114(0-0.5)	Iron*	4-18A
	MY05SS115(0-0.5)	Iron*	4-18A
	MY05SS116(0-0.5)	Iron*	4-18A
	MY05SS117(0-0.5)	Iron*	4-18A
	MY05SS118(0-0.5)	Iron*	4-18A
	MY05SS119(0-0.5)	Iron*	4-18A
	MY05SS12(0-0.5)	Iron*, PAHs	4-18A
	MY05SS13(0-0.5)	Iron*	4-18A
	MY05TP107A(9-11)	EPH, Iron*, PAHs	4-18A
	MY05TP110A(7-9)	EPH, Iron*	4-18A
	MY05TP111A(9-11)	EPH, Iron*, PAHs	4-18A
	MY05TP113(7-9)	EPH, Iron*	4-18A
	MY05TP115(7-9)	Iron*	4-18A
	MY05TP116(6-8)	Iron*	4-18A

Table 4-28
Soil PAL Exceedence Summary
Bailey Point

Location	Sample Identification	Compound Exceeding PAL	Table Reference
345 kV Transmission Line Area, continued	MY05TP118(13-15)	Iron*	4-18A
	MY05TP125(6-8)	Iron*	4-18A
	MY05TP129(7-9)	PAH	4-18A
Pre-operation Cleaning Basin	MY05SB42(4-6)	Iron*	4-18B
	MY05SB43(6-8)	Iron*	4-18B
	MY05SB44(4.7-6.7)	Iron*	4-18B
	MY05SB44(6.7-14)	EPH	4-18B
	MY05SB44(14-16)	Iron*	4-18B
	MY05SB45(2-4)	Iron*	4-18B
	MY05SB45(4-6)	Iron*	4-18B
	MY05SB46(4-6)	Iron*	4-18B
Former Truck Maintenance Garage	MY05SB47(0-0.5)	Iron*	4-18C
	MY05TP104(7-9)	EPH	4-18C
Bailey Farm House	MY05SB25(0-0.5)	Iron*	4-20
	MY05SB54(2-4)	EPH, Iron*	4-20
	MY05SB54(6-8)	Iron*	4-20
	MY05SS76	EPH	4-20

Note:

* The average reference iron concentration at Maine Yankee is near the PAL, and has a maximum reference concentration exc eeding the PAL. The detected iron is within the documented range of reference concentrations (MY, 2003b).

Table 4-29
Groundwater PAL Exceedence Summary
Bailey Point

Location	Well Number	Compound Exceeding PAL	Table Reference
ISFSI	98-1-OW	Aluminum, Sodium	4-8
	98-9-OW	Aluminum, Antimony	4-8
	98-10-OW	EPH, Aluminum, Antimony, Arsenic, Chromium, Iron, Lead, Manganese, Sodium	4-8
	MW-302A	EPH/DRO, Aluminum, Molybdenum, Sodium	4-8
	MW-302B	EPH/DRO, Aluminum, Manganese, Sodium	4-8
	MW-303A	DRO, Sodium	4-8
	MW-303B	EPH/DRO	4-8
	MW-304A	Manganese, Molybdenum	4-8
	MW-304B	DRO	4-8
	MW-305A	EPH/DRO, Lead, Manganese, Molybdenum, Sodium	4-8
	MW-305B	EPH/DRO, Manganese, Sodium	4-8
RA Area	B-202	DRO, Sodium	4-10
	B-203B	DRO, Sodium	4-10
	B-205	DRO, Sodium	4-10
	B-206	Sodium	4-10
	BK-1	DRO, Sodium	4-10
	CS-1	DRO, Arsenic, Molybdenum, Sodium, Dieldrin	4-10
	PAB	DRO, Chromium, Mercury, Molybdenum, Sodium, Dieldrin	4-10
	MW-401A	DRO, Manganese, Sodium, Dieldrin	4-10
	MW-401B	DRO, Aluminum, Arsenic, Molybdenum, Sodium	4-10
	MW-402	DRO, Aluminum, Manganese, Sodium	4-10
	MW-312	EPH/DRO, Aluminum, Arsenic, Sodium, Dieldrin	4-10
	B-206A	DRO, Sodium	4-10
Industrial Area	MW-306	DRO, Sodium	4-12
	MW-307	DRO, Manganese, Sodium	4-12
	B-201	DRO, Manganese, Sodium	4-12
	MW-308	DRO, Manganese, Molybdenum	4-12
	MW-317	EPH, Manganese	4-12
	MW-318	DRO, Manganese, Sodium	4-12
	MW-403	DRO, Sodium	4-12
Warehouse 2/3	MW-404	Arsenic, Iron, Manganese, Ethylbenzene	4-15
	MW-405	Aluminum, Manganese, Molybdenum, Silver, Sodium, Vinyl Chloride	4-15
	MW-406A	Sodium, Vinyl Chloride	4-15
	MW-406B	Aluminum, Manganese, Chloromethane	4-15
	MW-407A	1,1-Dichloroethene	4-15
	MW-407B	Aluminum, Molybdenum	4-15
	MW-408	Manganese, Sodium, 1,1,1-Trichlorethane, 1,1-Dichloroethene, Vinyl Chloride, 1,1-Dichloroethane	4-15
	MW-409A	1,1,1-Trichlorethane, 1,1-Dichloroethene, Vinyl Chloride, 1,1-Dichloroethane	4-15
	MW-420	Sodium	4-15
	MW-421	Sodium, 1,1-Dichloroethene	4-15
	MW-311	Manganese, Molybdenum, 1,1-Dichloroethene, Vinyl Chloride	4-15

Table 4-29

Groundwater PAL Exceedence Summary
Bailey Point

Location	Well Number	Compound Exceeding PAL	Table Reference
345 kV Transmission Line Area	MW-413	DRO, Iron, Manganese, Sodium	4-19
	MW-414	DRO, Iron, Manganese, Sodium	4-19
	MW-415	DRO, Boron, Iron, Manganese, Sodium	4-19
	MW-416	DRO, Iron, Manganese, Sodium	4-19
	MW-309	EPH/DRO, Iron, Manganese, Sodium	4-19
	MW-319	EPH/DRO, Arsenic, Manganese, Sodium	4-19
	MW-320	EPH/DRO, Manganese, Sodium	4-19
	MW-321	EPH/DRO, Manganese, Sodium	4-19
	MW-322	EPH/DRO, Manganese, Sodium, Thallium	4-19
	MW-323	EPH/DRO, Arsenic, Boron, Iron, Manganese, Sodium	4-19
Pre-operation Cleaning Basin	MW-313	DRO, Manganese, Sodium, Thallium	4-19
	MW-314	EPH/DRO, Manganese, Sodium	4-19
	MW-315	EPH/DRO, Manganese, Sodium, Heptachlor	4-19
Former Truck Maintenance Garage	MW-316	EPH/DRO	4-19
	MW-424A	DRO	4-19
	MW-424B	DRO	4-19
	MW-425	DRO	4-19
Bailey Farm House	MW-310	EPH	4-21
	MW-324	Manganese	4-21

Table 4-30
Fate and Transport Properties for Selected Organic Compounds

Chemical	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m^3/mol)	Koc (ml/g)	Kow
Polychlorinated Biphenyls (PCBs) (Note 1)					
Aroclor 1016	4.20E-01	4.00E-04	2.40E+04	2.90E-04	5.30E+05
Aroclor 1221	1.50E+01	6.70E-03	1.23E+04	3.50E-03	NA
Aroclor 1232	1.45E+00	4.06E-03	1.58E+03	NA	NA
Aroclor 1242	2.40E-01	4.10E-04	1.29E+04	5.60E-04	NA
Aroclor 1248	5.40E-02	4.90E-04	5.62E+05	3.50E-03	NA
Aroclor 1254	1.20E-02	7.70E-05	1.07E+06	2.70E-03	4.25E+04
Aroclor 1260	2.70E-03	4.10E-05	1.38E+07	7.10E-03	NA
Pesticides (Note 1)					
Dieldrin	1.95E-01	1.78E-07	4.58E-07	1.70E+03	3.16E+03
DDT	5.00E-03	5.50E-06	5.13E-04	2.43E+05	1.55E+06
Endrin	2.50E-01	NA	7.52E-06	1.23E+01	1.15E+05
Gamma-BHC	2.00E+00	NA	1.06E-05	1.23E+03	6.31E+03
Heptachlor Epoxide	2.00E-01	NA	9.50E-06	NA	1.00E+05
Methoxychlor	4.50E-02	NA	1.58E-05	8.00E+04	1.20E+05
SVOCs/PAHs (Note 1)					
Anthracene	4.50E-02	1.95E-04	1.02E-03	1.40E+04	2.82E+04
Benzo(a)anthracene	5.70E-03	2.20E-08	1.16E-06	1.38E+06	3.98E+05
Benzo(a)pyrene	1.20E-03	5.60E-09	1.55E-06	5.50E+06	1.15E+06
Benzo(b)flouranthene	1.40E-02	5.00E-07	1.19E-05	5.50E+05	1.15E+06
Benzo(k)flouranthene	4.30E-03	5.10E-07	3.94E-05	5.50E+05	1.15E+06
Benzo(g,h,I)perylene	7.00E-04	1.03E-10	5.34E-08	1.60E+06	3.24E+06
Bis(2-ethylhexyl)phthalate	2.85E-01	2.00E-07	3.61E-07	5.90E+03	9.50E+03
Carbazole	7.48E+00	NA	1.53E-08	3.04E+06	3.89E+03
Chrysene	1.80E-03	6.30E-09	1.05E-06	2.00E+05	4.07E+05
Dibenzo(a,h) anthracene	5.00E-04	1.00E-10	7.33E-08	3.30E+06	6.31E+06
Fluoranthene	2.06E-01	5.00E-06	6.46E-06	3.80E+04	7.94E+04
Indeno(1,2,3-cd)pyrene	5.30E-04	1.00E-10	6.86E-08	1.60E+06	3.16E+06
Naphthalene	3.17E+01	2.30E-01	1.15E-03	1.30E+03	2.76E+03
Phenanthrene	1.00E+00	6.80E-04	1.59E-04	1.40E+04	2.88E+04
Pyrene	1.32E-01	2.50E-06	5.04E-06	3.80E+04	7.59E+04
VOCs (Note 2)					
1,1,1-Trichloroethane	9.50E+02	1.00E+02	2.76E-02	1.52E+02	3.09E+02
1,1-Dichloroethene	4.00E+02	5.00E+02	1.54E-01	6.50E+01	1.35E+02
1,1-Dichloroethane	5.50E+03	1.82E+02	5.70E-03	3.00E+01	6.17E+01
Benzene	1.76E+03	7.52E+01	5.18E-03	6.50E+01	1.35E+02
Ethylbenzene	1.52E+02	7.08E+00	7.72E-03	1.20E+03	2.19E+03
m-,p, o-Xylene	1.75E+02	1.60E+01	7.30E-03	7.00E+02	1.45E+03
Toluene	5.15E+02	2.18E+01	6.30E-03	2.40E+02	4.90E+02
Trichloroethene	1.10E+03	6.90E+01	1.03E-01	1.60E+02	2.63E+02
Vinyl Chloride	1.10E+03	2.30E+03	6.95E-01	8.20E+00	1.70E+01
Petroleum Hydrocarbon Fractions (Note 3)					
Aliphatics					
C8-10	4.30E-01	6.30E-03	1.92E+00	3.16E+04	NA
C10-12	3.40E-02	6.30E-04	2.88E+00	2.51E+06	NA

Table 4-30
Fate and Transport Properties
for Selected Organic Compounds

Chemical	Water Solubility (mg/l)	Vapor Pressure (mm Hg)	Henry's Law Constant (atm-m^3/mol)	Koc (ml/g)	Kow
C12-16	7.60E-04	4.80E-05	1.25E+01	5.01E+06	NA
C16-21	2.50E+06	1.10E-06	1.18E+02	6.31E+08	NA
Aromatics					
C8-10	6.50E+01	6.30E-03	1.15E-02	1.58E+03	NA
C10-12	2.50E+01	6.30E-04	3.30E-03	2.51E+03	NA
C12-16	5.80E+00	4.80E-05	1.27E-03	5.01E+03	NA
C16-21	6.50E-01	1.10E-06	3.12E-04	1.58E+04	NA
C21-35	6.60E-03	4.40E-10	1.61E-05	1.26E+05	NA

<u>Notes:</u>
NA – Not Available
Sources:

1) Basics of Pump-and-Treat Groundwater Remediation Technology, USEPA document 600/8-90/003
2) Arthur D. Little, Inc. (1987) The Installation Restoration Program Toxicology Guide, Volume 1, Section 2:1-16.
3) Gustafson, J.B., Tell, J.G., and Orem, D, 1997, Selection of Representative TPH Fractions based on Fate and Transport Considerations, Amherst Scientific Publishers, Amherst, MA. 102 pp.

Table 4-31
RFI Areas of Interest
Bailey Point

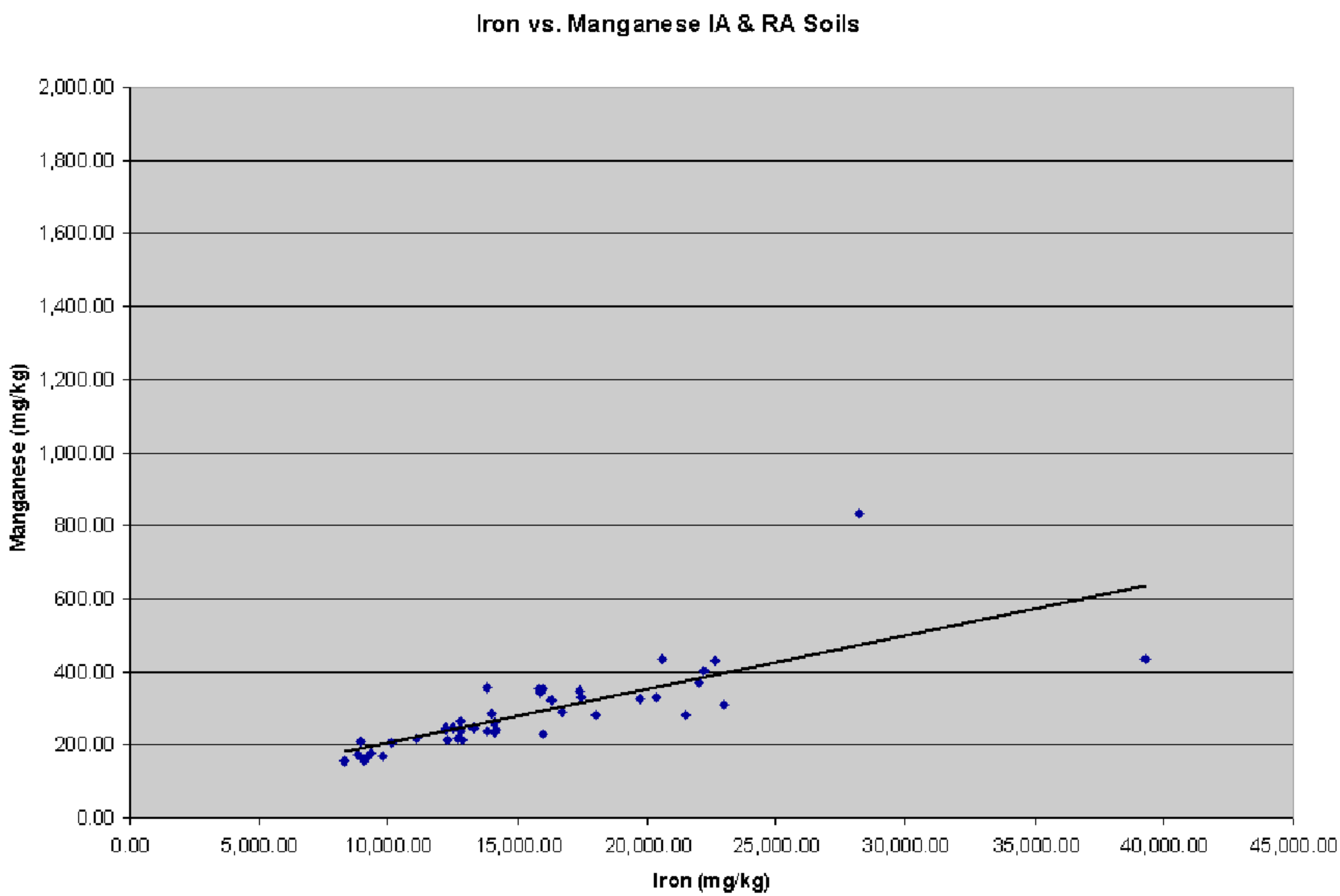
Location	Description	Issue(s)	Cause(s)	Fate
Soil				
Industrial/Radiological Restricted Area	Areas of soil fill during construction	Low level pesticides (dieldrin) in soils	Construction period backfill from off-site sources	Strongly partitioned to soil; very slow degradation
Industrial Area	Soil beneath sumps and specific sources within former Turbine Hall	Areas of petroleum-contaminated soils and PAHs	Specific areas of petroleum product usage during operation	Strongly partitioned to soil; slow degradation
Warehouse 2/3	Soils on southwest side of warehouse	Solvents and PCBs in soils	Spilling of paints and solvents onto soils during operation	Plans being made for source removal
Warehouse 2/3	Soils on northwest side of warehouse	PCBs, lead and PAHs in shallow soils	Surface disposal of paint blasting grit	Strongly partitioned to soil; slow degradation
Construction Transformer (X5)	Soils in area surrounding transformer pad	EPH and PCBs	Operational leaks of transformer fluid	Plans being made for source removal
Former Truck Maintenance Garage	Soils beneath and near former garage	Areas of petroleum-contamination	Probable releases from construction-era maintenance garage	Plans being made for further characterization
345 kV Transmission Line Area	Area of construction debris	EPH and PAHs in subsurface soils	Construction period disposal	Strongly partitioned to soil; slow degradation
Bailey Farmhouse	Soils beneath fuel oil tank in basement	Area of petroleum-contamination beneath fuel oil tank	Operation of fuel tank	Source material removed July 2003
Bailey Farmhouse	Soils in leachfield west of access road	EPH and detected PCBs	Operation of leachfield	Strongly partitioned to soil; slow degradation
Parking Lot C	Along access road on eastern edge of parking lot in the area of the former Gatehouse	EPH and PAHs in shallow soils	Gasoline leak from a vehicle waiting at the Gatehouse	Strongly partitioned to soil; slow degradation
Groundwater				
Industrial/Radiological Restricted Area	Groundwater in IA/RA	Sodium and manganese exceedences of MEGs	Saltwater intrusion in deep wells; operational dosing with seawater due to pipe leaks and	Groundwater discharge in nearshore area at south end Bailey Point, concentrations

Table 4-31
RFI Areas of Interest
Bailey Point

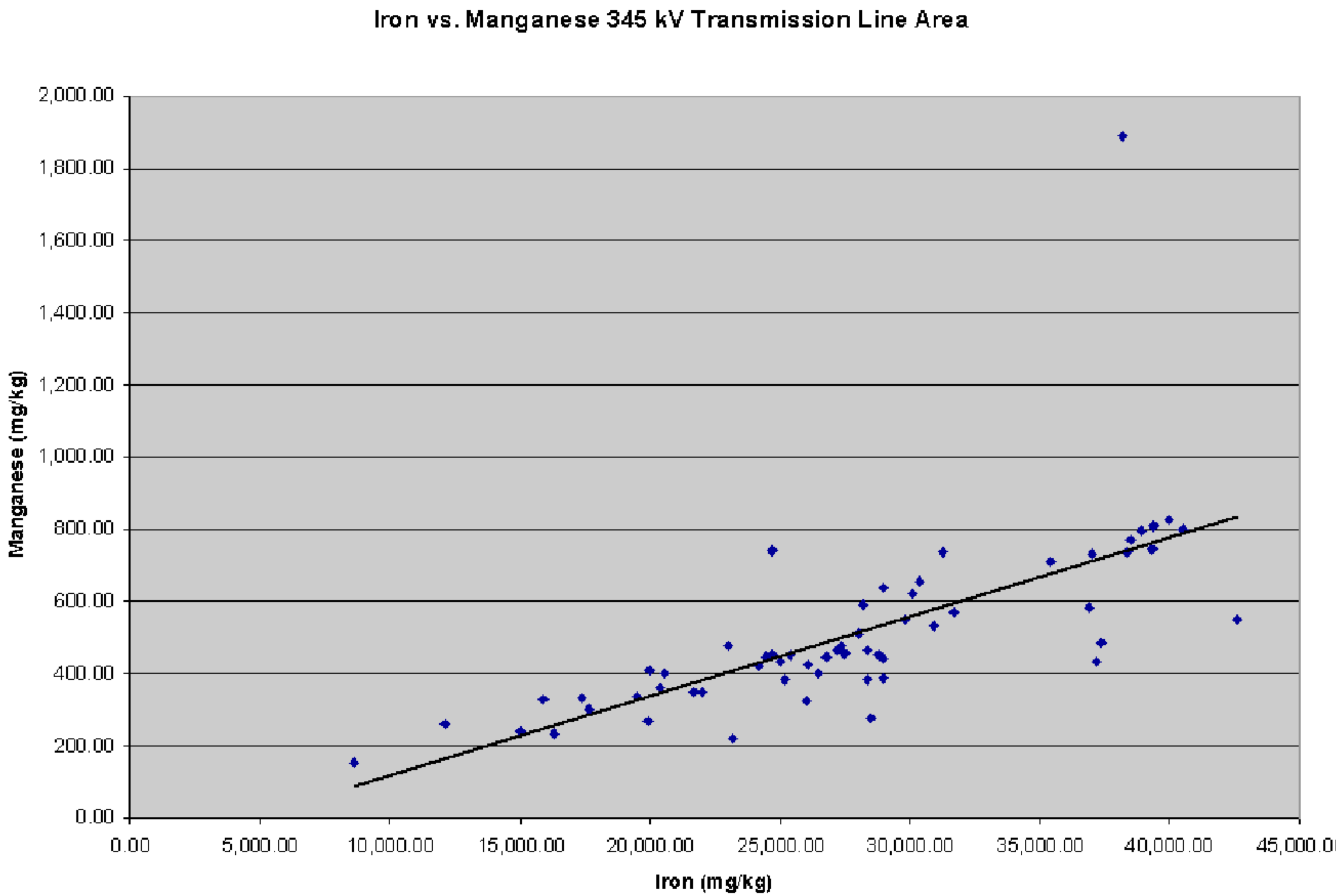
Location	Description	Issue(s)	Cause(s)	Fate
			stormdrain backup; winter deicing; sodium chromate leaks	decreasing with time due to source removal, except deep wells with saltwater intrusion
RA/IA	Groundwater in RA/IA	DRO exceedences of MEGs	Several DRO/EPH sources (i.e., PAB alleyway, MW-401B area, main transformer fire; removed USTs, and other non-point sources)	Groundwater discharge in nearshore area at south end Bailey Point, concentrations decreasing with time due to source removal
Warehouse 2/3	Groundwater east and south of WH 2/3	TCA and related chlorinated daughter products exceed MEGs	Emptying drums containing residual TCA	Slow degradation of daughter products and southward migration of plume to nearshore discharge near Outfall 005 and 006
Warehouse 2/3	Groundwater on west side of warehouse	Ethylbenzene, vinyl chloride and metals exceed MEGs	Spilling of paints and solvents onto soils during operation	Groundwater discharge in nearshore areas to west in Bailey Cove; concentrations decreasing after soil source removal
North of ISFSI and 345 kV Switchyard	Groundwater beneath dredge spoil disposal area	Metals in groundwater including sodium, iron, and manganese, exceed MEGs and PRGs	Sediments with saltwater pore water leaching sodium chloride deposited on top of former marsh deposits	Sodium decreasing with time through exchange processes and dilution; metals released through anaerobic reduction unlikely to decrease; discharge to nearshore areas of Bailey Cove but also some transport to the south of Na and As through deep bedrock transport
North end of Bailey Point	Groundwater in most of area north of Knoll	DRO exceeds MEGs in groundwater in most wells	Kerosene spill, concrete maintenance garage source, ops cleaning basin, several remediated soil areas, and miscellaneous sources in	Identifiable soil sources have been or will be remediated; discharge to nearshore areas of Bailey Cove but also some transport to the south likely

Table 4-31
RFI Areas of Interest
Bailey Point

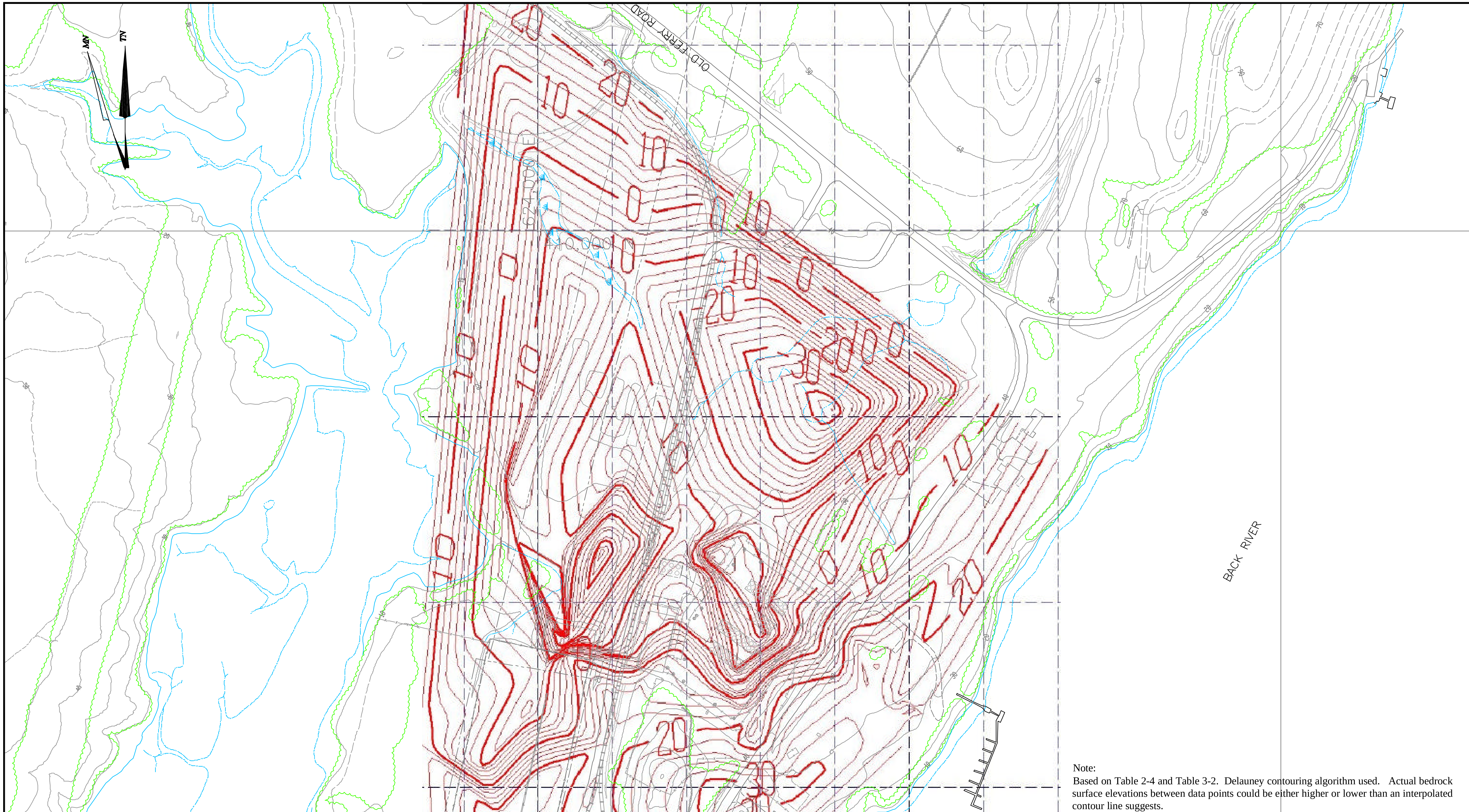
Location	Description	Issue(s)	Cause(s)	Fate
			construction debris dump	in deep bedrock transport
Various Areas of site	Groundwater in most of area surrounding ISFSI; MW-308; MW-405; MW-401B	Molybdenum exceeds MEG	Possible source in petroleum lubricant spills; possible natural source from rock mineral	Wide distribution of groundwater discharge in nearshore areas; ISFSI area groundwater may move south in deep rock flow; concentrations in MW-405 and -401B may decrease after source removal; concentrations from natural causes not likely to decrease
Sediment				
Outfall 009	Industrial area outfall south of former Circulating Water Pumphouse that received stormwater runoff from the south and east sides of the former Turbine Hall	PAHs in shallow sediments	Various petroleum spills	Sediment removed in fall 2003



Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report				
	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY				DRAWING TITLE: IRON vs. MANGANESE IA & RA SOILS
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS / REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPH NH		PROJECT NUMBER/PHASE: MEP02167/8A	SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 4-1



Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: IRON vs. MANGANESE 345 kV TRANSMISSION LINE AREA SOILS
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPH NH		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 4-2



Note:
Based on Table 2-4 and Table 3-2. Delauney contouring algorithm used. Actual bedrock surface elevations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:

- LINES OF EQUAL BEDROCK SURFACE ELEVATION, FT NGVD
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET
125 0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM:
JAMES SEWALL COMPANY

Maine Yankee

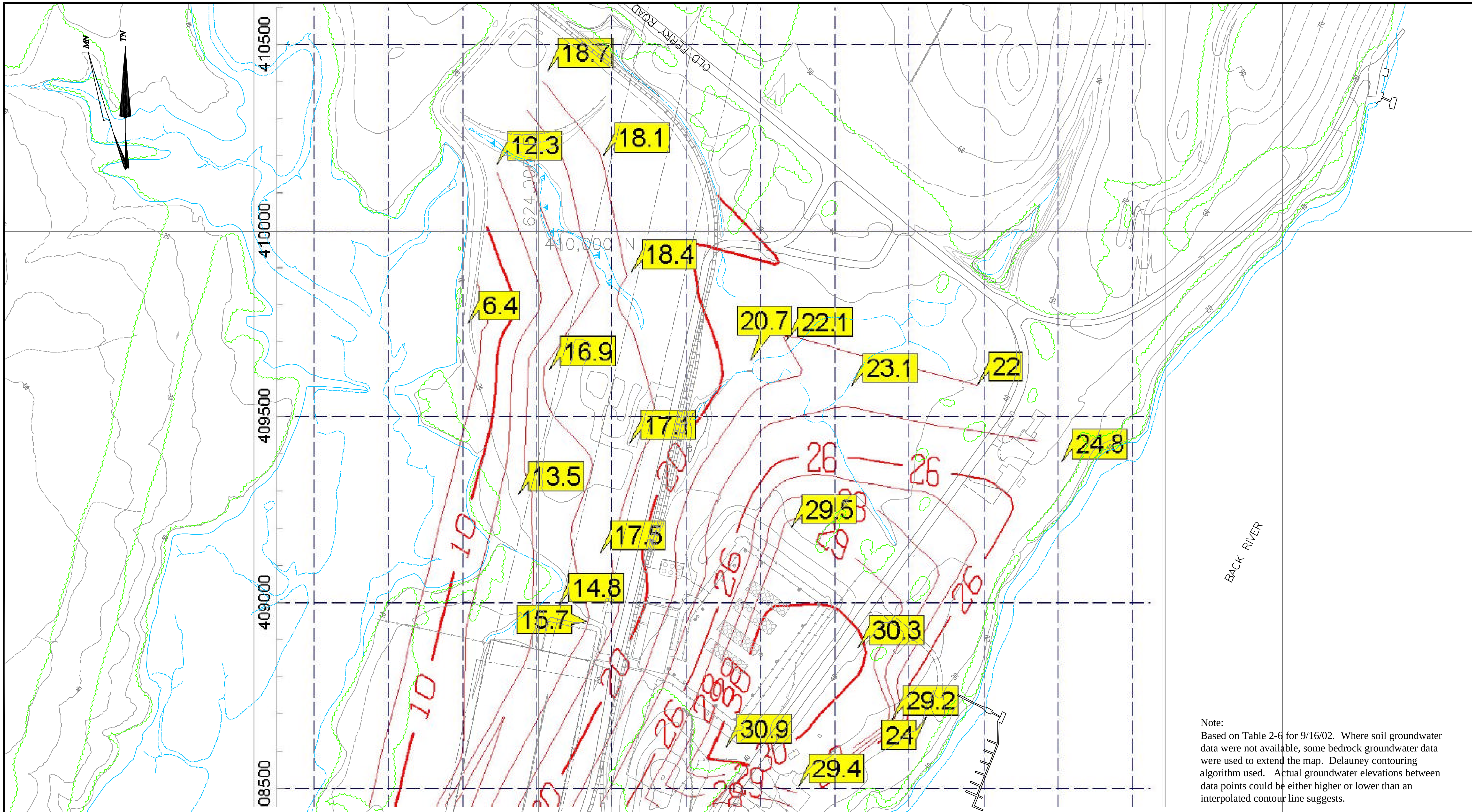
CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY						DRAWING TITLE: **DETAILED TOP OF BEDROCK CONTOUR MAP, NORTHERN BAILEY POINT**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG		
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=250'		PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. 4-3



Note:
Based on Table 2-6 for 9/16/02. Where soil groundwater data were not available, some bedrock groundwater data were used to extend the map. Delauney contouring algorithm used. Actual groundwater elevations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:

- LINES OF EQUAL GROUNDWATER ELEVATION, FT. NGVD
- 29.4 ELEVATION AT MONITORING WELL, NGVD
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

125 0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM:
JAMES SEWALL COMPANY

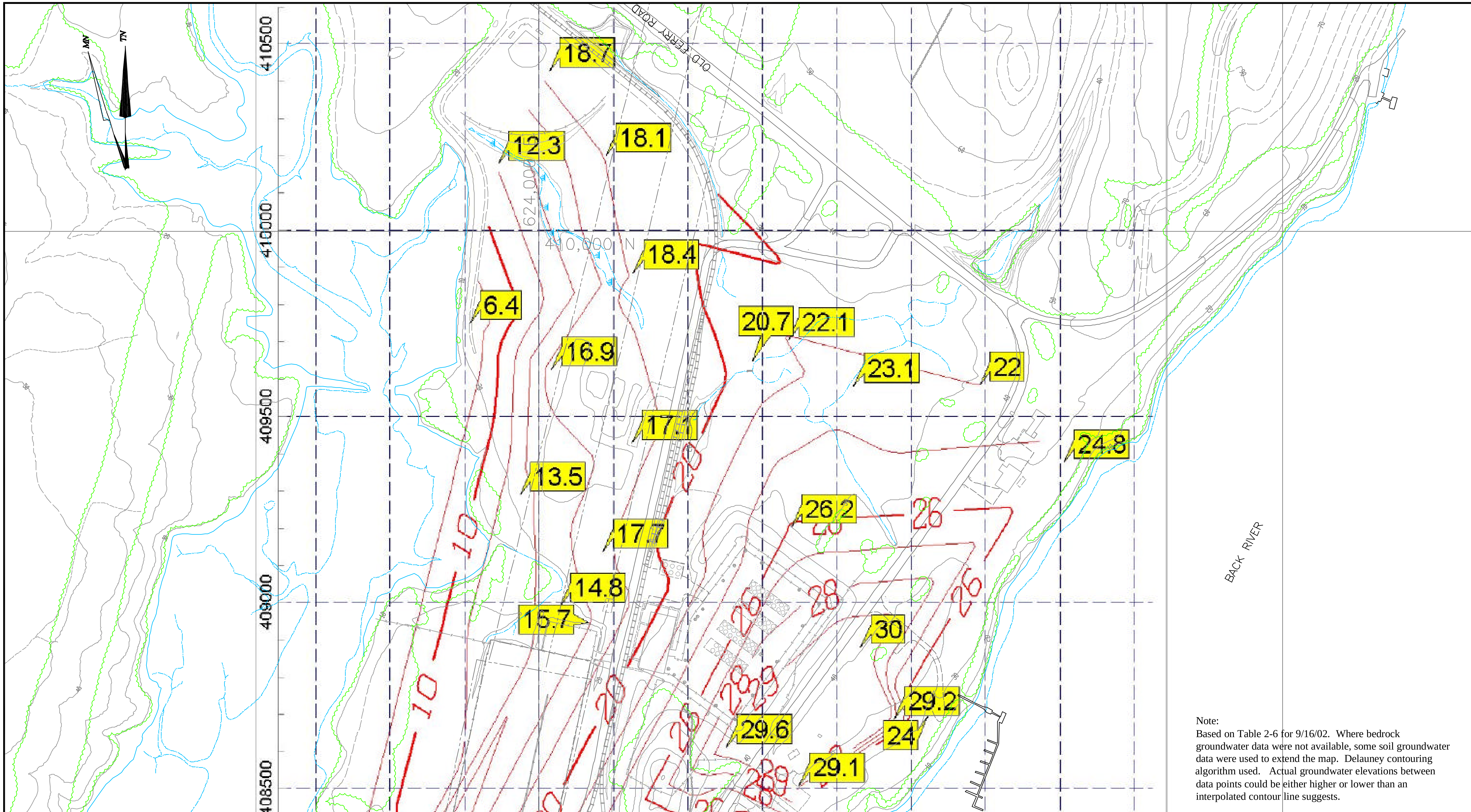
Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DETAILED SOIL GROUNDWATER CONTOUR MAP, NORTHERN BAILEY POINT
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	FIGURE NO. 4-4
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=250'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.



Note:
Based on Table 2-6 for 9/16/02. Where bedrock groundwater data were not available, some soil groundwater data were used to extend the map. Delauney contouring algorithm used. Actual groundwater elevations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:

- LINES OF EQUAL GROUNDWATER ELEVATION, FT. NGVD
- 0.0705 — ELEVATION AT MONITORING WELL, NGVD
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

125 0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

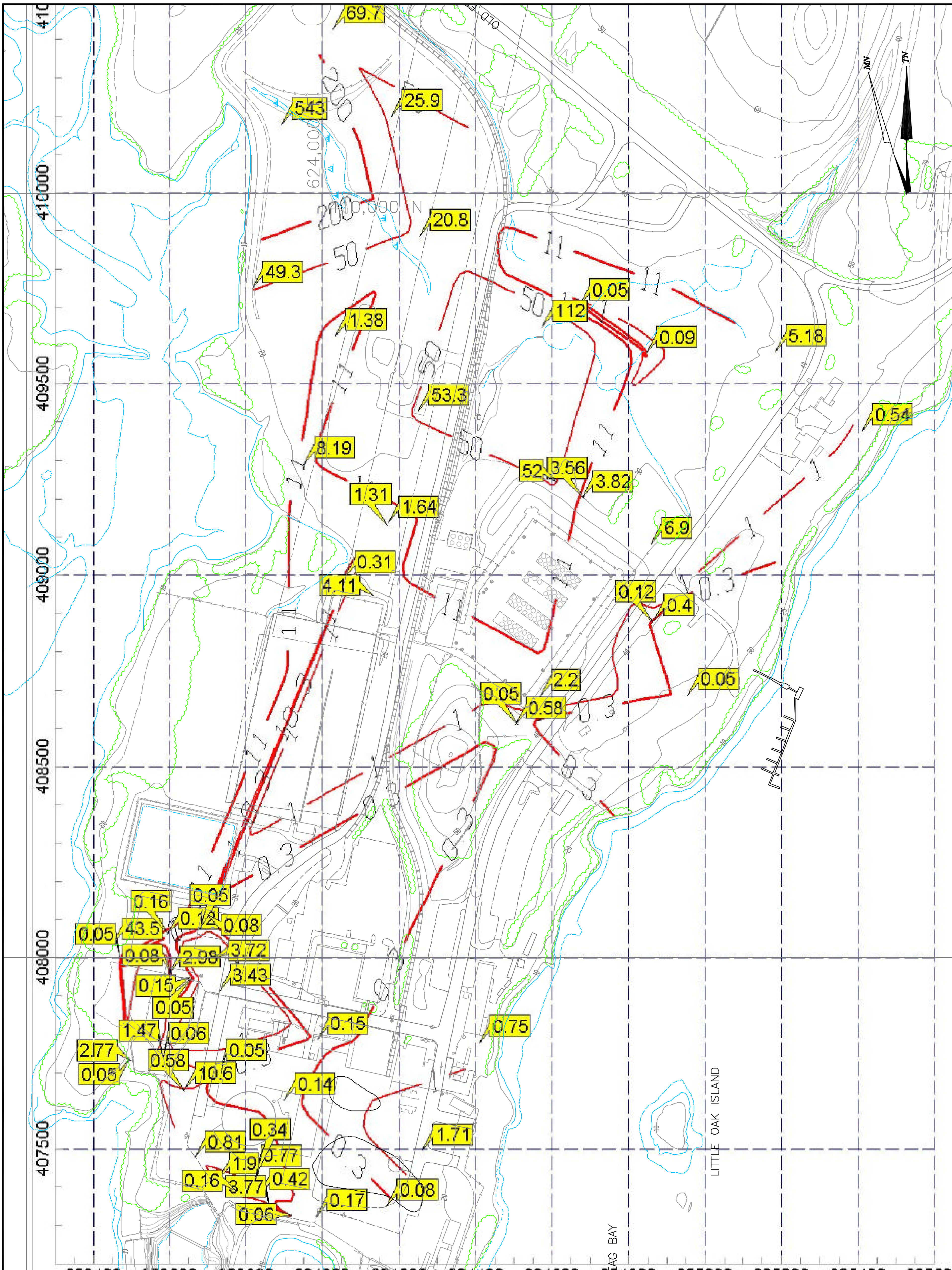
PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:
BAILEY/BPRCRA	MEP02167/8A	1"=250'

DRAWING TITLE:

DETAILED BEDROCK GROUNDWATER CONTOUR MAP, NORTHERN BAILEY POINT

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. 4-5



Note:
Based on the most recent value of iron concentration at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where iron was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests, particularly just south of the Knoll where data density is sparse.

LEGEND:
- LINES OF EQUAL IRON CONCENTRATION, Mg/L
- 0.17 IRON CONCENTRATION AT MONITORING WELL, Mg/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET
0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

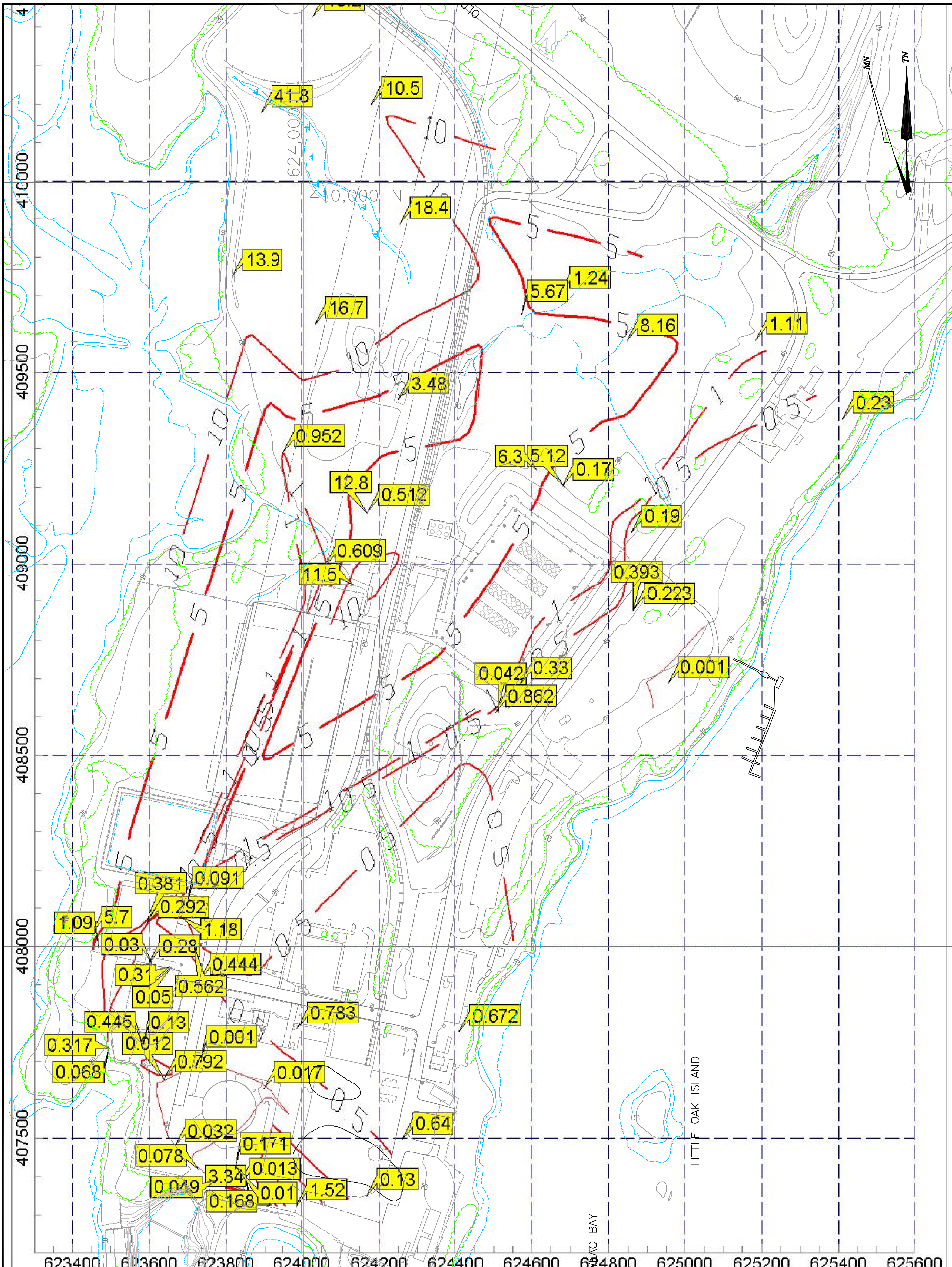
DRAWING TITLE: **IRON DISTRIBUTION ON BAILEY POINT**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:
BAILEY/BPRCRA	MEP02167/8A	1"=250'

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. 4-6



LEGEND:
LINES OF EQUAL MANGANESE CONCENTRATION, Mg/L
0.17 MANGANESE CONCENTRATION AT MONITORING WELL, Mg/L
RAILROAD
TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
UTILITY LINES (USGS QUAD)
WATER WAY / STREAM / RIVER

Note:
Based on the most recent value of manganese concentration at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where manganese was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests, particularly just south of the Knoll where data density is sparse.

SCALE IN FEET
0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee
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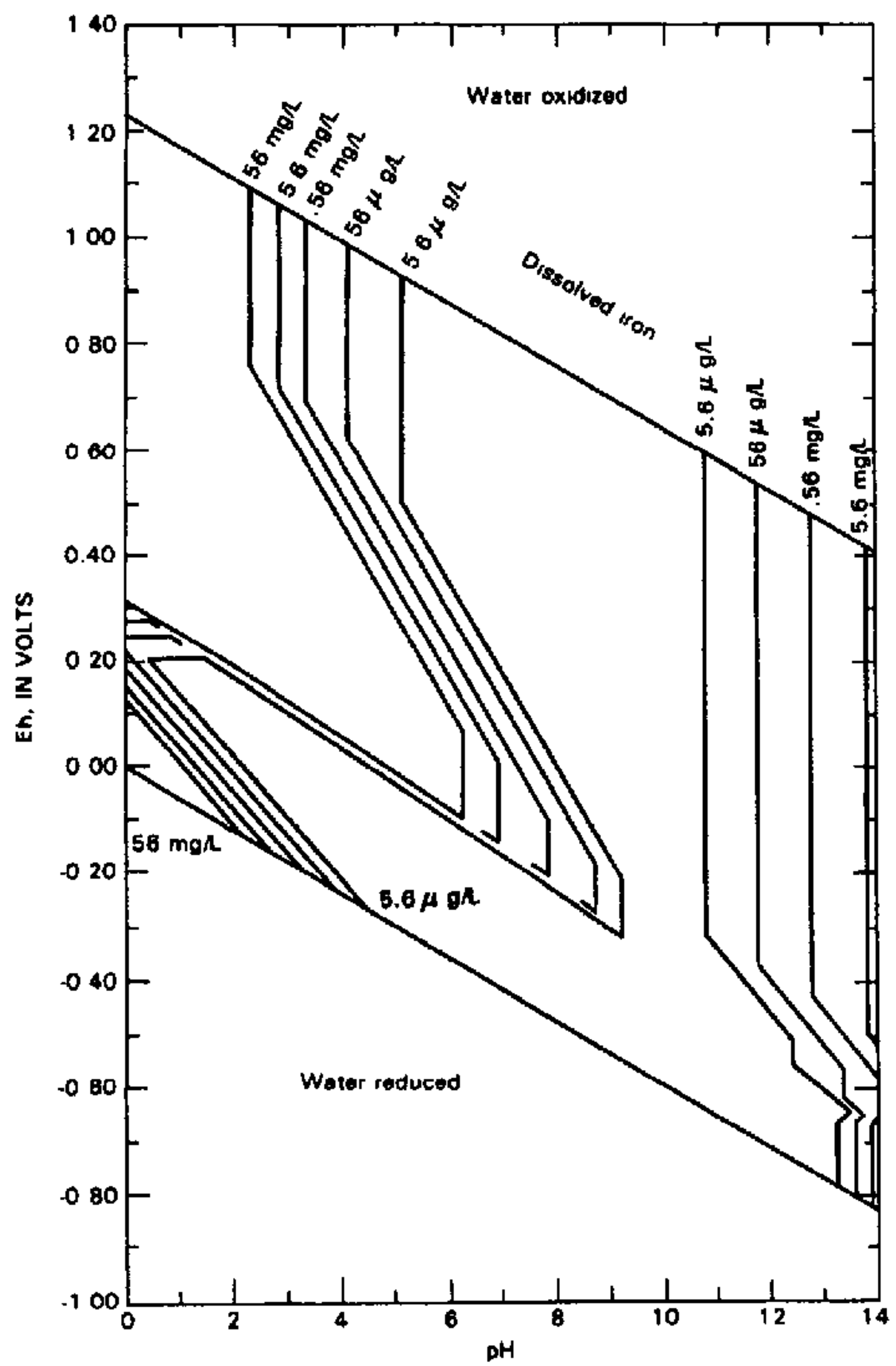
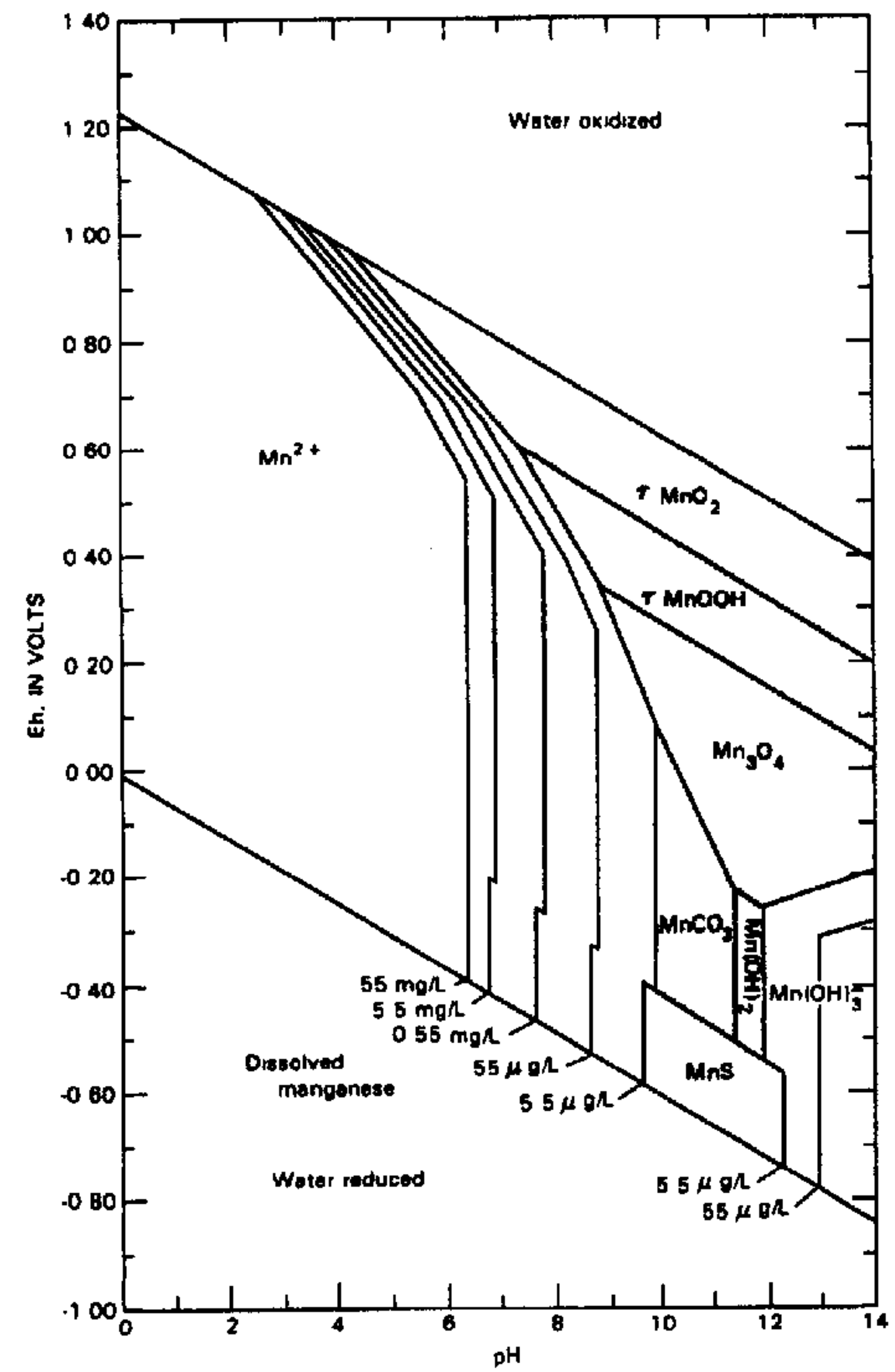
STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: MANGANESE DISTRIBUTION ON BAILEY POINT
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=250'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 4-7

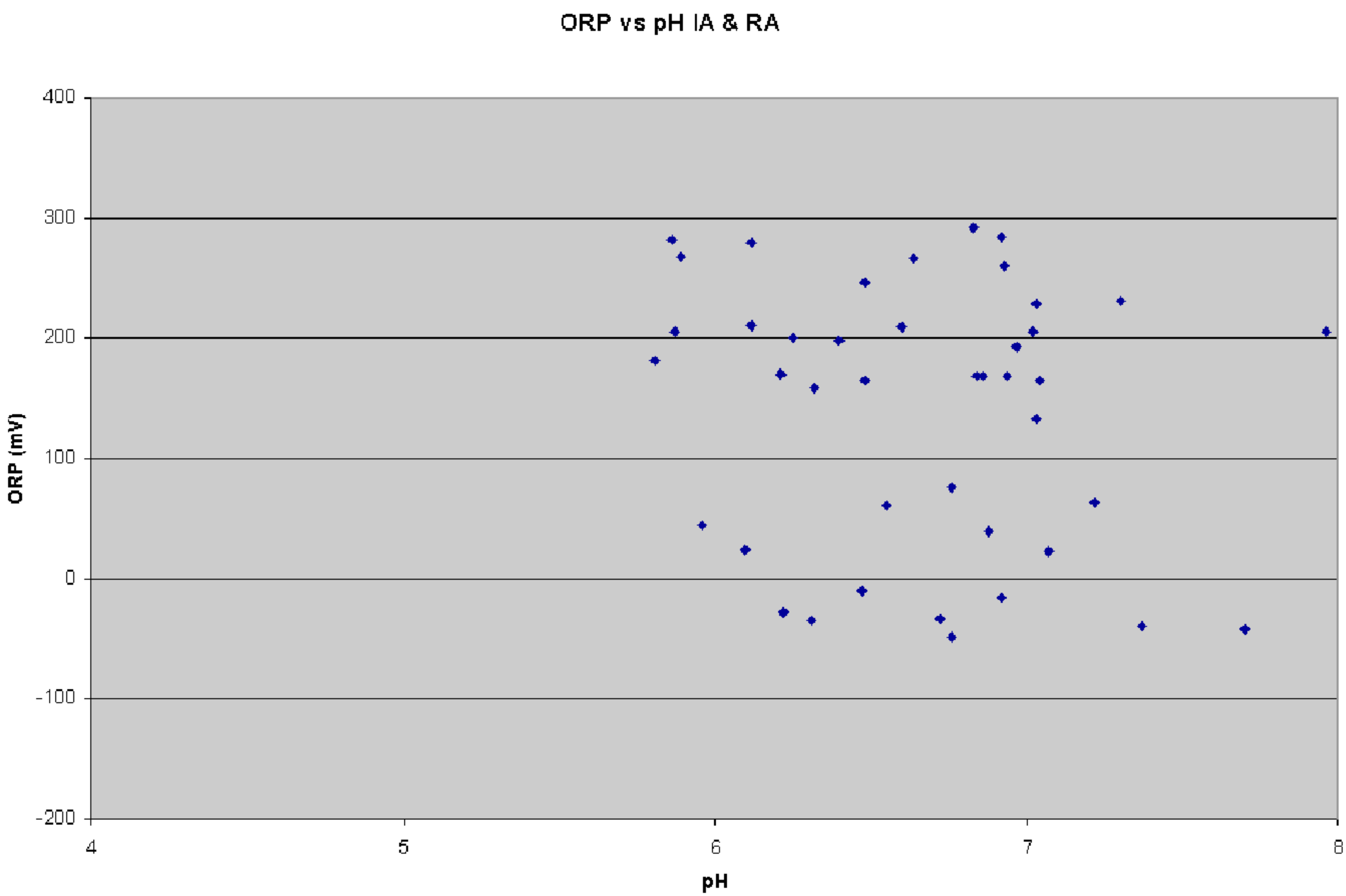


IRON SOLUBILITY AS A
FUNCTION OF Eh AND pH
(from Hem, 1985)

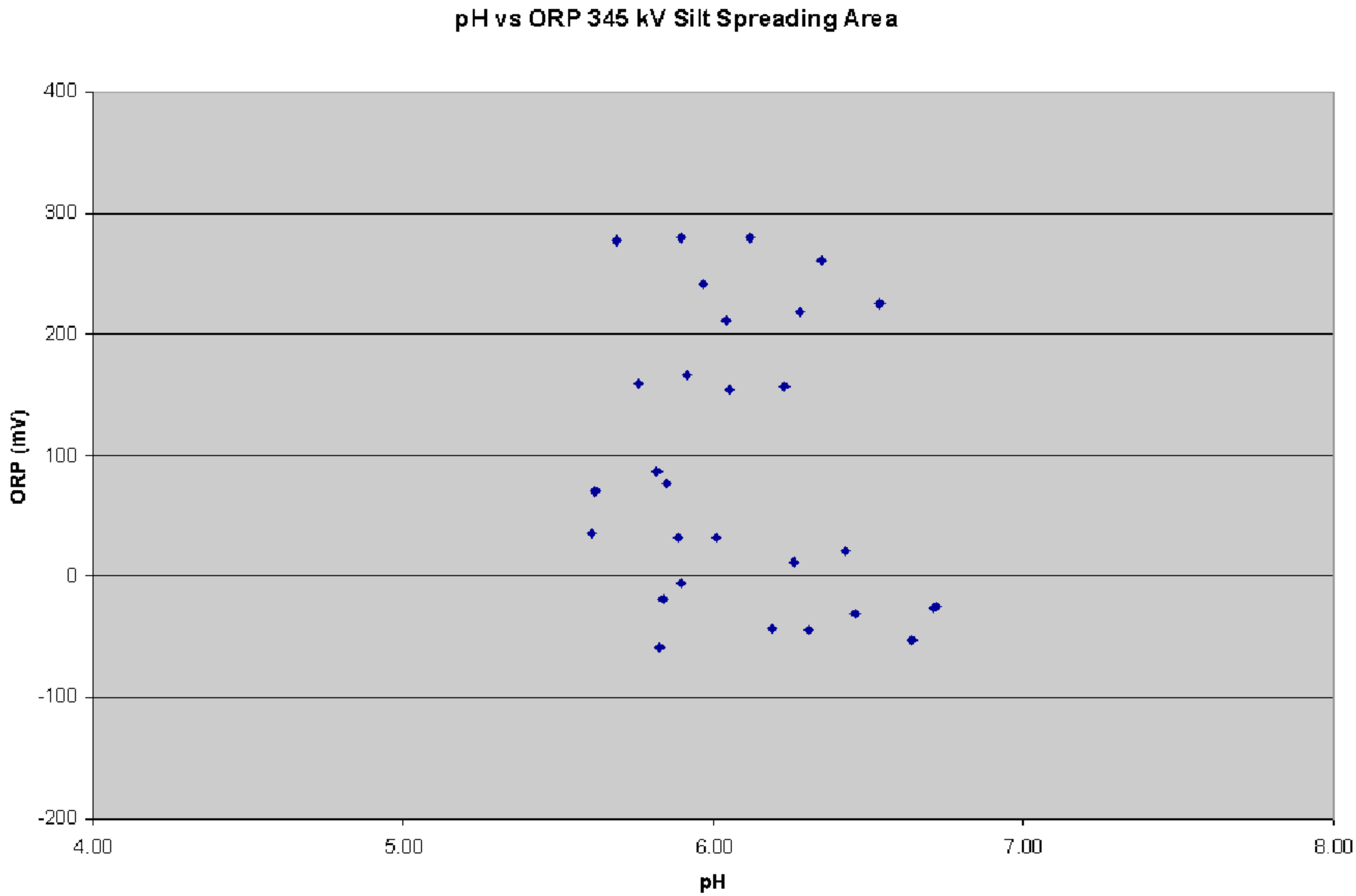


MANGANESE SOLUBILITY AS A
FUNCTION OF Eh AND pH
(from Hem, 1985)

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
CH2MHILL STRATEX	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: IRON AND MANGANESE SOLUBILITY AS FUNCTION OF Eh AND pH
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	FIGURE NO. 4-8
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPH NH		PROJECT NUMBER/PHASE: MEP02167/8A	SCALE: SHOWN		PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

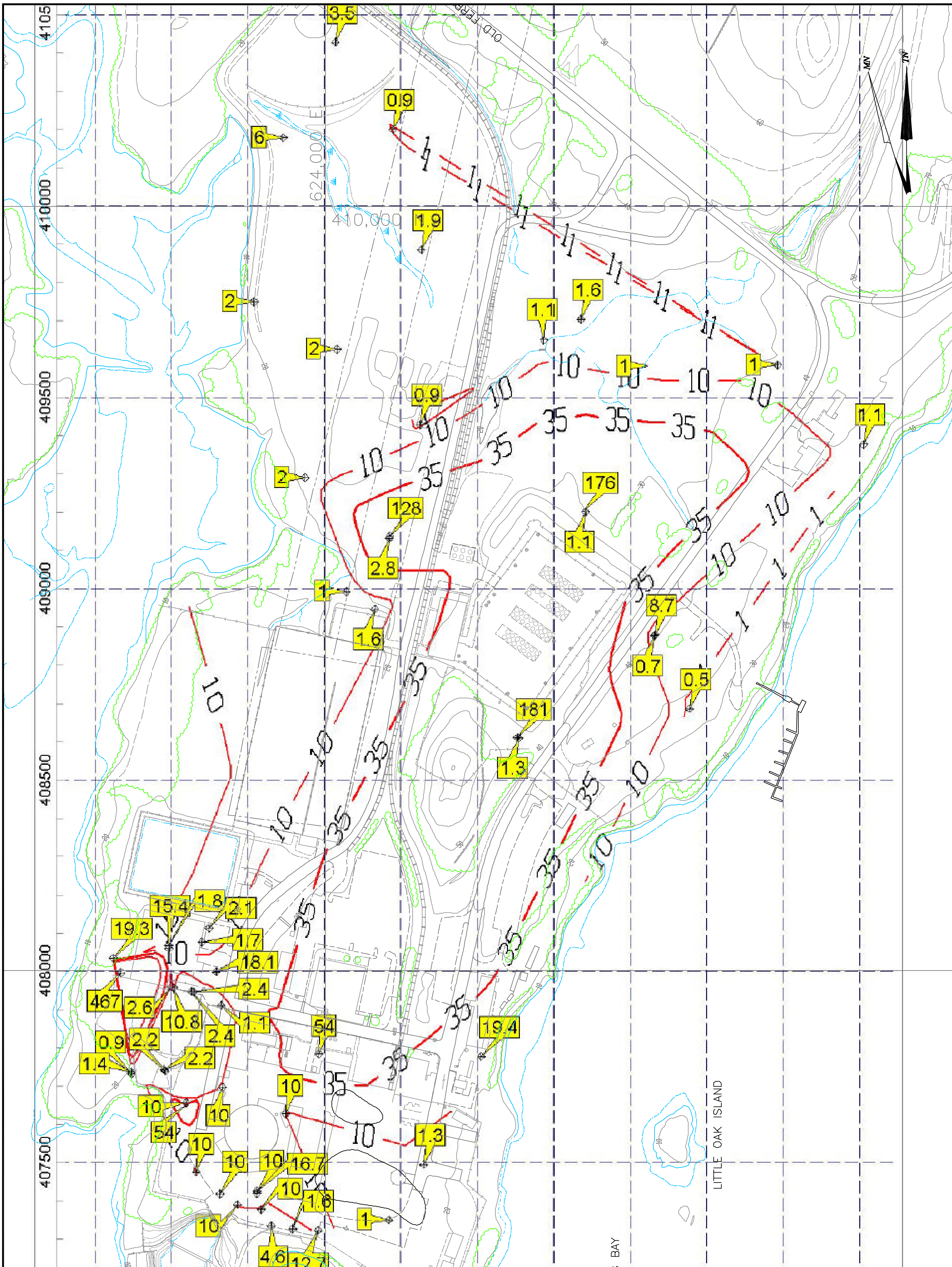


Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: **pH vs. ORP IA & RA**
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPH NH		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 4-9



Maine Yankee

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: **pH vs. ORP 345 kV SILT SPREADING AREA**
DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/XLSGRAPH NH		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 4-10



LEGEND:

(red line)	LINES OF EQUAL MOLYBDENUM CONCENTRATION, Ug/L
0.17	MOLYBDENUM CONCENTRATION AT MONITORING WELL, Ug/L
(symbol)	RAILROAD
50	TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
(symbol)	UTILITY LINES (USGS QUAD)
(symbol)	WATER WAY / STREAM / RIVER

Note:
Based on the most recent value of molybdenum concentration at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where molybdenum was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests, particularly just south of the Knoll where data density is sparse.

SCALE IN FEET
0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

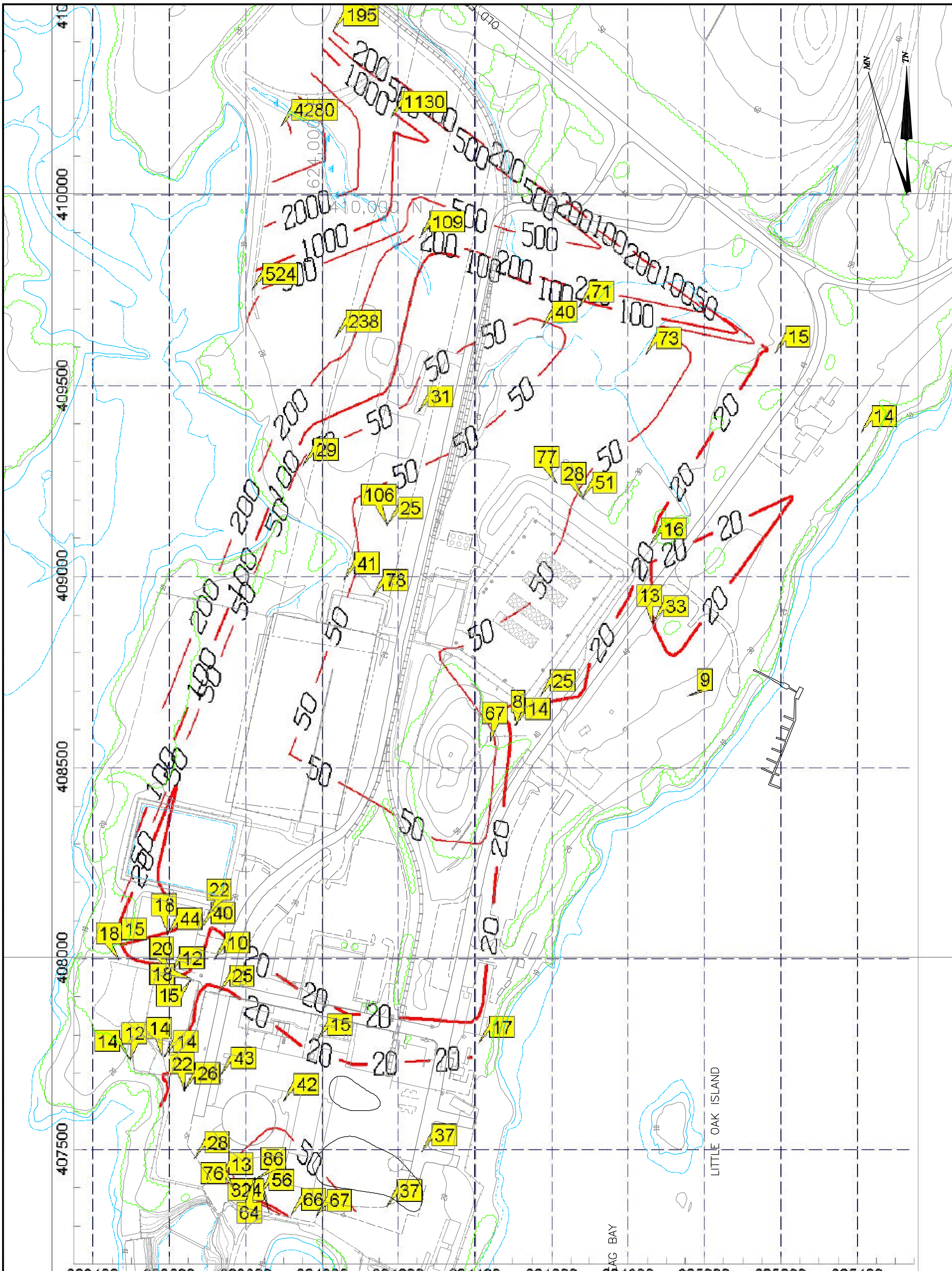
DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DRAWING TITLE: MOLYBDENUM DISTRIBUTION ON BAILEY POINT

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:
BAILEY/BPRCRA	MEPO2167/8A	1"=250'	MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. 4-11



LEGEND:

- LINES OF EQUAL SODIUM CONCENTRATION, Mg/L
- 0.17 — SODIUM CONCENTRATION AT MONITORING WELL, Mg/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

Note:
Based on the most recent value of sodium concentration at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where sodium was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests, particularly just south of the Knoll where data density is sparse.

SCALE IN FEET
0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

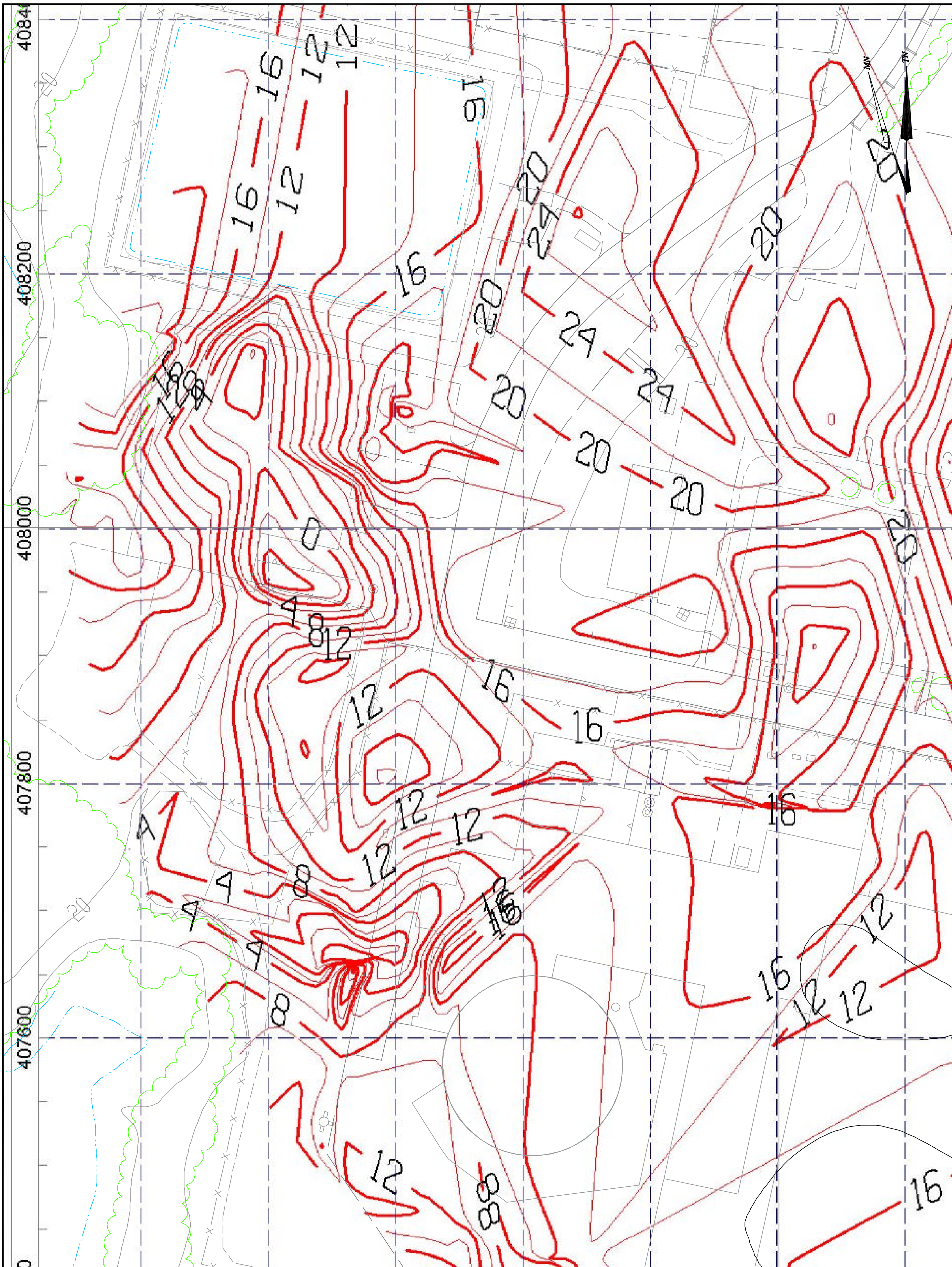
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY					DRAWING TITLE: SODIUM DISTRIBUTION ON BAILEY POINT
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=250'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. — FIGURE NO. 4-12



Note:
Based on Table 2-4 and Table 3-2. Delauney contouring algorithm used. Actual bedrock surface elevations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:

- TOP OF BEDROCK SURFACE CONTOUR, FT NGVD
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

0 75 150

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

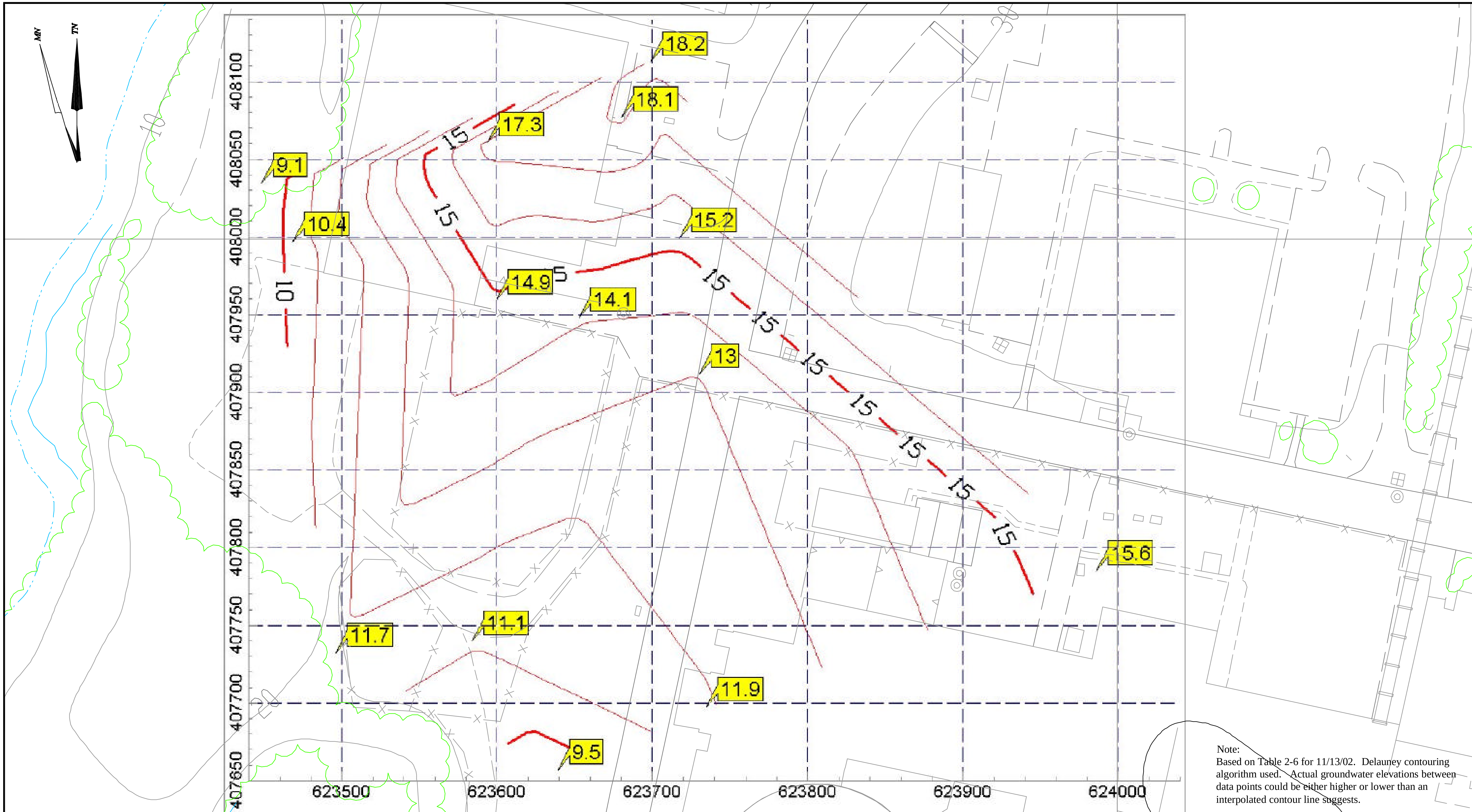
Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: DETAILED TOP OF BEDROCK CONTOUR MAP OF WH 2-3 AREA
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	FIGURE NO. 4-13
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=75'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.



Note:
Based on Table 2-6 for 11/13/02. Delauney contouring algorithm used. Actual groundwater elevations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:

- BEDROCK GROUNDWATER SURFACE ELEVATION CONTOUR, FT. NGVD
- 11.9 GROUNDWATER ELEVATION (RECORDED IN FT. NGVD, NOVEMBER 2002)
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

30 0 60 120

ORIGINAL BASE MAP INFO OBTAINED FROM:
JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

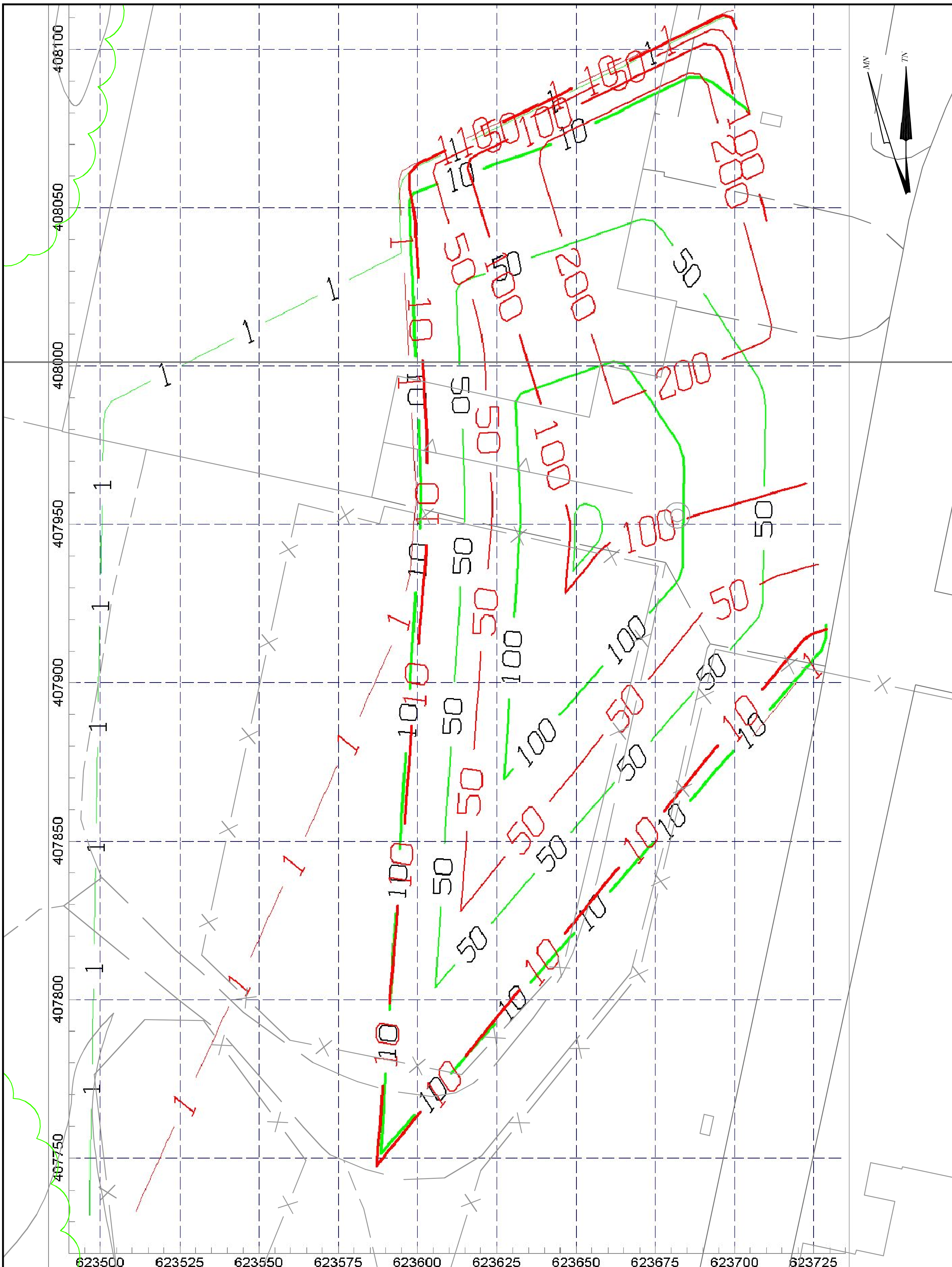
DRAWINGS PRODUCED BY:				
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY				
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=60'

DRAWING TITLE:

DETAILED BEDROCK GROUNDWATER CONTOUR MAP OF WH 2-3 AREA

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. 4-14



Note:
Based on the most recent values of TCA and DCA concentrations at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where TCA or DCA was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests.

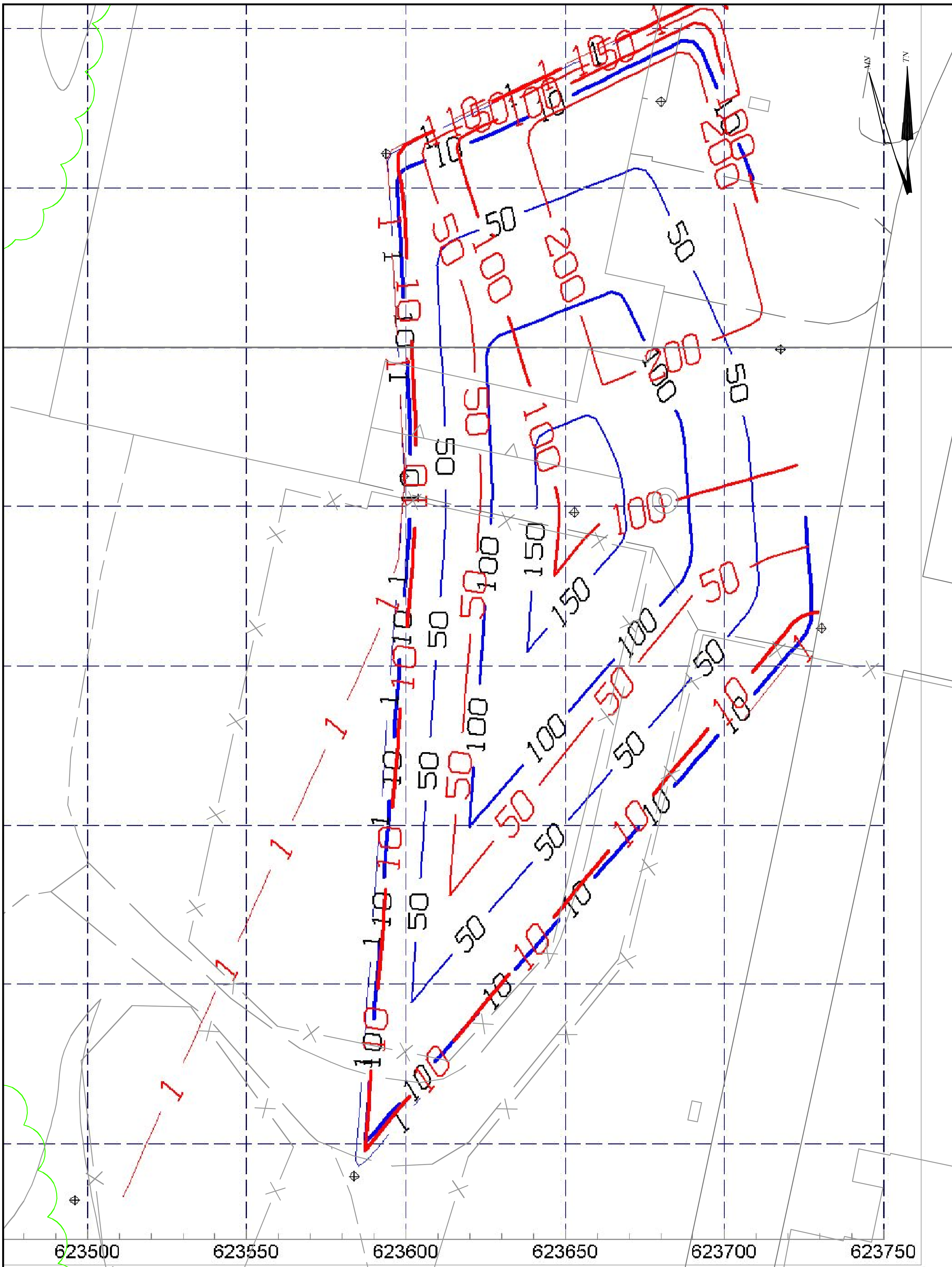
LEGEND:

- LINES OF EQUAL TCA CONCENTRATION, Ug/L
- LINES OF EQUAL DCA CONCENTRATION, Ug/l
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET
0 30 60

ORIGINAL BASE MAP INFO OBTAINED FROM:	JAMES SEWALL COMPANY
Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report
DRAWINGS PRODUCED BY:	CH2MHILL, STRATEX JACQUES WHITFORD COMPANY
DRAWING TITLE:	TCA AND DCA ISOCONS NEAR WH 2-3
DATE PREPARED:	09-02-03
DESIGNED BY:	NOS
DRAWN BY:	BSB
CHECKED BY:	NOS
REVIEWED BY:	RGG
PROJECT NAME/FILE NAME:	BAILEY/BPRCRA
PROJECT NUMBER/PHASE:	MEP02167/8A
SCALE:	1"=30'
PREPARED FOR:	MAINE YANKEE ATOMIC POWER CO.
FIGURE NO.	4-15A

CH2MHILL
STRATEX strategic consulting



Note:
Based on the most recent values of TCA and DCE concentrations at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where TCA or DCE was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:
- LINES OF EQUAL TCA CONCENTRATION, Ug/L
- LINES OF EQUAL DCE CONCENTRATION, Ug/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET
0 30 60

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

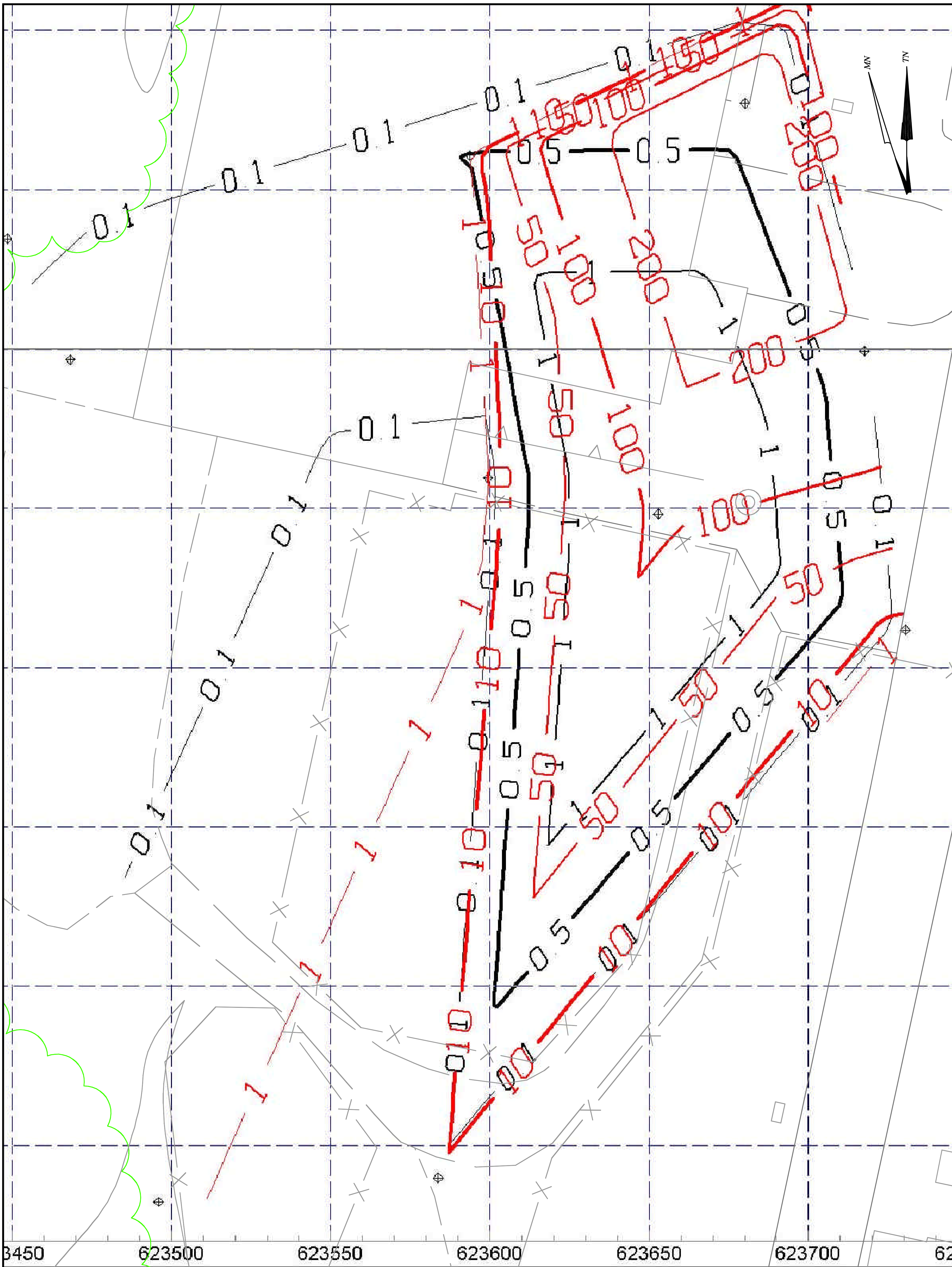
CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					TCA AND DCE ISOCONS NEAR WH 2-3
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=30'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. 4-15B



Note:
Based on the most recent values of TCA and VC concentrations at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where TCA or VC was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:
- LINES OF EQUAL TCA CONCENTRATION, Ug/L
- LINES OF EQUAL VC CONCENTRATION, Ug/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

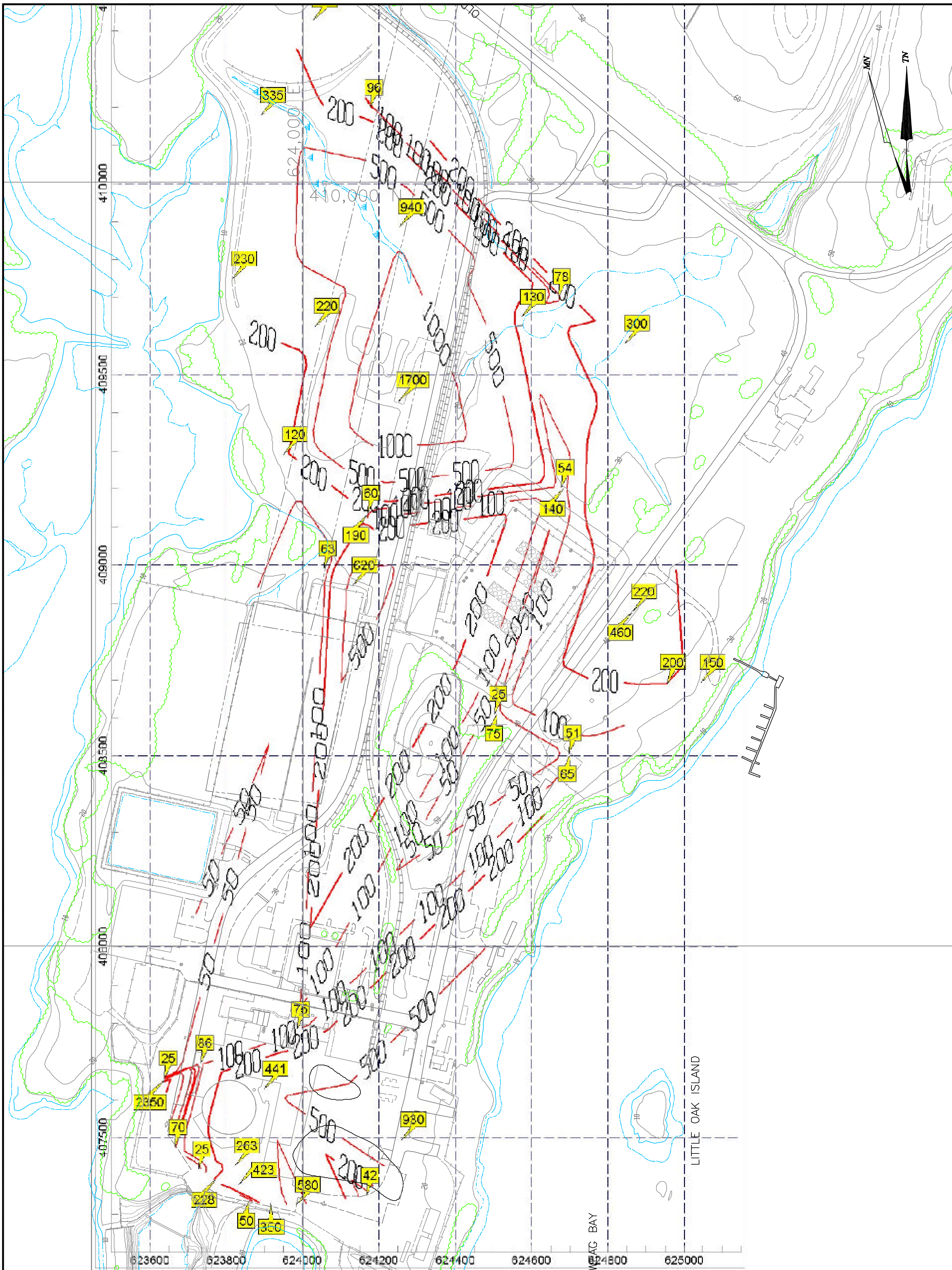
SCALE IN FEET
0 30 60

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY					DRAWING TITLE: TCA AND VC ISOCONS NEAR WH 2-3
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=30'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. — FIGURE NO. 4-15C



LEGEND:

LINES OF EQUAL DRO CONCENTRATION, Ug/L

350 DRO CONCENTRATION AT MONITORING WELL, Ug/L

RAILROAD

TOPOGRAPHIC CONTOURS (10-FT INTERVALS)

UTILITY LINES (USGS QUAD)

WATER WAY / STREAM / RIVER

Note:
Based on the most recent value of DRO concentration at each sampling point. Where multi-level wells are present, the higher of the two values is contoured. Where DRO was non-detect, one half the detection value was used. Delauney contouring algorithm used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests, particularly just south of the Knoll where data density is sparse.

SCALE IN FEET

0 250 500

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: **DRO DISTRIBUTION IN GROUNDWATER ON BAILEY POINT**
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=250'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. 4-17

SECTION 5.0 – BASELINE HUMAN HEALTH RISK ASSESSMENT

LIST OF TABLES

LIST OF FIGURES

5.0 BASELINE HUMAN HEALTH RISK ASSESSMENT

This section presents the Human Health Risk Assessment (HHRA) for the Bailey Point portion of the Maine Yankee facility required as part of the RFI for this site. Two types of risk assessments are presented in this section. The first is a semi-quantitative risk evaluation conducted using the MDEP Remedial Action Guidelines for the areas within Bailey Point minimally impacted by industrial operations. The second is a quantitative evaluation of baseline risks using standard MDEP and USPEA methodology for the areas within Bailey Point impacted by industrial operations. Both were conducted to evaluate potential human health risks associated with exposure to residual chemical contamination in soil, sediment, groundwater, and biota associated with the industrial portion of the facility. An Ecological Risk Assessment (ERA) is presented in **Section 6.0** of this RFI. A separate risk assessment was conducted for the "Backlands" portion of the site and is presented in *Backlands RCRA Facility Investigation Report* (MY, 2004). The results of the HHRA and ERA will be combined with other information comprising the RFI to determine the need, if any, for further corrective actions.

The specific objectives of this HHRA are to provide:

- an evaluation of potential human health risks due to exposure to residual contamination in soils, sediment, groundwater and biota;
- a basis for determining the need for further corrective actions;
- a basis for determining the appropriate remedial target cleanup levels, as necessary; and
- a basis for comparing the health impacts of various proposed corrective actions.

This HHRA was based on analytical data collected as part of the RFI and developed to assist Maine Yankee, USEPA and MDEP in determining what actions are necessary to reduce risks at this site to acceptable levels.

5.1 Methodology

Based on guidance provided by MDEP/BOH, the site history and results of the RFI, Bailey Point was divided into 10 discrete areas for purposes of site and risk characterization (see **Section 4.0**). These contiguous areas are shown in **Figures 5-1A and 1B** and described as follows:

1. Foxbird Island – includes the 11.3-acre peninsula south of the plant Forebay under which the diffuser pipeline is buried.
2. Forebay – is a 4.2-acre engineered structure where water was discharged to the diffuser system.
3. Former Truck Maintenance Garage – is the 6.1-acre location of the former truck maintenance garage that was used during plant construction.

4. 115kV Switchyard – is a 0.5-acre switchyard located west of the Restricted Area (RA) and south of Warehouse 2/3.
5. Personnel Buildings and Parking Lot Areas – includes the Fire Pond, Parking Lots, Information Center and Personnel Building. This is a 21.6-acre contiguous area running east to west through the center of Bailey Point.
6. Plant Area – includes the 19.5-acre RA and Industrial Area of the plant.
7. Warehouse 2/3 – is a 2.9-acre area located on the southwest side of Bailey Point and was used to receive and store chemicals used in plant operations.
8. 345 kV Transmission Line Area – includes the 345 kV Switchyard, Silt Spreading Area, Ball Field and Pre-Op Cleaning Basin. This area is 45.9 acres and is located in the northern portion of Bailey Point and received several episodes of dredged fill material and land clearing debris associated with plant construction.
9. Bailey Farmhouse Area – is an 8.4-acrea area that includes the septic system/leach field and gray water leach field associated with the Farmhouse.
10. ISFSI – is a 9.5-acre bermed area making up the dry spent fuel storage facility.

The risks associated with exposure to soils at Foxbird Island, the Forebay, and the Former Truck Maintenance Garage were not evaluated as part of this risk assessment. These areas have either not been impacted by industrial operations and have chemical concentrations consistent with PALs (Foxbird Island), have been remediated (Forebay) or require additional site characterization to assess potential remedial options (Former Truck Maintenance Garage).

The risks associated with exposure to soils at the 115 kV Switchyard, Personnel Buildings and Parking Lot Areas and ISFSI were evaluated by comparing detected concentrations to the MDEP Remedial Action Guidelines concentrations. These concentrations are chemical specific guidelines that are used to assist MDEP in making remedial decisions at hazardous substance sites. They are presented in "*Division of Remediation Guidance – Implementation of Remedial Action Guidelines*" (MDEP, 1997) and are discussed in more detail in **Section 5.6.1**. Soils present at concentrations at or below the Remedial Action Guidelines generally do not require remedial action. This type of risk evaluation was considered appropriate as sampling and analytical results support the conclusion that these areas have not been adversely impacted by industrial site activities.

The risks associated with soil exposure at the Plant Areas, Warehouse 2/3, the 345 kV Transmission Line Area and the Bailey Farmhouse Area were evaluated in accordance with the Draft Human Health Exposure Assessment (HHEA) Work Plan for conducting a baseline Human Health Risk Assessment (**Appendix H-1**) and correspondence between Maine Yankee, MBOH, MDEP and USEPA (CH2MHill, 2001a and 2003a; MDEP, 2003b and 2003d; MY, 2003c and 2003e; and USEPA 2003). The HHEA document was based on current MDEP and USEPA methodology and guidance for conducting risk assessments and implementing corrective action at RCRA facilities, and presents the site-specific exposure assumptions to be used in this baseline HHRA (CH2MHill, 2003a, MDEP, 1994 and USEPA, 1996e). The following documents were used and provide the procedures, assumptions, methods, and format for conducting a baseline risk assessment:

- *Guidance Manual for Human Health Risk Assessment at Hazardous Waste Sites* (MDEP, 1994).
- *Risk Assessment Guidance for Superfund: Volume I Human Health Evaluation, Part A* (USEPA, 1989b); Part *B,* (USEPA, 1991b)*; and Part E, Supplemental Guidance for Dermal Assessment, Interim Guidance* (USEPA, 2001a).
- *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* (USEPA, 2002a).
- *Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors* (USEPA, 1991a).
- *USEPA Region I Waste Management Division Risk Update No. 1* (December 1992)*, No. 2* (August 1994)*, No. 3* (August 1995)*, No. 4* (November 1996), and *No. 5* (September 1999).
- *Exposure Factors Handbook*, *Volumes I through III* (USEPA, 1997b).
- *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (USEPA, 2001b).
- The *Integrated Risk Information System* – USEPA managed database for toxicological information.

Additional guidance documents were used in the HHRA and are cited where appropriate.

5.2 Site Characterization

The site characterization presented in this section is a summary of the information provided in detail in **Sections 1.3** (Site Description), **1.4** (Site History) and **3.1** (Site Setting) of this report. Information in this section provides the basis for identifying potential human receptors and the exposure pathways by which these receptors may come in contact with site-related chemicals.

The Maine Yankee site consists of approximately 820 acres. Approximately 670 acres of the site located north of Old Ferry Road and west of Bailey Cove, referred to as the "Backlands," has seen no industrial activity and is virtually undeveloped. The industrial portion of the site is located on approximately 150 acres south of Old Ferry Road and east of Bailey Cove and referred to as Bailey Point. The site also includes terrestrial, wetland and near shore environments. The near shore environment supports populations of clams and mussels that may be commercially harvested and consumed by area residents.

The Maine Yankee facility generated power in the present location for approximately 26 years (1972-1997). The majority of the site disturbance on the 150-acre Bailey Point peninsula has been associated with industrial activities consistent with the operation of the facility. During the time of operation minor spills and releases of primarily petroleum products occurred as did a few significant releases that required remediation and/or additional studies (see **Section 1.5**).

The plant is in the process of being decommissioned, with most plant structures scheduled to be demolished and removed.

As part of the RFI, an extensive sampling and analysis program was conducted throughout Bailey Point and included the collection of soil, concrete, sediment, groundwater, surface water and/or tissue samples for laboratory analysis. The analytical data indicate the presence of metals, SVOCs, PCBs and pesticides and/or VOCs suggesting that exposure to these media may present human health risks.

The plant is in the process of being decommissioned, with most plant structures scheduled to be demolished and removed. However, some structures will remain including the ISFSI, the two electrical switchyards (115 kV and 345 kV) and transmission lines. Maine Yankee has indicated their intention to implement institutional controls to limit future development of Bailey Point to industrial/commercial land-use. This restriction and the presence of the ISFSI will effectively restrict any future residential development on Bailey Point.

Based on the preliminary site understanding, a schematic site conceptual model relating the primary and secondary sources at the site to potential pathways and receptors is shown in **Figure 5-2.** Potential receptors to residual soil contamination include future construction workers employed during the redevelopment of the site, and office and/or landscape workers employed by future commercial or industrial enterprises. Construction worker may be exposed to residual soil contamination through three primary pathways: inhalation of fugitive dust, and incidental ingestion and direct contact exposure to soil. The on-site worker may be exposed to residual contamination through the same exposure pathways. However, as will be discussed, the duration and intensity of exposure differs for these two receptors.

Due to the presence of the near shore environment, other potential receptors include commercial and recreational fishermen and other recreational users who may be exposed to residual sediment contamination while wading in the intertidal and subtidal zones. Potential routes of exposure include direct contact with and incidental ingestion of sediment. Also, because of the potential for contaminant uptake by biota, the ingestion of shellfish represents another exposure pathway to be evaluated.

Because land-use restrictions will limit the development of Bailey Point, Maine Yankee initially did not include a future residential land use scenario in the HHEA. However, at the request of MDEP and MBOH, a residential land use scenario was included. Potential exposure pathways include inhalation and ingestion of and direct contact exposure with soil, sediment and groundwater and ingestion of shellfish. Because of the potential for contaminant uptake in vegetables, the ingestion of homegrown produce is also considered a potential exposure pathway for soil contaminants. A more detailed discussion of the magnitude and extent of exposure to a future resident is presented in **Section 5.4** of this report.

5.3 Hazard Assessment

The objective of the hazard assessment is to present a summary of the analytical data for each study area and to identify Chemicals of Potential Concern (COPCs). The COPCs are a subset of all contaminants detected in each medium and are selected to focus the risk assessment on those compounds that may present the greatest health concern. The COPCs in this HHRA were selected using the criteria presented in the HHEA Work Plan (**Appendix H-1**) and the data set presented in **Sections 3.0 and 4.0** of this RFI report.

The analytical results from samples collected within each study area/medium were subjected to standard USEPA data validation and quality control review and were used to select COPCs consistent with the HHEA Work Plan and USEPA guidance as discussed below.

- <u>Flagged data</u>. Laboratory data flagged with “J” indicate that the reported concentrations are estimated values, generally falling between the IDL and PQL. Other inconsistencies in sample management and analysis may also result in flagged sample results. Consistent with USEPA guidance, the “J” flagged data was used in the risk assessment at the estimated concentrations (USEPA, 1992a). Laboratory data flagged with “U” indicate that the contaminant was undetected, and the concentrations reported represent the PQLs. The “U” flagged data are considered as “non-detects” as discussed below. Some compounds are identified as part of the data validation process as being laboratory contaminants and are flagged as “R”. These data were not included in the selection of COPCs or evaluation of risk (USEPA, 1992a).

- <u>Non-Detects</u>. Chemicals that are not detected are flagged with “U” and reported at the PQL. One-half the detection limit (i.e., PQL) was used as the concentration for each non-detect value when calculating the arithmetic mean of each COPC (USEPA, 2002a).

- <u>Duplicate samples</u>. Duplicate soil, sediment, tissue and groundwater samples were collected to evaluate inherent variability of contaminant distribution and the sampling procedures. Duplicate sample results were averaged and included as a single data point.

COPCs were selected for soils, sediment, shellfish and groundwater in accordance with the process outlined in USEPA’s Risk Updates (1995 and 1999). Only those chemicals that met the following criteria were eliminated as COPCs.

- <u>PAH and PCB compounds</u>. The concentration of each of the seven carcinogenic PAH compounds (i.e., benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene) was modified by its toxic equivalent factor (TEF) and summed to yield a benzo(a)pyrene equivalent concentration (see **Section 5.5.3** for a discussion of TEFs).

This benzo(a)pyrene equivalent concentration was used to select COPCs and estimate carcinogenic risks associated with exposure to PAHs. It is referred to as "carcinogenic PAHs (cPAHs)" in the text. The individual aroclor concentrations were summed to yield a total PCB concentration. This total PCB concentration was used to select COPCs and calculate noncarcinogenic and carcinogenic risks associated with exposure to PCBs.

- Frequency of Detection. Consistent with USEPA guidance (USEPA, 1989b), compounds detected at a low frequency of detection (i.e. less than 5%), were eliminated as a COPC and apply only to data sets with more than a total of 20 samples. Compounds detected in less than 5% of samples but at concentrations greater than their respective regulatory guidance or risk based screening criteria were retained as COPCs.

- Comparison to Risk Based Concentrations. Consistent with USEPA Region I Guidance, compounds detected in various media at concentrations below appropriate risk-based concentrations were eliminated as COPCs. Risk based concentrations are media-specific chemical concentrations derived using standard exposure assumptions and set at a cancer risk of $1x10^{-6}$ or a hazard index (HI) of 1. The risk based concentrations used in this HHRA were obtained from one of the following sources: USEPA Region 9 Preliminary Remediation Guidelines (PRGs); Maine Bureau of Health (MBOH) Fish Tissue Action Levels (FTAL) or USEPA Region 3 Risk Based Concentrations (RBCs) (USEPA, October, 2002 and Maine Bureau of Health, 2001). Per USEPA guidance, the noncarcinogenic criteria were modified to one-tenth their risk-based concentration making them equivalent to an HI of 0.1. In addition, the FTALs were modified to reflect a 1×10^{-6} risk level. The risk based concentrations used to select COPCs are referred to as "Screening RBC".

  The USEPA Region 9 "Residential Soil" PRGs were used to select soil and sediment COPCs. These concentrations are considered protective of human health based on residential exposure through ingestion, inhalation and dermal contact to soil. The USEPA Region 9 "Tap Water" PRGs used to select groundwater COPCs. These concentrations are considered protective of human health based on residential exposure through inhalation and ingestion of water. The lower of the MBOH FTALs or USEPA Region 3 RBCs were used to select COPCs in shellfish tissue. These concentrations are considered protective of human health based on the consumption of shellfish.

  All compounds having an oral/dermal ratio of greater than 10 percent (as listed in Appendix B-3 of USEPA, 2001a) were retained as groundwater COPCs for the dermal route of exposure.

- Essential Nutrients. Several of the metals detected in soil and sediment at the Maine Yankee Facility are essential human nutrients and include magnesium, calcium, and potassium (USEPA, 1989b). According to USEPA guidance these chemicals can be eliminated from consideration in the quantitative risk assessment (USEPA, 2003). As such, magnesium, calcium and potassium are not included as COPCs.

- Insufficient Toxicity Information. Some of the chemicals detected at the site lack sufficient toxicity information to complete a quantitative risk evaluation. These compounds are identified as COPCs, carried forward in the risk evaluation and discussed in the Uncertainty and Limitations Section.

- Reference Concentrations. Reference soil samples were collected from areas outside the influence of Maine Yankee and used to compare concentrations of chemicals detected in the various study areas. Reference concentrations for the TAL metals detected in soils were identified and discussed in **Section 4.1** and presented in **Table 4-2.** Of particular interest in this risk assessment are the presence of arsenic and iron in the soils. These metals are naturally occurring elements present in all soils in this area. Neither metal is related to plant operations. Although reference concentrations were not used in selecting COPCs, potential risks attributable to reference conditions are considered in this risk assessment.

The analytical data including the occurrence and distribution of all detected chemicals and the criteria used to identify the COPCs for each study area and media of concern are presented in **Tables 5-1A through 5-1J**[1] and are discussed in the following subsections.

5.3.1 115kV Switchyard

Composite soil samples were collected from test pits excavated to evaluate stained surface soils and a surface soil sample was collected from a drainage ditch within the 115kV Switchyard and analyzed for VOCs, SVOCs, PCBs and pesticides, EPH and metals. A summary of the analytical data for constituents detected in these soil samples is presented in **Table 5-1A**.

A total of thirty five compounds were detected in the surface soils from the 115 kV Switchyard. Of these, eight compounds were retained as COPCs because they were detected at concentrations exceeding their Residential Soil Screening RBC or lacked toxicity based screening criteria. These compounds include: aluminum, arsenic, iron, manganese, sodium, cPAHs, benzo[g,h,i]perylene and phenanthrene. The remaining constituents were eliminated as COPCs because they were either detected at concentrations below their respective Residential Soil Screening RBC or are considered essential nutrients. The risks associated with exposure to surface soils at the 115kV Switchyard are evaluated by comparing the maximum detected

[1] Due to the number of areas being evaluated, each Study Area was assigned a unique alphabetical suffix as follows: A – 115 kV Switchyard, B – Personnel Buildings and Parking Lot Areas, C – Plant Area, D - Warehouse 2/3, E - 345 kV Transmission Lines, F – Bailey Farmhouse, G – ISFSI; H – Shoreline Sediments, I- Shellfish Tissue, J – Groundwater and K - Produce. This suffix is used in numbering the data summary tables and subsequent Non-Cancer Hazard and Cancer Risk Tables. For example, the summary of data for the 115 kV Switchyard is found in Table 5-1A, all subsequent tables specific to 115 kV Switchyard will have the "A" suffix in the Table number.

concentration of each COPC to its MDEP Remedial Action Guideline concentration. This evaluation is presented in **Section 5.6**.

5.3.2 Personnel Buildings and Parking Lot Areas

Surface and subsurface soil samples were collected from the Fire Pond, Parking Lots Information Center and Personnel Buildings. These are all areas of limited industrial activity and are primarily support areas of the facility. Soil samples were analyzed for VOCs, SVOCs, PCBs and pesticides, EPH and metals. A summary of the analytical data for constituents detected in surface and subsurface soil samples including the criteria and rationale for selecting soil COPCs is presented in **Table 5-1B**.

Twenty-four compounds were detected in the surface soil samples around the Personnel Buildings and Parking Lot Areas. Of these, six compounds were retained as COPCs because they either were present at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity-based screening criteria. The surface soil COPCs include; aluminum, arsenic, iron, lead, manganese, and sodium. All other constituents were eliminated as COPCs because they were either detected at concentrations less than their respective Residential Soil Screening RBC or are considered essential nutrients. The risks associated with exposure to surface soil around the Personnel Buildings and Parking Lot Area are evaluated for the area resident using the MDEP Remedial Action Guideline concentrations and presented in **Section 5.6**.

Thirty-five compounds were detected in subsurface soil samples around the Personnel Buildings and Parking Lot Areas. Of these, 11 compounds were retained as COPCs because they either were present at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity-based screening criteria. The subsurface soil COPCs include the 6 surface soil COPCs and vanadium, cPAHs, benzo(g,h,i)perylene, phenanthrene and trichloroethene. The risks associated with exposure to subsurface soil are evaluated for the area resident by comparing the maximum detected concentration of each COPC to its MDEP Remedial Action Guideline concentration. This evaluation is presented in **Section 5.6**.

5.3.3 Plant Area

The Plant Area consists of the southern portion of Study Area 5, including the restricted and industrial area where the majority of plant operations occurred. Surface and subsurface soil samples were collected from within this area to characterize potential impacts from plant operations. These samples were typically analyzed for VOCs, SVOCs, PCBs and pesticides, metals, and EPH. As discussed in **Section 4.8**, PAHs, PCBs, pesticides, and EPH were detected in the soil. A summary of the analytical data for constituents detected in these samples including the criteria and rationale for selecting soil COPCs is presented in **Table 5-1C**.

A total of 60 constituents were detected in the surface soil samples collected from within the Plant Area. Of these, 17 were retained as COPCs because they were present at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity based screening criteria. The surface soil COPCs include, aluminum, arsenic, copper, iron, manganese, thallium, vanadium, total PCBs, cPAHs, phenanthrene, carbazole, benzo(g,h,i)perylene, 2-methylnaphthalene, endrin aldehyde, sodium, lead, and DRO. The remaining constituents were eliminated as COPCs because they were detected at concentration below their respective Residential Soil Screening RBC or considered essential nutrients. The risks associated with exposure to surface soils around the Plant Area are evaluated for the resident, on-site worker and construction worker and are presented in **Section 5.6**.

A total of 62 constituents were detected in subsurface samples collected from within the Plant Area. Of these, 17 were retained as COPCs because they were detected at concentrations exceeding their respective Residential Soil Screening RBC or lacked sufficient toxicity screening criteria. These COPCs are the same as those identified for surface soils. All other compounds were eliminated as COPCs because they were detected at concentrations below their respective Residential Soil Screening RBC or considered essential nutrients. The risks associated with exposure to subsurface soils from the Plant Area are evaluated for the construction worker and are presented in **Section 5.6**.

5.3.4 Warehouse 2/3

Surface and subsurface soil samples were collected from around the Warehouse 2/3 area to characterize potential impacts from previous drum handling, paint waste and sand blast grit disposal activities at this location. These samples were analyzed for VOCs, SVOCs, PCBs and pesticides, EPH and metals. As discussed in **Section 4.8**, elevated levels of PAHs and PCBs were detected in soils from the northwest side of the Warehouse 2/3 and elevated levels of VOCs (xylenes, ethylbenzene and toluene) were detected in soils from the southwest side of Warehouse 2/3. A summary of the analytical data for constituents detected in surface and subsurface soil samples including the criteria and rationale for selecting soil COPCs is presented in **Table 5-1D**.

A total of 44 constituents were detected in the surface soil samples collected around Warehouse 2/3. Of these, 11 compounds were retained as COPCs because they were present at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity based screening criteria. The COPCs for surface soils include: aluminum, arsenic, iron, lead, manganese, sodium, total PCBs, cPAHs, benzo(g,h,i)perylene, carbazole, and phenanthrene. The remaining constituents were eliminated as COPCs because they were detected at concentration less than their respective Residential Soil Screening RBC or are considered essential nutrients. The risks associated with exposure to surface soil around Warehouse 2/3 are evaluated for the resident, on-site worker and construction worker and are presented in **Section 5.6**.

A total of 57 constituents were detected in the subsurface soil samples collected around Warehouse 2/3. Of these, 16 constituents were retained as COPCs because they were present at concentrations exceeding their Residential Soil Screening RBC or lacked toxicity based screening criteria. The subsurface COPCs include the 11 surface soil COPCs, and vanadium, 2-methynaphthalene, ethylbenzene, m,p-xylene, and o-xylene. One compound, 2-hexanone, was not selected as a COPC because it was detected in only 1 of 61 soil samples collected (i.e. 2 percent of all samples). All other compounds were eliminated as COPCs because they were either detected at concentrations below their respective Residential Soil Screening RBC or considered essential nutrients. The risks associated with exposure to these subsurface COPCs are evaluated for the construction worker and are presented in **Section 5.6**.

5.3.5 345 kV Transmission Line Area

The 345 kV Transmission Line Area is in the northern portion of Bailey Point and includes the Silt Spreading Area, 345 kV Switchyard, Ball Field and the Pre-Op Cleaning Basin. During plant construction fill was placed in much of this study area and a portion of the area was used for silt spreading during plant operation. Surface and subsurface soil samples were collected to evaluate the potential impact of plant operations (i.e., 345 kV switchyard and silt fill/spreading activities). Soil samples were analyzed for VOCs, SVOCs, PCBs and pesticides, EPH and metals. A summary of the analytical data for constituents detected in surface and subsurface soil samples including the criteria and rationale for selecting soil COPCs is presented in **Table 5-1E**.

A total of 43 constituents were detected in the surface soils samples. Of these, 11 were retained as COPCs because they either were present at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity based screening criteria. The surface soil COPCs include; aluminum, arsenic, iron, manganese, sodium, thallium, vanadium, cPAHs, benzo(g,h,i)perylene, carbazole and phenanthrene. All other constituents were eliminated as COPCs because they were either detected at concentrations below their respective Residential Soil Screening RBC or are considered essential nutrients. The risks associated with exposure to surface soil around the 345 kV Transmission Line Area are evaluated for the resident, on-site worker and construction worker and are presented in **Section 5.6**.

Fifty-four constituents were detected in the subsurface soils samples collected around the 345 kV Transmission Line Area. Of these, 13 constituents were retained as soil COPCs and include the 11 surface soil COPCs, lead, and PCBs. All other constituents were eliminated as COPCs because they were either detected at concentrations below their respective Residential Soil Screening RBC or are considered essential nutrients. The risks associated with exposure to subsurface soil around the 345 kV Transmission Line Area are evaluated for the resident and on-site worker and are presented in **Section 5.6**.

5.3.6 Bailey Farmhouse

Soil samples were collected from two soil borings and three test pits excavated in the former leach fields of the Bailey Farmhouse. These samples were analyzed for VOCs, SVOC, PCBs and pesticides, EPH and metals. A summary of the analytical data for constituents detected in these samples including the criteria and rationale for selecting soil COPCs is presented in **Table 5-1F**.

Twenty constituents were detected in the surface soil samples collected from the Bailey Farmhouse. Of these, six metals were retained as COPCs because they were detected at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity based screening criteria. The soil COPCs includes aluminum, arsenic, iron, lead, manganese and sodium. All other constituents were detected at concentrations less than their respective Residential Soil Screening RBC or are considered essential nutrients. The risks associated with exposure to surface soil from the Bailey Farmhouse are evaluated for the resident, on-site worker and construction worker and are presented in **Section 5.6**.

Twenty-four constituents were detected in subsurface soil samples collected from the Bailey Farmhouse. Of these, six constituents were retained as COPCs because they were detected at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity based screening criteria and include aluminum, arsenic, iron, lead, manganese and sodium. All other constituents were detected at concentrations less than their respective Residential Soil Screening RBC or are considered essential nutrients. The risks associated with exposure to subsurface soil from the Bailey Farmhouse are evaluated for the construction worker and are presented in **Section 5.6**.

5.3.7 ISFSI

As discussed in **Section 4.3**, soil samples were collected as part of two separate investigations of the ISFSI; one to support the RFI and one to support the MDEP Site Location of Development Order L-17973-26-Q-M associated with the ISFSI construction activities. The RFI sampling included the collection of two composite soil samples from a test pit excavated to confirm the removal of oil-contaminated soils. These samples were analyzed for SVOCs, PCBs and EPH. The Site Location sampling included the collection of two subsurface soil samples taken from utility trenches on the southern and eastern portions of ISFSI. These samples were analyzed for VOCs, RCRA-8 metals, and DRO.

A summary of the analytical data for constituents detected in these samples including the criteria and rationale for selecting soil COPCs are presented in **Table 5-1G**.

Seven SVOCs were detected in the soil samples collected from the ISFSI. Concentrations of all detected compounds were less than 0.5 ug/kg confirming the removal of oil-contaminated soils. All compounds were detected well below their Residential Soil Screening RBC and eliminated as COPCs. Benzo(g,h,i)perylene lacks sufficient toxicity screening criteria and is retained as a COPC.

Five metals were detected in the surface soil samples collected from the trenches excavated in the ISFSI. Concentrations of all metals except arsenic were detected below their Residential

Soil Screening RBC and eliminated as COPCs. Arsenic was detected at concentrations exceeding its Residential Soil Screening RBC and is retained as a COPC.

5.3.8 Shoreline Sediments

Sediment samples were collected from the intertidal and subtidal zones around the Bailey Point area to assess the impact of industrial area stormwater discharge to the Back River and Bailey Cove environments. These samples were analyzed for VOCs, SVOCs, PCBs and pesticides, EPH and metals. As discussed in **Section 4**, elevated levels of PAHs were detected in the outfall sediments. A summary of the analytical data for constituents detected in these samples including the criteria and rationale for selecting sediment COPCs are presented in **Table 5-1H**.

A total of 50 constituents were detected in the sediment samples. Of these, 11 constituents were retained as COPCs because they were detected at concentrations exceeding their respective Residential Soil Screening RBC or lacked toxicity based screening criteria. The sediment COPCs include aluminum, arsenic, iron, manganese, sodium, 2-methylnaphthalene, acenaphthylene, cPAHs, benzo(g,h,i)perylene, carbazole, and phenanthrene. Thirty four compounds were eliminated as COPCs because they were detected at concentration below their respective Residential Soil Screening RBC or are considered essential nutrients. Endrin aldehyde was detected in only 1 of 33 samples and was eliminated as a COPC based on low frequency of detection. The risks associated with exposure to sediment are evaluated for the Commercial Shellfisherman who is exposed to sediments while harvesting shellfish or worms and the area resident who is exposed to sediment while recreating in the area. These risks are presented in **Section 5.6**.

5.3.9 Shellfish

Tissue samples were collected from shellfish in the intertidal and subtidal zones around Bailey Point to assess the impact of stormwater discharge to biota in the Back River and Bailey Cove environments. Samples were collected from mussels, clams, lobster, and lobster tomalley and analyzed for metals, PCBs, pesticides, and SVOCs. Tissue samples were also collected from clams and mussels in the intertidal and subtidal zones from a reference location and analyzed for metals, PCBs, pesticides and SVOCs. A summary of the analytical data for constituents detected in shellfish tissue, including the criteria and rationale for selecting COPCs, is presented in **Table 5-1I**.

A total of 56 constituents were detected in mussels. Of these, 17 were retained as COPCs because they were present at concentrations exceeding their respective Screening RBC or lacked toxicity based screening criteria. The COPCs for mussels include: aluminum, arsenic, cadmium, iron, lead, mercury, sodium, alpha-hexachlorocyclohexane, beta-hexachlorocyclohexane, endosulfan II, endosulfan sulfate, endrin ketone, 2-methylnaphthalene, acenaphthylene, cPAHs, benzo(g,h,i)perylene, and phenanthrene. The remaining constituents were eliminated as COPCs because they were detected at concentrations below their respective Screening RBC or are considered essential nutrients (i.e., calcium, magnesium and potassium).

A total of 67 constituents were detected in clams. Of these, 23 were retained as COPCs because they were present at concentrations exceeding their respective Screening RBC or lacked toxicity based screening criteria. The COPCs for clams include: aluminum, arsenic, copper, iron, lead, manganese, mercury, sodium, vanadium, total PCBs, alpha-hexachlorocyclohexane, beta-hexachlorocyclohexane, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin aldehyde, endrin ketone, 4-chloro-3-methylphenol, acenaphthylene, cPAHs, benzo(g,h,i)perylene, and phenanthrene. The remaining constituents were eliminated as COPCs because they were detected at concentrations below their respective Screening RBC or considered essential nutrients.

A total of 47 constituents were detected in lobsters. Of these, 10 were retained as COPCs because they were present at concentrations exceeding their respective Screening RBC or lacked toxicity based screening criteria. The COPCs for lobsters include: arsenic, copper, lead, mercury, sodium, alpha-hexachlorocyclohexane, dieldrin, endosulfan sulfate, 4-chloro-3-methylphenol and acenaphthylene. The remaining constituents were eliminated as COPCs because they were detected at concentrations below their respective Screening RBC or are considered essential nutrients.

A total of 55 constituents were detected in lobster tomalley. Of these, 19 were retained as COPCs because they were present at concentrations exceeding their respective Screening RBC or lacked toxicity based screening criteria. The COPCs for lobster tomalley include: arsenic, cadmium, copper, lead, mercury, selenium, sodium, total PCBs, 4,4'-DDE, alpha-hexachlorocyclohexane, dieldrin, endrin aldehyde, endrin ketone, heptachlor epoxide, 4-chloro-3-methylphenol, acenaphthylene, cPAHs, benzo(g,h,i)perylene, and phenanthrene. The remaining constituents were eliminated as COPCs because they were detected at concentrations below their respective Screening RBC or considered essential nutrients.

A total of 62 constituents were detected in clams obtained from the reference locations. Of these, 19 were retained as COPCs because they were present at concentrations exceeding their respective Screening RBC or lacked toxicity based screening criteria. The COPCs for the reference clams include: aluminum, antimony, arsenic, copper, iron, lead, manganese, mercury, sodium, vanadium, total PCBs, delta-hexachlorocyclohexane, endosulfan sulfate, endrin ketone, acenaphthylene, cPAHs, benzo(g,h,i)perylene, phenanthrene and 4-chloro-3-methylphenol. All other compounds were eliminated as COPCs because they were detected at concentrations below their respective Screening RBC or considered essential nutrients.

A total of 46 constituents were detected in mussels obtained from the reference locations. Of these, 11 were retained as COPCs because they were present at concentrations exceeding their respective Screening RBC or lacked toxicity based screening criteria. The COPCs for the reference mussels include: arsenic, cadmium, iron, lead, mercury, sodium, vanadium, endosulfan sulfate, endrin ketone, acenaphthylene, and cPAHs. All other compounds were eliminated as COPCs because they were detected at concentrations below their respective Screening RBC or considered essential nutrients.

The risks associated with exposure to shellfish tissue are evaluated for the area resident and are presented in **Section 5.6**.

5.3.10 Groundwater

Groundwater samples were collected from monitoring wells placed throughout Bailey Point and analyzed for VOCs, SVOCs, PCBs and pesticides, metals and DRO/EPH. A summary of the analytical data for constituents detected in these samples including the criteria and rationale for selecting groundwater COPCs is presented in **Table 5-1J**.

A total of 54 constituents were detected in the groundwater monitoring wells. Of these, 24 constituents were retained as COPCs because they were detected at concentrations exceeding their Residential Tap Water Screening RBC or Maine MEG. These compounds include: DRO, aluminum, arsenic, barium, boron, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, sodium, thallium, dieldrin, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, benzene, chloroform, o-xylene, vinyl chloride and nitrate. Eleven compounds were detected in less than 5 percent of groundwater samples, however, at concentrations greater than their respective Residential Tap Water Screening RBC or MEG concentration. These compounds were retained as COPCs and include: heptachlor, bis(2-ethylhexyl)phthalate, naphthalene, 1,1,2-trichloroethane, 1,2-dichloroethane, bromodichloromethane, bromomethane, chloromethane, ethylbenzene, m/p xylene, and trichloroethene. Six additional compounds were retained as COPCs based on their dermal /oral ratio and include beryllium, cadmium, chromium, vanadium, di-n-butyl-phthalate and toluene (USEPA, 2001a). All other compounds were eliminated as COPCs because they were either detected below screening criteria, considered essential nutrients or had dermal/oral ratios less than 10 percent (USEPA, 2001a). The risks associated with exposure to groundwater is evaluated for the area resident and presented in **Section 5.6**.

5.3.11 Produce

Although there is currently no exposure to contaminated produce grown on-site, a vegetable uptake scenario was developed to evaluate the potential for soil contaminants to be concentrated in both above and below ground produce. Given the lack of site-specific produce to analyze, contaminant concentrations in produce were estimated using the methodology presented in *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (USEPA, 1998f). This guidance document provides chemical-specific bioconcentration factors for both root vegetables and above ground produce (USEPA, 1998f). Because there are no soil screening RBC for produce, the compounds retained as surface soil COPCs based on ingestion and dermal contact for each area were retained as produce COPCs (refer to **Table 5-1A through 5-1F**). Chemical-specific bioconcentration factors were used to estimate contaminant concentrations in produce. Bioconcentration factors are not available for all compounds detected in soil, as such, only those compounds for which bioconcentration factors are available are quantitatively evaluated. The risks associated with ingestion of contaminated produce are evaluated for the area resident and presented in **Section 5.6.**

5.4 Exposure Assessment

The purpose of the Exposure Assessment is to estimate the type and magnitude of potential exposure to site-related chemicals present at, or migrating from, the site. A quantitative exposure assessment was conducted for the four areas evaluated as part of the baseline HHRA (i.e., Plant Area, Warehouse 2/3, 345 kV Transmission Line Area and Bailey Farmhouse). This assessment was conducted in accordance with USEPA and MDEP methodology and guidance (USEPA, 1989b, 1990, 1991a and b, 1997b, 2001 a and b, and 2002, and MDEP, 1994) and is consistent with the HHEA Work Plan (**Appendix H-1**). These guidance documents provide standard exposure scenarios and default values for many exposure parameters and were used, as appropriate, in this assessment. This quantitative exposure information was combined with the exposure point concentrations (EPCs) for each COPC to quantitatively estimate exposure under each scenario. The methods for deriving EPCs and the exposure assumptions used in the Baseline HHRA are discussed below.

5.4.1 Exposure Point Concentrations

The EPC represents the concentration of a chemical that a human receptor is reasonably expected to contact at a point of exposure (USEPA, 1992 and USEPA, 2002). EPCs are generally used to derive a quantitative estimate of exposure under both a reasonable maximum exposure (RME) and central tendency (CT) exposure. The RME exposure is defined as the highest exposure that is reasonably expected to occur at the site. The CT exposure provides a less conservative estimate of exposure that may occur at the site. USEPA guidance states that the EPC for each soil COPC under the RME and CT be set at the 95% Upper Confidence Level (UCL) of the arithmetic mean concentration. The maximum detected concentration should be used as the EPC when the 95% UCL concentration exceeds the maximum detected concentration (USEPA, 1992).

The USEPA has established guidance for calculating the 95% UCL concentration. This guidance, however, is only applicable to randomly sampled data sets (USEPA, 2002a). Because the soil data collected as part of the RFI was biased to areas of known or suspected contamination as described in the approved QAPP, no method or approach presented in USEPA guidance was applicable to the soil data collected as part of this RFI. To overcome the limitations placed on the biased sampling dataset, a tiered approach for identifying site-specific COPCs and calculating appropriate EPCs for these compounds was developed in concert with MDEP and USEPA and described in the following paragraphs.

For areas where greater than 10 samples were collected (i.e., Plant Area, Warehouse 2/3 and 345 kV Transmission Line), preliminary risk estimates were developed for each soil COPCs retained after screening (see **Tables 5-1A through 1F**). Carcinogenic risk estimates were based on exposure to the maximum detected soil concentration (all depths) assuming the residential RME exposure scenario. Noncarcinogenic risk estimates were based on exposure to the maximum detected soil concentration (all depths) assuming a 6-year childhood residential exposure scenario. These scenarios result in the greatest potential exposure and therefore, are considered protective of other exposure conditions.

Compounds present in soil at concentrations associated with an HI = 0.1 or 1 x 10^{-6} or greater risk were considered primary COPCs. The statistical distribution of these COPCs was determined (i.e. normal, log normal or non-parametric) and the 95% UCL on the mean concentration was calculated based on the appropriate test method presented in *Calculating the Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* and using the USEPA sponsored ProUCL software (USEPA, 2002b and USEPA, 2003b). The analytical data presented in **Section 4.0** were used as inputs to the ProUCL calculations.. The mean concentration, the standard deviation, the statistical distribution and EPC calculated using the ProUCL software for each COPC is presented in **Appendix H-2**. For compounds having neither a normal nor lognormal distribution, the ProUCL program provides five non-parametric results (CLT, Jackknife, Standard Bootstrap, Bootstrap-t, and Chebyshev). The most conservative (i.e., highest) non-parametric result was selected as the EPC.

COPCs present in soils at concentrations associated with less than an HI = 0.1 or 1 x 10^{-6} risk level were retained as COPCs and their EPC set at the maximum detected concentration. The distribution of the primary COPCs and their respective EPCs are presented in **Appendix H-2** and discussed in more detail in **Section 5.6.3**.

The USEPA guidance also discusses the uncertainty of deriving a mean concentration and 95% UCL based on a small data sets stating, "if the number of samples is small (n<5), no method will work well" (USEPA, 2002a). Although the guidance does not state that the maximum concentration be used, USPEA Region 1 and MBOH have stated their preference for defaulting to the maximum concentration as the EPC, for data sets with less than 10 samples. Maine Yankee has agreed to use this approach for areas where less than 10 samples were taken. As such, the EPC for evaluating exposure to soils at the Bailey Farmhouse are set at the maximum detected concentration.

Consistent with EPA guidance, the EPC for groundwater contaminants was set at the average and maximum detected concentration for the CT and RME scenarios, respectively (USEPA Region 1, 1992)

5.4.2 Exposure Scenarios

Exposure scenarios describe the unique way(s) by which an individual or population may be exposed to contaminants at or originating from a site. These scenarios generally include more than one route of exposure. Common routes of exposure include ingestion of, dermal contact with, or inhalation of contaminated media. A quantitative estimate of exposure (e.g., an exposure dose) is generated for each route of exposure by combining the EPC with standard exposure parameters.

Potential receptors and exposure scenarios are based on current and future site use. Currently, the site is in the process of being decommissioned, with most plant structures scheduled to be demolished and removed. Future land use at the site will most likely be industrial/commercial as Maine Yankee has indicated their intention to implement deed restrictions to limit future development of Bailey Point to industrial/commercial land use. Potential receptors to residual soil and groundwater contamination include future on-site workers and construction workers. Other potential receptors include commercial and recreational shellfish harvesters, worm diggers, and other recreational users who may be exposed to residual sediment and shellfish tissue contamination. Because land use restrictions will limit the development of Bailey Point, Maine Yankee initially did not include residents as potential receptors. However, at the request of MDEP and MBOH, residential exposure to soil and groundwater is being evaluated in this risk assessment. Maine Yankee considers the residential scenario to be an overly conservative evaluation of future potential exposure and does not propose making risk management decisions based on this assumed future land-use.

The standard exposure equations and parameters for each exposure scenario are presented and referenced in **Tables 5-2 through 5-8** and are discussed below.

Surface Soils

Site-related compounds were detected in surface soils from all areas of interest. Because commercial/industrial zoning is the most likely future land-use for Bailey Point, the exposure assessment focused on evaluating future potential exposure to an on-site worker and a construction worker. The on-site worker is assumed to have long-term exposure to incidental soil contamination (e.g. dust) and the construction worker is assumed to have short-term intense exposure to surface and subsurface soils (USEPA, 2001b). Although it is extremely unlikely that this area could and/or would be developed for residential land-use, a residential exposure scenario was evaluated at the request of MBOH and MDEP for purposes of supporting the Cumulative Risk Assessment (CH2MHill, 2003b). The residential scenario is based on long-term repetitive exposure to soils by both children and adults.

The routes of exposure evaluated for the residential and worker scenarios include ingestion and dermal contact with soils. The residential scenario also includes exposure to soil contaminants through the ingestion of homegrown produce. The inhalation route of exposure was initially not included in this risk assessment based on a comparison of the maximum detected soil concentration (all depths) to USEPA Region 9 inhalation PRGs. These route-specific PRGs are derived based on standard USEPA exposure parameters and toxicity information and set at an HI of 1 or cancer risk of 10^{-6}. All chemicals detected in soil throughout Bailey Point are present at concentrations below their respective inhalation PRG suggesting that inhalation is not a significant route of exposure at this site.

At the request of MBOH, two focused risk evaluations were conducted to evaluate the potential risk to human health from inhalation exposure to fugitive dust; a quantitative risk evaluation calculating the noncancer hazards and incremental cancer risks associated with exposure to fugitive dust based on less-than-lifetime exposure and an evaluation of projected long term fugitive dust concentrations assuming continuous lifetime exposure (USEPA, 1991a and USEPA 2002b). Both scenarios were based on exposure to the maximum detected concentration of all compounds present in soil (all depths). This is the most conservative exposure assumption possible and is considered to be protective of more refined and site-specific exposure assumptions. The inhalation and fugitive dust risk evaluations are presented in **Appendix H-3**. The carcinogenic risks estimates are 2.0×10^{-8}, 1.4×10^{-8} , 2.0×10^{-6} for the residential, the on-site worker and the construction worker scenarios, respectively and 1.8×10^{-7} for continuous lifetime exposure to predicted fugitive dust concentrations. The non cancer HI's were all below 1.0 and are 0.006 for the on-site worker, 0.007 for the resident, 0.02 for the child, 0.05 for the construction worker and 0.03 for lifetime exposure to predicted fugitive dust concentrations. All risk estimates were below MDEP target risk levels.

Inhalation of volatile compounds was not considered to be a significant route of exposure and was not quantitatively evaluated. Warehouse 2/3 was the only area where VOCs were detected in subsurface soils. The area of VOC soil contamination was limited to a small area (i.e., 40 ft x 50 ft) and appropriate response actions are being evaluated for these soils to protect groundwater quality. These actions will result in a decrease of VOC soil concentrations to levels below those considered to present a health risk. Based on these results, the inhalation route of exposure was not evaluated for the individual sub areas.

In summary the following soil exposure scenarios were evaluated as part of this risk assessment and are consistent the HHEA work plan:

- On-Site Workers (adults) exposed to surface soils (i.e., 0 to 0.5 feet) through direct contact and incidental ingestion. The RME scenario is reflective of an employee working outdoors and the CT scenario is reflective of an employee working indoors (USEPA, 2001b). The on-site worker is assumed to ingest 50 mg soil/day (CT) and 100 mg soil/day (RME). The exposure frequency is 150 days per year, for 25 years (RME) and 6.6 years (CT) exposure duration. Additional exposure parameters for this scenario are presented in **Table 5-2**.

- Construction Worker (adults) exposed to surface soils through direct contact and incidental ingestion. This worker is assumed to have very high and intense exposure to soils during construction activities (USEPA, 2001b). Because of the unique manner in which this worker is assumed to contact soil only the RME scenario is evaluated. The construction worker is assumed to ingest 330 mg soil/day, with an exposure frequency of 173 days/year corresponding to 5 days/week for 8 months over a 1 year duration. An exposed surface area of 3,300 cm^2 is assumed. Additional exposure parameters for this scenario are presented in **Table 5-3**.

- Residents (children and adults) exposed to surface soils through direct contact and incidental ingestion. A time-weighted ingestion rate and dermal factor was used to combine the child and adult exposure to soils. The exposure frequency is 150 days per year for both the RME and CT scenarios (USEPA, 1994). Exposure duration under the RME is assumed to be 30 years and includes 6-year exposure as a child and 24-year exposure as an adult (USEPA, 1991a). Exposure duration under the CT is assumed to be 9 years and includes 2-year exposure as a child and 7-year exposure as an adult (USEPA, 1994). A separate exposure evaluation was conducted to evaluate the non-carcinogenic risks to a child from a 6-year residential soil exposure. Additional exposure parameters for this scenario are presented in **Table 5-4**.

  Ingestion of home-grown produce was also evaluated as part of the Residential scenario and assumes a person ingests 71 grams dry weight of produce (14 % root crops and 86% above ground produce) for 350 days per year (USEPA, 1998f). An exposure duration of 30 years is assumed consistent with the long-term resident. Only the RME scenario was evaluated for this route of exposure. Additional exposure parameters for this scenario are presented in **Table 5-5**. The input values for estimating contaminant concentration in produce are presented in **Appendix H-4**.

Sub-Surface Soil

Site related compounds have been detected in subsurface soils from these study areas. Exposure to these soils was evaluated for the construction worker only. It is not expected that an on-site worker or resident would have long-term repetitive exposure to soils below 0.5 feet bgs. The same exposure assumptions used to evaluate the Construction Worker exposure to surface soils are assumed for the Construction Worker exposure to sub-surface soil. The EPC for the subsurface soils was based on both surface and subsurface soils concentrations.

Sediments

Site-related compounds and/or naturally occurring inorganic elements were detected in sediment samples in the shoreline outfall areas. Consistent with the HHEA Work Plan, potential receptors likely to frequent this area include teenagers and adults trespassing or harvesting shellfish and/or worms (MY, 2003a). The Commercial Fisherman harvesting shellfish was selected as the potential receptor for this exposure pathway. This receptor receives the greatest potential exposure and would, therefore, be protective of less frequent or casual users (i.e., trespasser). Although, young children (0 to 6 years) are not expected to frequent this area of the site based on limited access and lack of recreational beaches suitable for swimming, a sediment exposure scenario was developed for the area resident to assist in estimating the total site risk. Routes of exposure evaluated in this assessment include dermal contact and ingestion of sediments. Dermal contact with marine surface water is not considered to be a significant route of exposure given the large influx of tidal water into the bay twice each day. Constituents potentially discharging from the outfalls are dissipated by tidal flushing and are not expected to accumulate in marine surface water. Exposure to sediments is assumed to occur as follows:

- An adult Commercial Shellfisherman is exposed to sediments through direct contact and incidental ingestion while harvesting clams or worms. The frequency of contact is assumed to be 52 and 104 days per year for CT and RME exposure, respectively (MY, 2003c) for a 30-year (RME) and 9 year (CT) exposure duration. It is assumed that the adult ingests 50 mg (CT) to 100 mg (RME) sediment per exposure (USEPA 1991a). The exposed surface area is assumed to be 5,700 cm^2 which corresponds to the face, forearm, hands, and lower legs. This scenario is considered to be the most conservative of receptors likely to access shoreline sediments and is considered protective of the more casual trespasser. Additional exposure parameters for this scenario are presented in **Table 5-6**.

- An area resident is exposed to sediments through direct contact and incidental ingestion while wading along the shoreline sediments. The frequency of contact is assumed to be 2 times per week for the 13 summer weeks for a 30-year exposure duration (6 years as a child and 24 years as an adult). An age weighted ingestion rate of 114 mg-yr/kg-day and an age weighted dermal factor of 360 mg-yr/kg-event is assumed for this scenario. Additional exposure parameters for this scenario are presented in **Table 5-6**.

Shellfish Tissue

Site-related compounds were detected in clams, mussels and lobsters obtained from the Back River. Ingestion of potentially contaminated tissue was evaluated for each species for the area resident as follows:

- A resident (child and adult) is exposed to site-related contaminants through ingestion of shellfish. An adult is assumed to ingest 0.034 kg/day (RME) and 0.016 kg/day (CT) and a child is assumed to ingest 0.008 kg/day (MBOH, 2001 and USEPA, 1999d). The consumption rate under the RME scenario is the upper estimate of sport fish consumption and is used by the Maine Bureau of Health to establish FTALs. The consumption rate under the CT scenario is the recommended default rate presented in *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories* (USEPA, 1999d). The consumption rate for children is based on the USEPA Fish Consumption Advisories that recommends one 2-ounce meal of cooked fish per week for a small child (USEPA, 2001c). An exposure frequency of 365 days/year is assumed for an exposure duration of either 30 years (RME) or 9 years (CT). Additional exposure parameters for this scenario are presented in **Table 5-7**.

Groundwater

Site-related compounds have been detected in groundwater beneath Bailey Point. Although Maine Yankee does not use the groundwater at the facility for potable purposes**,** exposure to groundwater was evaluated under a residential land use scenario. The routes of exposure evaluated include ingestion of groundwater and inhalation of VOCs during showering. Dermal exposure was also evaluated for those compounds that are identified in Appendix B-3 to the *Supplemental Guidance for Dermal Risk Assessment* (USEPA, 2001a) as compounds that may contribute "significantly" to the total exposure dose received under a residential groundwater scenario. The USEPA considers a "significant" contribution to be more than 10 percent of the assumed exposure dose estimated under a standard residential groundwater ingestion scenario (USEPA, 2001a). In summary, the following exposure scenario was evaluated:

- Residents exposed to groundwater through ingestion, dermal contact, and inhalation of volatiles. Residents are assumed to ingest 1.4 liters (CT) to 2 liters (RME) of water per day, 350 days per year, for either a 9-year (CT) or 30-year (RME) exposure duration. Inhalation exposure to VOCs is assumed to be equal to the exposure attributed to the ingestion pathway (USEPA 1991b). Exposure through dermal contact was evaluated using the USEPA *Interim Risk Assessment Guidance for Dermal Exposure* (USEPA, 2001a). Additional exposure parameters for this scenario are presented in **Table 5-8**.

5.5 Toxicity Assessment

The purpose of the toxicity assessment is to provide current toxicological information for each COPC. This information includes the potential for a specific COPC to cause adverse effects in humans, and characterizes the relationship between the dose of a chemical and the incidence of adverse health effects in the exposed population. The purpose of this assessment is to identify dose-response values that can be used to quantitatively evaluate potential health risks as a function of chemical exposure. The USEPA's Integrated Risk Information System (IRIS) database maintains a current listing of all the verified toxicity values and was the primary source of information for this section. Toxicity information for compounds not listed on IRIS was obtained from USEPA Region I, the National Center of Environmental Assessment (NCEA), or Health Effects Summary Tables (HEAST) as presented in USEPA Region 9 PRG table (USEPA, 2003, USEPA NCEA website, April 2003, and USEPA Region 9 website, October 2002). The non-carcinogenic and carcinogenic toxicity factors used in this HHRA are discussed below.

5.5.1 Non-Carcinogens

Non-carcinogens are compounds that may damage an organ or organ systems, but do not cause cancer. Unlike carcinogens, non-carcinogens are believed to have threshold dosage levels below which adverse effects are not expected. Carcinogens may also have noncarcinogenic effects and these effects are considered and included with the effects of non-carcinogenic compounds.

USEPA's preferred criterion for quantifying non-carcinogenic risk from oral and dermal exposure is the reference dose (RfD), which corresponds to USEPA's identification of the threshold effects level with an added margin of safety. RfDs are expressed in units of milligrams (mg) of a chemical per kilogram (kg) of body weight per day (mg/kg-day). Various types of RfDs are available depending on the exposure route (oral or inhalation) and length of exposure being evaluated (chronic, subchronic, or acute) as discussed below:

Chronic Oral RfDs. The chronic oral RfD is defined as an estimate of an average daily exposure level below which significant, adverse non-carcinogenic health effects are not expected. Chronic RfDs are specifically developed to be protective for long-term exposure to a compound (i.e., seven years to a lifetime) (USEPA, 1989). Chronic RfDs were available for the majority of the COPC and used in this HHRA to evaluate potential risks to the resident and on-site worker from chronic ingestion and dermal contact exposure. **Section 5.10** discusses the uncertainties associated with evaluating noncarcinogenic hazards for compounds for which no chronic RfDs were available.

Chronic Inhalation RfDs. USEPA's preferred criterion for quantifying non-carcinogenic risk from chronic inhalation exposure is the Reference concentration (RfC). These concentrations are expressed in units of mg/m^3 and are estimates of a continuous inhalation exposure to a population that is likely to be without an appreciable risk of harmful effects during a lifetime. RfCs can be converted to units of mg/kg-day (i.e., Inhalation RfDs) using the following equation:

$$RfC\ (mg/m^3) \times 20m^3/day \times 1/70\ kg = Inhalation\ RfD\ (mg/kg\text{-}day)$$

Chronic Inhalation RfCs were used to evaluate non cancer risks to the resident and on-site worker from the inhalation of fugitive dust (see **Appendix H-3**). RfC and RfDs were obtained from IRIS, NCEA or USEPA Region 1.

Sub Chronic Oral RfDs. The subchronic RfD is used to evaluate less than lifetime exposure. The USEPA defines the subchronic RfD as an estimate of a daily exposure level that is likely to be without deleterious effects during a portion of a lifetime (i.e., two weeks to seven years) (USEPA, 1989). Subchronic RfDs are available for many of the COPCs and were used in this HHRA to evaluate potential risks to the construction worker from direct contact and ingestion exposure to soil. **Section 5.10** discusses the uncertainties associated with evaluating noncarcinogenic hazards for compounds for which no subchronic RfDs were available

Sub Chronic Inhalation RfDs. The USEPA is currently reevaluating its approach to characterizing risk from less than lifetime (i.e., subchronic) inhalation exposure (USEPA, 2002b). Applying toxicity values currently available for inhalation exposures to scenarios other than residential (i.e., construction worker) may not be appropriate (USEPA, 2002b). At the request of the MDEP, the long term predicted fugitive dust air concentrations were compared directly to the inhalation RfC concentration. This evaluation is presented in **Appendix H-3**.

5.5.2 Carcinogens

The USEPA Carcinogen Assessment Group (CAG) has developed Carcinogenic Slope Factors (CSFs) for compounds classified as known, potential, or possible human carcinogens. CSFs are developed to estimate the theoretical, upper-bound, excess lifetime cancer risks associated with oral and dermal exposures to potential human carcinogens. The USEPA has also developed Unit Risk Factors (URFs) to evaluate carcinogenic risks from the inhalation route of exposure (see **Appendix H-3**). URFs are expressed in units of $(ug/m^3)^{-1}$ and are defined as the upper bound excess lifetime cancer risk estimated from continuous exposure to a chemical at a concentration of 1 ug/m^3. URFs can be converted to units of $(mg/kg\text{-}day)^{-1}$ (i.e., inhalation CSFs) using the following equation:

$$URF\ (m^3/ug)^{-1}\ x\ day/20m^3\ x\ 70\ kg\ x\ 10^3\ ug/mg = Inhalation\ CSF\ 1/(mg/kg\text{-}day)$$

The inhalation URFs are based on continuous lifetime exposure and, therefore, may not be appropriate for evaluating sub chronic exposure durations. To address this limitation, at the request of MDEP the long term predicted fugitive dust air concentrations were multiplied by the URF with no adjustment for frequency and duration of exposure (USEPA, 2002b). This evaluation is presented in **Appendix H-3**.

CSFs and URFs for the carcinogenic COPCs were obtained from the IRIS, NCEA or USEPA Region 1.

The CAG uses a weight-of-evidence classification system to identify compounds as carcinogens. The USEPA is currently in the process of revising the guidelines for evaluating carcinogenic effects. The proposed guidelines will result in changes, including how the USEPA evaluates the mode of action of suspected carcinogens, the descriptors for classifying carcinogenic potential, and the subsequent hazard and risk characterization. Until these guidelines are final, USEPA continues to rely on existing assessments.

Currently carcinogens are categorized according to the weight of scientific evidence:

- **Group A - Human Carcinogen** - This category indicates that there is sufficient evidence from epidemiological studies to support a causal association between an agent and cancer in humans.
- **Group B - Probable Human Carcinogen** - This category generally indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of positive data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).

- **Group C - Possible Human Carcinogen** - This category indicates that there is limited evidence of carcinogenicity in animals, in the absence of positive human data.
- **Group D - Not Classified** - This category indicates that there was no data to evaluate or that the evidence for carcinogenicity in humans and in animals was inadequate.
- **Group E - No Evidence of Carcinogenicity to Humans** - This category indicates that there is no evidence for carcinogenicity in at least two adequate animal tests in different species or in both epidemiological and animal studies.

5.5.3 Other Issues

Toxicity data for the dermal route of exposure was reviewed using the *Supplemental Guidance for Dermal Risk Assessment* (USEPA, 2001a), and the equations outlined in Risk Assessment Guidance - Part B (USEPA, 1991b). Based on current guidance, the oral RfD for cadmium was adjusted for the dermal risk evaluation (USEPA, 2001a). An oral absorption efficiency of 5% is assumed for cadmium, which leads to an estimated dermal reference dose of 2.5E-4.

The Dermally Absorbed Dose (DAD) for groundwater contact (standard residential assumptions) was calculated using the chemical specific Absorbed Dose/event (DA_{event}) factors presented in Table B-3 of the *Supplemental Guidance for Dermal Risk Assessment* (USEPA, 2001a).

Cancer slope factors for PCBs were obtained from the USEPA Guidance *PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures* (USEPA, 1996e). This document presents a range of CSFs for PCB mixtures based on potential health risks and persistence in the environment. A CSF of 2.0 $(mg/kg\text{-}day)^{-1}$ was selected for evaluating PCB exposure to soils and groundwater. This CSF is the upper end of the range of possible CSFs and is based on the most persistent and toxic aroclors (USEPA, 1996). Because the CSF is based on total PCBs, the individual detected aroclor concentrations were summed to provide an estimate of total PCB exposure.

The RfD for Aroclor 1254 was used as a surrogate RfD to evaluate the noncarcinogenic risks from exposure to all PCBs (USEPA, 2003).

The risk from incidental ingestion and dermal contact exposure to carcinogenic PAHs in soils was evaluated using toxic equivalence factors (TEFs) developed based on the relative potency of benzo(a)pyrene (B(a)P) (USEPA Region I Risk Update, 1994). The concentration of each of the six carcinogenic PAHs was modified using the following

TEFs to yield a benzo(a)pyrene equivalent concentration:

Compound	**TEF**
benzo(a)anthracene	0.1
benzo(b)fluoranthene	0.1
benzo(k)fluoranthene	0.01
chrysene	0.001
dibenzo(a,h)anthracene	1.0
indeno(1,2,3-cd)pyrene	0.1

The CSF derived for B(a)P of 7.3 $(mg/kg\text{-}day)^{-1}$ was used to evaluate oral and dermal risk from exposure to carcinogenic PAHs. There is insufficient information regarding the application of TEFs in evaluating potential risks from the inhalation of PAHs in fugitive dust. As a conservative measure, the URF for benzo(a)pyrene was used as a surrogate URF to evaluate potential risks from inhalation exposure to other carcinogenic PAHs (see **Appendix H-2**).

The seafood consumption assessment assumes that the arsenic detected in the shellfish samples exists as inorganic arsenic. The Agency for Toxic Substances and Disease Registry (ATSDR) reported that 80 to 99 percent of arsenic in seafood is present in the nontoxic organic form of arsenic (ATSDR, 2000). The USEPA has not yet developed default values to assess the risk from the toxic inorganic portion of total arsenic in seafood. As such, the risk estimated for exposure to arsenic through seafood consumption may be overestimated by as much as an order of magnitude or more.

Toxicity information was not available for some of the compounds detected at the site, including DRO, carbazole, sodium, endrin aldehyde, benzo(g,h,i)perylene and pyrene. These chemicals can not be quantitatively evaluated; however, these compounds are carried forward in the risk assessment and appear in the risk tables. In addition, subchronic RfDs or RfCs were not available for many of the soil COPCs.

Although quantitative risk estimates were not developed for the different EPH fractions, the risk from exposure to petroleum hydrocarbons is assessed as part of the quantitative risk estimates generated for the target SVOCs. Soil samples collected and analyzed for EPH typically contained the heavier C19 to C36 aliphatic and C11 to C22 aromatic fractions. With the exception of the Former Truck Maintenance Garage Area, the lighter fraction (i.e., C9 to C18 aliphatics) were typically either not detected or were present at concentrations less than the heavier aliphatic and aromatic fractions. The heavier aromatic fraction of petroleum hydrocarbons is associated with the PAHs included in the standard SVOC analysis. Areas with elevated EPH concentrations also had elevated PAH concentrations (i.e., Plant Area). Quantitative risk estimates were developed for PAHs and are presented in **Section 5.6**.

A summary of the current toxicity information and regulatory standards and guidelines for the COPCs used in this HHRA is presented in **Table 5-9**.

5.6 Risk Characterization

This section presents the risk characterization for the Bailey Point RFI. Section 5.6.1 presents the MDEP Remedial Action Guideline methodology used to evaluate existing conditions at two areas within Bailey Point having minimal impact from industrial activities. Section 5.6.2 presents the methodology used to conduct a baseline HHRA for the remaining areas of Bailey Point and for media impacted by site activities. Quantitative risk estimates were generated by combining the numerical exposure dose estimates with the quantitative dose-response data. It should be emphasized that the risk estimates are based on numerous conservative exposure assumptions and likely overestimate actual risk. Both non-carcinogenic and carcinogenic risk estimates were derived consistent with the HHEA work plan and as described below. The non-carcinogenic risk estimates include non-carcinogenic effects from exposure to carcinogens. The results of the risk assessment are presented for each media in **Sections 5.6.3 through 5.6.8**.

5.6.1 Remedial Action Guidelines

MDEP has developed Remedial Action Guidelines for contaminated soils that are derived using specific standard exposure scenarios and are considered to be protective of human health (MDEP, 1997). The Remedial Action Guidelines are set at a noncancer HI of 1.0 and an incremental cancer risk of 1×10^{-5}. These guidelines can be used to determine if an acceptable level of total site risk has been achieved by comparing the ratios of residual contaminant concentrations to chemical specific cleanup guidelines to a value of 1.

Three areas within Bailey Point were evaluated using this type of risk evaluation and include the 115 kV Switchyard, Personnel Buildings and Parking Lot Areas and the ISFSI. The site history indicates these areas received minimal impact from historical site operations and was confirmed by the sampling program and analytical results (see **Section 4**). A summary of the analytical data and rationale for selecting COPCs for the 115 kV Switchyard, Personnel Building and Parking Lot Areas and ISFSI are presented in **Tables 5-1A, 5-1B and 5-1G**. A comparison of the maximum detected concentration of each soil COPC to its respective Remedial Action Guideline is presented in **Table 5-10A, 10B and 5-10G** for the 115 kV Switchyard, Personnel Buildings and Parking Lot Areas, and ISFSI, respectively.

5.6.2 Baseline Human Health Risk Assessment

The risks associated with exposure to soils, sediments, shellfish tissue and groundwater constituents detected within and around Bailey Point were estimated as part of the baseline HHRA. Both noncarcinogenic and carcinogenic risk estimates were derived as described in the HHEA Work Plan and summarized below.

Non-Carcinogenic Hazards

Non-carcinogenic risks are estimated by dividing the exposure dose of each COPC by its respective RfD to yield a Hazard Quotient (HQ). The non-carcinogenic risks from exposure to each medium are quantified in terms of a Hazard Index (HI), which is calculated by summing the HQs for each COPC.

$$HQ = Exposure\ Dose\ (mg/kg\text{-}day) / RfD\ (mg/kg\text{-}day)$$

$$HI_{pathway} = HQ_{chemcial\ 1} + HQ_{chemical\ 2} + HQ_{chemical\ n}$$

The resulting cumulative non-carcinogenic risks are then compared to the USEPA target HI of 1. If the HI is less than or equal to 1, no adverse health effects are anticipated from the predicted exposure dose level. If the HI is greater than 1, the predicted exposure dose level could potentially cause adverse effects (USEPA, 1989b).

The quantitative risk estimates for non cancer hazards for the RME and CT evaluation of each exposure scenario are provided in **Tables 5-10C through 5-10I** and discussed along with the carcinogenic risk estimates in the following section. The noncarcinogenic risks for ingestion of groundwater and produce are presented with their respective carcinogenic risks in **Tables 5-11J and 5-11K**.

Carcinogenic Risks

Carcinogenic risks are estimated by multiplying the estimated exposure dose by the CSF to obtain an estimate of incremental risk, as follows:

$$Carcinogenic\ Risk = Exposure\ Dose\ (mg/kg\text{-}day)\ x\ CSF\ (mg/kg\text{-}day)^{-1}$$

The CSF converts the estimated daily intake of a chemical averaged over a lifetime of exposure (i.e., 70 years) to an incremental risk of an individual developing cancer. The CSF used in these calculations is often the upper 95-percentile confidence limit of the probability of a response based on experimental data. As such, the carcinogenic risk estimates presented in this assessment are considered to be an upper-bound estimate of risk. The “true risk” to an individual is likely to be much less than predicted in this assessment (USEPA, 1989b).

The cumulative carcinogenic risk for each medium was estimated by summing the carcinogenic risks of each COPC. The resulting cumulative risk estimate was then compared to the USEPA target risk range of $1x10^{-6}$ to $1x10^{-4}$ (USEPA, 1990) and MDEP upper bound risk level of $1x10^{-5}$.

The calculations of cancer risks for the RME and CT evaluation of each exposure scenario are presented in **Tables 5-11C through 5-11K**

5.6.3 Summary of the Risks from Exposure to Soils

The Remedial Action Guideline Ratios for the 115 kV Switchyard, Personnel Buildings and Parking Lot Areas and ISFSI are presented in **Tables 5-10A, 10B and 10G**. The non cancer and cancer risk estimates associated with exposure to soils throughout other portions of Bailey Point are presented in **Tables 5-10C through F** and **Tables 5-11C through F** and are discussed by sub area in this section.

115kV Switchyard

This risk assessment evaluated exposure to soils from the 115kV Switchyard by comparing the maximum detected soil concentration of each COPC to its MDEP Remedial Action Guideline concentration. The guideline concentrations are derived to be protective of human health under a residential land use.

The Risk Ratio based on residential exposure to soils from the 115kV Switchyard is 1.4 and slightly exceeds the target ratio of 1.0 (see **Table 5-10A**). The major contributor to this ratio is arsenic. Arsenic was detected at the 115 kV Switchyard at concentrations consistent with background conditions (see **Section 4.7.1**). Removing arsenic from the calculation results in a ratio of 0.2, below the target risk level of 1.0.

Personnel Buildings and Parking Lot Areas

This risk assessment evaluated exposure to surface and subsurface soil around the Personnel Buildings and Parking Lot Areas by comparing the maximum detected soil concentration of each COPC to its MDEP Remedial Action Guideline concentration. The guideline concentrations are derived to be protective of human health under a residential land use.

The Personnel Building and Parking Lot Area includes the location of the former Fire Pond, Personnel Buildings and Parking Lots where limited industrial activity occurred. The primary contaminants detected in soils from this area are PAHs and metals. The COPCs selected for this area include metals and individual PAH compounds consistent with the primary contaminants detected at the site.

The Risk Ratios based on residential exposure to surface and subsurface soils from the Personnel Building and Parking Lot Areas are 3.8 and 4.0, respectively (see **Table 5-10B**). These ratios slightly exceed the target ratio of 1.0. The major contributors to these ratios are lead and arsenic.

Lead was initially detected at a maximum concentration of 969 mg/kg in a soil sample collected from below the slab of the Information Center. This concentration compared to its Remedial

Action Guideline concentration of 375 mg/kg lead results in a risk ratio greater than 1.0. Fifteen additional soil samples were collected in October 2003 within the immediate area of the elevated lead concentration to better delineate the extent of contamination (see **Section 4.4.9**). The high lead concentration was not replicated in any of the soil samples. The total lead concentrations for these samples ranged from 14.4 mg/kg to 22.2 mg/kg (see **Table 4-17**) consistent with background conditions. Risk ratios for lead based on the October 2003 sampling data are all below 1.0 indicating that lead does not present a health risk as this site. (Additional discussion of the health risks associated with lead in soil is presented in **Section 5.6.4**).

The presence of arsenic in soil also leads to a risk ratio greater than 1.0. As discussed in **Section 4.7.1**, arsenic was detected in soils from this area at concentrations consistent with background conditions. Removing arsenic and lead from the calculation results in ratios of 0 and 0.2 for surface and subsurface soils, respectively.

ISFSI

This risk assessment evaluated exposure to soils from the ISFSI by comparing the maximum detected soil concentration of each COPC to its MDEP Remedial Action Guideline concentration. The guideline concentrations are derived to be protective of human health under a residential land use. Only arsenic and benzo(g,h,i)perylene were retained as COPCs for the ISFSI and of these only arsenic has a Remedial Action Guideline Concentration. There is insufficient toxicity information to develop a Remedial Action Guideline Concentration for benzo(g,h,i)perylene. However, this compound is present at concentrations less than the Remedial Action Guidelines developed for other PAH compounds (i.e., benzo(a)pyrene).

The Risk Ratio based on residential exposure to soils from the ISFSI is 0.8 and below the target ratio of 1.0 (see **Table 5-10G**). Arsenic is the only contributor to this ratio. Arsenic was detected at the ISFSI at concentrations consistent with background conditions and is not considered to be present as a result of any industrial activities (see Section 4.7.1).

Plant Area

This risk assessment evaluated exposure to surface and subsurface soils around the Plant Area. As discussed in **Section 5.4.1**, primary soil COPCs were identified based on the noncancer and cancer risk estimates associated with exposure to the maximum detected concentration of each COPC (see **Table 5-1C**). **Appendix H-2, Table H-2C1** and **HC2** present the noncarcinogenic and carcinogenic screening risk estimates associated with exposure to soil at the Plant Area. The statistical distribution of the primary COPCs was determined and the 95% UCL concentration calculated using the formula appropriate for the particular distribution as presented in the USEPA guidance (USEPA, 2002a). The EPCs for the Plant Area surface and subsurface soils are presented in **Appendix H-2, Table H-2C3**.

The Plant Area is comprised of the Industrial and Restricted Areas and is the center of all industrial activities at this site. PAHs, pesticides and PCBs were identified in surface and subsurface soils from this area. The COPCs selected for the Plant Area include metals, pesticide and PAH compounds and adequately reflect the primary contaminants detected in the Plant Area (see **Section 4.8.1**).

Three scenarios were developed to evaluate the carcinogenic and non-carcinogenic risks from exposure to surface soil and include exposure under a residential land-use, exposure to an on-site worker, and exposure to a construction worker. The non-carcinogenic risks to a child (i.e., 6-year exposure duration) resulting from exposure to soil under a residential scenario were also evaluated (see **Tables 5-10C and 5-11C**). Non-carcinogenic and carcinogenic risks from exposure to subsurface soils were evaluated for the construction worker.

The non-carcinogenic risks for the residential, on-site and construction worker scenarios are all below an HI of 1.0 and ranged from an HI of 0.05 for the construction worker (subsurface exposure) to 0.8 for childhood exposure (RME exposure).

The carcinogenic risks for the on-site and construction worker scenarios are within the USEPA target risk range and ranged from 1.6×10^{-6} for the construction worker (subsurface soils) to 1.9×10^{-5} for the on-site worker (RME exposure). The on-site worker (RME exposure is slightly above the MDEP target risk level of 1×10^{-5}. Constituents present in soils at a concentration associated with an individual cancer risk greater than 1×10^{-6} include arsenic (on-site worker RME exposure), and cPAHs (on-site worker CT and RME exposure and construction worker surface soils).

The carcinogenic risks for the CT and RME residential scenarios are within the USEPA target risk range and greater than the MDEP target risk for the RME scenario. The risks are 6.5×10^{-6} (CT) and 4.8×10^{-5} (RME). Arsenic and cPAHs are present in soils at concentrations associated with a greater than 1×10^{-6} risk level and cPAHs are the only constituents present in soil at concentrations associated with a greater than 1×10^{-5} risk level. The risk from exposure to cPAHs under the residential RME scenario is 3.6×10^{-5} (see **Table 5-11C**).

A significant contributor to the carcinogenic risk estimates for exposure to soil in the Plant Area is arsenic. As discussed in **Section 4.7.1**, arsenic was detected in the Plant Area at concentrations consistent with background conditions. Eliminating arsenic from the risk calculations results in a reduction of the cancer risk to 3.7×10^{-5} for the residential RME scenario and 1.5×10^{-5} for the on-site worker RME scenario.

Warehouse 2/3

This risk assessment evaluated exposure to surface and subsurface soils at Warehouse 2/3. Primary soil COPCs were identified based on the noncancer and cancer risk estimates associated with exposure to the maximum detected concentration of each COPC (see **Table 5-**

1D) **Appendix H-2, Tables H-2D1** and **2D2** present the noncarcinogenic and carcinogenic screening risk estimates associated with exposure to soil at the Warehouse 2/3 area. The statistical distribution of the primary COPCs was determined and the 95 % UCL concentration calculated using the formula appropriate for each distribution as presented in the USEPA guidance (USEPA, 2002a). The EPCs for the Warehouse 2/3 soil COPCs are presented in **Appendix H-2, Table H-2D3**.

Warehouse 2/3 was used to receive and store chemicals used in plant operations. As discussed in **Section 4.8.1**, soils on the northwest side of the warehouse contained elevated levels of PAHs and PCBs and pesticides were also detected in the soil. Soils on the southwest side of the warehouse contained elevated levels of VOCs. The COPCs for this area include metals, and individual PAH, and PCBs and adequately reflect the contamination at this site.

Three scenarios were developed to evaluate the carcinogenic and noncarcinogenic risks from exposure to surface and subsurface soil and include exposure under a residential land-use, exposure to an on-site worker and exposure to a construction worker The non-carcinogenic risks to a child (i.e., 6-year exposure duration) resulting from exposure to soil under a residential scenario were also evaluated (see **Tables 5-10D and 5-11D**). Noncarcinogenic and carcinogenic risks from exposure to subsurface soils were evaluated for the construction worker.

The noncarcinogenic risks for exposure to soils from the Warehouse 2/3 area are at or below an HI of 1.2 for all exposure scenarios and ranged from 0.06 for the on-site worker (CT exposure) to 1.2 for the child (RME exposure). All individual HIs are below 1.0.

Arsenic and iron are the metals that contribute significantly to the overall HI for childhood exposure to soil. As discussed in **Sections 4.7.1 and 4.8.1.1**, iron and arsenic are present in soils at Warehouse 2/3 at concentrations consistent with background conditions. Eliminating iron and arsenic from the HI calculation results in a reduction of the noncancer risks to 0.5 for the child residential RME scenario.

The carcinogenic risks from exposure to soil around the Warehouse 2/3 area are at or below the MDEP target risk level of 10^{-5} for the on-site worker and construction worker scenarios.. The cancer risks ranged from 8.8×10^{-7} for the construction worker (subsurface soils) to 1.5×10^{-5} for the on-site worker (RME exposure). The carcinogenic risk for the CT and RME residential scenarios are within the USPEA target risk range and exceeded the MDEP target risk for the RME scenario. The risk estimates are 5.2×10^{-6} and 3.8×10^{-5} for CT and RME exposure, respectively. Constituents present in soil at concentrations associated with individual cancer risks greater than 10^{-6} include arsenic (resident RME and CT exposure and on-site worker RME exposure), cPAHs (resident RME and CT exposure and on-site worker RME exposure) and total PCBs (resident RME exposure). Arsenic and cPAHs are present at concentrations associated with an incremental risk greater than 10^{-5} and are estimated to be 1.4

x 10^{-5} (arsenic) and 2.3 x 10^{-5} (cPAHs) under the residential RME scenario (see **Table 5-11D**).

A significant contributor to the carcinogenic risk estimates for exposure to soil in the Warehouse 2/3 area is arsenic. As discussed in **Section 4.7.1**, arsenic is present in soils at Warehouse 2/3 at concentrations consistent with background conditions. Eliminating arsenic from the risk calculations results in a reduction of the cancer risk to 9.9 x 10^{-6} for the on-site worker (RME exposure). The total site risks for the resident (RME exposure) still exceeds the MDEP target risk level and is estimated at 2.4 x 10^{-5}..

345 kV Transmission Line Area

This risk assessment evaluated exposure to surface and subsurface soil around the 345 kV Transmission Line Area. Primary soil COPCs were identified based on the noncancer and cancer risk estimates associated with exposure to the maximum detected concentration of each COPC (see **Table 5-1E**). **Appendix H-2, Table H-2E1** and **2E2** presents the noncarcinogenic and carcinogenic screening risk estimates associated with exposure to soils at the 345 kV Transmission Line Area. The statistical distribution of the primary COPCs was determined and the 95 % UCL concentration calculated using the formula appropriate for each distribution as presented in the USEPA guidance (USEPA, 2002a). The EPCs for the 345 kV Transmission Line Area COPCs are presented in **Appendix H-2, Table H-2E3**.

The 345 kV Transmission Line Area is located in the northern portion of Bailey Point and received several episodes of fill material and debris associated with plant construction. Contaminants detected in these soils include metals and individual PAH, PCB and pesticide compounds. The COPCs selected for the 345 kV Transmission Line Area reflect the soil data and include metals and PAH compounds.

Three scenarios were developed to evaluate the carcinogenic and noncarcinogenic risks from exposure to surface soil and include exposure under a residential land-use, exposure to an on-site worker and exposure to a construction worker. The non-carcinogenic risks to a child (i.e., 6-year exposure duration) resulting from exposure to soil under a residential scenario were also evaluated (see **Tables 5-10E and Tables 5-11E**). Noncarcinogenic and carcinogenic risks from exposure to subsurface soils were evaluated for the construction worker.

The noncarcinogenic risks for exposure to soils from the 345 kV Transmission Line Area are at or below an HI of 1.1 for all scenarios. The HI's based on the on-site and construction worker and residential scenarios ranged from 0.05 for the construction worker (surface soil) to 0.3 for the resident (RME exposure). The risk for the 6-year child exposure duration was 1.1 slightly above the target HI of 1.0. No constituent had an individual HI greater than 1.0.

The significant contributors to the overall HI for childhood exposure to soil are arsenic and iron. As discussed in **Sections 4.7.1 and 4.8.1.1**, arsenic and iron are present in soils at the 345 kV

Transmission Line Area at concentrations consistent with background conditions. Eliminating arsenic and iron from the HI calculation results in a reduction of the noncancer risks from 1.1 to 0.3 for the child residential RME scenario.

The carcinogenic risks associated with exposure to soil in this area are all within the USEPA target risk range and ranged from 5.9 x 10^{-7} for the on-site worker (CT exposure) to 1.5 x 10^{-5} for the resident (RME exposure). Arsenic was the only constituent present in soil at concentrations associated with an individual cancer risk greater than 1 x $10^{-5.}$ Eliminating arsenic from the risk estimates results in a reduction of the cancer risks to 2.9 x 10^{-6} for the resident (RME exposure). This risk estimate is below the MDEP risk level. Constituents present in soil at concentrations associated with a cancer risk greater than 10^{-6} include arsenic (onsite worker – RME exposure and resident CT and RME exposure) and cPAHs (resident – RME exposure).

Bailey Farmhouse

This risk assessment evaluated exposure to soils collected from the Bailey Farmhouse Area. All COPCs selected and presented in **Table 5-1F** were retained as final COPCs. The EPCs were set at the maximum detected concentration as the sampling data set consisted of less than 10 samples.

The Bailey Farmhouse had been used as a residence by the former landowners. Of interest in this area, was residual contamination remaining in the leach fields and below an oil tank. Soil samples collected from these areas contained EPH, PCBs and VOCs.

Three scenarios were developed to evaluate the carcinogenic and noncarcinogenic risks from exposure to surface soil and include exposure under a residential land-use, exposure to an on-site worker and exposure to a construction worker. The non-carcinogenic risks to a child (i.e., 6-year exposure duration) resulting from exposure to soil under a residential scenario were also evaluated (see **Tables 5-10F and Tables 5-11F**). Noncarcinogenic and carcinogenic risks from exposure to subsurface soils were evaluated for the construction worker.

The noncarcinogenic risks for exposure to soils from Bailey Farmhouse are below an HI of 1.0 for all exposure scenarios and ranged from 0.04 for the construction worker (surface and subsurface soil) to 0.7 for the child (RME exposure).

Arsenic was the only carcinogenic compound retained as a soil COPC for the Bailey Farmhouse and as such, the following cancer risks are attributed entirely to arsenic. The carcinogenic risks for on-site and construction worker scenarios were within or below the USEPA target risk range and below the MDEP target risk of 1 x 10^{-5}. The carcinogenic risks ranged from 3.1 x 10^{-7} for the on-site worker (CT exposure) to 2.7 x 10^{-6} for the on-site worker (RME exposure). The residential risk scenarios were within the USEPA target risk range and below the MDEP target risk. The risks are 1.2 x 10^{-6} for the CT exposure and 7.9 x 10^{-6} for the RME exposure. .

5.6.4 Summary of the Risks from Exposure to Lead in Soils

The risks from exposure to lead could not be quantitatively evaluated. As discussed in **Section 5.5**, exposure to lead is to be qualitatively evaluated using the Interim Soil Lead Screening Concentration of 400 mg/kg. This soil concentration is considered to be protective of lead exposure under a residential land use. Lead was detected in 175 soil samples throughout Bailey Point at concentrations ranging from 3.4 mg/kg to 969 mg/kg. Sample location MS05SS75 (0 – 0.5 ft), a soil sample collected beneath the concrete slab of the former Information Center, was the only location where lead was reported at a concentration exceeding 400 mg/kg. However, the results of fifteen additional soil samples collected from the area immediately around MS05SS75 reported lead at concentrations ranging from 14.4 to 22.2 mg/kg. These concentrations are consistent with background conditions and are well below the 400 mg/kg screening concentration. Two other locations, MY05TP02 and MY05TP107A, reported lead at 397 mg/kg and 396 mg/kg, respectively. The remaining 175 locations reported lead at concentrations ranging from 3.4 mg/kg to 62.2 mg/kg.

In addition to the comparison of lead concentrations to the screening level, the USEPA evaluated the potential risks to children from lead exposure using the Integrated Exposure Uptake Biokinetic (IEUBK) Model. This model predicts possible blood lead levels based on site-specific data. The USEPA used groundwater and soil data collected from Bailey Point to evaluate site-specific lead risks**.** The results of the IEUBK model are presented in **Appendix H-5** and indicate that 99.9% of the population would have blood lead levels below the Center for Disease Control and USEPA goal of 10 micrograms lead per deciliter blood. The USEPA concluded that the soils at Bailey Point do not require remediation based on detected lead concentration (USEPA, 2004).

5.6.5 Summary of the Risks from Exposure to Shoreline Sediments

This risk assessment evaluated exposure to sediment by both a Commercial Shell fisherman exposed to sediments while harvesting clams, shellfish or worms and an area resident exposed to sediments while recreating around the intertidal and subtidal zones around Bailey Point (see **Tables 5-10H and Tables 5-11H**). PAHs were the primary contaminant in sediments. The estimated cancer and non-cancer risks for sediment exposure were below the MDEP target risk level of 10^{-5} and HI of 1.0 and within the USEPA target risk range of 10^{-4} to 10^{-6}. The estimated non-cancer HIs are 0.01 and 0.05 for the Commercial Shell fisherman CT and RME scenarios, respectively and 0.03 for the area resident. The estimated cancer risks for the Commercial Shell fisherman are 1.7 x 10^{-6} and 1.4 x 10^{-5} for the CT and RME scenarios, respectively and 6.0 x 10^{-6} for the area resident. CPAHs and arsenic were present in sediment at concentrations associated with individual cancer risks greater than 10^{-6} (RME exposures only). No constituents were present at concentrations associated with an individual cancer risk greater than 10^{-5} .

5.6.6 Summary of the Risks from Ingestion of Shellfish Tissue

This risk assessment evaluated future residential exposure to shellfish, including mussels, clams, lobsters and lobster tomalley obtained from the intertidal and subtidal zones around Bailey Point. Cancer and non-cancer risks were evaluated for a CT and RME exposure to residents, based on age-weighted factors to account for both childhood and adult exposure. In addition, non-cancer risks were also evaluated for a residential RME exposure for children (i.e. 6-year exposure duration) (see **Tables 5-10I and Tables 5-11I**).

The noncarcinogenic risks were greater than an HI of 1 for all species and ranged from 6 to 10 for the clam; 2 to 3 for the mussel; 3 to 5 for lobster and 7 to 12 for lobster tomalley. Individual constituents present in shellfish tissue at concentrations exceeding an HI of 1 include arsenic in all species (CT and RME exposure), iron in clams (CT and RME exposure), vanadium in clams (child RME exposure), and total PCBs in lobster tomalley (CT and RME exposure).

The carcinogenic risk estimates for ingestion of shellfish exceed both the MDEP target risk level of 10^{-5} and the USEPA target risk range of 10^{-6} to 10^{-4} for all species. The carcinogenic risks ranged from 2.0×10^{-4} to 1.1×10^{-3} for ingestion of clams; 7.2×10^{-5} to 4.0×10^{-4} for ingestion of mussels; 1.6×10^{-4} to 9.0×10^{-4} for ingestion of lobster and 2.6×10^{-4} to 1.4×10^{-3} for ingestion of lobster tomalley. Constituents present in shellfish tissue at concentrations exceeding an individual cancer risk of 10^{-5} included arsenic in all species, cadmium in mussels, and total PCBs in tomalley (RME exposure). The only constituent present in shellfish tissue exceeding an individual cancer risk of 10^{-4} was arsenic in all species (RME exposure). As discussed in **Section 5.5.3**, the assumption that arsenic in shellfish is in the toxic inorganic form overestimates the potential risk as 80 to 99 percent of arsenic is present in shellfish in the nontoxic organic form (ATSDR, 2000).

Reference samples of clams and mussels were collected from areas outside the influence of Maine Yankee and used to compare the concentration of chemicals detected in the clams and mussels collected from the Back River. Quantitative risk estimates were generated based on exposure to the average detected concentration of each COPC and age-weighted factors to account for both childhood and adult exposure (see **Tables 5-10I and Tables 5-11I**).

The noncarcinogenic risks associated with exposure to ingestion of shellfish tissue from reference locations were greater than an HI of 1 for both clams (HI of 10) and mussels (HI of 3). Individual constituents present in shellfish tissue at concentrations exceeding an HI of 1 include arsenic (clam and mussels) and iron (clam).

The carcinogenic risk estimates for ingestion of clams and mussels exceed both the MDEP target risk level of 10^{-5} and the USEPA target risk range of 10^{-6} to 10^{-4}. The carcinogenic risks ranged from 4.9×10^{-4} for ingestion of mussels to 1.1×10^{-3} for ingestion of clams. Constituents present in clams and mussels at concentrations exceeding an individual cancer risk of 10^{-5} included arsenic.

The noncarcinogenic and carcinogenic risk estimates based on exposure to the contaminants in the reference samples are similar to the risk estimates based on exposure to contaminants in the site samples. Many of the contaminants detected in the clams and mussels collected from the Back River were also detected at similar concentrations in clams and mussels collected from the reference locations. **Table 5-12** presents the COPCs and average contaminant concentration for site and reference clam and mussels samples. The relative percent difference between the average reference and average site concentrations was calculated and presented in **Table 5-12**.

A comparison of the site and reference clam data shows the presence of the same metals and PAHs in both site and reference samples (see **Table 5-12**). All contaminant concentrations were greater in the reference samples with the exception of copper, sodium, and 4-chloro-3-methylnaphthalene. The site samples reported more individual pesticide compounds, but both the reference and site samples contained the same classes of pesticides. A comparison of the site and reference mussel data shows a similar trend. Similar compounds were detected in both the site and reference mussel locations with the reference samples having slightly higher concentrations of most contaminants. Fewer individual pesticides were detected in reference mussel samples; however, the common pesticides were detected at higher concentrations in the reference locations.

5.6.7 Summary of the Risks from Exposure to Groundwater

This risk assessment evaluated groundwater exposure under a future potential residential land use scenario. As stated, it is unlikely that Bailey Point will support future residential land use suggesting that the calculated risk estimates are an overestimate of actual future risks from exposure to groundwater. The estimated cancer and non-cancer risks for groundwater exposure exceed the MDEP target risk level of 10^{-5} and an HI of 1 for both the CT and RME scenario (see **Tables 5-10J and Tables 5-11J**). The estimated cancer risk ranged from 5.1 x 10^{-5} to 6.1 x 10^{-4} for the CT and RME scenario, respectively. The estimated HIs were 4 and 80 for the CT and RME scenarios, respectively.

Arsenic is present in groundwater at concentrations that are associated with an individual carcinogenic risk greater than a 10^{-4} risk level. The EPC for arsenic under the RME exposure scenario is 23 ug/L and is associated with an incremental cancer risk level of 4 x 10^{-4}. Dieldrin, heptachlor, trichloroethene and vinyl chloride are present in groundwater at concentrations associated with individual cancer risk estimates greater than 10^{-5} (RME exposure). Arsenic, iron, manganese and molybdenum had individual HIs greater than 1.0 under the RME exposure and iron had an individual HI greater than 1.0 under the CT exposure. All other compounds had individual HIs less than one.

5.6.8 Summary of the Risks from Ingestion of Produce

This risk assessment evaluated the potential risks to soil contaminants through the uptake and ingestion of above and below ground produce. Because no produce is grown on-site, contaminant concentrations in produce were estimated using chemical-specific bioconcentration factors (USEPA, 1998f). The exposure scenario assumed that an area resident consumed produce over a 30-year exposure duration. The estimated contaminant concentration in produce is presented in **Appendix H-4**. Noncancer and cancer risks were estimated for this route of exposure (see **Tables 5-11K**). The noncarcinogenic hazards ranged from 0.2 for produce grown in soils from Bailey Farmhouse to 1.3 for produce grown in soils from Warehouse 2/3. The carcinogenic risks were all above the MDEP target risk level and ranged from 2.9×10^{-5} for produce grown in soils from the Bailey Farmhouse to 2.2×10^{-4} for produce grown in soils from the Plant Area. Constituents estimated to be present in produce and associated with in individual cancer risk greater than 10^{-6} include arsenic (all areas) and cPAHs (Plant Area, Warehouse 2/3 and 345 kV Transmission Line). Constituents estimated to be present in produce and associated with in individual cancer risk greater than 10^{-5} include cPAHs (Plant Area, Warehouse 2/3 and 345 kV Transmission Line).

5.7 Comparison of Groundwater Constituents to MCLs and MEGs

A comparison of the maximum detected groundwater concentrations to federal MCLs and Maine Maximum Exposure Guidelines (MEGs) was made to identify compounds present in groundwater above federal primary drinking water standards or state guidelines. Groundwater contaminants and their respective MEGs and MCLs are presented in **Table 5-13**.

Eighteen groundwater constituents were identified as being present at concentrations greater than their respective standard or guideline concentration and include 9 metals (aluminum, arsenic, boron, lead, manganese, molybdenum, silver, sodium and thallium), two pesticides (dieldrin and heptachlor) six organic compounds (4-methylphenol, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, ethylbenzene and vinyl chloride) and DRO.

5.8 Total Site Risks

Future residential land use is unlikely for Bailey Point, since it is Maine Yankees' intention to limit future land use in the Bailey Point area to industrial/commercial activities. Estimates of total site risks (i.e., the sum of risks from various exposure pathways) were developed at the request of MDEP and MBOH and are presented in **Table 5-14** and **Table 5-15** for non cancer and caner risks, respectively. These risk estimates are based on the assumption that an area resident or site/construction worker may experience exposure to site related contaminants through multiple exposure pathways (i.e., direct contact and ingestion of soil and sediment and ingestion of home grown produce). It is important to note that the total residential site risks presented for Bailey Point are biased high as a result of compounding or summing sequentially conservative exposure assumptions. Risk estimates based on a more probabilistic model of total exposure will be lower than those presented in **Table 5-14** and **Table 5-15**. Total site risks are summarized below by land use scenarios.

Industrial/Commercial Land Use: The total site risks to the on-site and construction workers are based on concurrent ingestion and direct contact exposure to soil, and are consistent with an industrial/commercial future land use. The total site non cancer risks to the on-site worker and construction were all below an HI of 1.0 (see **Table 5-14**). The total site cancer risks to the on site worker (including arsenic) ranged from 3.1 x 10^{-7} for Bailey Farmhouse (CT) to 1.9 x 10^{-5} for the Plant Area (RME). The total site risks to the construction worker (including arsenic) ranged from 3.4 x 10^{-7} for Bailey Farmhouse to 1.9 x 10^{-6} for the Plant Area (surface soils). Removing arsenic from the risk calculation results in lower risk levels for the site/construction worker. The total site risk estimates associated with an exposure consistent with industrial/commercial future land use are at or below the MDEP target risk of 1 x 10^{-5} (see **Table 5-15**).

Residential Land Use: The total site non cancer risks to the future resident are all below and HI of 1.0 except for Warehouse 2/3. The non cancer risks based on exposure in this area are 1.5 (CT) and 1.6 (RME) (see **Table 5-14**).The total site cancer risks for the future resident are all above the MDEP target risk and range from 3.6 x 10^{-5} for the Bailey Farmhouse (CT) to 2.7 x 10^{-4} for the Plant Area (RME). Total site risks for the future resident excluding the contribution from arsenic were still above the target risk for all areas except Bailey Farmhouse and ranged from 1.7 x 10^{-5} for the 345 kV Transmission Line Area (CT) to 2.2 x 10^{-4} for the Plant Area (RME). The risk from the ingestion of homegrown produce contributes the most to the total site risks. For residents who may also ingest shellfish total site risks may be increased by 7.2 x 10^{-5} to 1.4 x 10^{-3} depending upon the type of shellfish. It should be noted that the risk from ingestion of shellfish collected around Bailey Point are indistinguishable from background risks and are not attributed to activities conducted at Maine Yankee.

5.9 Summary and Conclusions

The purpose of this baseline HHEA was to evaluate potential human health risks due to exposure to residual contamination in soils, sediment, shellfish tissue and groundwater at or surrounding the industrial portion of the Maine Yankee Facility. Based on the site history and results of the RFI (**see Section 4**.), the site was divided into 10 discrete areas for purposes of site and risk characterization. The risks associated with exposure to soils in three of these areas were not evaluated as part of this risk assessment. These areas have either not been impacted by historical land use and have chemical concentrations consistent with PALs (Foxbird Island), have been remediated (Forebay) or require additional site characterization to assess potential remedial options (Former Truck Maintenance Garage). The risks associated with exposure to soils at the 115 kV Switchyard, Personnel Buildings and Parking Lot Areas and ISFSI were evaluated by comparing detected concentrations to the MDEP Remedial Action Guidelines concentrations. This approach was considered appropriate for these areas as sampling and analytical results support the conclusion that these areas have not been adversely impacted by historical site activities. The risks associated with exposure at the Plant Areas, Warehouse 2/3, the 345 kV Transmission Line Area and the Bailey Farmhouse were evaluated in accordance with MDEP and USEPA methodology as presented in the Draft HHEA Work Plan.

Based on the site background and site conceptual model, exposure to contaminated media was evaluated for shoreline sediment, shellfish tissue, groundwater and soil and homegrown produce from four areas within Bailey Point. Exposure to soils within each study area was evaluated for a construction worker, on-site worker and resident. Exposure to sediment, fish tissue, groundwater and homegrown produce was evaluated for a hypothetical resident on the Maine Yankee site. COPCs were selected for each study areas based on USEPA screening criteria. EPCs were calculated for each COPC and used to estimate an exposure dose concentration for each exposure pathway. The exposure dose concentrations were combined with toxicity information to quantitatively estimate non-carcinogenic and carcinogenic risks. Estimated cancer risks were compared to the USEPA risk range of 10^{-4} to 10^{-6} and MDEP target risk level of 10^{-5}. Non-carcinogenic risks were compared to an HI of 1. The quantitative risk estimates were based on assumptions to render the final risk estimates as overly conservative.

A summary of the non-carcinogenic and carcinogenic risks associated with each exposure scenario is discussed below by media.

Soils

Residual soil contamination was detected throughout Bailey Point. The source of and primary contaminants detected within each study area are presented and discussed in **Sections 4.4 and 4.8.1**. In general, EPH and PAH compounds were detected most frequently and at elevated concentrations in soils. PCBs, pesticides and VOC were also detected but sporadically throughout the site. The risk assessment focused on a subset of all compounds detected in soils. Primary COPCs were selected for each study area by comparing the maximum detected concentration to appropriate risk-based screening concentrations. Final COPCs were selected based on a conservative screening of noncancer and cancer risks. EPCs for soil contaminants were calculated using appropriate formulae presented in USEPA guidance (USEPA, 2002a). The COPCs selected for and evaluated in the risk assessment were an accurate reflection of the key contaminants at each site.

Noncarcinogenic and carcinogenic risks associated with exposure to soil were evaluated for the on-site worker, construction worker and resident. A residential scenario was included at the request of MBOH although future residential land-use at this site is considered unlikely. Maine Yankee has indicated their intention to implement deed restrictions to limit future development of Bailey Point to industrial/commercial land-use. This restriction and the presence of the ISFISI suggest that future residential development on Bailey Point is highly unlikely. Therefore, the risk estimates developed for the residential scenario should not be considered to reflect future potential risks and should not be the sole basis for risk management decisions. A summary of the non cancer and cancer risks are provided below.

Non Cancer Risks

A summary of the noncarcinogenic risks associated with exposure around Bailey Point is presented in **Table 5-14**. The noncarcinogenic risks for all exposure scenarios except the child residential exposure scenario were at or below an HI of 1.0. The HI based on a 6-year childhood exposure duration was slightly above 1.0 for the Warehouse 2/3 (HI of 1.2) and 345 kV Transmission Lines (HI of 1.1). Exposure to arsenic and iron account for the majority of the non-carcinogenic risks in this area. Arsenic and iron are naturally occurring elements and are not related to plant activities. They are present in soils at concentrations associated with background conditions. Eliminating the risks associated with exposure to arsenic and iron results in a lowering of the noncarcinogenic risk estimate to below an HI of 1.0.The noncarcinogenic risks from exposure to soils throughout the Bailey Point are below levels considered to present a non cancer hazard to human health..

Cancer Risks

A summary of the carcinogenic risks associated with exposure around Bailey Point is presented in **Table 5-15**. Carcinogenic risks associated with exposure to soil were evaluated for the construction worker, on-site worker and resident and are discussed below.

The carcinogenic risks associated with exposure to soil for the construction worker scenarios were all at or below the lower end of the USEPA target risk range (i.e., below 10^{-6}) and below MDEP target risk level of 10^{-5}. No individual constituents were present in soils at concentrations associated with an individual cancer risk level greater than 1 x 10^{-6} risk. These risk estimates indicate that short-term intense exposure to both surface and subsurface soils throughout the Bailey Point does not present a significant health risk.

The carcinogenic risks associated with exposure to soil for the on-site worker were at or below the MDEP target risk level and within or below the USEPA target risk range. Carcinogenic risks ranged from 3.1 x 10^{-7} for the Bailey Farmhouse (CT exposure) to 1.9 x 10^{-5} for Plant Area (RME exposure). Only two constituents are present in soil at concentrations associated with individual risk level greater than 10^{-6} and include arsenic and cPAHs. No constituents are present in soils at a concentration associated with an individual risk level greater than 10^{-5} .

Exposure to arsenic presents the greatest risk to the on-site worker. As discussed in **Section 4.7.1** arsenic has been detected throughout Bailey Point at concentrations associated with background conditions. Arsenic was not utilized or produced by any plant-related activities. Removing arsenic from the risk calculations results in lower carcinogenic risk estimates to be between 9.9 x 10^{-8} for 345 kV Transmission Line to 1.5 x 10^{-5} for the Plant Area . CPAHs becomes the only constituent present in soils at concentrations associated with individual cancer risks greater than 10^{-6} (Plant Area and Warehouse 2/3), and no constituents are present in soils at concentrations associated with individual cancer risks greater than 10^{-5} . These risk estimates indicate that long-term exposure to soil by an on-site worker does not present a significant health risk.

The carcinogenic risks based on direct contact and incidental ingestion of soil under the residential scenario were within the USEPA target risk range. The residential risks under the CT exposure scenarios were all below the MDEP target risk of 1×10^{-5} and ranged from 1.2×10^{-6} (Bailey Farmhouse) to 6.5×10^{-6} (Plant Area). The residential risks under the RME exposure scenarios exceeded the MDEP target risk level of 1×10^{-5} for all areas except Bailey Farmhouse and ranged from 7.9×10^{-6} (Bailey Farmhouse) to 4.8×10^{-5} (Plant Area) (see **Table 5-15**). CPAHs and arsenic are present in soils at concentrations associated with a greater than a 10^{-6} risk level

The risk estimates developed for the construction and on-site worker scenarios indicate that future exposure to soils at Bailey Point under a commercial/industrial land use do not present a significant health risk. Although some compounds were detected in these soils at concentrations greater than their PAL, the risks based on site-specific exposure considerations are below levels of concern. Arsenic and cPAHs are the only constituents present in soils at concentrations associated with an incremental cancer risk to the on-site or construction worker greater than 1×10^{-6} and no constituents are present at concentrations associated with an incremental cancer risk to the on-site or construction worker greater than 1×10^{-5}. Based on these risk estimates, no additional actions are considered necessary to reduce human health risks from exposure to surface soils at this site.

Subsurface Soils

Residual contamination was detected in subsurface soils at the Plant Area, Warehouse 2/3, 345 kV Transmission Line Area, and Bailey Farmhouse. Key contaminants present in these soils include PAHs and EPH. A hypothetical construction worker scenario was developed consistent with USEPA guidance to evaluate potential risks from exposure to subsurface soil. The scenario assumes short-term but intense exposure to soil. The noncarcinogenic risk estimates for this scenario were all below an HI of 1.0 (see **Table 5-14**). The carcinogenic risks for this scenario were all below the MDEP target risk level of 1×10^{-5} and ranged from 3.9×10^{-7} (Bailey Farmhouse) to 1.6×10^{-6} (Plant Area) (see **Table 5-15**). No compounds were present at concentrations associated with an individual cancer risk above 1×10^{-6} . These risk estimates indicate that future exposure to subsurface soils at Bailey Point do not present a significant health risk. No additional actions are considered necessary to reduce human health risks from exposure to subsurface soils at this site.

Sediments

Residual contamination was detected in sediments collected from the intertidal and subtidal portion of the Back River and Bailey Cove. PAH compounds were the key contaminants present in sediment. Risk estimates were developed for the Commercial Shellfisherman and the area resident. The routes of exposure included ingestion and dermal contact with sediment.

The carcinogenic risk estimates for both receptors were within and below the USEPA target risk range and at or below the MDEP target risk level (see **Table 5-15**). The noncarcinogenic risks were all below a target HI of 1.0 (see **Table 5-14**). These risk estimates indicate that future exposure to sediments within the Back River do not present a significant health risk. No additional actions are considered necessary to reduce human health risks from exposure to sediments at this site.

Shellfish Tissue

This risk assessment evaluated the ingestion of shellfish, including mussels, clams, lobsters, and lobster tomalley. The carcinogenic risk estimates for this route of exposure exceed both the MDEP target risk level of 10^{-5} and the USEPA target risk range of 10^{-6} to 10^{-4} for all species. The carcinogenic risks ranged from 7.2×10^{-5} for ingestion of mussels (CT exposure) to 1.4×10^{-3} for ingestion of tomalley (RME exposure) (see **Table 5-15**). The noncarcinogenic risks were greater than an HI of 1 for all species and ranged from 2 for the mussel (CT exposure) to 12 for the lobster tomalley (RME exposure) (see **Table 5-14**). As discussed in **Section 5.5.3**, the carcinogenic risks from the ingestion of arsenic in seafood may be overestimated by an order of magnitude.

Carcinogenic and noncarcinogenic risks from ingestion of clams and mussels obtained from the reference locations were greater than the MDEP target risk level of 10^{-5} and the USEPA target risk range of 10^{-6} to 10^{-4} USEPA and exceeded an HI of 1.0 (see **Tables 5-14 and 5-15**). No lobsters were collected from reference locations.

Similar contaminants were detected in site and reference clam and mussel samples with the majority of contaminants being present at greater concentrations in the reference samples (see **Table 5-12**). The concentration of individual PAH compounds, the primary contaminant in the outfall sediments, were actually greater in the reference samples. There does not appear to be a significant difference between the chemical composition of the site and reference samples. As such, the risks from ingestion of biota appear to be the result of background conditions.

Groundwater

Residual contamination was detected in the groundwater collected from Bailey Point. A residential groundwater scenario was evaluated to estimate potential risks from groundwater exposure under future unrestricted land use. The EPC were set at the average and maximum detected concentration for both the CT and RME scenarios, respectively. The exposure pathways included ingestion, inhalation and dermal contact with groundwater.

The carcinogenic and noncarcinogenic risk estimates exceeded both the USEPA target risk range and the MDEP target risk level. Exposure to arsenic was associated with an individual carcinogenic risk greater than 10^{-4}. Exposure to dieldrin, heptachlor, trichloroethene and vinyl chloride was associated with individual carcinogenic risk estimates greater than 10^{-5}. Exposure to arsenic, iron, manganese and molybdenum were associated with noncarcinogenic HIs greater than 1.0.

The following groundwater constituents were detected at concentrations greater than their respective MCL or MEG concentration: aluminum, arsenic, boron, lead, manganese, molybdenum, silver, sodium, thallium, dieldrin, heptachlor, 4-methylphenol, 1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, ethylbenzene vinyl chloride and DRO (see **Table 5-13**).

These risk estimates indicate that exposure to groundwater from the Bailey Point may present health risks. As such, the CMS should evaluate potential corrective actions to either reduce exposure to or reduce contaminant concentrations in groundwater.

Produce

This risk assessment evaluated the potential risks from contaminant uptake and ingestion of homegrown produce. Contaminant concentrations in produce were estimated using chemical specific bioconcentration factors and site-specific surface soil concentrations (USEPA, 1998f). The noncarcinogenic risks were all below an HI of 1.0 except for Warehouse 2/3 and ranged from 0.2 for produce grown in at Bailey Farmhouse to 1.3 for produce grown in the Warehouse 2/3 area (see **Table 5-14**). The carcinogenic risks were all above the MDEP target risk level and ranged from 2.9×10^{-5} for produce grown in the Bailey Farmhouse to 2.2×10^{-4} for produce grown in the Plant Area (see **Table 5-15**).

The risks from ingestion of homegrown produce presents the greatest risks to the future resident and in some areas is up to two orders of magnitude greater than the risks associated with direct contact and incidental ingestion exposure to soil (**see Table 5-15**).

5.10 Uncertainties and Limitations

The quantitative risk estimates are based on a considerable number of assumptions, extrapolations and uncertainties. Areas of uncertainty are associated with most aspects of the project including sampling and analysis, data evaluation, estimating exposure point concentrations, quantifying exposure parameters and quantifying toxicity dose-response evaluations. Each of these areas may result in an under- or overestimate of risk as described below.

The data used to estimate EPC were from sampling data biased high. Soil, sediment and groundwater samples were collected from known or suspected areas of contamination and may not accurately reflect actual exposure to various receptors. In addition, long term exposure was evaluated based on current conditions with no correction for chemical dilution, dispersion or degradation. It is extremely unlikely that site conditions will remain unchanged for the next 25 to 30 years.

Arsenic and iron were retained as COPCs and carried through in the risk assessment. As discussed in **Sections 4.7.1 and 4.8.1.1**, these metals are naturally occurring and were present at the site typically within reference concentrations (see **Tables 4-2** and **4-6** through **4-20**). A significant portion of the estimated carcinogenic risk is attributed to exposure to arsenic and would be present regardless of the impacts of previous site activities.

Exposure parameters used to estimate frequency, duration and intensity of exposure were typically based on conservative exposure assumptions (i.e., 95 percentile ingestion rates, surface areas, etc.). However, many exposure parameters are based on limited scientific data (i.e., adherence factors and dermal absorption factors) and are only estimates of what may actually be occurring.

The toxicity data used in this evaluation is based on uncertainty as reflected in the use of modifying and uncertainty factors. Some toxicity factors were based on route-to-route extrapolations and from sub-chronic to chronic effects. The effect of these uncertainties is not know and may under- or over-estimate risk. Toxicity data were not available for all compounds detected at the site and therefore exposure may have been underestimated. This was most apparent in evaluation the dermal route of exposure. Chronic toxicity factors were used to evaluate subchronic childhood exposure to soils and therefore, may have overestimated the potential risks to this population.

Sufficient quantitative toxicity information was not available for seven organic compounds detected in soil and sediment including acenaphthalene, 2-hexanone, benzo(g,h,i)perylene, phenanthrene, endrin aldehyde, 2-methylnaphthalene and carbazole. These compounds were carried through as COPCs but the risk from exposure to these constituents could not be quantified. Of these, two compounds were detected at very low frequency and at very low concentrations and are not considered to be site related. These compounds are 2-hexanone (detected in 1 of 61 soil samples and no sediment samples) and endrin aldehyde (detected in 2 of 34 soil and 1 of 33 sediment samples). The remaining five compounds were commonly present throughout the site and included, acenapthalene, 2-methylnaphthalene, benzo(g,h,i)perylene, phenanthrene and carbazole. The lack of sufficient toxicity information for these compounds may underestimate the total risk, however, these compounds were associated, both in their distribution and concentration, with other PAH compounds that were quantitatively evaluated

These same compounds and some additional pesticide compounds lacking sufficient quantitative toxicity information were also detected in shellfish. However, the distribution and concentration of these compounds were indistinguishable from reference samples and are attributed to background conditions.

There are limited scientific data to quantify the uptake of soil contaminants in produce. The bioconcentration factors used in this risk assessment are conservative values and likely overestimate the contaminant concentration in produce. Bioconcentration factors however, were not available for all compounds detected in soils and therefore may underestimate the total contaminant concentration in produce.

The risks from ingestion of seafood are likely overestimated because of the assumption that the arsenic present in these samples is in the toxic inorganic form. The ATSDR reports that 80 to 99 percent of arsenic is seafood is present in the nontoxic organic form.

These are some of the uncertainties inherent in this baseline HHRA. Their effect on the overall risk estimates cannot be quantified. However, the standard assumptions developed by the regulatory agencies and used in this risk assessment are selected to render the final risk estimates as conservative in part to offset the uncertainties.

Table 5-1A
Occurrence, Distribution and Selection of COPCs
115kV Switchyard

Medium	CAS No.	Chemical	Min. Conc.	Max. Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
Soils												
Metals	7429-90-5	ALUMINUM	9600	23900	mg/kg	MY05TP08(6.5-6.8)	3/3	16733	23900	7600	Y	ASL
	7440-36-0	ANTIMONY	0.04	0.07	mg/kg	MY05TP08(6.5-6.8)	2/3	0.04	0.07	3.1	N	BSL
	7440-38-2	ARSENIC	8.4	11.1	mg/kg	MY05TP06(6.5-6.8)	3/3	9	11.1	0.39	Y	ASL
	7440-39-3	BARIUM	47.1	86.5	mg/kg	MY05TP08(6.5-6.8)	3/3	68	86.5	540	N	BSL
	7440-41-7	BERYLLIUM	0.4	0.7	mg/kg	MY05TP08(6.5-6.8)	3/3	0.547	0.7	150	N	BSL
	7440-42-8	BORON	1.2	3.4	mg/kg	MY05TP08(6.5-6.8)	2/3	1.595	3.4	1600	N	BSL
	7440-43-9	CADMIUM	0.12	0.12	mg/kg	MY05TP07(5.5-5.8)	1/3	0.057	0.12	3.7	N	BSL
	7440-70-2	CALCIUM	1450	2980	mg/kg	MY05TP08(6.5-6.8)	3/3	2217	2980	NA	N	NUT
	7440-47-3	CHROMIUM	20.5	56.2	mg/kg	MY05TP08(6.5-6.8)	3/3	38	56.2	10000	N	BSL
	7440-48-4	COBALT	6.4	13.5	mg/kg	MY05TP06(6.5-6.8)	3/3	11	13.5	90	N	BSL
	7440-50-8	COPPER	17.7	25.1	mg/kg	MY05TP08(6.5-6.8)	3/3	20	25.1	310	N	BSL
	7439-89-6	IRON	15500	33200	mg/kg	MY05TP08(6.5-6.8)	3/3	24533	33200	2300	Y	ASL
	7439-92-1	LEAD	8	12.2	mg/kg	MY05TP07(5.5-5.8)	3/3	11	12.2	40	N	BSL
	7439-95-4	MAGNESIUM	4840	9480	mg/kg	MY05TP08(6.5-6.8)	3/3	6963	9480	NA	N	NUT
	7439-96-5	MANGANESE	304	660	mg/kg	MY05TP06(6.5-6.8)	3/3	474	660	180	Y	ASL
	7439-97-6	MERCURY	0.03	0.03	mg/kg	MY05TP07(5.5-5.8)	1/3	0.013	0.03	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.86	1.1	mg/kg	MY05TP06(6.5-6.8)	3/3	0.960	1.1	39	N	BSL
	7440-02-0	NICKEL	17.3	45.8	mg/kg	MY05TP08(6.5-6.8)	3/3	32	45.8	160	N	BSL
	7440-09-7	POTASSIUM	2110	5890	mg/kg	MY05TP08(6.5-6.8)	3/3	4100	5890	NA	N	BSL
	7440-23-5	SODIUM	106	238	mg/kg	MY05TP08(6.5-6.8)	3/3	184	238	NA	Y	NTX
	7440-28-0	THALLIUM	0.22	0.26	mg/kg	MY05TP08(6.5-6.8)	2/3	0.18	0.26	0.52	N	BSL
	7440-62-2	VANADIUM	23.1	50.6	mg/kg	MY05TP08(6.5-6.8)	3/3	38	50.6	55	N	BSL
	7440-66-6	ZINC	53.8	74.4	mg/kg	MY05TP08(6.5-6.8)	3/3	67	74.4	2300	N	BSL
SVOCs	120-12-7	ANTHRACENE	260	260	ug/kg	MY05TP07(5.5-5.8)	1/3	230	260	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	430	430	ug/kg	MY05TP07(5.5-5.8)	1/3					
	50-32-8	**BENZO(A)PYRENE**	380	380	ug/kg	MY05TP07(5.5-5.8)	1/3					
	205-99-2	**BENZO(B)FLUORANTHENE**	470	470	ug/kg	MY05TP07(5.5-5.8)	1/3					
	218-01-9	**CHRYSENE**	430	430	ug/kg	MY05TP07(5.5-5.8)	1/3					
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	230	230	ug/kg	MY05TP07(5.5-5.8)	1/3					
		BENZO(A)PYRENE equivalent		493	ug/kg				493	62	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	210	210	ug/kg	MY05TP07(5.5-5.8)	1/3	213	210	NA	Y	NTX
	206-44-0	FLUORANTHENE	1000	1000	ug/kg	MY05TP07(5.5-5.8)	1/3	477	1000	230000	N	BSL
	85-01-8	PHENANTHRENE	990	990	ug/kg	MY05TP07(5.5-5.8)	1/3	473	990	NA	Y	NTX
	129-00-0	PYRENE	720	720	ug/kg	MY05TP07(5.5-5.8)	1/3	383	720	230000	N	BSL
VOCs	67-64-1	ACETONE	13	13	ug/kg	MY05TP06(6.5-6.8)	1/3	8	13	160000	N	BSL
	75-09-2	METHYLENE CHLORIDE	90	90	ug/kg	MY05TP06(6.5-6.8)	1/3	35	90	9100	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text

1 - USEPA Region 9 Soil PRGs modified to an HI = 0.1. Same units as reported concentrations

COPC - Compounds of Potential Concern

DRO - Diesel Range Organics　　Conc. - Concentration　　NUT - Essential Nutrient

J - estimated concentration　　Min. - Minimum　　BSL - Below Screening Level

NTX - Insufficient toxicity information　　Max - Maximum　　ASL - Above Screening Level

Table 5-1B
Occurrence, Distribution and Selection of COPCs
Personnel Buildings and Parking Lot Areas

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
Surface Soils												
Metals	7429-90-5	ALUMINUM	9620	11400	mg/kg	MY05SB17(0-0.5)	3/3	10506.67	11400	7600	Y	ASL
	7440-36-0	ANTIMONY	1.5 J	1.5 J	mg/kg	MY05SS75(0-0.5)	1/1	1.50	1.5 J	3.1	N	BSL
	7440-38-2	ARSENIC	7.8	12	mg/kg	MY05SS67	3/3	9.87	12	0.39	Y	ASL
	7440-39-3	BARIUM	43.4	52.2	mg/kg	MY05SS67	3/3	47.57	52.2	540	N	BSL
	7440-41-7	BERYLLIUM	0.37	0.41	mg/kg	MY05SS75(0-0.5)	3/3	0.40	0.41	150	N	BSL
	7440-42-8	BORON	0.65	0.65	mg/kg	MY05SB17(0-0.5)	1/3	0.34	0.65	1600	N	BSL
	7440-43-9	CADMIUM	0.12	0.17	mg/kg	MY05SS67	2/3	0.14	0.17	3.7	N	BSL
	7440-70-2	CALCIUM	1530	3120	mg/kg	MY05SB17(0-0.5)	3/3	2086.67	3120	NA	N	NUT
	7440-47-3	CHROMIUM	19.9 J	44 J	mg/kg	MY05SS75(0-0.5)	3/3	29.27	44 J	10000	N	BSL
	7440-48-4	COBALT	6.7	7.9	mg/kg	MY05SS75(0-0.5)	3/3	7.20	7.9	90	N	BSL
	7440-50-8	COPPER	16.7	25.3	mg/kg	MY05SS67	3/3	19.93	25.3	310	N	BSL
	7439-89-6	IRON	15800	17000	mg/kg	MY05SS75(0-0.5)	3/3	16300.00	17000	2300	Y	ASL
	7439-92-1	LEAD	11.9	969	mg/kg	MY05SS75(0-0.5)	3/3	331.43	969	40	Y	ASL
	7439-95-4	MAGNESIUM	5270	5620	mg/kg	MY05SS75(0-0.5)	3/3	5450.00	5620	NA	N	NUT
	7439-96-5	MANGANESE	301	362	mg/kg	MY05SS75(0-0.5)	3/3	328.67	362	180	Y	ASL
	7439-98-7	MOLYBDENUM	0.48	0.77	mg/kg	MY05SS67	2/3	0.55	0.77	39	N	BSL
	7440-02-0	NICKEL	17.8	21	mg/kg	MY05SS75(0-0.5)	3/3	19.80	21	160	N	BSL
	7440-09-7	POTASSIUM	2440	2540	mg/kg	MY05SB17(0-0.5)	3/3	2500.00	2540	NA	N	NUT
	7440-22-4	SILVER	0.04	1.9	mg/kg	MY05SS67	2/3	0.69	1.9	39	N	BSL
	7440-23-5	SODIUM	106 J	415 J	mg/kg	MY05SB17(0-0.5)	3/3	217.67	415 J	NA	Y	NTX
	7440-28-0	THALLIUM	0.29	0.29	mg/kg	MY05SB17(0-0.5)	1/3	0.19	0.29	0.52	N	BSL
	7440-62-2	VANADIUM	22.8	40.8	mg/kg	MY05SB17(0-0.5)	3/3	29.43	40.8	55	N	BSL
	7440-66-6	ZINC	63.1	74.8	mg/kg	MY05SS67	3/3	69.13	74.8	2300	N	BSL
VOCs	67-64-1	ACETONE	7 J	22 J	ug/kg	MY05SB17(0-0.5)	2/3	11.83	22 J	160000	N	BSL
Surface and Subsurface Soils												
Metals	7429-90-5	ALUMINUM	8330	30500	mg/kg	MY05SB19(10-12)	8/8	14131.25	30500	7600	Y	ASL
	7440-36-0	ANTIMONY	1.5 J	1.5 J	mg/kg	MY05SS75(0-0.5)	1/5	0.33	1.5 J	3.1	N	BSL
	7440-38-2	ARSENIC	7.4	12	mg/kg	MY05SS67	8/8	9.41	12	0.39	Y	ASL
	7440-39-3	BARIUM	43.1	119	mg/kg	MY05SB19(10-12)	8/8	58.94	119	540	N	BSL
	7440-41-7	BERYLLIUM	0.33	0.84	mg/kg	MY05SB19(10-12)	8/8	0.49	0.84	150	N	BSL
	7440-42-8	BORON	0.63	0.65	mg/kg	MY05SB17(0-0.5)	2/8	1.06	0.65	1600	N	BSL
	7440-43-9	CADMIUM	0.02 J	0.17	mg/kg	MY05SS67	7/8	0.09	0.17	3.7	N	BSL
	7440-70-2	CALCIUM	1080	9220	mg/kg	MY05SB17(4-5)	8/8	3145.00	9220	NA	N	NUT
	7440-47-3	CHROMIUM	19.8	64.2	mg/kg	MY05SB19(10-12)	8/8	31.99	64.2	10000	N	BSL
	7440-48-4	COBALT	5	17	mg/kg	MY05SB19(10-12)	8/8	8.54	17	90	N	BSL
	7440-50-8	COPPER	12.5	27.9	mg/kg	MY05SB19(10-12)	8/8	18.96	27.9	310	N	BSL
	7439-89-6	IRON	9750	39600	mg/kg	MY05SB19(10-12)	9/9	18538.89	39600	2300	Y	ASL

Table 5-1B
Occurrence, Distribution and Selection of COPCs
Personnel Buildings and Parking Lot Areas

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
	7439-92-1	LEAD	5.9	969	mg/kg	MY05SS75(0-0.5)	8/8	130.10	969	40	Y	ASL
	7439-95-4	MAGNESIUM	3640	14100	mg/kg	MY05SB19(10-12)	8/8	6283.75	14100	NA	N	NUT
	7439-96-5	MANGANESE	296	732	mg/kg	MY05SB19(10-12)	8/8	401.13	732	180	Y	ASL
	7439-98-7	MOLYBDENUM	0.43	1.2	mg/kg	MY05SB17(4-5)	7/8	0.73	1.2	39	N	BSL
	7440-02-0	NICKEL	14.5	52.5	mg/kg	MY05SB19(10-12)	8/8	24.71	52.5	160	N	BSL
	7440-09-7	POTASSIUM	2010	8670	mg/kg	MY05SB19(10-12)	8/8	3492.50	8670	NA	N	NUT
	7782-49-2	SELENIUM	0.52 J	0.53 J	mg/kg	MY05SB19(10-12)	2/8	0.32	0.53 J	39	N	BSL
	7440-22-4	SILVER	0.04	1.9	mg/kg	MY05SS67	6/8	0.29	1.9	39	N	BSL
	7440-23-5	SODIUM	106 J	452	mg/kg	MY05SB19(10-12)	6/8	206.38	452	NA	Y	NTX
	7440-28-0	THALLIUM	0.29	0.29	mg/kg	MY05SB17(0-0.5)	1/8	0.13	0.29	0.52	N	BSL
	7440-62-2	VANADIUM	19.8	61.1	mg/kg	MY05SB19(10-12)	8/8	31.76	61.1	55	Y	ASL
	7440-66-6	ZINC	32.9	85.1	mg/kg	MY05SB19(10-12)	8/8	60.01	85.1	2300	N	BSL
SVOCs	56-55-3	**BENZO(A)ANTHRACENE**	330 J	330 J	ug/kg	MY05SB17(4-5)	1/7	426.43				
	50-32-8	**BENZO(A)PYRENE**	300 J	300 J	ug/kg	MY05SB17(4-5)	1/7	422.14				
	205-99-2	**BENZO(B)FLUORANTHENE**	370	370	ug/kg	MY05SB17(4-5)	1/7	432.14				
	218-01-9	**CHRYSENE**	310 J	310 J	ug/kg	MY05SB17(4-5)	1/7	423.57				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	240 J	240 J	ug/kg	MY05SB17(4-5)	1/7	413.57				
		BENZO(A)PYRENE equivalent		394	ug/kg				394	62	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	200 J	200 J	ug/kg	MY05SB17(4-5)	1/7	407.86	200 J	NA	Y	NTX
	206-44-0	FLUORANTHENE	940	940	ug/kg	MY05SB17(4-5)	1/7	513.57	940	230000	N	BSL
	85-01-8	PHENANTHRENE	520	520	ug/kg	MY05SB17(4-5)	1/7	453.57	520	NA	Y	NTX
	129-00-0	PYRENE	520	520	ug/kg	MY05SB17(4-5)	1/7	453.57	520	230000	N	BSL
VOCs	67-64-1	ACETONE	7 J	22 J	ug/kg	MY05SB17(0-0.5)	2/9	11.83	22 J	160000	N	BSL
	79-01-6	TRICHLOROETHENE	58	58	ug/kg	MY05SB19(10-12)	1/9	9.06	58	53	Y	ASL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text

1 - USEPA Region 9 Soil PRGs modified to an HI = 0.1. Same units as reported concentrrations

COPC - Compound of Potential Concern

J - estimated concentration — BSL - Below Screening Level

Conc. - Concentration — ASL - Above Screening Level

Min. - Minimum — NUT - Essential Nutrient

Max. - Maximum — NTX - Insufficient Toxicity Information

Table 5-1C
Occurrence, Distribution and Selection of COPCs
Plant Area

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
Surface Soils												
Fuel	NA	DIESEL RANGE ORGANICS	5.5	110	mg/kg	MYLOSS05(0-0.5)	5/5	45.20	110	NA	Y	NTX
Metals	7429-90-5	ALUMINUM	4990	25400	mg/kg	MY05SB16(0-0.5)	39/39	9433.72	25400	7600	Y	ASL
	7440-36-0	ANTIMONY	0.315 J	0.6725 J	mg/kg	MY05SB01 & SB75(0-0.5)	4/36	0.22	0.6725 J	3.1	N	BSL
	7440-38-2	ARSENIC	4.6	22.3 J	mg/kg	MY05SB57(0-0.5)	39/39	7.67	22.3 J	0.39	Y	ASL
	7440-39-3	BARIUM	23.5	169	mg/kg	MY05SB16(0-0.5)	39/39	51.64	169	540	N	BSL
	7440-41-7	BERYLLIUM	0.2	2.1	mg/kg	MY05SB16(0-0.5)	35/39	0.38	2.1	150	N	BSL
	7440-42-8	BORON	0.365 J	8.6	mg/kg	MY05SS31& SS97(0-0.5)	19/39	1.76	8.6	1600	N	BSL
	7440-43-9	CADMIUM	0.11	0.7	mg/kg	MY05SS28(0-0.5)	29/39	0.21	0.7	3.7	N	BSL
	7440-70-2	CALCIUM	1270	56800	mg/kg	MY05SS25(0-0.5)	38/39	7864.36	56800	NA	N	NUT
	7440-47-3	CHROMIUM	9.3 J	79.5	mg/kg	MY05SB11(0-0.5)	32/32	25.29	79.5	10000	N	BSL
	7440-48-4	COBALT	3.3	13.3	mg/kg	MY05SB57(0-0.5)	39/39	6.14	13.3	90	N	BSL
	7440-50-8	COPPER	8.3 J	757 J	mg/kg	MY05SS99(0-0.5)	39/39	80.90	757 J	310	Y	ASL
	7439-89-6	IRON	8310	46600 J	mg/kg	MY05SB01 & SB75(0-0.5)	40/40	15656.25	46600 J	2300	Y	ASL
	7439-92-1	LEAD	4.4	42.5	mg/kg	MY05SS52(0-0.5)	39/39	11.19	42.5	40	Y	ASL
	7439-95-4	MAGNESIUM	2760	12100	mg/kg	MY05SB11(0-0.5)	39/39	4848.59	12100	NA	N	NUT
	7439-96-5	MANGANESE	154	835	mg/kg	MY05SB16(0-0.5)	39/39	286.09	835	180	Y	ASL
	7439-97-6	MERCURY	0.01 J	0.27	mg/kg	MY05SS31& SS97(0-0.5)	13/39	0.03	0.27	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.38	11.15 J	mg/kg	MY05SB01 & SB75(0-0.5)	12/39	0.96	11.15 J	39	N	BSL
	7440-02-0	NICKEL	8.5 J	54.4 J	mg/kg	MY05SB01 & SB75(0-0.5)	39/39	19.37	54.4 J	160	N	BSL
	7440-09-7	POTASSIUM	956 J	11100 J	mg/kg	MY05SB11(0-0.5)	39/39	2654.64	11100 J	NA	N	NUT
	7782-49-2	SELENIUM	0.73 J	0.73 J	mg/kg	MY05SB16(0-0.5)	1/39	0.24	0.73 J	39	N	BSL
	7440-22-4	SILVER	0.04	7.4 J	mg/kg	MY05SS80 & SS95(0-0.5)	8/39	0.43	7.4 J	39	N	BSL
	7440-23-5	SODIUM	81.3	552	mg/kg	MY05SS31& SS97(0-0.5)	38/39	263.30	552	NA	Y	NTX
	7440-28-0	THALLIUM	0.22	1.5 J	mg/kg	MY05SB02(0-0.5)	6/39	0.33	1.5 J	0.52	Y	ASL
	7440-62-2	VANADIUM	11.2	59.1	mg/kg	MY05SB02(0-0.5)	39/39	23.56	59.1	55	Y	ASL
	7440-66-6	ZINC	27.5 J	1060	mg/kg	MY05SS70	39/39	91.12	1060	2300	N	BSL
PCBs	53469-21-9	PCB-1242	22	47	ug/kg	MY05SS28(0-0.5)	3/48	10.51				
	12672-29-6	PCB-1248	64	64	ug/kg	MY05SS35(0-0.5)	1/48	10.18				
	11097-69-1	PCB-1254	18.9	240	ug/kg	MY05SS36(0-0.5)	19/48	37.71				
	11096-82-5	PCB-1260	21	38.5	ug/kg	MY05SB01 & SB75(0-0.5)	2/48	9.90				
		Total PCBs		389.5	ug/kg				389.5	220	Y	ASL
Pesticides	50-29-3	4,4'-DDT	2.57	7.2 J	ug/kg	MY05SB15(0-0.5)	2/15	3.10	7.2 J	1700	N	BSL
	60-57-1	DIELDRIN	5.4 J	5.4 J	ug/kg	MY05SS03(0-0.5)	1/15	2.93	5.4 J	30	N	BSL
	7421-93-4	ENDRIN ALDEHYDE	2.41	2.41	ug/kg	MY05SS03(0-0.5)	1/15	2.73	2.41	NA	Y	NTX
	1024-57-3	HEPTACHLOR EPOXIDE	0.874	0.874	ug/kg	MY05SB57(0-0.5)	1/15	1.37	0.874	53	N	BSL

Table 5-1C
Occurrence, Distribution and Selection of COPCs
Plant Area

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
	72-43-5	METHOXYCHLOR	9.78	9.78	ug/kg	MY05SS03(0-0.5)	1/15	13.74	9.78	31000	N	BSL
SVOCs	91-57-6	2-METHYLNAPHTHALENE	40	1700	ug/kg	MY05SS29(0-0.5)	9/47	387.13	1700	NA	Y	TX
	83-32-9	ACENAPHTHENE	240 J	3400	ug/kg	MY05SS80 & SS95(0-0.5)	13/47	592.23	3400	370000	N	BSL
	120-12-7	ANTHRACENE	177.5 J	8900	ug/kg	MY05SS80 & SS95(0-0.5)	20/47	995.21	8900	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	100 J	19000	ug/kg	MY05SS80 & SS95(0-0.5)	29/47	1779.10				
	50-32-8	**BENZO(A)PYRENE**	85 J	16000	ug/kg	MY05SS80 & SS95(0-0.5)	28/47	1632.27				
	205-99-2	**BENZO(B)FLUORANTHENE**	95 J	21000	ug/kg	MY05SS80 & SS95(0-0.5)	29/47	2029.95				
	207-08-9	**BENZO(K)FLUORANTHENE**	81 J	8400 J	ug/kg	MY05SS80 & SS95(0-0.5)	24/47	923.41				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	280 J	1750	ug/kg	MY05SS80 & SS95(0-0.5)	10/47	412.87				
	218-01-9	**CHRYSENE**	120 J	19000	ug/kg	MY05SS80 & SS95(0-0.5)	29/47	1736.86				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	190 J	9700	ug/kg	MY05SS80 & SS95(0-0.5)	22/47	1150.27				
		BENZO(A)PYRENE equivalent		22823	ug/kg				22823	62	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	222.5 J	8350	ug/kg	MY05SS80 & SS95(0-0.5)	20/47	988.56	8350	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	230 J	2300	ug/kg	MY05SS53(0-0.5)	5/44	350.85	2300	35000	N	BSL
	85-68-7	BUTYL BENZYL PHTHALATE	570 J	2600 J	ug/kg	MY05SS24 & SS152(0-0.5)	2/44	348.81	2600 J	1200000	N	BSL
	86-74-8	CARBAZOLE	210 J	8100 J	ug/kg	MY05SS80 & SS95(0-0.5)	22/44	833.69	8100 J	NA	Y	NTX
	132-64-9	DIBENZOFURAN	220 J	2450	ug/kg	MY05SS80 & SS95(0-0.5)	12/44	514.55	2450	29000	N	BSL
	206-44-0	FLUORANTHENE	180	49000	ug/kg	MY05SS80 & SS95(0-0.5)	29/47	4068.35	49000	230000	N	BSL
	86-73-7	FLUORENE	210 J	4550	ug/kg	MY05SS80 & SS95(0-0.5)	16/47	632.13	4550	270000	N	BSL
	91-20-3	NAPHTHALENE	210 J	1100	ug/kg	MY05SS38(0-0.5)	9/47	326.76	1100	5600	N	BSL
	85-01-8	PHENANTHRENE	130 J	34500	ug/kg	MY05SS80 & SS95(0-0.5)	29/47	3262.61	34500	NA	Y	NTX
	129-00-0	PYRENE	180	39000	ug/kg	MY05SS80 & SS95(0-0.5)	29/47	3182.71	39000	230000	N	BSL
VOCs	78-93-3	2-BUTANONE	11 J	11 J	ug/kg	MY05SS25(0-0.5)	1/14	5.79	11 J	730000	N	BSL
	108-10-1	4-METHYL-2-PENTANONE	8 J	8 J	ug/kg	MYLOSS01 & SS06(0-0.5)	1/34	6.87	8 J	79000	N	BSL
	67-64-1	ACETONE	10.25 J	62 J	ug/kg	MYLOSS05(0-0.5)	7/44	13.07	62 J	160000	N	BSL
	136777-61-2	M-,P-XYLENE	4 J	4 J	ug/kg	MY05SS24 & SS152(0-0.5)	1/44	3.48	4 J	27000	N	BSL
	75-09-2	METHYLENE CHLORIDE	6 J	28 J	ug/kg	MY05SS53(0-0.5)	5/44	6.48	28 J	9100	N	BSL
Surface and Subsurface Soils												
Fuel	NA	DIESEL RANGE ORGANICS	5.5	110	mg/kg	MYLOSS05(0-0.5)	5/5	45.20	110	NA	Y	NTX
Metals	7429-90-5	ALUMINUM	1600	25400	mg/kg	MY05SB16(0-0.5)	53/53	10153.30	25400	7600	Y	ASL
	7440-36-0	ANTIMONY	0.315 J	0.6725 J	mg/kg	MY05SB01 & SB75(0-0.5)	4/40	0.22	0.6725 J	3.1	N	BSL
	7440-38-2	ARSENIC	2	22.3	mg/kg	MY05SB57(0-0.5)	52/53	7.74	22.3	0.39	Y	ASL
	7440-39-3	BARIUM	7.4	169	mg/kg	MY05SB16(0-0.5)	53/53	52.92	169	540	N	BSL
	7440-41-7	BERYLLIUM	0.2	2.1	mg/kg	MY05SB16(0-0.5)	42/53	0.39	2.1	15	N	BSL
	7440-42-8	BORON	0.365	8.6	mg/kg	MY05SS31& SS97(0-0.5)	21/53	1.68	8.6	1600	N	BSL
	7440-43-9	CADMIUM	0.03	1.3	mg/kg	MY05SB11(12-13.5)	33/53	0.24	1.3	3.7	N	BSL

Table 5-1C
Occurrence, Distribution and Selection of COPCs
Plant Area

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
	7440-70-2	CALCIUM	592	56800	mg/kg	MY05SS25(0-0.5)	51/53	6693.34	56800	NA	N	NUT
	7440-47-3	CHROMIUM	6.4	79.5	mg/kg	MY05SB11(0-0.5)	45/45	25.41	79.5	10000	N	BSL
	7440-48-4	COBALT	0.98	16.8	mg/kg	MY05SB10(14-16)	53/53	6.58	16.8	90	N	BSL
	7440-50-8	COPPER	2.8	757	mg/kg	MY05SS99(0-0.5)	53/53	65.40	757	310	Y	ASL
	7439-89-6	IRON	3410 J	46600 J	mg/kg	MY05SB01 & SB75(0-0.5)	54/54	16862.22	46600 J	2300	Y	ASL
	7439-92-1	LEAD	3.4	42.5	mg/kg	MY05SS52(0-0.5)	53/53	11.41	42.5	40	Y	ASL
	7439-95-4	MAGNESIUM	574	13100	mg/kg	MY05SB10(14-16)	53/53	5183.94	13100	NA	N	NUT
	7439-96-5	MANGANESE	68.7	835	mg/kg	MY05SB16(0-0.5)	53/53	311.29	835	180	Y	ASL
	7439-97-6	MERCURY	0.01	0.27	mg/kg	MY05SS31& SS97(0-0.5)	14/53	0.02	0.27	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.38 J	11.15 J	mg/kg	MY05SB01 & SB75(0-0.5)	18/53	0.86	11.15 J	39	N	BSL
	7440-02-0	NICKEL	3.2 J	54.4 J	mg/kg	MY05SB01 & SB75(0-0.5)	53/53	19.59	54.4 J	160	N	BSL
	7440-09-7	POTASSIUM	575	11100	mg/kg	MY05SB11(0-0.5)	53/53	2859.17	11100	NA	N	NUT
	7782-49-2	SELENIUM	0.53	0.73	mg/kg	MY05SB16(0-0.5)	2/53	0.24	0.73	39	N	BSL
	7440-22-4	SILVER	0.04	7.4	mg/kg	MY05SS80 & SS95(0-0.5)	10/53	0.39	7.4	39	N	BSL
	7440-23-5	SODIUM	77.9	3700	mg/kg	MY05SB13(4-5.5)	50/53	314.68	3700	NA	Y	NTX
	7440-28-0	THALLIUM	0.15 J	1.5 J	mg/kg	MY05SS02(0-0.5)	8/53	0.34	1.5 J	0.52	Y	ASL
	7440-62-2	VANADIUM	3	59.1	mg/kg	MY05SB02(0-0.5)	53/53	24.94	59.1	55	Y	ASL
	7440-66-6	ZINC	12.2	1060	mg/kg	MY05SS70	53/53	87.50	1060	2300	N	BSL
PCBs	53469-21-9	PCB-1242	22	47	ug/kg	MY05SS28(0-0.5)	3/64	9.98				
	12672-29-6	PCB-1248	64	64	ug/kg	MY05SS35(0-0.5)	1/64	9.73				
	11097-69-1	PCB-1254	18.9	240	ug/kg	MY05SS36(0-0.5)	20/64	30.58				
	11096-82-5	PCB-1260	21	38.5	ug/kg	MY05SB01 & SB75(0-0.5)	2/64	9.52				
		Total PCBs		389.5	ug/kg				389.5	220	Y	ASL
Pesticides	50-29-3	4,4'-DDT	2.57	7.2	ug/kg	MY05SB15(0-0.5)	2/29	2.27	7.2	1700	N	BSL
	60-57-1	DIELDRIN	2.38	13	ug/kg	MY05SB12(8-10)	5/29	2.82	13	30	N	BSL
	7421-93-4	ENDRIN ALDEHYDE	2.41	2.41	ug/kg	MY05SS03(0-0.5)	1/29	2.07	2.41	NA	Y	NTX
	58-89-9	GAMMA BHC	3.99 J	3.99 J	ug/kg	MY05SB05(12-13.5)	1/29	1.13	3.99 J	440	N	BSL
	1024-57-3	HEPTACHLOR EPOXIDE	0.874	0.874	ug/kg	MY05SB57(0-0.5)	1/29	1.04	0.874	53	N	BSL
	72-43-5	METHOXYCHLOR	9.78	9.78	ug/kg	MY05SS03(0-0.5)	1/29	10.44	9.78	31000	N	BSL
SVOCs	91-57-6	2-METHYLNAPHTHALENE	40	1700	ug/kg	MY05SS29(0-0.5)	10/61	322.95	1700	NA	Y	TX
	83-32-9	ACENAPHTHENE	240	3400	ug/kg	MY05SS80 & SS95(0-0.5)	14/61	490.00	3400	370000	N	BSL
	120-12-7	ANTHRACENE	177.5	8900	ug/kg	MY05SS80 & SS95(0-0.5)	21/61	807.87	8900	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	100	19000	ug/kg	MY05SS80 & SS95(0-0.5)	32/61	1446.19				
	50-32-8	**BENZO(A)PYRENE**	85	16000	ug/kg	MY05SS80 & SS95(0-0.5)	31/61	1327.48				
	205-99-2	**BENZO(B)FLUORANTHENE**	95	21000	ug/kg	MY05SS80 & SS95(0-0.5)	32/61	1634.39				
	218-01-9	**CHRYSENE**	110	19000	ug/kg	MY05SS80 & SS95(0-0.5)	32/61	1408.07				

Table 5-1C
Occurrence, Distribution and Selection of COPCs
Plant Area

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	280	1750	ug/kg	MY05SS80 & SS95(0-0.5)	11/61	347.38				
	207-08-9	**BENZO(K)FLUORANTHENE**	81	8400	ug/kg	MY05SS80 & SS95(0-0.5)	27/61	768.06				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	190	9700	ug/kg	MY05SS80 & SS95(0-0.5)	24/61	940.53				
		BENZO(A)PYRENE equivalent		22823	ug/kg				22823	62	Y	ASL
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	120	2300	ug/kg	MY05SS53(0-0.5)	7/58	310.04	2300	35000	N	BSL
	85-68-7	BUTYL BENZYL PHTHALATE	570	2600	ug/kg	MY05SS24 & SS152(0-0.5)	2/58	290.22	2600	1200000	N	BSL
	86-74-8	CARBAZOLE	210	8100	ug/kg	MY05SS80 & SS95(0-0.5)	23/58	671.16	8100	NA	Y	NTX
	191-24-2	BENZO[G,H,I]PERYLENE	222.5	8350	ug/kg	MY05SS80 & SS95(0-0.5)	22/61	798.40	8350	NA	Y	NTX
	132-64-9	DIBENZOFURAN	220	2450	ug/kg	MY05SS80 & SS95(0-0.5)	13/58	421.98	2450	29000	N	BSL
	206-44-0	FLUORANTHENE	140	49000	ug/kg	MY05SS80 & SS95(0-0.5)	33/61	3282.50	49000	230000	N	BSL
	86-73-7	FLUORENE	210	4550	ug/kg	MY05SS80 & SS95(0-0.5)	17/61	523.20	4550	270000	N	BSL
	91-20-3	NAPHTHALENE	210	1100	ug/kg	MY05SS38(0-0.5)	10/61	278.57	1100	5600	N	BSL
	85-01-8	PHENANTHRENE	130	34500	ug/kg	MY05SS80 & SS95(0-0.5)	32/61	2644.30	34500	NA	Y	NTX
	129-00-0	PYRENE	100	39000	ug/kg	MY05SS80 & SS95(0-0.5)	33/61	2579.47	39000	230000	N	BSL
VOCs	78-93-3	2-BUTANONE	11	11	ug/kg	MY05SS25(0-0.5)	1/27	5.39	11	730000	N	BSL
	108-10-1	4-METHYL-2-PENTANONE	8	8	ug/kg	MYLOSS01 & SS06(0-0.5)	1/47	6.34	8	79000	N	BSL
	67-64-1	ACETONE	6	62	ug/kg	MYLOSS05(0-0.5)	8/61	11.22	62	160000	N	BSL
	75-15-0	CARBON DISULFIDE	4 J	4 J	ug/kg	MY05SB05(12-13.5)	1/61	5.39	4 J	36000	N	BSL
	136777-61-2	M-,P-XYLENE	4	4	ug/kg	MY05SS24 & SS152(0-0.5)	1/61	3.64	4	27000	N	BSL
	75-09-2	METHYLENE CHLORIDE	2.9	28	ug/kg	MY05SS53(0-0.5)	8/61	5.88	28	9100	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text

1 - USEPA Region 9 Soil PRG modified to an HI = 0.1. Same units as reported concentrations

COPCs - Compounds of Potential Concer Max. - Maximum TX - Toxicity information is available
DRO - Diesel Range Organics BSL - Below Screening Level NTX - Insufficient Toxicity Information
J - estimated Concentration ASL - Above Screening Level Y - Yes
Min. - Minimum NUT - Essential Nutrient N- No

Table 5-1D
Occurrence, Distribution and Selection of COPCs
Warehouse 2/3

Medium	Cas No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
Surface Soils												
Metals	7429-90-5	ALUMINUM	2670	30700	mg/kg	MY05TP01(0-0.5)	8/8	14436.25	30700	7600	Y	ASL
	7440-36-0	ANTIMONY	0.05 J	0.12 J	mg/kg	MY05SS10(0-0.5) & SS14	3/4	0.08	0.12 J	3.1	N	BSL
	7440-38-2	ARSENIC	2.1	16.6	mg/kg	MY05TP01(0-0.5)	8/8	9.34	16.6	0.39	Y	ASL
	7440-39-3	BARIUM	17	102	mg/kg	MY05TP01(0-0.5)	8/8	54.19	102	540	N	BSL
	7440-41-7	BERYLLIUM	0.14	0.93	mg/kg	MY05TP01(0-0.5)	8/8	0.44	0.93	150	N	BSL
	7440-42-8	BORON	2.85	4.5	mg/kg	MY05TP01(0-0.5)	3/8	1.64	4.5	1600	N	BSL
	7440-43-9	CADMIUM	0.3 J	0.37 J	mg/kg	MY05SS74	2/8	0.16	0.37 J	3.7	N	BSL
	7440-70-2	CALCIUM	474 J	2460	mg/kg	MY05SS10(0-0.5) & SS14	8/8	1601.75	2460	NA	N	NUT
	7440-47-3	CHROMIUM	15.1 J	58 J	mg/kg	MY05TP01(0-0.5)	8/8	31.66	58 J	10000	N	BSL
	7440-48-4	COBALT	1.8	18.3	mg/kg	MY05TP01(0-0.5)	8/8	9.31	18.3	90	N	BSL
	7440-50-8	COPPER	21.6	124	mg/kg	MY05SS72	8/8	48.23	124	310	N	BSL
	7439-89-6	IRON	9040	36500	mg/kg	MY05TP01(0-0.5)	8/8	20236.25	36500	2300	Y	ASL
	7439-92-1	LEAD	3.9	397	mg/kg	MY05TP02(0-0.5)	8/8	60.94	397	40	Y	ASL
	7439-95-4	MAGNESIUM	645	8740	mg/kg	MY05SS10(0-0.5) & SS14	8/8	5303.13	8740	NA	N	NUT
	7439-96-5	MANGANESE	76.5	744	mg/kg	MY05TP03(0-0.5)	8/8	381.63	744	180	Y	ASL
	7439-97-6	MERCURY	0.02 J	0.47	mg/kg	MY05TP01(0-0.5)	3/8	0.07	0.47	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.77	1.2	mg/kg	MY05TP02(0-0.5)	2/8	0.45	1.2	39	N	BSL
	7440-02-0	NICKEL	12.3	47.6	mg/kg	MY05TP01(0-0.5)	8/8	26.99	47.6	160	N	BSL
	7440-09-7	POTASSIUM	341 J	4650 J	mg/kg	MY05TP01(0-0.5)	8/8	2578.88	4650 J	NA	N	NUT
	7440-22-4	SILVER	0.06	1.2	mg/kg	MY05SS72	4/8	0.30	1.2	39	N	BSL
	7440-23-5	SODIUM	93.2	198	mg/kg	MY05TP03(0-0.5)	8/8	138.94	198	NA	Y	NTX
	7440-62-2	VANADIUM	5.1	55.5	mg/kg	MY05TP01(0-0.5)	8/8	30.06	55	55	N	BSL
	7440-66-6	ZINC	25.8	103.1 J	ug/kg	MY05SS10(0-0.5) & SS14	8/8	60.28	103.1 J	2300	N	BSL
PCBs	11097-69-1	PCB-1254	1400	1400	ug/kg	MY05TP01(0-0.5)	1/16	96.00				
	11096-82-5	PCB-1260	150 J	600 J	ug/kg	MY05HA09(0-0.5)	3/16	81.75				
		Total PCBs		2000	ug/kg				2000	220	Y	ASL
Pesticides	60-57-1	DIELDRIN	12 J	12 J	ug/kg	MY05TP02(0-0.5)	1/4	4.49	12 J	30	N	BSL
	72-20-8	ENDRIN	9.6 J	9.6 J	ug/kg	MY05TP02(0-0.5)	1/4	3.89	9.6 J	1800	N	BSL
SVOCs	120-12-7	ANTHRACENE	630	1000	ug/kg	MY05SS101	3/12	350.83	1000	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	220 J	4200	ug/kg	MY05SS101	4/12	937.08				
	50-32-8	**BENZO(A)PYRENE**	200 J	3400	ug/kg	MY05SS101	4/12	777.08				
	205-99-2	**BENZO(B)FLUORANTHENE**	330 J	5300	ug/kg	MY05SS101	4/12	1187.92				
	207-08-9	**BENZO(K)FLUORANTHENE**	1000	2400	ug/kg	MY05SS101	3/12	542.50				
	218-01-9	**CHRYSENE**	255 J	4600	ug/kg	MY05SS101	4/12	998.33				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	250 J	430	ug/kg	MY05SS101	3/12	222.50				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	1100	2300	ug/kg	MY05SS101	3/12	559.17				
		BENZO(A)PYRENE equivalent		5039	ug/kg				5039	62	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	910	1800	ug/kg	MY05SS101	3/12	468.33	1800	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALAT	187.5 J	187.5 J	ug/kg	MY05SS103& SS115	1/12	181.46	187.5 J	35000	N	BSL
	86-74-8	CARBAZOLE	380	380	ug/kg	MY05SS101	1/12	202.92	380	NA	Y	NTX
	206-44-0	FLUORANTHENE	380 J	8400	ug/kg	MY05SS101	4/12	1650.42	8400	230000	N	BSL

Table 5-1D
Occurrence, Distribution and Selection of COPCs
Warehouse 2/3

Medium	Cas No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
	85-01-8	PHENANTHRENE	910	2800	ug/kg	MY05SS101	3/12	535.00	2800	NA	Y	NTX
	129-00-0	PYRENE	440	8100	ug/kg	MY05SS101	4/12	1688.75	8100	230000	N	BSL
VOCs	67-64-1	ACETONE	180 J	180 J	ug/kg	MY05HA09(0-0.5)	1/13	27.50	180 J	160000	N	BSL
	75-09-2	METHYLENE CHLORIDE	90 J	90 J	ug/kg	MY05HA09(0-0.5)	1/13	13.62	90 J	9100	N	BSL
	79-01-6	TRICHLOROETHENE	3 J	4 J	ug/kg	MY05SS74	2/13	2.88	4 J	53	N	BSL
Surface and Subsurface Soils												
Metals	7429-90-5	ALUMINUM	2670	30700	mg/kg	MY05TP01(0-0.5)	19/19	15300.53	30700	7600	Y	ASL
	7440-36-0	ANTIMONY	0.03 J	0.14 J	mg/kg	MY05SB36(6.5-8.5)	6/8	0.10	0.14 J	3.1	N	BSL
	7440-38-2	ARSENIC	2.1	16.8	mg/kg	MY05TP01(3-3.5)	19/19	8.72	16.8	0.39	Y	ASL
	7440-39-3	BARIUM	17	104	mg/kg	MY05SB36(6.5-8.5)	19/19	56.17	104	540	N	BSL
	7440-41-7	BERYLLIUM	0.14	0.93	mg/kg	MY05TP01(0-0.5)	19/19	0.52	0.93	150	N	BSL
	7440-42-8	BORON	0.57 J	5.5	mg/kg	MY05SB36(6.5-8.5)	7/19	1.46	5.5	1600	N	BSL
	7440-43-9	CADMIUM	0.04	0.37 J	mg/kg	MY05SS74	6/19	0.09	0.37 J	3.7	N	BSL
	7440-70-2	CALCIUM	474 J	5740 J	mg/kg	MY05SB36(6.5-8.5)	19/19	1887.84	5740 J	NA	N	NUT
	7440-47-3	CHROMIUM	14.1 J	62.7 J	mg/kg	MY05TP01(3-3.5)	19/19	31.76	62.7 J	10000	N	BSL
	7440-48-4	COBALT	1.8	18.3	mg/kg	MY05TP01(0-0.5)	19/19	9.03	18.3	90	N	BSL
	7440-50-8	COPPER	9.4	124	mg/kg	MY05SS72	19/19	31.95	124	310	N	BSL
	7439-89-6	IRON	9040	41800	mg/kg	MY05TP01(3-3.5)	19/19	20652.11	41800	2300	Y	ASL
Metals	7439-92-1	LEAD	3.9	397	mg/kg	MY05TP02(0-0.5)	19/19	31.38	397	40	Y	ASL
	7439-95-4	MAGNESIUM	645	11300	mg/kg	MY05SB36(6.5-8.5)	19/19	5419.74	11300	NA	N	NUT
	7439-96-5	MANGANESE	76.5	910	mg/kg	MY05TP03(0.5-7.0)	19/19	425.16	910	180	Y	ASL
	7439-97-6	MERCURY	0.01 J	0.47	mg/kg	MY05TP01(0-0.5)	5/19	0.03	0.47	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.6	3.5	mg/kg	MY05TP01(9.5-10)	7/19	0.65	3.5	39	N	BSL
	7440-02-0	NICKEL	10.7	50.4	mg/kg	MY05TP01(3-3.5)	19/19	25.82	50.4	160	N	BSL
	7440-09-7	POTASSIUM	7.9	6860 J	mg/kg	MY05SB36(6.5-8.5)	19/19	2820.47	6860 J	NA	N	NUT
	7440-22-4	SILVER	0.01 J	1.2	mg/kg	MY05SS72	8/19	0.14	1.2	39	N	BSL
	7440-23-5	SODIUM	91.35	352	mg/kg	MY05SB36(6.5-8.5)	18/19	156.84	352	NA	Y	NTX
	7440-28-0	THALLIUM	0.24	0.24	mg/kg	MY05SB41(2-2.4)	1/19	0.12	0.24	0.52	N	BSL
	7440-62-2	VANADIUM	5.1	61.8	mg/kg	MY05TP01(3-3.5)	19/19	31.00	61.8	55	Y	ASL
	7440-66-6	ZINC	25.8	103.1 J	mg/kg	MY05SS10 & SS14(0-0.5)	19/19	54.20	103.1 J	2300	N	BSL
PCBs	11097-69-1	PCB-1254	52	1400	ug/kg	MY05TP01(0-0.5)	4/35	67.73				
	11096-82-5	PCB-1260	31 J	600 J	ug/kg	MY05HA09(0-0.5)	4/35	42.81				
		Total PCBs		2000	ug/kg				2000	220	Y	ASL
Pesticides	60-57-1	DIELDRIN	12 J	12 J	ug/kg	MY05TP02(0-0.5)	1/15	3.91	12 J	30	N	BSL
	72-20-8	ENDRIN	9.6 J	9.6 J	ug/kg	MY05TP02(0-0.5)	1/15	3.75	9.6 J	1800	N	BSL
SVOCs	91-57-6	2-METHYLNAPHTHALENE	710	2810 J	ug/kg	MY05TP15&TP25(4-6)	3/39	333.33	2810 J	NA	Y	TX
	120-12-7	ANTHRACENE	630	1000	ug/kg	MY05SS101	3/39	242.69	1000	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	220 J	4200	ug/kg	MY05SS101	4/39	423.08				
	50-32-8	**BENZO(A)PYRENE**	200 J	3400	ug/kg	MY05SS101	4/39	373.85				
	205-99-2	**BENZO(B)FLUORANTHENE**	180 J	5300	ug/kg	MY05SS101	5/39	500.26				
	207-08-9	**BENZO(K)FLUORANTHENE**	1000	2400	ug/kg	MY05SS101	3/39	301.67				
	218-01-9	**CHRYSENE**	255 J	4600	ug/kg	MY05SS101	4/39	441.92				

Table 5-1D
Occurrence, Distribution and Selection of COPCs
Warehouse 2/3

Medium	Cas No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	Screening Conc.	Risk Based Conc.[1]	Selected as COPC	Rationale
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	250 J	430	ug/kg	MY05SS101	3/39	203.21				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	1100	2300	ug/kg	MY05SS101	3/39	306.79				
		BENZO(A)PYRENE equivalent		5039	ug/kg				5039	62	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	910	1800	ug/kg	MY05SS101	3/39	278.85	1800	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALAT	187.5 J	187.5 J	ug/kg	SS103&115	1/39	190.58	187.5 J	35000	N	BSL
	86-74-8	CARBAZOLE	380	380	ug/kg	MY05SS101	1/39	197.18	380	NA	Y	NTX
	84-74-2	DI-N-BUTYL PHTHALATI	510	510	ug/kg	MY05SB105(0-2.0)	1/39	200.38	510	610000	N	BSL
	206-44-0	FLUORANTHENE	380 J	8400	ug/kg	MY05SS101	4/39	640.71	8400	230000	N	BSL
	91-20-3	NAPHTHALENE	1200	1250 J	ug/kg	MY05TP15&TP25(4-6)	2/39	244.36	1250 J	5600	N	BSL
	85-01-8	PHENANTHRENE	910	2800	ug/kg	MY05SS101	3/39	299.36	2800	NA	Y	NTX
	129-00-0	PYRENE	200 J	8100	ug/kg	MY05SS101	5/39	654.87	8100	230000	N	BSL
VOCs	71-55-6	1,1,1-TRICHLOROETHANI	6	6.25	ug/kg	MY05GP103&GP115(8-11.3)	3/61	3.03	6.25	120000	N	BSL
	78-93-3	2-BUTANONE	14 J	93 J	ug/kg	MY05TP01(3-3.5)	6/38	10.18	93 J	730000	N	BSL
	591-78-6	2-HEXANONE	41 J	41 J	ug/kg	MY05TP01(3-3.5)	1/61	6.23	41 J	NA	N	NTX/IFD
	108-10-1	4-METHYL-2-PENTANONI	188.25	2900	ug/kg	MY05TP01(3-3.5)	3/61	58.77	2900	79000	N	BSL
	67-64-1	ACETONE	6 J	630 J	ug/kg	MY05GP102(0-2)	13/46	33.66	630 J	160000	N	BSL
	71-43-2	BENZENE	16 J	16 J	ug/kg	MY05TP01(3-3.5)	1/61	3.07	16 J	600	N	BSL
	100-41-4	ETHYLBENZENE	93	61000 J	ug/kg	MY05TP01(9.5-10)	6/61	1402.55	61000 J	8900	Y	ASL
	136777-61-2	M-,P-XYLENE	240	200000 J	ug/kg	MY05TP01(9.5-10)	6/61	4628.17	200000 J	27000	Y	ASL
	75-09-2	METHYLENE CHLORIDE	90 J	90 J	ug/kg	MY05HA09(0-0.5)	1/61	7.32	90 J	9100	N	BSL
	95-47-6	O-XYLENE	92	79000 J	ug/kg	MY05TP01(9.5-10)	6/61	1758.19	79000 J	27000	Y	ASL
	108-88-3	TOLUENE	6	490 J	ug/kg	MY05TP01(3-3.5)	5/61	14.75	490 J	52000	N	BSL
	79-01-6	TRICHLOROETHENE	3 J	4 J	ug/kg	MY05SS74, MY05TP01(3-3.5)	3/61	2.91	4 J	53	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text

1 - USEPA Region 9 Soil PRGs modified to an HI = 0.1. Same units as reported concentrations

COPC - Compounds of Potential Concern

DRO - Diesel Range Organics

J - estimated concentration

Conc. - Concentration

Min. - Minimum | NUT - Essential Nutrient

Max - Maximum | NTX - Insufficient toxicity information

BSL - Below Screening Level | IFD - Detected in less than 5 % of samples

ASL - Above Screening Level | TX - toxicity information is available to evaluate risks

Y - Yes

N - No

Table 5-1E
Occurrence, Distribution and Selection of COPCs
345 kV Transmission Line Area

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
Surface Soils												
Metals	7429-90-5	ALUMINUM	8025	27250	mg/kg	MY05SB50 & SB58(0-0.5)	26/26	16424.04	27250	7600	Y	ASL
	7440-36-0	ANTIMONY	0.02	0.02	mg/kg	MY05SB54 & SB55(0-0.5)	1/7	0.11	0.02	3.1	N	BSL
	7440-38-2	ARSENIC	3.5	15.1	mg/kg	MY05SS109(0-0.5)	26/26	10.42	15.1	0.39	Y	ASL
	7440-39-3	BARIUM	31.85	105.85	mg/kg	MY05SB50 & SB58(0-0.5)	26/26	63.08	105.85	540	N	BSL
	7440-41-7	BERYLLIUM	0.275	1.1	mg/kg	MY05SS107(0-0.5)	20/26	0.63	1.1	150	N	BSL
	7440-42-8	BORON	0.46	21.7	mg/kg	MY05SS107(0-0.5)	20/26	5.02	21.7	1600	N	BSL
	7440-43-9	CADMIUM	0.07	0.52	mg/kg	MY05SS107(0-0.5)	20/26	0.29	0.52	3.7	N	BSL
	7440-70-2	CALCIUM	1192.5	12435	mg/kg	MY05SS111& SS150(0-0.5)	26/26	3086.63	12435	NA	N	NUT
	7440-47-3	CHROMIUM	21.1	55.85	mg/kg	MY05SB50 & SB58(0-0.5)	25/26	37.05	55.85	10000	N	BSL
	7440-48-4	COBALT	4.75	18.35	mg/kg	MY05SB50 & SB58(0-0.5)	26/26	10.15	18.35	90	N	BSL
	7440-50-8	COPPER	11.2	30.65	mg/kg	MY05SS111& SS150(0-0.5)	26/26	19.83	30.65	310	N	BSL
	7439-89-6	IRON	10540	37200	mg/kg	MY05SS107(0-0.5)	26/26	25440.00	37200	2300	Y	ASL
	7439-92-1	LEAD	4.7	20.4	mg/kg	MY05SS110(0-0.5)	26/26	11.82	20.4	40	N	BSL
	7439-95-4	MAGNESIUM	3045	8650	mg/kg	MY05SS112(0-0.5)	26/26	6806.54	8650	NA	N	NUT
	7439-96-5	MANGANESE	194	1300	mg/kg	MY05SB50 & SB58(0-0.5)	26/26	440.25	1300	180	Y	ASL
	7439-97-6	MERCURY	0.0075	0.06	mg/kg	MY05SB23(0-0.5)	10/26	0.02	0.06	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.76	1.15	mg/kg	MY05SS111& SS150(0-0.5)	7/26	0.75	1.15	39	N	BSL
	7440-02-0	NICKEL	11.45	43.8	mg/kg	MY05SB50 & SB58(0-0.5)	26/26	28.48	43.8	160	N	BSL
	7440-09-7	POTASSIUM	1645	5400	mg/kg	MY05SB52(0-0.5)	26/26	3932.88	5400	NA	N	NUT
	7782-49-2	SELENIUM	0.215	0.77	mg/kg	MY05SS118(0-0.5)	3/26	0.36	0.77	39	N	BSL
	7440-22-4	SILVER	0.055	0.45	mg/kg	MY05SB50 & SB58(0-0.5)	8/26	0.24	0.45	39	N	BSL
	7440-23-5	SODIUM	95.5	402	mg/kg	MY05SS111& SS150(0-0.5)	21/26	187.15	402	NA	Y	NTX
	7440-28-0	THALLIUM	0.105	1.3	mg/kg	MY05SS114(0-0.5)	7/26	0.47	1.3	0.52	Y	ASL
	7440-62-2	VANADIUM	17.35	62.65	mg/kg	MY05SB50 & SB58(0-0.5)	26/26	37.73	62.65	55	Y	ASL
	7440-66-6	ZINC	26.3	150.85	mg/kg	MY05SB50 & SB58(0-0.5)	26/26	67.24	150.85	2300	N	BSL
	120-12-7	ANTHRACENE	440	440	ug/kg	MY05SS12(0-0.5)	1/25	208.37	440	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	207.5	1100	ug/kg	MY05SS12(0-0.5)	2/25	234.23				
	50-32-8	**BENZO(A)PYRENE**	217.5	860	ug/kg	MY05SS12(0-0.5)	2/25	225.38				
	205-99-2	**BENZO(B)FLUORANTHENE**	202.5	1100	ug/kg	MY05SS12(0-0.5)	2/25	234.04				
	207-08-9	**BENZO(K)FLUORANTHENE**	350	350	ug/kg	MY05SS12(0-0.5)	1/25	204.90				
	218-01-9	**CHRYSENE**	212.5	1000	ug/kg	MY05SS12(0-0.5)	2/25	230.58				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	440	440	ug/kg	MY05SS12(0-0.5)	1/25	208.37				
		BENZO(A)PYRENE equivalent		1129	ug/kg				1129	62	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	360	360	ug/kg	MY05SS12(0-0.5)	1/25	205.29	360	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	232.5	237.5	ug/kg	MY05SS113 & SS151(0-0.5)	2/25	201.06	237.5	35000	N	BSL
	86-74-8	CARBAZOLE	350	350	ug/kg	MY05SS12(0-0.5)	1/25	204.90	350	NA	Y	NTX
	206-44-0	FLUORANTHENE	200	2400	ug/kg	MY05SS12(0-0.5)	4/25	285.67	2400	230000	N	BSL
	86-73-7	FLUORENE	200	200	ug/kg	MY05SS12(0-0.5)	1/25	199.13	200	270000	N	BSL
	85-01-8	PHENANTHRENE	202.5	1800	ug/kg	MY05SS12(0-0.5)	2/25	260.96	1800	NA	Y	NTX
	129-00-0	PYRENE	210	2200	ug/kg	MY05SS12(0-0.5)	5/25	281.83	2200	230000	N	BSL
VOCs	78-93-3	2-BUTANONE	39	160	ug/kg	MY05SB46(0-0.5)	2/15	19.13	160	730000	N	BSL
	67-64-1	ACETONE	21	26.25	ug/kg	MY05SB50 & SB58(0-0.5)	2/23	11.16	26.25	160000	N	BSL
	108-88-3	TOLUENE	2.75	2.75	ug/kg	MY05SS111& SS150(0-0.5)	1/24	3.27	2.75	52000	N	BSL
	79-01-6	TRICHLOROETHENE	5	5	ug/kg	MY05SB42(0-0.5)	1/24	3.34	5	53	N	BSL
Surface and Subsurface Soils												
Metals	7429-90-5	ALUMINUM	8025	29000	mg/kg	MY05SB44(4.7-6.7)	49/49	18256.63	29000	7600	Y	ASL
	7440-36-0	ANTIMONY	0.02	2.2	mg/kg	MY05TP113(7-9)	12/29	0.31	2.2	3.1	N	BSL
	7440-38-2	ARSENIC	3.5	16.2	mg/kg	MY05SB46(4-6)	49/49	11.01	16.2	0.39	Y	ASL
	7440-39-3	BARIUM	31.85	118	mg/kg	MY05TP107A(9-11)	49/49	74.19	118	540	N	BSL
	7440-41-7	BERYLLIUM	0.275	1.1	mg/kg	MY05SS107(0-0.5)	34/49	0.61	1.1	150	N	BSL
	7440-42-8	BORON	0.46	23.4	mg/kg	MY05TP107A(9-11)	32/49	4.71	23.4	1600	N	BSL
	7440-43-9	CADMIUM	0.03	1.6	mg/kg	MY05TP111A(9-11)	31/49	0.27	1.6	3.7	N	BSL
	7440-70-2	CALCIUM	1192.5	32100	mg/kg	MY05TP107A(9-11)	49/49	3664.54	32100	NA	N	NUT
	7440-47-3	CHROMIUM	21.1	162	mg/kg	MY05TP107A(9-11)	46/49	43.27	162	10000	N	BSL
	7440-48-4	COBALT	4.75	18.35	mg/kg	MY05SB50 & SB58(0-0.5)	49/49	11.59	18.35	90	N	BSL
	7440-50-8	COPPER	11.2	92.7	mg/kg	MY05TP113(7-9)	49/49	26.00	92.7	310	N	BSL
	7439-89-6	IRON	10540	42600	mg/kg	MY05TP107A(9-11)	49/49	28876.33	42600	2300	Y	ASL
	7439-92-1	LEAD	4.7	396	mg/kg	MY05TP107A(9-11)	49/49	21.28	396	40	Y	ASL

Table 5-1E
Occurrence, Distribution and Selection of COPCs
345 kV Transmission Line Area

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
	7439-95-4	MAGNESIUM	3045	12000	mg/kg	MY05SB44(14-16)	49/49	7170.92	12000	NA	N	NUT
	7439-96-5	MANGANESE	194	1300	mg/kg	MY05SB50 & SB58(0-0.5)	49/49	505.74	1300	180	Y	ASL
	7439-97-6	MERCURY	0.0075	0.06	mg/kg	MY05SB23(0-0.5), SS108(0-0.5), SB23(0-0.5)	12/49	0.01	0.06	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.67	1.2	mg/kg	MY05SB44(4.7-6.7)	14/49	1.14	1.2	39	N	BSL
	7440-02-0	NICKEL	11.45	153	mg/kg	MY05TP129(7-9)	49/49	38.48	153	160	N	BSL
	7440-09-7	POTASSIUM	1645	8470	mg/kg	MY05SB44(14-16)	49/49	4338.57	8470	NA	N	NUT
	7782-49-2	SELENIUM	0.215	1.3	mg/kg	MY05TP116(6-8)	6/49	0.38	1.3	39	N	BSL
	7440-22-4	SILVER	0.04	0.85	mg/kg	MY05TP110A(7-9)	17/49	0.19	0.85	39	N	BSL
	7440-23-5	SODIUM	95.5	1480	mg/kg	MY05SB52(14-16)	39/49	292.77	1480	NA	Y	NTX
	7440-28-0	THALLIUM	0.105	1.3	mg/kg	MY05SS114(0-0.5)	10/49	0.42	1.3	0.52	Y	ASL
	7440-62-2	VANADIUM	17.35	62.65	mg/kg	MY05SB50 & SB58(0-0.5)	49/49	41.33	62.65	55	Y	ASL
	7440-66-6	ZINC	26.3	302	mg/kg	MY05TP113(7-9)	49/49	83.14	302	2300	N	BSL
PCBs	53469-21-9	PCB-1242	24	98	ug/kg	MY05TP111A(9-11)	2/49	10.93				
	11097-69-1	PCB-1254	27	130	ug/kg	MY05TP111A(9-11)	3/49	12.45				
	11096-82-5	PCB-1260	49	75	ug/kg	MY05TP111A(9-11)	3/49	11.83				
		Total PCBs		303	ug/kg				303	220	Y	ASL
Pesticides	309-00-2	ALDRIN	4.1	4.1	ug/kg	MY05TP113(7-9)	1/49	1.10	4.1	29	N	BSL
	60-57-1	DIELDRIN	4.5	7	ug/kg	MY05TP107A(9-11)	2/49	2.15	7	30	N	BSL
SVOCs	106-44-5	4-METHYLPHENOL	470	470	ug/kg	MY05TP118(13-15)	1/48	206.68	470	31000	N	BSL
	120-12-7	ANTHRACENE	440	440	ug/kg	MY05SS12(0-0.5)	1/48	206.28	440	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	207.5	1100	ug/kg	MY05SS12(0-0.5)	4/48	223.37				
	50-32-8	**BENZO(A)PYRENE**	217.5	860	ug/kg	MY05SS12(0-0.5)	5/48	233.37				
	205-99-2	**BENZO(B)FLUORANTHENE**	202.5	1100	ug/kg	MY05SS12(0-0.5)	5/48	240.61				
	207-08-9	**BENZO(K)FLUORANTHENE**	350	560	ug/kg	MY05TP107A(9-11)	4/48	219.64				
	218-01-9	**CHRYSENE**	212.5	1000	ug/kg	MY05SS12(0-0.5)	3/48	220.92				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	420	420	ug/kg	MY05TP111A(9-11)	1/48	205.77				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	360	560	ug/kg	MY05TP107A(9-11)	4/48	220.87				
		BENZO(A)PYRENE equivalent		1557	ug/kg				1557	62	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	310	490	ug/kg	MY05TP107A(9-11)	4/48	215.56	490	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	232.5	1100	ug/kg	MY05TP111A(9-11)	3/48	222.09	1100	35000	N	BSL
	86-74-8	CARBAZOLE	350	350	ug/kg	MY05SS12(0-0.5)	1/48	204.44	350	NA	Y	NTX
	206-44-0	FLUORANTHENE	200	2400	ug/kg	MY05SS12(0-0.5)	7/48	269.85	2400	230000	N	BSL
	86-73-7	FLUORENE	200	200	ug/kg	MY05SS12(0-0.5)	1/48	201.38	200	270000	N	BSL
	85-01-8	PHENANTHRENE	202.5	1800	ug/kg	MY05SS12(0-0.5)	5/48	244.90	1800	NA	Y	NTX
	129-00-0	PYRENE	210	2200	ug/kg	MY05SS12(0-0.5)	8/48	257.40	2200	230000	N	BSL
VOCs	78-93-3	2-BUTANONE	35	160	ug/kg	MY05SB46(0-0.5)	3/37	11.94	160	730000	N	BSL
	67-64-1	ACETONE	5	93	ug/kg	MY05TP118(13-15)	10/53	15.10	93	160000	N	BSL
	67-66-3	CHLOROFORM	3	3	ug/kg	MY05SB48(8-10)	1/56	3.12	3	360	N	BSL
	100-41-4	ETHYLBENZENE	3	3	ug/kg	MY05TP118(13-15)	1/56	3.11	3	8900	N	BSL
	75-09-2	METHYLENE CHLORIDE	4	4	ug/kg	MY05TP118(13-15)	1/56	6.22	4	9100	N	BSL
	108-88-3	TOLUENE	2.75	76	ug/kg	MY05TP118(13-15)	7/56	4.68	76	52000	N	BSL
	79-01-6	TRICHLOROETHENE	5	5	ug/kg	MY05SB42(0-0.5), MY05TP115(7-9) & TP136	2/56	3.20	5	53	N	BSL
	75-01-4	VINYL CHLORIDE	10	26.5	ug/kg	MY05TP115(7-9) & TP136	3/56	6.71	26.5	79	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text
1 - USEPA Region 9 Soil PRGs modified to an HI = 0.1. Same units as reported concentration
COPC - Compounds of Potential Concern
J - estimated concentratior

Conc. - Concentration	NUT - Essential Nutrient
BSL - Below Screening Leve	NTX - Insufficient toxicity informatior
ASL - Above Screening Leve	Y - Yes
	N - No

Table 5-1F
Occurrence, Distribution and Selection of COPCs
Bailey Farmhouse

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
Surface Soils												
Metals	7429-90-5	ALUMINUM	23200	23200	mg/kg	MY05SB25(0-0.5)	1/1	23200	23200	7600	Y	ASL
	7440-36-0	ANTIMONY	0.08	0.08	mg/kg	MY05SB25(0-0.5)	1/1	0.08	0.08	3.1	N	BSL
	7440-38-2	ARSENIC	7.2	7.2	mg/kg	MY05SB25(0-0.5)	1/1	7.2	7.2	0.39	Y	ASL
	7440-39-3	BARIUM	100	100	mg/kg	MY05SB25(0-0.5)	1/1	100	100	540	N	BSL
	7440-41-7	BERYLLIUM	0.75	0.75	mg/kg	MY05SB25(0-0.5)	1/1	0.75	0.75	150	N	BSL
	7440-43-9	CADMIUM	0.24	0.24	mg/kg	MY05SB25(0-0.5)	1/1	0.24	0.24	3.7	N	BSL
	7440-70-2	CALCIUM	2290	2290	mg/kg	MY05SB25(0-0.5)	1/1	2290	2290	NA	N	NUT
	7440-47-3	CHROMIUM	40.5	40.5	mg/kg	MY05SB25(0-0.5)	1/1	40.5	40.5	10000	N	BSL
	7440-48-4	COBALT	10.6	10.6	mg/kg	MY05SB25(0-0.5)	1/1	10.6	10.6	90	N	BSL
	7440-50-8	COPPER	48.9	48.9	mg/kg	MY05SB25(0-0.5)	1/1	48.9	48.9	310	N	BSL
	7439-89-6	IRON	24300	24300	mg/kg	MY05SB25(0-0.5)	1/1	24300	24300	2300	Y	ASL
	7439-92-1	LEAD	62.2	62.2	mg/kg	MY05SB25(0-0.5)	1/1	62.2	62.2	40	Y	ASL
	7439-95-4	MAGNESIUM	5610	5610	mg/kg	MY05SB25(0-0.5)	1/1	5610	5610	NA	N	NUT
	7439-96-5	MANGANESE	522	522	mg/kg	MY05SB25(0-0.5)	1/1	522	522	180	Y	ASL
	7439-97-6	MERCURY	0.51	0.51	mg/kg	MY05SB25(0-0.5)	1/1	0.51	0.51	2.3	N	BSL
	7440-02-0	NICKEL	28.7	28.7	mg/kg	MY05SB25(0-0.5)	1/1	28.7	28.7	160	N	BSL
	7440-09-7	POTASSIUM	2270	2270	mg/kg	MY05SB25(0-0.5)	1/1	2270	2270	NA	N	NUT
	7440-23-5	SODIUM	141	141	mg/kg	MY05SB25(0-0.5)	1/1	141	141	NA	Y	NTX
	7440-62-2	VANADIUM	39.1	39.1	mg/kg	MY05SB25(0-0.5)	1/1	39.1	39.1	55	N	BSL
	7440-66-6	ZINC	154	154	mg/kg	MY05SB25(0-0.5)	1/1	154	154	2300	N	BSL
Surface and Subsurface Soils												
Metals	7429-90-5	ALUMINUM	8320	23200	mg/kg	MY05SB25(0-0.5)	3/3	14606.67	23200	7600	Y	ASL
	7440-36-0	ANTIMONY	0.08	0.08	mg/kg	MY05SB25(0-0.5)	1/3	0.03	0.08	3.1	N	BSL
	7440-38-2	ARSENIC	6.4	8.2	mg/kg	MY05SB25(2-8)	3/3	7.27	8.2	0.39	Y	ASL
	7440-39-3	BARIUM	30.9	100	mg/kg	MY05SB25(0-0.5)	3/3	58.63	100	540	N	BSL
	7440-41-7	BERYLLIUM	0.4	0.75	mg/kg	MY05SB25(0-0.5)	3/3	0.55	0.75	150	N	BSL
	7440-43-9	CADMIUM	0.24	0.24	mg/kg	MY05SB25(0-0.5)	1/3	0.09	0.24	3.7	N	BSL
	7440-70-2	CALCIUM	615	2290	mg/kg	MY05SB25(0-0.5)	3/3	1218.33	2290	NA	N	NUT
	7440-47-3	CHROMIUM	13.9	40.5	mg/kg	MY05SB25(0-0.5)	3/3	25.30	40.5	10000	N	BSL
	7440-48-4	COBALT	4.9	10.6	mg/kg	MY05SB25(0-0.5)	3/3	7.30	10.6	90	N	BSL
	7440-50-8	COPPER	10.2	48.9	mg/kg	MY05SB25(0-0.5)	3/3	24.67	48.9	310	N	BSL
	7439-89-6	IRON	10900	24300	mg/kg	MY05SB25(0-0.5)	3/3	16600.00	24300	2300	Y	ASL
	7439-92-1	LEAD	4.2	62.2	mg/kg	MY05SB25(0-0.5)	3/3	25.13	62.2	40	Y	ASL

Table 5-1F
Occurrence, Distribution and Selection of COPCs
Bailey Farmhouse

Medium	CAS No.	Chemical	Minimum Conc.	Maximum Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
	7439-95-4	MAGNESIUM	2610	5610	mg/kg	MY05SB25(0-0.5)	3/3	3933.33	5610	NA	N	NUT
	7439-96-5	MANGANESE	246	522	mg/kg	MY05SB25(0-0.5)	3/3	348.00	522	180	Y	ASL
	7439-97-6	MERCURY	0.06	0.51	mg/kg	MY05SB25(0-0.5)	2/3	0.19	0.51	2.3	N	BSL
	7440-02-0	NICKEL	11.7	28.7	mg/kg	MY05SB25(0-0.5)	3/3	19.03	28.7	160	N	BSL
	7440-09-7	POTASSIUM	1490	2270	mg/kg	MY05SB25(0-0.5)	3/3	1940.00	2270	NA	N	NUT
	7440-23-5	SODIUM	107	141	mg/kg	MY05SB25(0-0.5)	3/3	119.00	141	NA	Y	NTX
	7440-62-2	VANADIUM	16.4	39.1	mg/kg	MY05SB25(0-0.5)	3/3	26.20	39.1	55	N	BSL
	7440-66-6	ZINC	23.4	154	mg/kg	MY05SB25(0-0.5)	3/3	71.27	154	2300	N	BSL
PCBs	11096-82-5	PCB-1260	37	59	ug/kg	MY05TP102(4-5)	3/6	27.17				
		Total PCBs		59	ug/kg				59	220	N	BSL
VOCs	78-93-3	2-BUTANONE	43	43	ug/kg	MY05TP101(4-4.5)	1/4	15.38	43	730000	N	BSL
	67-64-1	ACETONE	140	140	ug/kg	MY05TP101(4-4.5)	1/6	33.92	140	160000	N	BSL
	75-09-2	METHYLENE CHLORIDE	16	23	ug/kg	MY05TP102(4-5)	3/6	12.67	23	9100	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text
1 - USEPA Region 9 Soil PRGs modified to an HI = 0.1. Same units as reported concentrations
COPC - Compounds of Potential Concern
J - estimated concentration
Conc. - Concentration
BSL - Below Screening Level
ASL - Above Screening Level
NUT - Essential Nutrient
NTX - Insufficient toxicity information
Y - Yes
N - No

Table 5-1G
Occurrence, Distribution and Selection of COPCs
ISFSI

Medium	CAS No.	Chemical	Min. Conc.	Max. Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
Soils													
METALS	7440-38-2	ARSENIC	7.9	8.1	mg/kg	Trench Sample 2	2/2	8	NA	8.1	0.039	Y	ASL
	7440-39-3	BARIUM	50	58	mg/kg	Trench Sample 3	2/2	54	NA	58	540	N	BSL
	7440-47-3	CHROMIUM	25	36	mg/kg	Trench Sample 3	2/2	30.5	NA	36	10000	N	BSL
	7439-92-1	LEAD	6.8	8.9	mg/kg	Trench Sample 2	2/2	7.85	NA	8.9	40	N	BSL
	7439-97-6	MERCURY	0.038	0.038	mg/kg	Trench Sample 3	1/2	NA	NA	0.038	2.3	N	BSL
SVOCs	50-32-8	**BENZO(A)PYRENE**	0.21	0.21	ug/kg	MY04SS01	1/2	0.19	0.22				
	205-99-2	**BENZO(B)FLUORANTHENE**	0.39	0.39	ug/kg	MY04SS01	1/2	0.28	0.44				
	218-01-9	**CHRYSENE**	0.16	0.16	ug/kg	MY04SS01	1/2	0.16	0.17				
		BENZO(A)PYRENE equivalent		0.25	ug/kg					0.25	62	N	BSL
	191-24-2	BENZO(G,H,I)PERYLENE	0.14	0.14	ug/kg	MY04SS01	1/2	0.15	0.17	0.14	NA	Y	NTX
	206-44-0	FLUORANTHENE	0.185	0.49	ug/kg	MY04SS01	2/2	0.34	0.55	0.49	230000	N	BSL
	86-30-6	N-NITROSODIPHENYLAMINE	0.19	0.19	ug/kg	MY04SS02	1/2	0.18	0.20	0.19	9900	N	BSL
	129-00-0	PYRENE	0.185	0.48	ug/kg	MY04SS01	2/2	0.33	0.54	0.48	230000	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text
1 - USEPA Region 9 Soil PRGs modified to an HI = 0.1. Same units as reported concentrations
COPC - Compounds of Potential Concern
Conc. - Concentration
Min. - Minimum
Max - Maximum
BSL - Below Screening Level
ASL - Above Screening Level
NTX - No Toxicity Information
Y - Yes
N - No

Table 5-1H
Occurrence, Distribution and Selection of COPCs
Sediments

Medium	CAS No.	Chemical	Min. Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	95% UCL Concentration	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
Sediment													
Metals	7429-90-5	ALUMINUM	4870	20600	mg/kg	MY06SD03	33/33	11926	13505	20600	7600	Y	ASL
	7440-36-0	ANTIMONY	0.01 J	0.08 J	mg/kg	MY06SD16	29/30	0.033	0.038	0.08 J	3.1	N	BSL
	7440-38-2	ARSENIC	2.9	15.6	mg/kg	MY06SD05	33/33	7.72	8.79	15.6	0.39	Y	ASL
	7440-39-3	BARIUM	15.9	57.8	mg/kg	MY06SD28	33/33	34.30	38.08	57.8	540	N	BSL
	7440-41-7	BERYLLIUM	0.18	0.89	mg/kg	MY06SD03	33/33	0.471	0.540	0.89	150	N	BSL
	7440-42-8	BORON	5	38.3	mg/kg	MY06SD05	33/33	18.5	22.0	38.3	1600	N	BSL
	7440-43-9	CADMIUM	0.04	0.29	mg/kg	MY06SD05	32/33	0.13	0.15	0.29	3.7	N	BSL
	7440-70-2	CALCIUM	1340 J	16500 J	mg/kg	MY06SD30	33/33	3342	4372	16500 J	NA	N	NUT
	7440-47-3	CHROMIUM	12.4	58.1	mg/kg	MY06SD03	33/33	33	37	58.1	10000	N	BSL
	7440-48-4	COBALT	3.1	10.7	mg/kg	MY06SD28	33/33	6.77	7.46	10.7	90	N	BSL
	7440-50-8	COPPER	4.4	24.7	mg/kg	MY06SD16	33/33	13.35	15.37	24.7	310	N	BSL
	7439-89-6	IRON	7600	29700	mg/kg	MY06SD05	33/33	18602	20978	29700	2300	Y	ASL
	7439-92-1	LEAD	4.6	32.6	mg/kg	MY06SD03	33/33	15.45	18.15	32.6	40	N	BSL
	7439-95-4	MAGNESIUM	2690	9430	mg/kg	MY06SD17	33/33	5747	6431	9430	NA	N	NUT
	7439-96-5	MANGANESE	113	306	mg/kg	MY06SD28	33/33	207	228	306	180	Y	ASL
	7439-97-6	MERCURY	0.055	0.34 J	mg/kg	MY06SD05, MY06SD06	19/33	0.10	0.13	0.34 J	2.3	N	BSL
	7439-98-7	MOLYBDENUM	0.26	1.75	mg/kg	MY06SD04&SD40	30/33	0.89	1.02	1.75	39	N	BSL
	7440-02-0	NICKEL	6.7	29.7	mg/kg	MY06SD04A	33/33	18.17	20.60	29.7	160	N	BSL
	7440-09-7	POTASSIUM	1610	5950	mg/kg	MY06SD17	33/33	3383	3789	5950	NA	N	NUT
	7782-49-2	SELENIUM	0.57 J	0.73 J	mg/kg	MY06SD05	4/33	0.31	0.36	0.73 J	39	N	BSL
	7440-22-4	SILVER	0.02 J	0.18	mg/kg	MY06SD03, MY06SD06	31/33	0.08	0.10	0.18	39	N	BSL
	7440-23-5	SODIUM	2800	15300	mg/kg	MY06SD17	33/33	6708	7935	15300	NA	Y	NTX
	7440-28-0	THALLIUM	0.09	0.3	mg/kg	MY06SD07	19/33	0.15	0.18	0.3	0.52	N	BSL
	7440-62-2	VANADIUM	13.4	51.8	mg/kg	MY06SD17	33/33	32	36	51.8	55	N	BSL
	7440-66-6	ZINC	22.2	195	mg/kg	MY06SD16	33/33	63	74	195	2300	N	BSL
PCB Congeners	NA	Dichlorobiphenyls	1.1	2.2	ug/kg	MY06SD08&SD38	3/6	0.98	1.62	2.2	NA	N	NTX
	NA	Heptachlorobiphenyls	1.5	4.2	ug/kg	MY06SD04A	5/6	2.20	3.34	4.2	NA	N	NTX
	NA	Hexachlorobiphenyls	3	9.2	ug/kg	MY06SD16A	6/6	5.43	7.51	9.2	NA	N	NTX
	NA	Nonachlorobiphenyls	0.22 J	0.22 J	ug/kg	MY06SD04A	1/6	0.28	0.31	0.22 J	NA	N	NTX
	NA	Octachlorobiphenyls	0.67	1.9	ug/kg	MY06SD20A&SD41	2/6	0.61	1.13	1.9	NA	N	NTX
	NA	Pentachlorobiphenyls	8.7	17	ug/kg	MY06SD16A	4/6	8.9	13.3	17	NA	N	NTX
	NA	Tetrachlorobiphenyls	1.7	10	ug/kg	6SD04A, MY06SD20A&	5/6	5.1	8.4	10	NA	N	NTX
	NA	Trichlorobiphenyls	0.96 J	2.5	ug/kg	MY06SD20A&SD41	2/6	1.15	1.69	2.5	NA	N	NTX
Pesticides	50-29-3	4,4'-DDT	8.35 J	12	ug/kg	MY06SD16A	2/33	3.28	3.95	12	1700	N	BSL
	7421-93-4	ENDRIN ALDEHYDE	7.125 J	7.125 J	ug/kg	MY06SD20A&SD41	1/33	2.94	3.29	7.125 J	NA	N	IFD
	76-44-8	HEPTACHLOR	2.1 J	2.1 J	ug/kg	MY06SD20A&SD41	1/33	1.47	1.59	2.1 J	110	N	BSL
SVOCs	91-57-6	2-METHYLNAPHTHALENE	0.8 J	2300 J	ug/kg	MY06SD101A(0-3.5)	30/64	279	410	2300 J	NA	Y	TX
	83-32-9	ACENAPHTHENE	3 J	3000	ug/kg	MY06SD110(0-3.5)	32/64	421	599	3000	370000	N	BSL
	208-96-8	ACENAPHTHYLENE	1 J	25 J	ug/kg	MY06SD116&SD117	6/64	184	276	25 J	NA	Y	NTX
	120-12-7	ANTHRACENE	8 J	5800	ug/kg	MY06SD101A(0-3.5)	45/64	885	1264	5800	2200000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	47	14000 J	ug/kg	MY06SD16A	61/64	1857	2630				
	50-32-8	**BENZO(A)PYRENE**	24	10000	ug/kg	MY06SD101A(0-3.5)	61/64	1576	2210				
	205-99-2	**BENZO(B)FLUORANTHENE**	28	14000	ug/kg	MY06SD101A(0-3.5)	61/64	2016	2830				
	207-08-9	**BENZO(K)FLUORANTHENE**	12 J	5100	ug/kg	MY06SD101A(0-3.5)	61/64	806	1100				
	218-01-9	**CHRYSENE**	32 J	12000	ug/kg	MY06SD101A(0-3.5)	62/65	1725	2000				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	3 J	3400	ug/kg	101A(0-3.5), MY06SD10	37/64	509	729				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	17 J	6700	ug/kg	MY06SD101A(0-3.5)	60/63	1004	1410				
		BENZO(A)PYRENE equivalent		17041	ug/kg				3639	17041	62	Y	ASL

Table 5-1H
Occurrence, Distribution and Selection of COPCs
Sediments

Medium	CAS No.	Chemical	Min. Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Concentration	95% UCL Concentration	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
Sediment													
	191-24-2	BENZO[G,H,I]PERYLENE	10 J	6000	ug/kg	MY06SD101A(0-3.5)	61/64	894	1257	6000	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	280 J	280 J	ug/kg	MY06SD26	1/33	281	304	280 J	35000	N	BSL
	86-74-8	CARBAZOLE	420 J	3800	ug/kg	MY06SD16	5/33	469	690	3800	NA	Y	NTX
	132-64-9	DIBENZOFURAN	280 J	1900	ug/kg	MY06SD16	4/33	353	453	1900	29000	N	BSL
	131-11-3	DIMETHYL PHTHALATE	520	520	ug/kg	MY06SD16A	1/33	288	315	520	10000000	N	BSL
	206-44-0	FLUORANTHENE	29	26000	ug/kg	MY06SD101A(0-3.5)	61/64	4114	5841	26000	230000	N	BSL
	86-73-7	FLUORENE	5 J	3300	ug/kg	MY06SD110(0-3.5)	35/64	509	719	3300	270000	N	BSL
	91-20-3	NAPHTHALENE	1 J	965 J	ug/kg	Y06SD104(0-3.5)&SD1(	29/64	208	303	965 J	5600	N	BSL
	85-01-8	PHENANTHRENE	27 J	28000	ug/kg	MY06SD101A(0-3.5)	61/64	3845	5530	28000	NA	Y	NTX
	129-00-0	PYRENE	52	36000 J	ug/kg	MY06SD101A(0-3.5)	61/64	4114	5966	36000 J	230000	N	BSL
VOCs	75-09-2	METHYLENE CHLORIDE	210 J	390 J	ug/kg	MY06SD10	4/33	248	281	390 J	9100	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text
1 - USEPA Region 9 Soil PRGs modified to an HI = 0.1. Same units as reported concentration.
COPC - Compounds of Potential Concern
J - estimated concentration
Conc. - Concentration
Min. - Minimum
Maax. - Maximum
BSL - Below Screening Level
ASL - Above Screening Level
NUT - Essential Nutrient
NTX - Insufficient toxicity information
IFD - Detected in less than 5% of samples
TX - toxicity information is available to evaluate risks
Y - Yes
N - No

Table 5-1I
Occurrence, Distribution and Selection of COPCs
Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
Tissue/Mussel													
Metals	7429-90-5	ALUMINUM	53.4 J	155 J	mg/kg	MY06BM08	14/14	90.257	107.193	155 J	140	Y	ASL
	7440-38-2	ARSENIC	0.72	1.39	mg/kg	MY06BM03	14/14	1.123	1.223	1.39	0.0014	Y	ASL
	7440-39-3	BARIUM	0.31 J	0.84 J	mg/kg	MY06BM08	14/14	0.505	0.592	0.84 J	9.5	N	BSL
	7440-41-7	BERYLLIUM	0.005 J	0.008 J	mg/kg	MY06BM04 & BM08	5/14	0.004	0.005	0.008 J	0.27	N	BSL
	7440-42-8	BORON	3.77	4.805	mg/kg	MY06BM11 & BM14	14/14	4.293	4.446	4.805	12	N	BSL
	7440-43-9	CADMIUM	0.164	0.317	mg/kg	MY06BM03	14/14	0.240	0.263	0.317	0.22	Y	ASL
	7440-70-2	CALCIUM	537 J	1460 J	mg/kg	MY06BM07	14/14	814.964	945.674	1460 J	NA	N	NUT
	7440-47-3	CHROMIUM	0.29	1.99	mg/kg	MY06BM10	14/14	0.607	0.835	1.99	200	N	BSL
	7440-48-4	COBALT	0.072	0.13	mg/kg	MY06BM03	14/14	0.099	0.109	0.13	2.7	N	BSL
	7440-50-8	COPPER	0.86 J	4.04 J	mg/kg	MY06BM13	14/14	1.750	2.217	4.04 J	5.4	N	BSL
	7439-89-6	IRON	68 J	195 J	mg/kg	MY06BM05	14/14	132.429	154.852	195 J	41	Y	ASL
	7439-92-1	LEAD	0.168	0.364	mg/kg	MY06BM12	14/14	0.256	0.289	0.364	NA	Y	NTX
	7439-95-4	MAGNESIUM	596	818	mg/kg	MY06BM04	14/14	701.786	736.272	818	NA	N	NUT
	7439-96-5	MANGANESE	2	9 J	mg/kg	MY06BM04	14/14	3.837	4.705	9 J	30.2	N	BSL
	7439-97-6	MERCURY	0.04	0.06 J	mg/kg	BM06, BM11&BM14	14/14	0.050	0.055	0.06 J	NA	Y	NTX
	7439-98-7	MOLYBDENUM	0.09 J	0.22	mg/kg	MY06BM03, BM11&BM15	14/14	0.149	0.170	0.22	0.68	N	BSL
	7440-02-0	NICKEL	0.19	0.98	mg/kg	MY06BM12	14/14	0.360	0.469	0.98	4.3	N	BSL
	7440-09-7	POTASSIUM	1050	1680	mg/kg	MY06BM11 & BM14	14/14	1440.000	1530.192	1680	NA	N	NUT
	7782-49-2	SELENIUM	0.28 J	0.52 J	mg/kg	MY06BM03, BM08	14/14	0.421	0.460	0.52 J	0.675	N	BSL
	7440-22-4	SILVER	0.005 J	0.011	mg/kg	MY06BM08	12/14	0.007	0.008	0.011	1.1	N	BSL
	7440-23-5	SODIUM	4140	5570	mg/kg	MY06BM04	14/14	4842.143	5078.825	5570	NA	Y	NTX
	7440-62-2	VANADIUM	0.22 J	0.52 J	mg/kg	MY06BM05	14/14	0.377	0.433	0.52 J	0.6	N	BSL
	7440-66-6	ZINC	6.89	13.2 J	mg/kg	MY06BM12	14/14	10.154	11.247	13.2 J	65	N	BSL
Pesticides	72-54-8	4,4'-DDD	0.13 J	0.3 J	ug/kg	MY06BM08	14/14	0.199	0.224	0.3 J	6.4	N	BSL
	72-55-9	4,4'-DDE	0.36 J	0.76	ug/kg	MY06BM07	14/14	0.569	0.629	0.76	6.4	N	BSL
	50-29-3	4,4'-DDT	0.021 J	0.048 J	ug/kg	MY06BM06	11/14	0.059	0.086	0.048 J	6.4	N	BSL
	5103-71-9	ALPHA-CHLORDANE	0.13 J	0.23 J	ug/kg	MY06BM11 & BM14	14/14	0.179	0.195	0.23 J	1.7	N	BSL
	319-84-6	ALPHA-HEXACHLOROCYCLOHEXANE	0.017 J	0.039 J	ug/kg	MY06BM07	13/14	0.035	0.053	0.039 J	0.5	Y	NTX
	319-85-7	BETA-HEXACHLOROCYCLOHEXANE	0.058J	0.058J	ug/kg	MY06BM11	1/14	0.174	0.194	0.058J	NA	Y	NTX
	60-57-1	DIELDRIN	0.045 J	0.07 J	ug/kg	MY06BM05	14/14	0.057	0.061	0.07 J	0.14	N	BSL
	33213-65-9	ENDOSULFAN II	0.12 J	0.14 J	ug/kg	MY06BM05	3/14	0.173	0.189	0.14 J	NA	Y	NTX
	1031-07-8	ENDOSULFAN SULFATE	0.039	0.061 J	ug/kg	MY06BM07	11/14	0.075	0.103	0.061 J	NA	Y	NTX
	53494-70-5	ENDRIN KETONE	0.3 J	0.63	ug/kg	MY06BM13, BM15	12/14	0.413	0.489	0.63	NA	Y	NTX
	5103-74-2	GAMMA-CHLORDANE	0.046 J	0.081 J	ug/kg	MY06BM10	13/14	0.073	0.091	0.081 J	1.7	N	BSL
	1024-57-3	HEPTACHLOR EPOXIDE	0.014 J	0.015 J	ug/kg	MY06BM10, BM14	2/14	0.153	0.188	0.015 J	0.24	N	BSL
	58-89-9	LINDANE	0.023 J	0.045 J	ug/kg	MY06BM08	14/14	0.032	0.036	0.045 J	0.17	N	BSL
SVOCs	606-20-2	2,6-DINITROTOLUENE	1.4	1.4	mg/kg	MY06BM15	1/14	0.743	0.853	1.4	140	N	BSL
	91-57-6	2-METHYLNAPHTHALENE	0.0025 J	0.0025 J	mg/kg	MY06BM04	1/14	0.639	0.747	0.0025 J	NA	Y	NTX
	83-32-9	ACENAPHTHENE	1.1 J	1.1 J	ug/kg	MY06BM04	1/14	0.896	0.972	1.1 J	8100	N	BSL
	208-96-8	ACENAPHTHYLENE	0.22 J	0.39 J	ug/kg	MY06BM11 & BM14	14/14	0.305	0.332	0.39 J	NA	Y	NTX
	120-12-7	ANTHRACENE	0.3 J	2.4 J	ug/kg	MY06BM04	14/14	0.563	0.844	2.4 J	41000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	1 J	6.7	ug/kg	BM01&BM04	14/14	1.614	2.013				
	50-32-8	**BENZO(A)PYRENE**	0.6 J	6	ug/kg	BM01&BM04	14/14	1.074	1.454				
	205-99-2	**BENZO(B)FLUORANTHENE**	1.8	9.5	ug/kg	BM01&BM04	14/14	2.789	3.359				
	207-08-9	**BENZO(K)FLUORANTHENE**	0.58 J	3.2	ug/kg	BM01&BM04	14/14	0.971	1.168				
	218-01-9	**CHRYSENE**	1.6 J	8.5	ug/kg	BM01&BM04	14/14	2.439	2.922				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	0.087 J	0.7	ug/kg	BM01&BM04	14/14	0.144	0.189				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	0.53 J	4.2	ug/kg	BM01&BM04	14/14	0.902	1.160				
		BENZO(A)PYRENE equivalent		8.8	ug/kg					8.8	0.43	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	4.2	4.2	ug/kg	BM01&BM04	1/14	1.027	1.265	2.575	NA	Y	NTX

Table 5-1I
Occurrence, Distribution and Selection of COPCs
Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
	86-74-8	CARBAZOLE	0.017	0.017	mg/kg	BM01&BM04	1/14	0.663	0.732	0.3335 J	160	N	BSL
	132-64-9	DIBENZOFURAN	0.0054	0.0054	mg/kg	BM01&BM04	1/14	0.663	0.733	0.3277 J	270	N	BSL
	206-44-0	FLUORANTHENE	3.2	18	ug/kg	BM01&BM04	14/14	5.082	6.109	11.15	5400	N	BSL
	86-73-7	FLUORENE	0.37 J	1.2	ug/kg	BM01&BM04	2/14	0.882	0.976	1.075 J	5400	N	BSL
	78-59-1	ISOPHORONE	0.0091 J	0.037 J	mg/kg	MY06BM08	14/14	0.023	0.027	0.037 J	330	N	BSL
	85-01-8	PHENANTHRENE	1.2 J	11	ug/kg	BM01&BM04	4/14	1.455	2.173	5.975	NA	Y	NTX
	129-00-0	PYRENE	3.4	15	ug/kg	BM01&BM04	14/14	4.975	5.806	9.75	4100	N	BSL
Tissue/Clams													
Metals	7429-90-5	ALUMINUM	167	654 J	mg/kg	MY06BC01	18/18	332.5	394.99	654 J	140	Y	ASL
	7440-36-0	ANTIMONY	0.007 J	0.03	mg/kg	MY06BC01	18/18	0.012	0.01	0.03	0.054	N	BSL
	7440-38-2	ARSENIC	1.21	7.11	mg/kg	MY06BC01	18/18	2.817	3.52	7.11	0.0014	Y	ASL
	7440-39-3	BARIUM	0.97	4.49	mg/kg	MY06BC01	18/18	2.034	2.46	4.49	9.5	N	BSL
	7440-41-7	BERYLLIUM	0.01 J	0.043	mg/kg	MY06BC01 & BC17	18/18	0.021	0.03	0.043	0.27	N	BSL
	7440-42-8	BORON	2.24	3.84	mg/kg	MY06BC01	18/18	2.970	3.14	3.84	12	N	BSL
	7440-43-9	CADMIUM	0.028	0.063	mg/kg	MY06BC01	18/18	0.044	0.05	0.063	0.22	N	BSL
	7440-70-2	CALCIUM	1470	5970	mg/kg	MY06BC01	18/18	2521.1	3023.89	5970	NA	N	NUT
	7440-47-3	CHROMIUM	0.42	1.67	mg/kg	MY06BC01	18/18	0.87	1.03	1.67	200	N	BSL
	7440-48-4	COBALT	0.161	1.12	mg/kg	MY06BC01	18/18	0.32	0.42	1.12	2.7	N	BSL
	7440-50-8	COPPER	1.36 J	26.6 J	mg/kg	MY06BC16	18/18	6.75	10.30	26.6 J	5.4	Y	ASL
	7439-89-6	IRON	310	2850	mg/kg	MY06BC01	18/18	1077.1	1413.25	2850	41	Y	ASL
	7439-92-1	LEAD	0.381 J	1.96 J	mg/kg	MY06BC02	18/18	0.87	1.08	1.96 J	NA	Y	NTX
	7439-95-4	MAGNESIUM	623	925	mg/kg	MY06BC04	18/18	832.4	868.30	925	NA	N	NUT
	7439-96-5	MANGANESE	6 J	179 J	mg/kg	MY06BC01	18/18	25.2	43.38	179 J	30.2	Y	ASL
	7439-97-6	MERCURY	0.02	0.06	mg/kg	MY06BC11	18/18	0.041	0.05	0.06	NA	Y	NTX
	7439-98-7	MOLYBDENUM	0.21	0.45	mg/kg	MY06BC01	18/18	0.299	0.32	0.45	0.68	N	BSL
	7440-02-0	NICKEL	0.42 J	3.14 J	mg/kg	MY06BC11	18/18	1.003	1.35	3.14 J	4.3	N	BSL
	7440-09-7	POTASSIUM	1310	2210	mg/kg	MY06BC06	18/18	1665.0	1770.36	2210	NA	N	NUT
	7782-49-2	SELENIUM	0.25 J	0.5 J	mg/kg	MY06BC01	18/18	0.4	0.40	0.5 J	0.675	N	BSL
	7440-23-5	SODIUM	3760	5925	mg/kg	BC15&BC19	18/18	4928.6	5236.10	5925	NA	Y	NTX
	7440-28-0	THALLIUM	0.005 J	0.006 J	mg/kg	MY06BC01, BC11, BC12	7/18	0.004	0.0043	0.006 J	0.01	N	BSL
	7440-62-2	VANADIUM	0.73	4.77	mg/kg	MY06BC01	18/18	1.560	1.99	4.77	0.6	Y	ASL
	7440-66-6	ZINC	9.38	28.1	mg/kg	MY06BC02	18/18	15.955	18.34	28.1	65	N	BSL
PCBs	11097-69-1	PCB 1254	0.975 J	3 J	ug/kg	MY06BC02	18/18	2.065	2.37				
	11096-82-5	PCB 1260	1.1 J	3.4	ug/kg	MY06BC03	18/18	2.169	2.46				
		Total PCBs		6.4					4.83	6.4	1.10	Y	ASL
Pesticides	72-54-8	4,4'-DDD	0.032 J	0.1 J	ug/kg	MY06BC01	18/18	0.063	0.07	0.1 J	6.4	N	BSL
	72-55-9	4,4'-DDE	0.094 J	0.32 J	ug/kg	MY06BC06	18/18	0.209	0.24	0.32 J	6.4	N	BSL
	50-29-3	4,4'-DDT	0.01 J	0.11 J	ug/kg	MY06BC13, BC14	11/18	0.098	0.13	0.11 J	6.4	N	BSL
	5103-71-9	ALPHA-CHLORDANE	0.036 J	0.15 J	ug/kg	MY06BC02	17/18	0.098	0.11	0.15 J	1.7	N	BSL
	319-84-6	ALPHA-HEXACHLOROCYCLOHEXANE	0.012 J	0.0875 J	ug/kg	BC15&BC19	11/18	0.080	0.11	0.0875 J	NA	Y	NTX
	319-85-7	BETA-HEXACHLOROCYCLOHEXANE	0.035 J	0.4	ug/kg	MY06BC12	8/18	0.159	0.19	0.4	NA	Y	NTX
	60-57-1	DIELDRIN	0.037 J	0.39 J	ug/kg	MY06BC01	18/18	0.089	0.13	0.39 J	0.14	Y	ASL
	959-998-8	ENDOSULFAN I	0.03 J	0.03 J	ug/kg	MY06BC03	1/18	0.169	0.19	0.03 J	NA	Y	ASL
	33213-65-9	ENDOSULFAN II	0.035 J	0.16 J	ug/kg	MY06BC06	4/18	0.155	0.19	0.16 J	NA	Y	NTX
	1031-07-8	ENDOSULFAN SULFATE	0.024 J	0.052 J	ug/kg	MY06BC06	17/18	0.043	0.06	0.052 J	NA	Y	NTX
	72-20-8	ENDRIN	0.03 J	0.03 J	ug/kg	MY06BC10	1/18	0.169	0.19	0.03 J	40	N	BSL
	7421-93-4	ENDRIN ALDEHYDE	0.048 J	0.18 J	ug/kg	MY06BC06	11/18	0.138	0.17	0.18 J	NA	Y	NTX
	53494-70-5	ENDRIN KETONE	0.32 J	0.34	ug/kg	MY06BC09, BC12	4/18	0.211	0.25	0.34	NA	Y	NTX
	5103-74-2	GAMMA-CHLORDANE	0.0087 J	0.12 J	ug/kg	MY06BC07	16/18	0.060	0.08	0.12 J	1.7	N	BSL
	76-44-8	HEPTACHLOR	0.031 J	0.09 J	ug/kg	BC15&BC19	2/18	0.165	0.19	0.09 J	0.7	N	BSL
	1024-57-3	HEPTACHLOR EPOXIDE	0.0091 J	0.0925 J	ug/kg	BC15&BC19	11/18	0.086	0.13	0.0925 J	0.24	N	BSL

Table 5-1I
Occurrence, Distribution and Selection of COPCs
Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
	58-89-9	LINDANE	0.024 J	0.0685 J	ug/kg	BC15&BC19	18/18	0.036	0.04	0.0685 J	1.7	N	BSL
SVOCs	95-95-4	2,4,5-TRICHLOROPHENOL	0.088 J	0.11 J	mg/kg	MY06BC02	2/18	0.676	0.78	0.11 J	14000	N	BSL
	88-06-2	2,4,6-TRICHLOROPHENOL	0.039 J	0.045 J	mg/kg	MY06BC02	2/18	0.670	0.78	0.045 J	29	N	BSL
	120-83-2	2,4-DICHLOROPHENOL	0.007 J	0.054 J	mg/kg	MY06BC02	4/18	0.586	0.73	0.054 J	410	N	BSL
	105-67-9	2,4-DIMETHYLPHENOL	0.0068 J	0.061 J	mg/kg	MY06BC02	11/18	0.290	0.45	0.061 J	2700	N	BSL
	95-48-7	2-METHYLPHENOL	0.0043 J	0.037 J	mg/kg	MY06BC02	18/18	0.013	0.02	0.037 J	6800	N	BSL
	59-50-7	4-CHLORO-3-METHYLPHENOL	0.018 J	0.469 J	mg/kg	BC15&BC19	13/18	0.256	0.39	0.469 J	NA	Y	NTX
	106-44-5	4-METHYLPHENOL	0.0052 J	0.358 J	mg/kg	BC15&BC19	16/18	0.122	0.23	0.358 J	680	N	BSL
	83-32-9	ACENAPHTHENE	0.96 J	0.96 J	ug/kg	MY06BC11	1/18	0.851	0.88	0.96 J	8100	N	BSL
	208-96-8	ACENAPHTHYLENE	0.18 J	0.615 J	ug/kg	BC15&BC19	17/18	0.340	0.42	0.615 J	NA	Y	NTX
	120-12-7	ANTHRACENE	0.2 J	1.2 J	ug/kg	MY06BC17	18/18	0.444	0.57	1.2 J	41000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	1 J	3.7	ug/kg	MY06BC11	18/18	2.184	2.55				
	50-32-8	**BENZO(A)PYRENE**	0.88 J	3.5	ug/kg	MY06BC04	18/18	1.992	2.33				
	205-99-2	**BENZO(B)FLUORANTHENE**	1.6 J	6	ug/kg	MY06BC04	18/18	3.622	4.23				
	207-08-9	**BENZO(K)FLUORANTHENE**	0.68 J	2.1 J	ug/kg	MY06BC11	18/18	1.309	1.51				
	218-01-9	**CHRYSENE**	1.5 J	5.1	ug/kg	MY06BC11	17/17	2.942	3.49				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	0.11 J	0.37 J	ug/kg	MY06BC04, BC11	18/18	0.228	0.26				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	0.66 J	2.7	ug/kg	MY06BC04	18/18	1.558	1.83				
		BENZO(A)PYRENE equivalent		5.1	ug/kg				3.48	5.1	0.43	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	1.7	5.4	ug/kg	MY06BC11	18/18	3.181	3.60	5.4	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	0.0036 J	0.0054 J	mg/kg	MY06BC07	3/18	0.649	0.79	0.0054 J	230	N	BSL
	206-44-0	FLUORANTHENE	2.7	9.6	ug/kg	MY06BC17	18/18	5.544	6.45	9.6	5400	N	BSL
	86-73-7	FLUORENE	0.13 J	0.35 J	ug/kg	MY06BC11	7/18	0.584	0.73	0.35 J	5400	N	BSL
	87-86-5	PENTACHLOROPHENOL	0.033 J	0.32 J	mg/kg	MY06BC06	3/18	0.665	0.78	0.32 J	26	N	BSL
	85-01-8	PHENANTHRENE	0.9 J	5.6	ug/kg	MY06BC17	17/18	1.842	2.41	5.6	NA	Y	NTX
	129-00-0	PYRENE	2.7	9.3	ug/kg	MY06BC11	18/18	5.5	6.30	9.3	4100	N	BSL
Tissue/Lobster													
Metals	7440-38-2	ARSENIC	2.66	2.82	mg/kg	MY06BL02	4/4	2.74	2.810	2.82	0.0014	Y	ASL
	7440-39-3	BARIUM	0.12	0.17	mg/kg	MY06BL03	2/4	0.09	0.156	0.17	9.5	N	BSL
	7440-42-8	BORON	1.025	1.16	mg/kg	MY06BL01	4/4	1.08	1.139	1.16	12	N	BSL
	7440-70-2	CALCIUM	662 J	1630 J	mg/kg	MY06BL01	4/4	1011.0	1437.019	1630 J	NA	N	NUT
	7440-47-3	CHROMIUM	0.06J	0.06 J	mg/kg	MY06BL03	1/4	0.03	0.051	0.06 J	200	N	BSL
	7440-48-4	COBALT	0.0055 J	0.01 J	mg/kg	MY06BL02	4/4	0.01	0.010	0.01 J	2.7	N	BSL
	7440-50-8	COPPER	6.71	12.85 J	mg/kg	BL04&BL05	4/4	9.03	11.639	12.85 J	5.4	Y	ASL
	7439-92-1	LEAD	0.015	0.0815	mg/kg	BL04&BL05	4/4	0.04	0.069	0.0815	NA	Y	NTX
	7439-95-4	MAGNESIUM	356	412	mg/kg	MY06BL01	4/4	381.5	404.209	412	NA	N	NUT
	7439-96-5	MANGANESE	0.565	1.28	mg/kg	MY06BL01	4/4	0.83	1.142	1.28	30.2	N	BSL
	7439-97-6	MERCURY	0.17	0.21	mg/kg	MY06BL03	4/4	0.19	0.208	0.21	NA	Y	NTX
	7439-98-7	MOLYBDENUM	0.01 J	0.03	mg/kg	MY06BL03	4/4	0.02	0.026	0.03	0.68	N	BSL
	7440-02-0	NICKEL	0.05 J	0.23	mg/kg	BL04&BL05	4/4	0.10	0.186	0.23	4.3	N	BSL
	7440-09-7	POTASSIUM	2560	2695	mg/kg	BL04&BL05	4/4	2626.3	2687.106	2695	NA	N	NUT
	7782-49-2	SELENIUM	0.41	0.47	mg/kg	MY06BL01	4/4	0.444	0.470	0.47	0.675	N	BSL
	7440-22-4	SILVER	0.171 J	0.239 J	mg/kg	MY06BL02	4/4	0.204	0.232	0.239 J	1.1	N	BSL
	7440-23-5	SODIUM	3085	4040	mg/kg	MY06BL01	4/4	3678.8	4124.441	4040	NA	Y	NTX
	7440-66-6	ZINC	18.4	23.3	mg/kg	MY06BL02	4/4	20.150	22.268	23.3	65	N	BSL
Pesticides	72-55-9	4,4'-DDE	0.39 J	0.58 J	ug/kg	MY06BL03	4/4	0.463	0.549	0.58 J	6.4	N	BSL
	5103-71-9	ALPHA-CHLORDANE	.021J	.025J	ug/kg	MY06BL01, BL03	4/4	0.024	0.026	.025J	1.7	N	BSL
	319-84-6	ALPHA-HEXACHLOROCYCLOHEXANE	0.021 J	0.021 J	ug/kg	MY06BL03	1/4	0.387	0.730	0.021 J	NA	Y	NTX
	60-57-1	DIELDRIN	0.18 J	0.22	ug/kg	MY06BL03	4/4	0.203	0.219	0.22	0.14	Y	ASL
	1031-07-8	ENDOSULFAN SULFATE	0.017 J	0.017 J	ug/kg	MY06BL01	1/4	0.386	0.731	0.017 J	NA	Y	NTX
	1024-57-3	HEPTACHLOR EPOXIDE	0.0091 J	.012J	ug/kg	MY06BL01	3/3	0.008	0.014	.012J	0.24	N	BSL

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Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
SVOCs	95-95-4	2,4,5-TRICHLOROPHENOL	.0145J	0.11	mg/kg	MY06BL01	4/4	0.042	0.087	0.11	14000	N	BSL
	88-06-2	2,4,6-TRICHLOROPHENOL	0.04 J	0.04	mg/kg	MY06BL01	1/4	1.060	1.700	0.04	29	N	BSL
	120-83-2	2,4-DICHLOROPHENOL	0.036 J	0.036 J	mg/kg	MY06BL01	1/4	1.065	1.738	0.036 J	410	N	BSL
	105-67-9	2,4-DIMETHYLPHENOL	0.019 J	.051J	mg/kg	MY06BL01	4/4	0.027	0.043	.051J	2700	N	BSL
	95-57-8	2-CHLOROPHENOL	0.014 J	0.014	mg/kg	MY06BL01	1/4	1.060	1.740	0.014	680	N	BSL
	95-48-7	2-METHYLPHENOL	.0094J	.026J	mg/kg	MY06BL01	4/4	0.014	0.022	.026J	6800	N	BSL
	59-50-7	4-CHLORO-3-METHYLPHENOL	0.035 J	0.1J	mg/kg	MY06BL01	4/4	0.052	0.083	0.1J	NA	Y	NTX
	106-44-5	4-METHYLPHENOL	0.013 J	0.033J	mg/kg	MY06BL01	4/4	0.019	0.028	0.033J	680	N	BSL
	83-32-9	ACENAPHTHENE	0.041J	0.057 J	ug/kg	MY06BL01	4/4	0.046	0.055	0.057 J	8100	N	BSL
	208-96-8	ACENAPHTHYLENE	0.14 J	.02J	ug/kg	MY06BL01	4/4	0.180	0.207	.02J	NA	Y	NTX
	120-12-7	ANTHRACENE	0.072J	0.138J	ug/kg	BL04&BL05	4/4	0.096	0.125	0.138J	41000	N	BSL
	50-32-8	**BENZO(A)PYRENE**	0.16 J	0.26J	ug/kg	MY06BL03	4/4	0.195	0.241				ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	0.32 J	0.55J	ug/kg	MY06BL03	4/4	0.426	0.520				
	207-08-9	**BENZO(K)FLUORANTHENE**	0.11 J	0.25J	ug/kg	MY06BL03	4/4	0.175	0.232				
	218-01-9	**CHRYSENE**	0.68 J	0.9J	ug/kg	MY06BL03	4/4	0.780	0.875				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	0.017 J	0.028J	ug/kg	MY06BL03	4/4	0.024	0.029				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	0.11 J	0.22J	ug/kg	MY06BL03	4/4	0.154	0.204				
		BENZO(A)PYRENE equivalent		0.37	ug/kg					0.37	0.43	N	BSL
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	0.018 J	0.018 J	mg/kg	MY06BL02	1/4	1.073	1.763	0.018 J	230	N	BSL
	84-74-2	DI-N-BUTYL PHTHALATE	0.0099 J	0.018	mg/kg	BL04&BL05	3/4	0.372	1.076	0.018	14000	N	BSL
	206-44-0	FLUORANTHENE	1.5 J	2.1 J	ug/kg	MY06BL03	4/4	1.800	2.088	2.1 J	5400	N	BSL
	86-73-7	FLUORENE	0.11 J	0.11	ug/kg	MY06BL02	2/3	0.468	1.360	0.11	5400	N	BSL
	87-86-5	PENTACHLOROPHENOL	0.033 J	0.34 J	mg/kg	MY06BL01	3/4	0.459	1.088	0.34 J	26	N	BSL
	129-00-0	PYRENE	1 J	1.5 J	ug/kg	MY06BL03	4/4	1.2	1.490	1.5 J	4100	N	BSL
Tissue/Lobster/Tomalley													
Metals	7440-38-2	ARSENIC	4.29	4.29	mg/kg	MY06BL06	1/1	NA	NA	4.29	0.0014	Y	ASL
	7440-39-3	BARIUM	0.06 J	0.06 J	mg/kg	MY06BL06	1/1	NA	NA	0.06 J	9.5	N	BSL
	7440-42-8	BORON	1.24	1.24	mg/kg	MY06BL06	1/1	NA	NA	1.24	12	N	BSL
	7440-43-9	CADMIUM	0.85	0.85	mg/kg	MY06BL06	1/1	NA	NA	0.85	0.22	Y	ASL
	7440-70-2	CALCIUM	557	557	mg/kg	MY06BL06	1/1	NA	NA	557	NA	N	NUT
	7440-47-3	CHROMIUM	0.18	0.18	mg/kg	MY06BL06	1/1	NA	NA	0.18	200	N	BSL
	7440-48-4	COBALT	0.12	0.12	mg/kg	MY06BL06	1/1	NA	NA	0.12	2.7	N	BSL
	7440-50-8	COPPER	49.9	49.9	mg/kg	MY06BL06	1/1	NA	NA	49.9	5.4	Y	ASL
	7439-89-6	IRON	25	25	mg/kg	MY06BL06	1/1	NA	NA	25	41	N	BSL
	7439-92-1	LEAD	0.04	0.04	mg/kg	MY06BL06	1/1	NA	NA	0.04	NA	Y	NTX
	7439-95-4	MAGNESIUM	232	232	mg/kg	MY06BL06	1/1	NA	NA	232	NA	N	NUT
	7439-96-5	MANGANESE	2.65	2.65	mg/kg	MY06BL06	1/1	NA	NA	2.65	30.2	N	BSL
	7439-97-6	MERCURY	0.09	0.09	mg/kg	MY06BL06	1/1	NA	NA	0.09	NA	Y	NTX
	7439-98-7	MOLYBDENUM	0.36	0.36	mg/kg	MY06BL06	1/1	NA	NA	0.36	0.68	N	BSL
	7440-02-0	NICKEL	0.24	0.24	mg/kg	MY06BL06	1/1	NA	NA	0.24	4.3	N	BSL
	7440-09-7	POTASSIUM	2130	2130	mg/kg	MY06BL06	1/1	NA	NA	2130	NA	N	NUT
	7782-49-2	SELENIUM	1.04	1.04	mg/kg	MY06BL06	1/1	NA	NA	1.04	0.675	Y	ASL
	7440-22-4	SILVER	0.708	0.708	mg/kg	MY06BL06	1/1	NA	NA	0.708	1.1	N	BSL
	7440-23-5	SODIUM	3160	3160	mg/kg	MY06BL06	1/1	NA	NA	3160	NA	Y	NTX
	7440-62-2	VANADIUM	0.2	0.2	mg/kg	MY06BL06	1/1	NA	NA	0.2	0.6	N	BSL
	7440-66-6	ZINC	16.1	16.1	mg/kg	MY06BL06	1/1	NA	NA	16.1	65	N	BSL
PCBs	11096-82-5	Total PCBs (Aroclor 1260 only)	130 J	130 J	ug/kg	MY06BL06	1/1	NA	NA	130 J	1.1	Y	ASL
Pesticides	72-54-8	4,4'-DDD	2.6 J	2.6 J	ug/kg	MY06BL06	1/1	NA	NA	2.6 J	6.4	N	BSL
	72-55-9	4,4'-DDE	38 J	38 J	ug/kg	MY06BL06	1/1	NA	NA	38 J	6.4	Y	ASL
	50-29-3	4,4'-DDT	1.1 J	1.1 J	ug/kg	MY06BL06	1/1	NA	NA	1.1 J	6.4	N	BSL
	5103-71-9	ALPHA-CHLORDANE	0.91 J	0.91 J	ug/kg	MY06BL06	1/1	NA	NA	0.91 J	1.7	N	BSL

Table 5-1I
Occurrence, Distribution and Selection of COPCs
Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
SVOCs	319-84-6	ALPHA-HEXACHLOROCYCLOHEXANE	1.1 J	1.1 J	ug/kg	MY06BL06	1/1	NA	NA	1.1 J	NA	Y	NTX
	60-57-1	DIELDRIN	2.6 J	2.6 J	ug/kg	MY06BL06	1/1	NA	NA	2.6 J	0.14	Y	ASL
	7421-93-4	ENDRIN ALDEHYDE	3.8 J	3.8 J	ug/kg	MY06BL06	1/1	NA	NA	3.8 J	NA	Y	NTX
	53494-70-5	ENDRIN KETONE	0.63 J	0.63 J	ug/kg	MY06BL06	1/1	NA	NA	0.63 J	NA	Y	NTX
	5103-74-2	GAMMA-CHLORDANE	0.2 J	0.2 J	ug/kg	MY06BL06	1/1	NA	NA	0.2 J	1.7	N	BSL
	1024-57-3	HEPTACHLOR EPOXIDE	0.47 J	0.47 J	ug/kg	MY06BL06	1/1	NA	NA	0.47 J	0.24	Y	ASL
	58-89-9	LINDANE	0.26 J	0.26 J	ug/kg	MY06BL06	1/1	NA	NA	0.26 J	**1.7**	N	BSL
	105-67-9	2,4-DIMETHYLPHENOL	0.069 J	0.069 J	mg/kg	MY06BL06	1/1	NA	NA	0.069 J	2700	N	BSL
	95-48-7	2-METHYLPHENOL	0.082 J	0.082 J	mg/kg	MY06BL06	1/1	NA	NA	0.082 J	6800	N	BSL
	59-50-7	4-CHLORO-3-METHYLPHENOL	0.44 J	0.44 J	mg/kg	MY06BL06	1/1	NA	NA	0.44 J	NA	Y	NTX
	106-44-5	4-METHYLPHENOL	0.074 J	0.074 J	mg/kg	MY06BL06	1/1	NA	NA	0.074 J	680	N	BSL
	83-32-9	ACENAPHTHENE	0.82 J	0.82 J	ug/kg	MY06BL06	1/1	NA	NA	0.82 J	8100	N	BSL
	208-96-8	ACENAPHTHYLENE	1.9 J	1.9 J	ug/kg	MY06BL06	1/1	NA	NA	1.9 J	NA	Y	NTX
	120-12-7	ANTHRACENE	1.3 J	1.3 J	ug/kg	MY06BL06	1/1	NA	NA	1.3 J	41000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	5.6 J	5.6 J	ug/kg	MY06BL06	1/1	NA	NA				
	50-32-8	**BENZO(A)PYRENE**	2.7 J	2.7 J	ug/kg	MY06BL06	1/1	NA	NA				
	205-99-2	**BENZO(B)FLUORANTHENE**	8.8 J	8.8 J	ug/kg	MY06BL06	1/1	NA	NA				
	207-08-9	**BENZO(K)FLUORANTHENE**	2.7 J	2.7 J	ug/kg	MY06BL06	1/1	NA	NA				
	218-01-9	**CHRYSENE**	20 J	20 J	ug/kg	MY06BL06	1/1	NA	NA				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	0.49 J	0.49 J	ug/kg	MY06BL06	1/1	NA	NA				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	2.6 J	2.6 J	ug/kg	MY06BL06	1/1	NA	NA				
		BENZO(A)PYRENE equivalent		4.9	ug/kg					4.9	0.43	Y	ASL
	191-24-2	BENZO[G,H,I]PERYLENE	3.3 J	3.3 J	ug/kg	MY06BL06	1/1	NA	NA	3.3 J	NA	Y	NTX
	117-81-7	BIS(2-ETHYLHEXYL) PHTHALATE	0.11 J	0.11 J	mg/kg	MY06BL06	1/1	NA	NA	0.11 J	230	N	BSL
	206-44-0	FLUORANTHENE	55 J	55 J	ug/kg	MY06BL06	1/1	NA	NA	55 J	5400	N	BSL
	86-73-7	FLUORENE	1.9 J	1.9 J	ug/kg	MY06BL06	1/1	NA	NA	1.9 J	5400	N	BSL
	91-20-3	NAPHTHALENE	4.8 J	4.8 J	ug/kg	MY06BL06	1/1	NA	NA	4.8 J	2700	N	BSL
	87-86-5	PENTACHLOROPHENOL	0.11 J	0.11 J	mg/kg	MY06BL06	1/1	NA	NA	0.11 J	2.6	N	BSL
	85-01-8	PHENANTHRENE	6.7 J	6.7 J	ug/kg	MY06BL06	1/1	NA	NA	6.7 J	NA	Y	NTX
	129-00-0	PYRENE	43 J	43 J	ug/kg	MY06BL06	1/1	NA	NA	43 J	4100	N	BSL
Tissue/Clams - Reference Locations													
Metals	7429-90-5	ALUMINUM	328 J	427 J	mg/kg	MYRSB-C02	3/3	374.0	NA	427 J	140	Y	ASL
	7440-36-0	ANTIMONY	0.012	0.064	mg/kg	MYRSB-C02	3/3	0.030	NA	0.064	0.054	Y	ASL
	7440-38-2	ARSENIC	2.84	3.42	mg/kg	MYRSB-C02	3/3	3.187	NA	3.42	0.0014	Y	ASL
	7440-39-3	BARIUM	1.86	2.64	mg/kg	MYRSB-C02	3/3	2.220	NA	2.64	9.5	N	BSL
	7440-41-7	BERYLLIUM	0.02	0.023	mg/kg	MYRSB-C02	3/3	0.022	NA	0.023	0.27	N	BSL
	7440-42-8	BORON	2.85	3.3	mg/kg	MYRSB-C02	3/3	3.093	NA	3.3	12	N	BSL
	7440-43-9	CADMIUM	0.037	0.05	mg/kg	MYRSB-C01	3/3	0.044	NA	0.05	0.22	N	BSL
	7440-70-2	CALCIUM	1090	3830	mg/kg	MYRSB-C02	3/3	2616.7	NA	3830	NA	N	NUT
	7440-47-3	CHROMIUM	0.88	1.37	mg/kg	MYRSB-C02	3/3	1.06	NA	1.37	200	N	BSL
	7440-48-4	COBALT	0.316	0.336	mg/kg	MYRSB-C02	3/3	0.33	NA	0.336	2.7	N	BSL
	7440-50-8	COPPER	3.25 J	7.61 J	mg/kg	MYRSB-C02	3/3	5.39	NA	7.61 J	5.4	Y	ASL
	7439-89-6	IRON	1100	1500	mg/kg	MYRSB-C02	3/3	1310.0	NA	1500	41	Y	ASL
	7439-92-1	LEAD	1.08 J	1.47 J	mg/kg	MYRSB-C02	3/3	1.21	NA	1.47 J	NA	Y	NTX
	7439-95-4	MAGNESIUM	759	791	mg/kg	MYRSB-C02	3/3	771.0	NA	791	NA	N	NUT
	7439-96-5	MANGANESE	41.8 J	57.4 J	mg/kg	MYRSB-C03	3/3	47.4	NA	57.4 J	30.2	Y	ASL
	7439-97-6	MERCURY	0.05	0.05	mg/kg	MYRSB-C02	3/3	0.050	NA	0.05	NA	Y	NTX
	7439-98-7	MOLYBDENUM	0.34	0.36	mg/kg	MYRSB-C01	3/3	0.350	NA	0.36	0.68	N	BSL
	7440-02-0	NICKEL	0.62 J	0.91 J	mg/kg	MYRSB-C02	3/3	0.730	NA	0.91 J	4.3	N	BSL
	7440-09-7	POTASSIUM	1930	1950	mg/kg	MYRSB-C02	3/3	1940.0	NA	1950	NA	N	NUT
	7440-22-4	SILVER	0.129 J	0.178 J	mg/kg	MYRSB-C02	3/3	0.160	NA	0.178 J	1.1	N	BSL

Table 5-1I
Occurrence, Distribution and Selection of COPCs
Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
	7440-23-5	SODIUM	4200	4340	mg/kg	MYRSB-C02	3/3	4270.0	NA	4340	NA	Y	NTX
	7440-28-0	THALLIUM	.005 J	0.006 J	mg/kg	MYRSB-C03	2/3	0.006	NA	0.006 J	0.01	N	BSL
	7440-62-2	VANADIUM	1.86	2.17	mg/kg	MYRSB-C02	3/3	1.983	NA	2.17	0.6	Y	ASL
	7440-66-6	ZINC	16	18	mg/kg	MYRSB-C02	3/3	17.200	NA	18	65	N	BSL
PCBs	11097-69-1	PCB 1254	3.4	4.6	ug/kg	MYRSB-C02	3/3	3.967	NA				
	11096-82-5	PCB 1260	3.3 J	4	ug/kg	MYRSB-C02	3/3	3.700	NA				
		Total PCBs		8.6	ug/kg			7.660		8.6	1.10	Y	ASL
Pesticides	72-54-8	4,4'-DDD	0.12 J	0.14 J	ug/kg	MYRSB-C02	3/3	0.130	NA	0.14 J	6.4	N	BSL
	72-55-9	4,4'-DDE	0.29 J	0.39	ug/kg	MYRSB-C02	3/3	1.040	NA	0.39	6.4	N	BSL
	50-29-3	4,4'-DDT	0.053 J	0.065 J	ug/kg	MYRSB-C03	3/3	0.058	NA	0.065 J	6.4	N	BSL
	5103-71-9	ALPHA-CHLORDANE	0.13 J	0.14 J	ug/kg	MYRSB-C03	3/3	0.140	NA	0.14 J	1.7	N	BSL
	60-57-1	DIELDRIN	0.058 J	0.074 J	ug/kg	MYRSB-C03	3/3	0.064	NA	0.074 J	0.14	N	BSL
	1031-07-8	ENDOSULFAN SULFATE	0.048 J	0.059 J	ug/kg	MYRSB-C02	3/3	0.055	NA	0.059 J	NA	Y	NTX
	53494-70-5	ENDRIN KETONE	0.41	0.46	ug/kg	MYRSB-C02	3/3	0.427	NA	0.46	NA	Y	NTX
	5103-74-2	GAMMA-CHLORDANE	0.079 J	0.12 J	ug/kg	MYRSB-C02	3/3	0.282	NA	0.12 J	1.7	N	BSL
	1024-57-3	HEPTACHLOR EPOXIDE	0.012 J	0.02 J	ug/kg	MYRSB-C03	3/3	0.015	NA	0.02 J	0.24	N	BSL
	58-89-9	LINDANE	0.04 J	0.046 J	ug/kg	MYRSB-C03	3/3	0.045	NA	0.046 J	1.7	N	BSL
		ALPHA-BHC	0.025 J	0.036 J	ug/kg	MYRSB-C03	3/3	0.029	NA	0.036 J	0.5	N	BSL
		BETA-BHC	0.26 J	0.5	ug/kg	MYRSB-C01	3/3	0.360	NA	0.5	1.75	N	BSL
		DELTA-BHC	0.041 J	0.041 J	ug/kg	MYRSB-C03	1/3	0.041	NA	0.041 J	NA	Y	NTX
SVOCs	95-95-4	2,4,5-TRICHLOROPHENOL	0.033 J	0.1 J	mg/kg	MYRSB-C02	2/3	0.066	NA	0.1 J	14000	N	BSL
	88-06-2	2,4,6-TRICHLOROPHENOL	0.038 J	0.038 J	mg/kg	MYRSB-C02	1/3	0.038	NA	0.038 J	29	N	BSL
	120-83-2	2,4-DICHLOROPHENOL	0.013 J	0.043 J	mg/kg	MYRSB-C01	1/3	0.028	NA	0.043 J	410	N	BSL
	105-67-9	2,4-DIMETHYLPHENOL	0.021 J	0.061 J	mg/kg	MYRSB-C01	3/3	0.038	NA	0.061 J	2700	N	BSL
	95-48-7	2-METHYLPHENOL	0.016 J	0.035 J	mg/kg	MYRSB-C01	3/3	0.023	NA	0.035 J	6800	N	BSL
	59-50-7	4-CHLORO-3-METHYLPHENOL	0.064 J	0.2 J	mg/kg	MYRSB-C01	3/3	0.120	NA	0.2 J	NA	Y	NTX
	106-44-5	4-METHYLPHENOL	0.033 J	0.09 J	mg/kg	MYRSB-C01	3/3	0.063	NA	0.09 J	680	N	BSL
	100027	4-NITROPHENOL	0.31 R	1.3 R	mg/kg	MYRSB-C03	3/3	0.590	NA	1.3 R	1100	N	BSL
	87-86-5	PENTACHLOROPHENOL	0.049 J	0.17 J	mg/kg	MYRSB-C01	2/3	0.110	NA	0.17 J	2.6	N	BSL
	208-96-8	ACENAPHTHYLENE	0.4 J	0.52 J	ug/kg	MYRSB-C03	3/3	0.470	NA	0.52 J	NA	Y	NTX
	120-12-7	ANTHRACENE	0.32 J	0.4 J	ug/kg	MYRSB-C02	3/3	0.370	NA	0.4 J	41000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	3.3	4	ug/kg	MYRSB-C03	3/3	3.633	NA				
	50-32-8	**BENZO(A)PYRENE**	3.6	4.1	ug/kg	MYRSB-C03	3/3	3.867	NA				
	205-99-2	**BENZO(B)FLUORANTHENE**	5.8 J	7.1 J	ug/kg	MYRSB-C03	3/3	6.500	NA				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	0.46 J	0.5 J	ug/kg	MYRSB-C03	3/3	0.480	NA				
	218-01-9	**CHRYSENE**	4.5	6.2	ug/kg	MYRSB-C03	3/3	5.267	NA				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	2.8	3.2	ug/kg	MYRSB-C03	3/3	3.033	NA				
		BENZO(A)PYRENE equivalent		6.0	ug/kg			5.669		6	0.43	Y	ASL
	207-08-9	BENZO(K)FLUORANTHENE	2.1	2.5	ug/kg	MYRSB-C03	3/3	2.267	NA	2.5	43	N	BSL
	191-24-2	BENZO[G,H,I]PERYLENE	4.3	5	ug/kg	MYRSB-C03	3/3	4.700	NA	5	NA	Y	NTX
	206-44-0	FLUORANTHENE	6.2	7.8	ug/kg	MYRSB-C03	3/3	7.000	NA	7.8	5400	N	BSL
	86-73-7	FLUORENE	0.24 J	0.33 J	ug/kg	MYRSB-C01	3/3	0.290	NA	0.33 J	5400	N	BSL
	85-01-8	PHENANTHRENE	1.8 J	2 J	ug/kg	MYRSB-C02	3/3	1.900	NA	2 J	NA	Y	NTX
	129-00-0	PYRENE	7.6	9.2	ug/kg	MYRSB-C03	3/3	8.4	NA	9.2	4100	N	BSL
Tissue/Mussels - Reference Locations													
Metals	7429-90-5	ALUMINUM	57.8 J	93.6 J	mg/kg	MYRSB-M02	4/4	75.6	NA	93.6 J	140	N	BSL
	7440-38-2	ARSENIC	0.98	1.53	mg/kg	MYRSB-M02	4/4	1.370	NA	1.53	0.0014	Y	ASL
	7440-39-3	BARIUM	0.31 J	0.53 J	mg/kg	MYRSB-M02	4/4	0.450	NA	0.53 J	9.5	N	BSL
	7440-41-7	BERYLLIUM	0.005 J	0.006 J	mg/kg	MYRSB-M02	2/4	0.006	NA	0.006 J	0.27	N	BSL
	7440-42-8	BORON	3.95	4.43	mg/kg	MYRSB-M04	4/4	4.175	NA	4.43	12	N	BSL
	7440-43-9	CADMIUM	0.214	0.316	mg/kg	MYRSB-M04	4/4	0.276	NA	0.316	0.22	Y	ASL

Table 5-1I
Occurrence, Distribution and Selection of COPCs
Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale
	7440-70-2	CALCIUM	687 J	2060 J	mg/kg	MYRSB-M03	4/4	1397.0	NA	2060 J	NA	N	NUT
	7440-47-3	CHROMIUM	0.38	0.6	mg/kg	MYRSB-M03	4/4	0.52	NA	0.6	200	N	BSL
	7440-48-4	COBALT	0.092	0.14	mg/kg	MYRSB-M04	4/4	0.13	NA	0.14	2.7	N	BSL
	7440-50-8	COPPER	1.3 J	3.82 J	mg/kg	MYRSB-M02	4/4	2.09	NA	3.82 J	5.4	N	BSL
	7439-89-6	IRON	95 J	166 J	mg/kg	MYRSB-M02	4/4	133.0	NA	166 J	41	Y	ASL
	7439-92-1	LEAD	0.219	0.411	mg/kg	MYRSB-M02	4/4	0.31	NA	0.411	NA	Y	NTX
	7439-95-4	MAGNESIUM	609	740	mg/kg	MYRSB-M01	4/4	664.8	NA	740	NA	N	NUT
	7439-96-5	MANGANESE	3.35 J	7.2 J	mg/kg	MYRSB-M04	4/4	4.8	NA	7.2 J	30.2	N	BSL
	7439-97-6	MERCURY	0.04	0.05	mg/kg	MYRSB-M02	4/4	0.048	NA	0.05	NA	Y	NTX
	7439-98-7	MOLYBDENUM	0.17	0.29	mg/kg	MYRSB-M03	4/4	0.200	NA	0.29	0.68	N	BSL
	7440-02-0	NICKEL	0.23	0.51	mg/kg	MYRSB-M03	4/4	0.358	NA	0.51	4.3	N	BSL
	7440-09-7	POTASSIUM	1380	1810	mg/kg	MYRSB-M03	4/4	1672.5	NA	1810	NA	N	NUT
	7782-49-2	SELENIUM	0.38 J	0.62 J	mg/kg	MYRSB-M04	4/4	0.5	NA	0.62 J	0.675	N	BSL
	7440-22-4	SILVER	0.008 J	0.02	mg/kg	MYRSB-M04	4/4	0.013	NA	0.02	1.1	N	BSL
	7440-23-5	SODIUM	4180	5270	mg/kg	MYRSB-M01	4/4	4607.5	NA	5270	NA	Y	NTX
	7440-62-2	VANADIUM	0.32 J	0.64 J	mg/kg	MYRSB-M03	4/4	0.440	NA	0.64 J	0.6	Y	ASL
	7440-66-6	ZINC	8.98	14	mg/kg	MYRSB-M03	4/4	12.020	NA	14	65	N	BSL
Pesticides	72-54-8	4,4'-DDD	0.19 J	0.4	ug/kg	MYRSB-M02	4/4	0.320	NA	0.4	6.4	N	BSL
	72-55-9	4,4'-DDE	0.44	0.92	ug/kg	MYRSB-M03	4/4	0.750	NA	0.92	6.4	N	BSL
	5103-71-9	ALPHA-CHLORDANE	0.17 J	0.3 J	ug/kg	MYRSB-M03	4/4	0.240	NA	0.3 J	1.7	N	BSL
	60-57-1	DIELDRIN	0.04 J	0.073 J	ug/kg	MYRSB-M02	4/4	0.062	NA	0.073 J	0.14	N	BSL
	1031-07-8	ENDOSULFAN SULFATE	0.045 J	0.088 J	ug/kg	MYRSB-M03	4/4	0.075	NA	0.088 J	NA	Y	NTX
	53494-70-5	ENDRIN KETONE	0.25 J	0.37 J	ug/kg	MYRSB-M04	4/4	0.320	NA	0.37 J	NA	Y	NTX
	5103-74-2	GAMMA-CHLORDANE	0.06 J	0.13 J	ug/kg	MYRSB-M03	4/4	0.087	NA	0.13 J	1.7	N	BSL
	1024-57-3	HEPTACHLOR EPOXIDE	0.011 J	0.011 J	ug/kg	MYRSB-M02	1/4	0.011	NA	0.011 J	0.24	N	BSL
	58-89-9	LINDANE	0.021 J	0.044 J	ug/kg	MYRSB-M02	4/4	0.030	NA	0.044 J	1.7	N	BSL
		ALPHA-BHC	0.017 J	0.034 J	ug/kg	MYRSB-M03	4/4	0.030	NA	0.034 J	0.5	N	BSL
SVOCs	100027	4-NITROPHENOL	0.31 R	1.3 R	mg/kg	MYRSB-M02	4/4	0.820	NA	1.3 R	1100	N	BSL
	78591	ISOPHORONE	.025 J	0.028 J	mg/kg	MYRSB-M02	3/4	0.027	NA	0.028 J	330	N	BSL
	208-96-8	ACENAPHTHYLENE	0.32 J	0.6 J	ug/kg	MYRSB-M03	4/4	0.490	NA	0.6 J	NA	Y	NTX
	120-12-7	ANTHRACENE	0.3 J	0.56 J	ug/kg	MYRSB-M03	4/4	0.460	NA	0.56 J	41000	N	BSL
	56-55-3	**BENZO(A)ANTHRACENE**	1.6	2.6	ug/kg	MYRSB-M03	4/4	2.250	NA				
	50-32-8	**BENZO(A)PYRENE**	1.1 J	1.7	ug/kg	MYRSB-M03	4/4	1.550	NA				
	205-99-2	**BENZO(B)FLUORANTHENE**	3.1	5.2	ug/kg	MYRSB-M03	4/4	4.475	NA				
	207-08-9	**BENZO(K)FLUORANTHENE**	1	1.6 J	ug/kg	MYRSB-M03	4/4	1.400	NA				
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	0.18 J	0.27 J	ug/kg	MYRSB-M03	4/4	0.240	NA				
	218-01-9	**CHRYSENE**	2.3	4	ug/kg	MYRSB-M02	4/4	3.350	NA				
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	0.96 J	1.5 J	ug/kg	MYRSB-M02	4/4	1.340	NA				
		BENZO(A)PYRENE equivalent		2.9	ug/kg			2.614		2.9	0.43	Y	ASL
	206-44-0	FLUORANTHENE	3.5	6	ug/kg	MYRSB-M02	4/4	5.050	NA	6	5400	N	BSL
	129-00-0	PYRENE	4.5	7.8	ug/kg	MYRSB-M02	4/4	6.5	NA	7.8	4100	N	BSL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text

1 - MBOH FTALs or USEPA Region 3 RBCs modified to an HI = 0.1or 10^6. Same units as reported concentrations

COPC - Compounds of Potential Concern

DRO - Diesel Range Organics

J - estimated concentration

Conc. - Concentration

Min. - Minimum

Max - Maximum

IFD - Infrequently Detected

BSL - Below Screening Level

ASL - Above Screening Level

Table 5-1I
Occurrence, Distribution and Selection of COPCs
Shellfish Tissue

Medium	CAS No.	Chemical	Min Conc.	Max Conc.	Units	Location of Maximum	Detection Frequency	Average Conc.	95% UCL Conc.	Screening Conc.	Risk Based Conc. [1]	Selected as COPC	Rationale

NUT - Essential Nutrient
NTX - Insufficient toxicity information
TX - toxicity information is available to evaluate risks
Y - Yes
N - No

Table 5-1J
Occurrence, Distribution and Selection of COPCs
Groundwater

Medium	CAS No.	Chemical	Minimum Conc. (ug/L)	Maximum Conc. (ug/L)	Location of Maximum	Frequency of Detection	Average Concentration (ug/L)	Screening Concentraton (ug/L)	Risk Based Conc. (1)	Selected as COPC	Rationale
Groundwater											
Fuel	NA	DIESEL RANGE ORGANICS	51	5810 J	MY05GW100	55/60	517	5810 J	50	Y	ASL
Metals	7429-90-5	ALUMINUM	0.099 J	3850	MY05GW107	71/96	510.65	3850	3600	Y	ASL
	7440-36-0	ANTIMONY	0.007 J	0.033 J	MY04GW03	4/96	0.01	0.033 J	1.5	N	BSL
	7440-38-2	ARSENIC	0.01 J	23.3	MY05GW106-1C	31/97	6.60	23.3	0.045	Y	ASL
	7440-39-3	BARIUM	0.009 J	266	MY05GW20	97/97	55.66	266	260	Y	ASL
	7440-41-7	BERYLLIUM	0.0018 J	1.2 J	MY05GW23	11/97	0.41	1.2 J	73.0	Y	BSL/DER
	7440-42-8	BORON	0.18 J	2450	MY05GW117	88/97	155.20	2450	730	Y	ASL
	7440-43-9	CADMIUM	0.0014 J	1.7	MY05GW04-1C	25/97	0.39	1.7	2	Y	BSL/DER
	7440-70-2	CALCIUM	18	681000	MY05GW23	95/95	76002.21	681000	NA	N	NUT
	7440-47-3	CHROMIUM	0.002 J	22.2 J	MY05GW09-1B	32/97	4.73	22.2 J	5500	Y	BSL/DER
	7440-48-4	COBALT	0.006	60.8 J	MY05GW117	28/97	15.58	60.8 J	73	N	BSL
	7440-50-8	COPPER	0.004 J	296	MY05GW107	35/97	15.52	296	150	Y	ASL
	7439-89-6	IRON	0.012 J	543000	MY05GW23-1B&GW52-1B	80/97	16595.27	543000	1100	Y	ASL
	7439-92-1	LEAD	0.005 J	18.6	MY04GW07A	28/97	2.32	18.6	1	Y	ASL
	7439-95-4	MAGNESIUM	9.3	718000	MY05GW23-1B&GW52-1B	95/95	45644.99	718000	NA	N	NUT
	7439-96-5	MANGANESE	0.004	41800	MY05GW23-1B&GW52-1B	94/97	3568.50	41800	88	Y	ASL
	7439-97-6	MERCURY	0.000007 J	0.59 J	MY05GW09-1B	23/97	0.06	0.59 J	1.1	N	BSL
	7439-98-7	MOLYBDENUM	0.015 J	3170	MY05GW107	40/94	123.34	3170	18	Y	ASL
	7440-02-0	NICKEL	0.011	139	MY05GW107	50/97	22.62	139	73	Y	ASL
	09/07/7440	POTASSIUM	4.4 J	115000 J	MY05GW117	95/95	11085.32	115000 J	NA	N	NUT
	7782-49-2	SELENIUM	0.01 J	21.6 J	MY05GW23	16/93	3.65	21.6 J	18	Y	ASL
	7440-22-4	SILVER	0.004 J	49.9	MY05GW107	19/97	3.05	49.9	18	Y	ASL
	7440-23-5	SODIUM	16	4280000	MY05GW23-1B&GW52-1B	94/95	178154.91	4280000	NA	Y	NTX
	7440-28-0	THALLIUM	0.013	3.3	MY05GW22	12/96	0.89	3.3	0.24	Y	ASL
	7440-62-2	VANADIUM	0.006	20.8	MY05GW09-1B	17/97	6.52	20.8	26	Y	BSL/DER
	7440-66-6	ZINC	0.025 J	491	MY05GW112-1C	62/97	30.74	491	1100	N	BSL
Pesticides	60-57-1	DIELDRIN	0.057	0.1 J	MY05GW101	5/55	0.09	0.1 J	0.00420	Y	ASL/DER
	76-44-8	HEPTACHLOR	0.52	0.52	MY05GW17	1/55	0.52	0.52	0.0150	Y	ASL/DER
SVOCs	95-48-7	2-METHYLPHENOL	9.74	9.74	MY05GW100	1/58	9.74	9.74	180	N	BSL
	106-44-5	4-METHYLPHENOL	16.5	16.5	MY05GW102	1/58	16.50	16.5	18	N	BSL
	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	7 J	7 J	MY05GW21	1/61	7.00	7 J	4.8	Y	ASL
	84-74-2	DI-N-BUTYLPHTHALATE	1 J	1 J	MY04GW03	1/61	1.00	1 J	360	Y	BSL/DER
	91-20-3	NAPHTHALENE	9 J	9 J	MY05GW106	1/61	9.00	9 J	0.62	Y	ASL/DER
	108-95-2	PHENOL	25.7	265	MY05GW102	2/58	145.35	265	2200	N	BSL
VOCs	71-55-6	1,1,1-TRICHLOROETHANE	6	535 J	MY05GW112&GW120	7/77	225.86	535 J	320	Y	ASL/DER
	79-00-5	1,1,2-TRICHLOROETHANE	0.4 J	0.4 J	MY05GW113-1C	1/77	0.40	0.4 J	0.20	Y	ASL
	75-34-3	1,1-DICHLOROETHANE	0.9 J	240	MY05GW113	11/77	50.07	240	81	Y	ASL/DER
	75-35-4	1,1-DICHLOROETHENE	0.5 J	190	MY05GW113-1C	9/77	46.72	190	34	Y	ASL
	107-06-2	1,2-DICHLOROETHANE	2	2	MY05GW113-1C	1/77	2.00	2	0.12	Y	ASL
	78-93-3	2-BUTANONE	15	15	MY05GW102	1/63	15.00	15	190	N	BSL
	67-64-1	ACETONE	2 J	23 J	MY05GW06	10/55	5.46	23 J	61	N	BSL
	71-43-2	BENZENE	0.6 J	3.7	MY05GW100	4/76	1.48	3.7	0.34	Y	ASL/DER
	75-27-4	BROMODICHLOROMETHANE	2	2	MY05GW123	1/77	2.00	2	0.18	Y	ASL
	74-83-9	BROMOMETHANE	1 J	1 J	MY04GW06A	1/77	1.00	1 J	0.87	Y	ASL

Table 5-1J
Occurrence, Distribution and Selection of COPCs
Groundwater

Medium	CAS No.	Chemical	Minimum Conc. (ug/L)	Maximum Conc. (ug/L)	Location of Maximum	Frequency of Detection	Average Concentration (ug/L)	Screening Concentraton (ug/L)	Risk Based Conc. (1)	Selected as COPC	Rationale
	67-66-3	CHLOROFORM	0.66 J	38	MY05GW123	21/77	6.13	38	0.62	Y	ASL
	74-87-3	CHLOROMETHANE	2 J	3	MY05GW109-1C&GW152-1C	2/77	2.33	3	1.50	Y	ASL
	100-41-4	ETHYLBENZENE	1	160	MY05GW106-1C	3/77	93.67	160	2.90	Y	ASL/DER
	136777-61-2	M/P-XYLENE	1	340	MY05GW106	3/77	187.00	340	21	Y	ASL/DER
	75-09-2	METHYLENE CHLORIDE	1 J	1 J	MY05GW14	1/77	1.00	1 J	4.30	N	BSL
	95-47-6	O-XYLENE	0.15 J	170	MY05GW106	4/77	75.24	170	21	Y	ASL
	108-88-3	TOLUENE	0.5 J	2	MY05GW17, MY05GW106-1C	7/76	1.06	2	72	Y	BSL/DER
	79-01-6	TRICHLOROETHENE	1	4	MY05GW129	2/76	2.50	4	0.0280	Y	ASL/DER
	75-01-4	VINYL CHLORIDE	0.13 J	2 J	MY05GW113, MY05GW113-1C	8/77	0.69	2 J	0.0200	Y	ASL
Other	14797-55-8	NITRATE	50	3135	MY05GW05-1B&GW50-1B	31/41	1030	3135	1000	Y	ASL

BOLD - individual carcinogenic PAH compounds modified by the appropriate TEF and summed to yeild a Benzo(a)pyrene equivalent concentration- see text
(1) USEPA Region 9 Tap Water PRGs modified to an HI = 1. Same units as reported concentrations.
COPC - Compounds of Potential Concern
J - estimated concentration
BSL - Below Screening Level
ASL - Above Screening Level
NUT - Essential Nutrient
DER - Dermal/Oral ratio > 10% (see Appendix B-3 USEPA, 2001a)
Y - Yes
N - No

Table 5-2
Values Used for Daily Intake/Absorbed Dose Calculations - Soil
On-Site Worker

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Soil
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Equation/ Model Name
Ingestion	CS	Chemical Concentration in soil	mg/kg					CS x IR x RAF x CF x EF x ED
	IR	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	BW x AT x 365 days/yr
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	1	EPA, 1991a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 1991a	0.000001	EPA, 1991a	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	25	EPA, 2001b	6.6	EPA, 1997a	
	BW	Body Weight	kg	70	EPA, 1991a	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	25	EPA, 2001b	6.6	EPA, 1997a	
Dermal	CS	Chemical Concentration in soil	mg/kg					CS x SA x AF x ABS x CF x EF x EV x ED
	SA	Skin Surface Area	cm^2	3300	EPA, 2001a	3300	EPA, 2001a	BW x AT x 365 days/yr
	AF	Adherence Factor	mg/cm^2-event	0.2	EPA, 2001a	0.02	EPA, 2001a	
	ABS	Dermal Absorption Fraction	unitless	chem-specific	EPA, 2001a	chem-specific	EPA, 2001a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 2001a	0.000001	EPA, 2001a	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	EV	Event Frequency	event/day	1	EPA, 2001a	1	EPA, 2001a	
	ED	Exposure Duration	years	25	EPA, 2001b	6.6	EPA, 2001b	
	BW	Body Weight	kg	70	EPA, 1991a	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	ABSORBED DOSE
	AT-N	Averaging Time, non-cancer	years	25	EPA, 2000	6.6	EPA, 2000	

Definitions: mg - milligram
kg - kilogram
cm^2 - centimeter squared
RME - Reasonable Maximum Exposure
CT - Central Tendency

Table 5-3
Values Used for Daily Intake/Absorbed Dose Calculations - Soil
Construction Worker

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Surface/Subsurface Soil
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Parameter Code	Parameter Definitior	Units	RME Value	RME Rationale/ Reference	Equation/ Model Name
Ingestion	CS	Chemical Concentration in soil	mg/kg			CS x IR x RAF x CF x EF x ED
	IR	Ingestion Rate	mg/day	330	EPA, 2001b	BW x AT x 365 days/yr
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 1991a	
	EF	Exposure Frequency	days/year	173	BPJ	
	ED	Exposure Duration	years	1	EPA, 2001b	
	BW	Body Weight	kg	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	1	EPA, 2001b	
Dermal	CS	Chemical Concentration in soil	mg/kg			CS x SA x AF x ABS x CF x EF x EV x ED
	SA	Skin Surface Area	cm^2	3300	EPA, 2001a	BW x AT x 365 days/yr
	AF	Adherence Factor	mg/cm^2-event	0.2	EPA, 2001a	
	ABS	Dermal Absorption Fraction	unitless	chem-specific	EPA, 2001a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 2001a	
	EF	Exposure Frequency	days/year	173	BPJ	
	EV	Event Frequency	event/day	1	EPA, 2001b	
	ED	Exposure Duration	years	1	EPA, 2001b	
	BW	Body Weight	kg	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	ABSORBED DOSE
	AT-N	Averaging Time, non-cancer	years	1	EPA, 2001b	

Definitions:
- mg - milligram
- kg - kilogram
- cm^2 - centimeter squared
- RME - Reasonable Maximum Exposure
- CT - Central Tendency
- NA - Not Applicable

BPJ - Best Professional Judgement - assumes exposure 5 days/week for 8 months.

Table 5-4
Values Used for Daily Intake/Absorbed Dose Calculations - Soils
Residential Scenario

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Soil
Receptor Population:	Resident
Receptor Age:	child/adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Equation/ Model Name
Ingestion	CS	Chemical Concentration in soil	mg/kg					CS x IFadj x RAF x CF x EF / AT x 365 days/yr
	IFadj	Ingestion Rate, age weighted	mg-yr/kg-day	114	EPA, 1991a	18.3	EPA, 1991a	
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	1	EPA, 1991a	
	IR-A	Ingestion Rate, Adult	mg/day	100	EPA, 1991a	50	EPA, 1991a	IFadj = (IRchild X EDchild) / BWchild + (IRadult X EDadult) / BWadult
	IR-C	Ingestion Rate, Child	mg/day	200	EPA, 1991a	100	EPA, 1991a	
	ED-A	Exposure Duration, Adult	years	24	EPA, 1991a	7	EPA, 1991a	
	ED-C	Exposure Duration, Child	years	6	EPA, 1991a	2	EPA, 1991a	
	BW-A	Body Weight, Adult	kg	70	EPA, 1991a	70	EPA, 1991a	
	BW-C	Body Weight, Child	kg	15	EPA, 1991a	15	EPA, 1991a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 1991a	0.000001	EPA, 1991a	
	EF	Exposure Frequency	days/year	150	EPA, 1991a	150	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	9	EPA, 1994	
Dermal	CS	Chemical Concentration in soil	mg/kg					CS x SFSadj x ABS x CF x EF x EV / AT x 365 days/yr
	SFSadj	Age-weighted dermal factor	mg-yr/kg-event	360	EPA, 2001a	20.6	EPA, 2001a	
	SA-C	Skin Surface Area, child	cm^2	2800	EPA, 2001a	2800	EPA, 2001a	
	SA-A	Skin Surface Area, adult	cm^2	5700	EPA, 2001a	5700	EPA, 2001a	
	AF-C	Adherence Factor, child	mg/cm^2-event	0.2	EPA, 2001a	0.04	EPA, 2001a	SFSadj = (SAchild x AFchild x EDchild) / BWchild +
	AF-A	Adherence Factor, adult	mg/cm^2-event	0.07	EPA, 2001a	0.01	EPA, 2001a	
	ABS	Dermal Absorption Fraction	unitless	chem-specific	EPA, 2001a	chem-specific	EPA, 2001a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 2001a	0.000001	EPA, 2001a	(SAadult x AFadult x EDadult) / BWadult
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	EV	Event Frequency	event/day	1	EPA, 2001a	1	EPA, 2001a	
	ED-C	Exposure Duration, child	years	6	EPA, 1991a	2	EPA, 1994	
	ED-A	Exposure Duration, adult	years	24	EPA, 1991a	7	EPA, 1994	
	BW-C	Body Weight, child	kg	15	EPA, 1991a	15	EPA, 1991a	
	BW-A	Body Weight, adult	kg	70	EPA, 1991a	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	ABSORBED DOSE
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	9	EPA, 1991a	

Definitions:
mg - milligram
kg - kilogram
cm^2 - centimeter squared
yr - year
RME - Reasonable Maximum Exposure
CT - Central Tendency

Table 5-5
Values Used for Daily Intake/Absorbed Dose Calculations - Produce
Resident

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	fruits/vegetables
Receptor Population:	Resident
Receptor Age:	Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	Equation/ Model Name
Ingestion	CS	Chemical Concentration in soil	mg/kg	chemical-specific	95% UCL		$\frac{Pr_{produce} \text{ x IR x EF x CF x ED}}{\text{AT x BW x 365 day/year}}$
	Pr_{ag}	Concentration in aboveground produce - root uptake	mg/kg	chemical-specific	EPA, 1998f	NA	
						NA	
	Br_{ag}	Plant-soil bioconcentration factor	unitless	chemical-specific	EPA, 1998f	NA	$Pr_{ag} = Cs \text{ x } Br_{ag}$
	$Pr_{rootveg}$	Concentration in root vegetables	mg/kg	chemical-specific	EPA, 1998f	NA	
	$Br_{rootveg}$	Plant-soil bioconcentration factor	unitless	chemical-specific	EPA, 1998f	NA	$Pr_{bg} = Cs \text{ x } Br_{rootveg} \text{ x } VG_{rootveg}$
	$Vg_{rootveg}$	Correction factor	unitless	chemical-specific	EPA, 1998f	NA	
	$Pr_{produce}$	Total Produce Concentration	mg/kg	86% from aboveground	EPA, 1998f	NA	$Pr_{produce} = (Pr_{bg} * 14\%) + (Pr_{ag} *86\%)$
				14% from belowground	EPA, 1998f	NA	
	IR	Ingestion Rate	g/day	71	EPA, 1998f	NA	
	EF	Exposure Frequency	days/year	350	EPA, 1998f	NA	
	ED	Exposure Duration	years	30	EPA, 1991a	NA	
	BW	Body Weight	kg	70	EPA, 1991a	NA	INTAKE DOSE
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	NA	
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	NA	

Definitions:
mg - milligram
kg - kilogram
cm^2 - centimeter squared
yr - year
RME - Reasonable Maximum Exposure
CT - Central Tendency
BPJ - Best Professional Judgement

Table 5-6
Values Used for Daily Intake/Absorbed Dose Calculations - Sediment

Scenario Timeframe:	Future
Medium:	Sediments
Exposure Medium:	Sediments
Receptor Population:	Shellfisherman
Receptor Age:	Adults

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Equation/ Model Name
Ingestion	CS	Chemical Concentration in soil	mg/kg					CS x IR x RAF x CF x EF x ED
	IR	Ingestion Rate	mg/day	100	EPA, 1991a	50	EPA, 1991a	BW x AT x 365 days/yr
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	1	EPA, 1991a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 1991a	0.000001	EPA, 1991a	
	EF	Exposure Frequency	days/year	104	MY, 1996	52	MY, 1996	
	ED	Exposure Duration	years	30	BPJ	9	BPJ	
	BW	Body Weight	kg	70	EPA, 1991a	70	EPA,1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	30	BPJ	9	BPJ	
Dermal	CS	Chemical Concentration in soil	mg/kg					CS x SA x AF x ABS x CF x EF x ED x EV
	SA	Skin Surface Area	cm^2	5700	EPA, 2001a	5700	EPA, 2001a	BW x AT x 365 days/yr
	AF	Adherence Factor	mg/cm^2-event	0.2	EPA, 2001a	0.2	EPA, 2001a	
	ABS	Dermal Absorption Factor	unitless	chem-specific	EPA, 2001a	chem-specific	EPA, 2001a	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 1991a	0.000001	EPA, 1991a	
	EF	Exposure Frequency	days/year	104	MY, 1996	52	MY, 1996	
	ED	Exposure Duration	years	30	BPJ	9	BPJ	
	EV	Event Frequency	event/day	1	EPA, 2001a	1	EPA, 2001a	
	BW	Body Weight	kg	70	EPA, 1991a	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	ABSORBED DOSE
	AT-N	Averaging Time, non-cancer	years	30	BPJ	9	BPJ	

Table 5-6
Values Used for Daily Intake/Absorbed Dose Calculations - Sediment

Scenario Timeframe:	Future
Medium:	Sediments
Exposure Medium:	Sediments
Receptor Population:	Resident
Receptor Age:	Child/Adults

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale	Equation/ Model Name
Ingestion	CS	Chemical Concentration in soil	mg/kg			NA	NA	CS x IR x RAF x CF x EF x ED / BW x AT x 365 days/yr
	Iradj	Ingestion Rate, age weighted[1]	mg-yr/kg-day	114	EPA, 1991a	NA	NA	
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	NA	NA	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 1991a	NA	NA	
	EF	Exposure Frequency	days/year	26	BPJ	NA	NA	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	NA	NA	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	NA	NA	
Dermal	CS	Chemical Concentration in soil	mg/kg			NA	NA	CS x SA x AF x ABS x CF x EF x ED / BW x AT x 365 days/year
	SFSadj	Age-weighted dermal factor[1]	mg-yr/kg-event	360	EPA, 2001a	NA	NA	
	ABS	Dermal Absorption Factor	unitless	chem-specific	EPA, 2001a	NA	NA	
	CF	Conversion Factor	kg/mg	0.000001	EPA, 1991a	NA	NA	
	EF	Exposure Frequency	days/year	26	BPJ	NA	NA	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	NA	NA	ABSORBED DOSE
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	NA	NA	

(1) - See Table 5-4 for age specific factors

Definitions:
BPJ - Best Professional Judgement - corresponds to 2 times per week for the 13 summer weeks - per USEPA, 2003.
mg - milligrams
kg - kilograms
cm^2 - centimeters squared
NA - Not Applicable, A CT exposure scenario was not developed for the area resident.
RME - Reasonable Maximum Exposure
CT - Central Tendency

Table 5-7
Values Used for Daily Intake/Absorbed Dose Calculations - Shellfish Tissue
Resident

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Shellfish
Receptor Population:	Resident
Receptor Age:	Adults/Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Equation/ Model Name
Ingestion	CS	Chemical Concentration in tissue	mg/kg					$\frac{CS \times IFage \times RAF \times CF2 \times EF}{AT \times 365 \text{ days/yr}}$
	IR - A	Ingestion Rate - adult	kg/day	0.034	BOH, 2001	0.016	EPA, 1999	
	IR -C	Ingestion Rate - child	kg/day	0.008	EPA, 2001c	0.008	EPA, 2001c	
	IFadj	Ingestion Rate - age weighted	mg-yr/kg-day	14,860	(see calc)	2,670	(see calc)	$IFadj = \frac{IRchild \times Edchild \times CF}{BWchild} + \frac{IRadult \times Edadult \times CF}{BWadult}$
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	1	EPA, 1991a	
	CF	Conversion Factor	mg/kg	1.00E+06		1.00E+06		
	CF2	Conversion Factor	kg/mg	1.00E-06		1.00E-06		
	EF	Exposure Frequency	days/year	365	EPA, 2001c	365	EPA, 2001c	
	ED - Tot	Exposure Duration	years	30	EPA, 1991a	9	EPA, 1991a	
	ED - A	Exposure Duration - adult	years	24	EPA, 1991a	7	EPA, 1991a	
	ED - C	Exposure Duration -child	years	6	EPA, 1991a	2	EPA, 1991a	
	BW - A	Body Weight - adult	kg	70	EPA, 1991a	70	EPA, 1991a	
	BW - C	Body Weight - child	kg	15	EPA, 1991a	15	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	9	EPA, 1991a	

Definitions: BPJ = Best Professional Judgemen
mg - milligrams
kg - kilograms
RME - Reasonable Maximum Exposure
CT - Central Tendancy

Table 5-8
Values Used for Daily Intake/Absorbed Dose Calculations - Groundwater
Residential Scenario

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater
Receptor Population:	Resident
Receptor Age:	Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Equation/ Model Name
Ingestion	CW	Chemical Concentration in water	mg/l					CW x IR x RAF x EF x ED
	IR	Ingestion Rate	l/day	2	EPA, 1991a	1.4	EPA, 1994	BW x AT x 365 days/yr
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	1	EPA, 1991a	
	EF	Exposure Frequency	days/year	350	EPA, 1991a	350	EPA, 1991a	
	ED	Exposure Duration	years	30	EPA, 1991a	9	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1991a	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	9	EPA, 1994	
Inhalation								Applicable for VOCs only intake inhalation = intake ingestion (see text)
Dermal	CW	Chemical Concentration in water	mg/l					CW x DAevent x EV x ED x EF x SA
	DAevent	Dermal Absorbed Dose	mg/cm^2-event	chemical-specific*	EPA, 2001a	chemical-specific	EPA, 2001a	CWdefault x BW x AT x 365 days/yr
	EV	Event Frequency	events/day	1	EPA, 2001a	1	EPA, 2001a	
	ED	Exposure Duration	years	30	EPA, 2001a	9	EPA, 2001a	
	EF	Exposure Frequency	days/year	350	EPA, 2001a	350	EPA, 2001a	
	SA	Skin Surface Area	cm^2	18,000	EPA, 2001a	18,000	EPA, 2001a	
	CWdefault	Default conc. in water used in DAevent calculation	mg/l	1	EPA, 2001a	1	EPA, 2001a	
	BW	Body Weight	kg	70	EPA, 2001a	70	EPA, 2001a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	70	EPA, 1991a	ABSORBED DOSE
	AT-N	Averaging Time, non-cancer	years	30	EPA, 1991a	9	EPA, 1994	

Definitions: mg - milligrams
l - litre
cm^2 - centimeters squared
kg - kilogram
RME - Reasonable Maximum Exposure
CT - Central Tendency

* DA_{event} - obtained from Appendix B-3 and assume a t_{event} of 0.58 hrs/event (USEPA, 2001a).

Table 5-9
Dose-Response Toxcity Data for the site COPCs

Chemical of Potential Concern	Oral RfD (mg/kg-day)	ref	Oral Cancer Slope Factor 1/(mg/kg-d)	ref	Unit Risk Factor (ug/m3)-1	ref	Inhalation Slope Factor 1/(mg/kg-d)	ref	Chronic Reference Concentration (mg/m3)	ref	Chronic Inhalation RfD (mg/kg-day)	ref	Subchronic Reference Dose (mg/kg-day)	ref	Subchronic Reference Concentration (mg/m3)	ref
ALUMINUM	1.00E+00	N									1.00E-03	N	2.00E+00	M		
ANTIMONY	4.00E-04	I													4.00E-04	U
ARSENIC	3.00E-04	I	1.50E+00	I	4.30E-03	I							5.00E-03	I		
BARIUM	7.00E-02	I							5.00E-04	H	1.40E-04	H				
BERYLLIUM	2.00E-03	I			2.40E-03	I			2.00E-05	I	5.70E-06	I				
BORON	2.00E-01	I													9.00E-02	H
CADMIUM -food	1.00E-03	I			1.80E-03	I										
CADMIUM -water	5.00E-04	I														
CADMIUM -dermal	2.50E-05	E														
CHROMIUM	1.50E+00	I														
COPPER - water	4.00E-02	N														
COPPER													3.00E-02	M		
IRON	3.00E-01	U														
MANGANESE	1.40E-01	I							5.00E-05	I			1.40E-01	U		
MERCURY CHLORIDE	3.00E-04	I							3.00E-04	I			2.00E-03	I		
MOLYBDENUM	5.00E-03	I											5.00E-03	H		
NICKEL	2.00E-02	I														
SELENIUM	5.00E-03	I														
SILVER	5.00E-03	I							1.00E-05	U					1.00E-04	U
SODIUM																
THALLIUM																
VANADIUM	1.00E-03	N														
DIELDRIN	5.00E-05	I	1.60E+01	I	4.60E-03	I							1.00E-04	M		
ENDRIN ALDEHYDE													2.00E-03	M		
GAMMA BHC	3.00E-04	I	1.30E+00	H												
ALPHA BHC			6.30E+00	I	1.80E-03	I										
BETA BHC			1.80E+00	I	5.30E-04	I										
DELTA BHC																
HEPTACHLOR EPOXIDE	1.30E-05	I	9.10E+00	I	2.60E-03	I										
2-METHYLNAPHTHALENE	9.00E-03	N											9.00E-03	U		
BENZO(A)ANTHRACENE			7.30E-01	E	8.80E-04	U										
BENZO(A)PYRENE			7.30E+00	I	8.80E-04	U										
BENZO(B)FLUORANTHENE			7.30E-01	E	8.80E-04	U										
BENZO(K)FLUORANTHENE			7.30E-02	E	8.80E-04	U										
BENZO[G,H,I]PERYLENE																
BIS(2-ETHYLHEXYL) PHTHALATE	2.00E-02	I	1.40E-02	I			1.40E-02	N							1.00E-02	U
CARBAZOLE																
CHRYSENE			7.30E-03	E	8.80E-04	U										
DIBENZO(A,H)ANTHRACENE			7.30E+00	E	8.80E-04	U										
INDENO(1,2,3-CD)PYRENE			7.30E-01	E			8.80E-04	U								
NAPHTHALENE	2.00E-02	I							3.00E-03	I						
PHENANTHRENE																
1,1,1-TRICHLOROETHANE	2.80E-01	N														
BENZENE	4.00E-03	I	5.50E-02	I	7.80E-06	I			1.00E-01	I	3.00E-02	I				
CHLOROFORM	1.00E-02	I			2.30E-05	I			5.00E-02	U	8.60E-04	N			5.00E-02	U
ETHYLBENZENE	1.00E-01	I							1.00E+00	I			1.00E+00	I		
M-,P-XYLENE	2.00E-01	I							1.00E-01	I			2.00E-01	M		
O-XYLENE	2.00E-01	I							1.00E-01	I			2.00E-01	M		
TRICHLOROETHENE	3.00E-04	N	4.00E-01	N			0.4	N	4.00E-02	N			3.00E-03	I		

Table 5-9
Dose-Response Toxcity Data for the site COPCs

Chemical of Potential Concern	Oral RfD (mg/kg-day)	ref	Oral Cancer Slope Factor 1/(mg/kg-d)	ref	Unit Risk Factor (ug/m3)-1	ref	Inhalation Slope Factor 1/(mg/kg-d)	ref	Chronic Reference Concentration (mg/m3)	ref	Chronic Inhalation RfD (mg/kg-day)	ref	Subchronic Reference Dose (mg/kg-day)	ref	Subchronic Reference Concentration (mg/m3)	ref
VINYL CHLORIDE	3.00E-03	I	1.50E+00	I	4.40E-06	N	3.10E-02	I	1.00E-01	I			3.00E-03	I		
PCB-1242	2.00E-05	U	2.00E+00	E			2.00E+00	E					3.00E-05	M		
PCB-1248	2.00E-05	U	2.00E+00	E			2.00E+00	E					3.00E-05	M		
PCB-1254	2.00E-05	I	2.00E+00	E			2.00E+00	E					3.00E-05	M		
PCB-1260	2.00E-05	U	2.00E+00	E			2.00E+00	E					3.00E-05	M		
4,4'-DDE	3.00E-04	U	3.40E-01	I												
4-CHLORO-3-METHYLPHENOL																
ACENAPHTHYLENE																
BROMODICHLOROMETHANE	2.00E-02	I	6.20E-02	I												
BROMOMETHANE	1.40E-03	I							5.00E-03	I			1.40E-03	I		
CHLOROMETHANE									9.00E-02	I	2.60E-02	I				
ENDOSULFAN I	6.00E-03	I														
ENDOSULFAN II																
ENDOSULFAN SULFATE																
ENDRIN KETONE																
HEPTACHLOR	5.00E-04	I	4.50E+00	I	1.30E-03	I										
NITRATE	1.60E+00	I														
DI-N-BUTYL PHTHALATE	1.00E-01	I														
TOLUENE	2.00E-01	I							4.00E-01	I						
1,1,2-TRICHLOROETHANE	4.00E-03	I	5.70E-02	I	1.60E-05	I										
1,1-DICHLOROETHENE	5.00E-02	I														
1,2-DICHLOROETHANE	3.00E-02	N	9.10E-02	I	2.60E-05	I			5.00E-03	N	1.40E-03	N				
4-METHYLPHENOL	5.00E-03	H														
1,1-DICHLOROETHANE	1.00E-01	H							5.00E-01	H	1.40E-01	H				

ref - I - IRIS; N - NCEA; H - HEAST as referenced in USEPA Region 9 PRG Tables (USEPA,current); M - Minimal Risk Levels (ATSDR, current), E - EPA Region I Risk Update #2 and USEPA Guidance on PCBs (EPA/600/P-96/001F); U - USEPA in letter dated June 2, 2003 (USEPA, 2003); CA - California Office of Health Hazard Assessment (2003)

mg/kg-day = milligram/kilogram - day

IRIS - Integrated Risk Information System

NCEA - National Center for Environmental Assessment

HEAST - Health Effects Summary Table

The Reference Concentration (RC) can be converted to an RfDinhalation as follows: RC (mg/m3) * 20 m3/day * 1/70 kg = RfDinh (mg/kg-day)

The Unit Risk Factor (URF) can be converted to an Inhalation Slope Factor as follows: URF 1/(ug/m3) * 1/20 m3/day * 70 * 10E-3 ug/1 mg = CSF (mg/kg-day)-1

Table 5-12
Comparison of Shellfish Tissue COPC Concentrations
Site vs. Reference Locations

Chemical of Potential Concern	Average Concentration Site Location (mg/kg)	Average Concentration Reference Location (mg/kg)	Relative Percent Difference
Clams			
ALUMINUM	332	374	11
ARSENIC	2.8	3.19	12
COPPER	6.8	5.39	-25
IRON	1077	1310	18
LEAD	0.87	1.21	28
MANGANESE	25	47	47
MERCURY	0.04	0.05	18
SODIUM	4929	4270	-15
VANADIUM	1.560	2.00	22
PCB 1254	0.0021	0.00396	48
PCB 1260	0.0022	0.00370	41
ALPHA-HEXACHLOROCYCLOHEXANE	0.0001		
BETA-HEXACHLOROCYCLOHEXANE	0.0002	0.00036	56
DIELDRIN	0.0001		
ENDOSULFAN I	0.0002		
ENDOSULFAN II	0.0002		
ENDOSULFAN SULFATE	0.000043	0.00006	22
ENDRIN ALDEHYDE	0.0001		
ENDRIN KETONE	0.0002	0.00043	51
GAMMA-CHLORDANE	0.0001		
4-CHLORO-3-METHYLPHENOL	0.2558	0.12000	-113
ACENAPHTHYLENE	0.0003	0.00047	28
BENZO(A)ANTHRACENE	0.0022	0.00363	40
BENZO(A)PYRENE	0.0020	0.00387	49
BENZO(B)FLUORANTHENE	0.0036	0.00650	44
BENZO(K)FLUORANTHENE	0.0013		
BENZO[G,H,I]PERYLENE	0.0032	0.00470	32
DIBENZO(A,H)ANTHRACENE	0.0002	0.00048	53
INDENO(1,2,3-CD)PYRENE	0.0016	0.00303	49
PHENANTHRENE	0.0018	0.00190	3
Mussels			
ALUMINUM	90	75.6	-19
ARSENIC	1.12	1.37	18
CADMIUM	0.24	0.28	12
IRON	132	133	1
LEAD	0.26	0.31	16
MERCURY	0.05	0.05	-6
SODIUM	4842	4608	-5
ALPHA-HEXACHLOROCYCLOHEXANE	0.00004	0.00003	-17
BETA-HEXACHLOROCYCLOHEXANE	0.00004		
ENDOSULFAN II	0.00017		
ENDOSULFAN SULFATE	0.00008	0.00008	-2
ENDRIN KETONE	0.00041	0.00032	-28
2-METHYLNAPHTHALENE	0.63000		
ACENAPHTHYLENE	0.00031	0.00049	36
BENZO(A)ANTHRACENE	0.00161	0.00225	28
BENZO(A)PYRENE	0.00107	0.00155	31
BENZO(B)FLUORANTHENE	0.00279	0.00448	38
BENZO(K)FLUORANTHENE	0.00097	0.00140	31
CHRYSENE	0.00240	0.00330	27
BENZO[G,H,I]PERYLENE	0.00103		
CARBAZOLE	0.01700		
DIBENZO(A,H)ANTHRACENE	0.00014	0.00024	40
INDENO(1,2,3-CD)PYRENE	0.00090	0.00134	33
PHENANTHRENE	0.00146		

Table 5-13
Comparison of Groundwater Constituents to MEGs and MCLs

Groundwater Constituents	Maximum Detected Concentration (ug/L)		State MEG (ug/L)	Federal MCL (ug/L)
DRO	**5810***	J	50	
ALUMINUM	**3850**		1430	
ANTIMONY	0.03	J	3	6
ARSENIC	**23.3**		10	50
BARIUM	266		2000	2000
BERYLLIUM	1.2	J		
BORON	**2450**		630	
CADMIUM	1.7		3.5	5
CALCIUM	681000			
CHROMIUM	22.2		40	
COBALT	61	J		
COPPER	296		1300	1300
IRON	543000			
LEAD	**19**		10	15
MAGNESIUM	718000			
MANGANESE	**41800**		500	
MERCURY	0.59		2	2
MOLYBDENUM	**3170**		35	
NICKEL	139		140	
POTASSIUM	143000	J		
SELENIUM	21	J	35	50
SILVER	**50**		35	
SODIUM	**4280000**		20000	
THALLIUM	**3.3**		0.5	2
VANADIUM	21			
ZINC	491		2000	
DIELDRIN	**0.11**	J	0.02	
HEPTACHLOR	**0.52**		0.08	0
2-METHYLPHENOL	3.7			
4-METHYLPHENOL	**16.5**		3.5	
BIS(2-ETHYLHEXYL)PHTHALATE	7	J		
DI-N-BUTYLPHTHALATE	1	J	700	
NAPHTHALENE	3	J	14	
PHENOL	265		4000	200
1,1,1-TRICHLOROETHANE	**535**	J	200	5
1,1,2-TRICHLOROETHANE	0.4	J	6	
1,1-DICHLOROETHANE	**240**		70	7
1,1-DICHLOROETHENE	**190**		0.6	5
1,2-DICHLOROETHANE	2		4	
2-BUTANONE	15		1440	
ACETONE	23	J	700	
BENZENE	3.7		12	
BROMODICHLOROMETHANE	2		6	
BROMOMETHANE	1	J	10	
CHLOROFORM	36		57	
CHLOROMETHANE	3		3	
ETHYLBENZENE	**160**		70	700
M/P-XYLENE	340		14000	10000
METHYLENE CHLORIDE	1	J		
O-XYLENE	170		14000	10000
TOLUENE	2		1400	1000
TRICHLOROETHENE	4		32	5
VINYL CHLORIDE	**2**	J	0.2	2
NITRATE	3135		10000	10000

Note: **Bold** indicates compound exceeds either its MEG or MCL

* - sample collected from the PAB sump. Not considered representative of groundwater quality.

J - estimated concentration

MEG - Maximum Exposure Guideline

MCL - Maximum Contaminant Level

Table 5-15
Total Site Carcinogenic Risks
Bailey Point

Medium	Plant Area		Warehouse 2/3		345 kV Transmission Line		Bailey Farmhouse	
	CT	**RME**	**CT**	**RME**	**CT**	**RME**	**CT**	**RME**
Soils								
Soils	6.5E-06	4.8E-05	5.2E-06	3.8E-05	2.3E-06	1.5E-05	1.2E-06	7.9E-06
Produce	2.2E-04	2.2E-04	1.8E-04	1.8E-04	6.1E-05	6.1E-05	2.9E-05	2.9E-05
Sediments	6.0E-06	6.0E-06	6.0E-06	6.0E-06	6.0E-06	6.0E-06	6.0E-06	6.0E-06
Total Residental Site Risks Including Arsenic	**2.3E-04**	**2.7E-04**	**1.9E-04**	**2.2E-04**	**6.9E-05**	**8.2E-05**	**3.6E-05**	**4.3E-05**
Soils	4.8E-06	3.7E-05	3.1E-06	2.4E-05	3.8E-07	2.9E-06	0.00E+00	0.00E+00
Produce	1.8E-04	1.8E-04	1.3E-04	1.3E-04	1.2E-05	1.2E-05	0.00E+00	0.00E+00
Sediments	4.3E-06	4.3E-06	4.3E-06	4.3E-06	4.3E-06	4.3E-06	4.3E-06	4.3E-06
Total Residental Site Risks Excluding Arsenic	**1.9E-04**	**2.2E-04**	**1.4E-04**	**1.6E-04**	**1.7E-05**	**1.9E-05**	4.3E-06	4.3E-06
Total On-Site Worker Site Risks	1.7E-06	**1.9E-05**	1.4E-06	**1.5E-05**	5.9E-07	5.4E-06	3.1E-07	2.7E-06
On-Site Worker - Excluding Arseni	1.3E-06	**1.5E-05**	8.2E-07	9.9E-06	9.9E-08	1.2E-06	0.0E+00	0.0E+00
soil depth	**Surface**	**Subsurface**	**Surface**	**Subsurface**	**Surface**	**Subsurface**	**Surface**	**Subsurface**
Total Construction Worker Site Risk	1.9E-06	1.6E-06	1.5E-06	8.8E-07	6.4E-07	7.4E-07	3.4E-07	3.9E-07
	Sitewide Risks							
	CT	**RME**						
Sediment								
Shellfisherman	**1.7E-06**	**1.4E-05**						
Groundwater	**5.1E-05**	**6.1E-04**						
Tissue								
Clams	**2.0E-04**	**1.1E-03**						
Mussels	**7.2E-05**	**4.0E-04**						
Lobster	**1.6E-04**	**9.0E-04**						
Tomally	**2.6E-04**	**1.4E-03**						
Reference Clams		**1.1E-03**						
Reference Mussels		**4.9E-04**						

BOLD - total site cancer risks exceed the MDEP target risk of 1 x 10^{-5}.
CT - Central Tendency
RME - Reasonable Maximum Exposure

Table 5-14
Total Site Non Carcinogenic Risks
Bailey Point

Medium	Plant Area			Warehouse 2/3			345 kV Transmission Line			Bailey Farmhouse		
	CT	**RME**	**Child**	**CT**	**RME**	**Child**	**CT**	**RME**	**Child**	**CT**	**RME**	**Child**
Soils												
Soils	0.1	0.2	0.8	0.2	0.3	1.2	0.2	0.3	1.1	0.1	0.2	0.7
Produce	0.4	0.4		1.3	1.3		0.2	0.2		0.2	0.2	
Sediments	0.03	0.03		0.03	0.03		0.03	0.03		0.03	0.03	
Total Residental Site Risks Including Arsenic	0.5	0.6		**1.5**	**1.6**		0.4	0.6		0.3	0.4	
Total On-Site Worker Site Risks	0.04	0.09		0.06	0.1		0.06	0.1		0.04	0.08	
	Surface	**Subsurface**		**Surface**	**Subsurface**		**Surface**	**Subsurface**		**Surface**	**Subsurface**	
Total Construction Worker Site Risks	0.06	0.05		0.10	0.08		0.05	0.08		0.04	0.04	
	Sitewide Risks											
	CT	**RME**	**Child**									
Shellfisherman	**0.01**	**0.05**										
Groundwater	**4**	**80**										
Tissue												
Clams	**6**	**10**	**10**									
Mussels	**2**	**3**	**3**									
Lobster	**3**	**5**	**5**									
Tomally	**7**	**11**	**12**									
Reference Clams		**10**										
Reference Mussels		**3**										

BOLD - total site non cancer risks exceed the MDEP target risk of 1 HI = 1.0.
CT - Central Tendency
RME - Reasonable Maximum Exposure

Table 5-10H
Calculation of Non Cancer Hazards
Exposure to Sediments - Shellfisherman - CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Sediment
Receptor Population:	Shellfisherman
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer) mg/kg-day	Reference Dose (mg/kg-d)	Hazard Quotient
Ingestion (1)	ALUMINUM	13505	mg/kg	NA	1.37E-03	1.0E+00	1.37E-03
	ARSENIC	8.79	mg/kg	NA	8.94E-07	3.0E-04	2.98E-03
	IRON	20978	mg/kg	NA	2.13E-03	3.0E-01	7.12E-03
	MANGANESE	228	mg/kg	NA	2.32E-05	1.4E-01	1.66E-04
	SODIUM	7935	mg/kg	NA	8.07E-04		
	2-METHYLNAPHTHALENE	0.41	mg/kg	NA	4.17E-08	9.0E-03	4.64E-06
	ACENAPHTHYLENE	0.03	mg/kg	NA	2.54E-09		
	BENZO(A)PYRENE equivalent	3.60	mg/kg	NA	3.66E-07		
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	NA	1.28E-07		
	CARBAZOLE	0.69	mg/kg	NA	7.02E-08		
	PHENANTHRENE	5.53	mg/kg	NA	5.63E-07		
			mg/kg				
Dermal (2)	ALUMINUM	13505	mg/kg	NA		1.0E+00	
	ARSENIC	8.79	mg/kg	0.03	6.12E-07	3.0E-04	2.04E-03
	IRON	20978	mg/kg	NA		3.0E-01	
	MANGANESE	228	mg/kg	NA		1.4E-01	
	SODIUM	7935	mg/kg	NA			
	2-METHYLNAPHTHALENE	0.41	mg/kg	0.13	1.24E-07	9.0E-03	1.37E-05
	ACENAPHTHYLENE	0.03	mg/kg	0.13	7.54E-09		
	BENZO(A)PYRENE equivalent	3.60	mg/kg	0.13	1.09E-06		
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	0.13	3.79E-07		
	CARBAZOLE	0.69	mg/kg	0.13	2.08E-07		
	PHENANTHRENE	5.53	mg/kg	0.13	1.67E-06		
						Total Non Cancer HI Across All Routes of Exposure	**1.4E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 1.02E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 2.32E-06

EPC, mg/kg	chem-specific
IR, mg-day	50
CF, kg/mg	0.000001
RAF, unitless	1
EF, day/yr	52
AT, yr	9
SA cm2	5700
AF, mg/cm2	0.2
ED, years	9
BW, kg	70

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10H
Calculation of Non Cancer Hazards
Exposure to Sediments - Shellfisherman - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Sediment
Receptor Population:	Shellfisherman
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer) mg/kg-day	Reference Dose (mg/kg-d)	Hazard Quotient
Ingestion (1)	ALUMINUM	13505	mg/kg	NA	5.50E-03	1.0E+00	5.50E-03
	ARSENIC	8.79	mg/kg	NA	3.58E-06	3.0E-04	1.19E-02
	IRON	20978	mg/kg	NA	8.54E-03	3.0E-01	2.85E-02
	MANGANESE	228	mg/kg	NA	9.27E-05	1.4E-01	6.62E-04
	SODIUM	7935	mg/kg	NA	3.23E-03		
	2-METHYLNAPHTHALENE	0.41	mg/kg	NA	1.67E-07	9.0E-03	1.85E-05
	ACENAPHTHYLENE	0.03	mg/kg	NA	1.02E-08		
	BENZO(A)PYRENE equivalent	3.60	mg/kg	NA	1.47E-06		
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	NA	5.12E-07		
	CARBAZOLE	0.69	mg/kg	NA	2.81E-07		
	PHENANTHRENE	5.53	mg/kg	NA	2.25E-06		
			mg/kg				
Dermal (2)	ALUMINUM	13505	mg/kg	NA		1.0E+00	
	ARSENIC	8.79	mg/kg	0.03	1.22E-06	3.0E-04	4.08E-03
	IRON	20978	mg/kg	NA		3.0E-01	
	MANGANESE	228	mg/kg	NA		1.4E-01	
	SODIUM	7935	mg/kg	NA		NA	
	2-METHYLNAPHTHALENE	0.41	mg/kg	0.13	2.47E-07	9.0E-03	2.75E-05
	ACENAPHTHYLENE	0.03	mg/kg	0.13	1.51E-08		
	BENZO(A)PYRENE equivalent	3.60	mg/kg	0.13	2.17E-06		
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	0.13	7.58E-07		
	CARBAZOLE	0.69	mg/kg	0.13	4.16E-07		
	PHENANTHRENE	5.53	mg/kg	0.13	3.34E-06		
					Total Non Cancer HI Across All Routes of Exposure		**5.1E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 4.07E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.64E-06

EPC, mg/kg	chem-specific
IR, mg-day	100
CF, kg/mg	0.000001
RAF, unitless	1
EF, day/yr	104
AT, yr	30
SA cm2	5700
AF, mg/cm2	0.2
ED, years	30
BW, kg	70

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-10H
Calculation of Non Cancer Hazards
Exposure to Sediments - Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Sediment
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	13505	mg/kg	NA	3.66E-03	mg/kg-day	1.00E+00	(mg/kg-d)	3.66E-03
	ARSENIC	8.79	mg/kg	NA	2.38E-06	mg/kg-day	3.00E-04	(mg/kg-d)	7.93E-03
	IRON	20978	mg/kg	NA	5.68E-03	mg/kg-day	3.00E-01	(mg/kg-d)	1.89E-02
	MANGANESE	228	mg/kg	NA	6.17E-05	mg/kg-day	1.40E-01	(mg/kg-d)	4.40E-04
	SODIUM	7935	mg/kg	NA	2.15E-03	mg/kg-day			
	2-METHYLNAPHTHALENE	0.41	mg/kg	NA	1.11E-07	mg/kg-day	9.00E-03	(mg/kg-d)	1.23E-05
	ACENAPHTHALENE	0.03	mg/kg	NA	6.77E-09	mg/kg-day			
	BENZO(A)PYRENE equivalent	3.60	mg/kg	NA	9.74E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	NA	3.41E-07	mg/kg-day			
	CARBAZOLE	0.69	mg/kg	NA	1.87E-07	mg/kg-day			
	PHENANTHRENE	5.53	mg/kg	NA	1.50E-06	mg/kg-day			
Dermal (2)	ALUMINUM	13505	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	8.79	mg/kg	0.03	2.25E-07	mg/kg-day	3.00E-04	(mg/kg-d)	7.51E-04
	IRON	20978	mg/kg				3.00E-01	(mg/kg-d)	
	MANGANESE	228	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	7935	mg/kg						
	ACENAPHTHALENE	0.03	mg/kg	0.13	2.78E-09	mg/kg-day			
	2-METHYLNAPHTHALENE	0.41	mg/kg	0.13	4.56E-08	mg/kg-day	9.00E-03	(mg/kg-d)	5.06E-06
	BENZO(A)PYRENE equivalent	3.60	mg/kg	0.13	4.00E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	0.13	1.40E-07	mg/kg-day			
	CARBAZOLE	0.69	mg/kg	0.13	7.67E-08	mg/kg-day			
	PHENANTHRENE	5.53	mg/kg	0.13	6.15E-07	mg/kg-day			
	Total Hazard Index Across All Exposure Pathways								**3.2E-02**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.71E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 8.55E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	26
AT, yr	Averaging Time	30
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-10I
Calculation of Non-Cancer Hazards
Ingestion of Clams
Resident - CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Clams
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	3.95E+02	mg/kg	1	1.17E-01	mg/kg-day	1.00E+00	(mg/kg-d)	1.17E-01
	ARSENIC	3.52E+00	mg/kg	1	1.04E-03	mg/kg-day	3.00E-04	(mg/kg-d)	3.48E+00
	COPPER	1.03E+01	mg/kg	1	3.05E-03	mg/kg-day		(mg/kg-d)	
	IRON	1.41E+03	mg/kg	1	4.19E-01	mg/kg-day	3.00E-01	(mg/kg-d)	1.40E+00
	LEAD	1.08E+00	mg/kg	1	3.20E-04	mg/kg-day		(mg/kg-d)	
	MANGANESE	4.34E+01	mg/kg	1	1.29E-02	mg/kg-day	1.40E-01	(mg/kg-d)	9.18E-02
	MERCURY	4.56E-02	mg/kg	1	1.35E-05	mg/kg-day	3.00E-04	(mg/kg-d)	4.50E-02
	SODIUM	5.24E+03	mg/kg	1	1.55E+00	mg/kg-day		(mg/kg-d)	
	VANADIUM	1.99E+00	mg/kg	1	5.90E-04	mg/kg-day	1.00E-03	(mg/kg-d)	5.90E-01
	Total PCBs	4.83E-03	mg/kg	1	1.43E-06	mg/kg-day	2.00E-05	(mg/kg-d)	7.16E-02
	ALPHA-HEXACHLOROCYCLOHEXANE	8.70E-05	mg/kg	1	2.58E-08	mg/kg-day		(mg/kg-d)	
	BETA-HEXACHLOROCYCLOHEXANE	1.95E-04	mg/kg	1	5.77E-08	mg/kg-day		(mg/kg-d)	
	DIELDRIN	1.27E-04	mg/kg	1	3.75E-08	mg/kg-day	5.00E-05	(mg/kg-d)	7.50E-04
	ENDOSULFAN I	3.00E-05	mg/kg	1	8.89E-09	mg/kg-day	6.00E-03	(mg/kg-d)	1.48E-06
	ENDOSULFAN II	6.00E-04	mg/kg	1	1.78E-07	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN SULFATE	5.20E-04	mg/kg	1	1.54E-07	mg/kg-day		(mg/kg-d)	
	ENDRIN ALDEHYDE	1.69E-04	mg/kg	1	5.02E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	2.47E-04	mg/kg	1	7.32E-08	mg/kg-day		(mg/kg-d)	
	4-CHLORO-3-METHYLPHENOL	3.88E-01	mg/kg	1	1.15E-04	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	4.20E-04	mg/kg	1	1.25E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	3.48E-03	mg/kg	1	1.03E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	3.60E-03	mg/kg	1	1.07E-06	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	2.41E-03	mg/kg	1	7.15E-07	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**5.8E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.96E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 2.67E+03

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	9
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Clams
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Clams
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	3.95E+02	mg/kg	1	1.96E-01	mg/kg-day	1.00E+00	(mg/kg-d)	1.96E-01
	ARSENIC	3.52E+00	mg/kg	1	1.74E-03	mg/kg-day	3.00E-04	(mg/kg-d)	5.81E+00
	COPPER	1.03E+01	mg/kg	1	5.10E-03	mg/kg-day		(mg/kg-d)	
	IRON	1.41E+03	mg/kg	1	7.00E-01	mg/kg-day	3.00E-01	(mg/kg-d)	2.33E+00
	LEAD	1.08E+00	mg/kg	1	5.35E-04	mg/kg-day		(mg/kg-d)	
	MANGANESE	4.34E+01	mg/kg	1	2.15E-02	mg/kg-day	1.40E-01	(mg/kg-d)	1.53E-01
	MERCURY	4.56E-02	mg/kg	1	2.26E-05	mg/kg-day	3.00E-04	(mg/kg-d)	7.53E-02
	SODIUM	5.24E+03	mg/kg	1	2.59E+00	mg/kg-day		(mg/kg-d)	
	VANADIUM	1.99E+00	mg/kg	1	9.86E-04	mg/kg-day	1.00E-03	(mg/kg-d)	9.86E-01
	Total PCBs	4.83E-03	mg/kg	1	2.39E-06	mg/kg-day	2.00E-05	(mg/kg-d)	1.20E-01
	ALPHA-HEXACHLOROCYCLOHEXANE	8.70E-05	mg/kg	1	4.31E-08	mg/kg-day		(mg/kg-d)	
	BETA-HEXACHLOROCYCLOHEXANE	1.95E-04	mg/kg	1	9.65E-08	mg/kg-day		(mg/kg-d)	
	DIELDRIN	1.27E-04	mg/kg	1	6.27E-08	mg/kg-day	5.00E-05	(mg/kg-d)	1.25E-03
	ENDOSULFAN I	3.00E-05	mg/kg	1	1.49E-08	mg/kg-day	6.00E-03	(mg/kg-d)	2.48E-06
	ENDOSULFAN II	6.00E-04	mg/kg	1	2.97E-07	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN SULFATE	5.20E-04	mg/kg	1	2.58E-07	mg/kg-day		(mg/kg-d)	
	ENDRIN ALDEHYDE	1.69E-04	mg/kg	1	8.39E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	2.47E-04	mg/kg	1	1.22E-07	mg/kg-day		(mg/kg-d)	
	4-CHLORO-3-METHYLPHENOL	3.88E-01	mg/kg	1	1.92E-04	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	4.20E-04	mg/kg	1	2.08E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	3.48E-03	mg/kg	1	1.72E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	3.60E-03	mg/kg	1	1.78E-06	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	2.41E-03	mg/kg	1	1.20E-06	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**9.7E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 4.95E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-da	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	30
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Clams
Child Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Clams
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	3.95E+02	mg/kg	1	2.11E-01	mg/kg-day	1.00E+00	(mg/kg-d)	2.11E-01
	ARSENIC	3.52E+00	mg/kg	1	1.88E-03	mg/kg-day	3.00E-04	(mg/kg-d)	6.26E+00
	COPPER	1.03E+01	mg/kg	1	5.49E-03	mg/kg-day		(mg/kg-d)	
	IRON	1.41E+03	mg/kg	1	7.54E-01	mg/kg-day	3.00E-01	(mg/kg-d)	2.51E+00
	LEAD	1.08E+00	mg/kg	1	5.77E-04	mg/kg-day		(mg/kg-d)	
	MANGANESE	4.34E+01	mg/kg	1	2.31E-02	mg/kg-day	1.40E-01	(mg/kg-d)	1.65E-01
	MERCURY	4.56E-02	mg/kg	1	2.43E-05	mg/kg-day	3.00E-04	(mg/kg-d)	8.11E-02
	SODIUM	5.24E+03	mg/kg	1	2.79E+00	mg/kg-day		(mg/kg-d)	
	VANADIUM	1.99E+00	mg/kg	1	1.06E-03	mg/kg-day	1.00E-03	(mg/kg-d)	1.06E+00
	Total PCBs	4.83E-03	mg/kg	1	2.58E-06	mg/kg-day	2.00E-05	(mg/kg-d)	1.29E-01
	ALPHA-HEXACHLOROCYCLOHEXANE	8.70E-05	mg/kg	1	4.64E-08	mg/kg-day		(mg/kg-d)	
	BETA-HEXACHLOROCYCLOHEXANE	1.95E-04	mg/kg	1	1.04E-07	mg/kg-day		(mg/kg-d)	
	DIELDRIN	1.27E-04	mg/kg	1	6.75E-08	mg/kg-day	5.00E-05	(mg/kg-d)	1.35E-03
	ENDOSULFAN I	3.00E-05	mg/kg	1	1.60E-08	mg/kg-day	6.00E-03	(mg/kg-d)	2.67E-06
	ENDOSULFAN II	6.00E-04	mg/kg	1	3.20E-07	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN SULFATE	5.20E-04	mg/kg	1	2.77E-07	mg/kg-day		(mg/kg-d)	
	ENDRIN ALDEHYDE	1.69E-04	mg/kg	1	9.03E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	2.47E-04	mg/kg	1	1.32E-07	mg/kg-day		(mg/kg-d)	
	4-CHLORO-3-METHYLPHENOL	3.88E-01	mg/kg	1	2.07E-04	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	4.20E-04	mg/kg	1	2.24E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	3.48E-03	mg/kg	1	1.86E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	3.60E-03	mg/kg	1	1.92E-06	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	2.41E-03	mg/kg	1	1.29E-06	mg/kg-day		(mg/kg-d)	
									1.0E+01

(1) Intake Ingestion = EPC * (IR * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.33E-04

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, kg/day	Ingestion Rate	0.008
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	6
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Mussels
Resident - CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Mussels
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	1.07E+02	mg/kg	1	3.17E-02	mg/kg-day	1.00E+00	(mg/kg-d)	3.17E-02
	ARSENIC	1.22E+00	mg/kg	1	3.61E-04	mg/kg-day	3.00E-04	(mg/kg-d)	1.20E+00
	CADMIUM	2.60E-01	mg/kg	1	7.70E-05	mg/kg-day	1.00E-03	(mg/kg-d)	7.70E-02
	IRON	1.54E+02	mg/kg	1	4.56E-02	mg/kg-day	3.00E-01	(mg/kg-d)	1.52E-01
	LEAD	2.90E-01	mg/kg	1	8.59E-05	mg/kg-day		(mg/kg-d)	
	MERCURY	5.00E-02	mg/kg	1	1.48E-05	mg/kg-day	3.00E-04	(mg/kg-d)	4.94E-02
	SODIUM	5.08E+03	mg/kg	1	1.50E+00	mg/kg-day		(mg/kg-d)	
	ALPHA-HEXACHLOROCYCLOHEXANE	3.90E-05	mg/kg	1	1.16E-08	mg/kg-day		(mg/kg-d)	
	BETA-HEXACHLOROCYCLOHEXANE	5.80E-05	mg/kg	1	1.72E-08	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN II	1.40E-04	mg/kg	1	4.15E-08	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN SULFATE	6.00E-05	mg/kg	1	1.78E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	4.90E-04	mg/kg	1	1.45E-07	mg/kg-day		(mg/kg-d)	
	2-METHYLNAPHTHALENE	2.50E-03	mg/kg	1	7.41E-07	mg/kg-day	9.00E-03	(mg/kg-d)	8.23E-05
	ACENAPHTHYLENE	3.30E-04	mg/kg	1	9.78E-08	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	8.80E-03	mg/kg	1	2.61E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	1.20E-03	mg/kg	1	3.56E-07	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	2.10E-03	mg/kg	1	6.22E-07	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**1.5E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.96E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 2.67E+03

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	9
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Mussels
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Mussels
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	1.07E+02	mg/kg	1	5.30E-02	mg/kg-day	1.00E+00	(mg/kg-d)	5.30E-02
	ARSENIC	1.22E+00	mg/kg	1	6.04E-04	mg/kg-day	3.00E-04	(mg/kg-d)	2.01E+00
	CADMIUM	2.60E-01	mg/kg	1	1.29E-04	mg/kg-day	1.00E-03	(mg/kg-d)	1.29E-01
	IRON	1.54E+02	mg/kg	1	7.63E-02	mg/kg-day	3.00E-01	(mg/kg-d)	2.54E-01
	LEAD	2.90E-01	mg/kg	1	1.44E-04	mg/kg-day		(mg/kg-d)	
	MERCURY	5.00E-02	mg/kg	1	2.48E-05	mg/kg-day	3.00E-04	(mg/kg-d)	8.25E-02
	SODIUM	5.08E+03	mg/kg	1	2.51E+00	mg/kg-day		(mg/kg-d)	
	ALPHA-HEXACHLOROCYCLOHEXANE	3.90E-05	mg/kg	1	1.93E-08	mg/kg-day		(mg/kg-d)	
	BETA-HEXACHLOROCYCLOHEXANE	5.80E-05	mg/kg	1	2.87E-08	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN II	1.40E-04	mg/kg	1	6.93E-08	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN SULFATE	6.00E-05	mg/kg	1	2.97E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	4.90E-04	mg/kg	1	2.43E-07	mg/kg-day		(mg/kg-d)	
	2-METHYLNAPHTHALENE	2.50E-03	mg/kg	1	1.24E-06	mg/kg-day	9.00E-03	(mg/kg-d)	1.38E-04
	ACENAPHTHYLENE	3.30E-04	mg/kg	1	1.63E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	8.80E-03	mg/kg	1	4.36E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	1.20E-03	mg/kg	1	5.94E-07	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	2.10E-03	mg/kg	1	1.04E-06	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**2.5E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 4.95E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	30
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Mussels
Child Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Mussels
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	1.07E+02	mg/kg	1	5.71E-02	mg/kg-day	1.00E+00	(mg/kg-d)	5.71E-02
	ARSENIC	1.22E+00	mg/kg	1	6.51E-04	mg/kg-day	3.00E-04	(mg/kg-d)	2.17E+00
	CADMIUM	2.60E-01	mg/kg	1	1.39E-04	mg/kg-day	1.00E-03	(mg/kg-d)	1.39E-01
	IRON	1.54E+02	mg/kg	1	8.21E-02	mg/kg-day	3.00E-01	(mg/kg-d)	2.74E-01
	LEAD	2.90E-01	mg/kg	1	1.55E-04	mg/kg-day		(mg/kg-d)	
	MERCURY	5.00E-02	mg/kg	1	2.67E-05	mg/kg-day	3.00E-04	(mg/kg-d)	8.89E-02
	SODIUM	5.08E+03	mg/kg	1	2.71E+00	mg/kg-day		(mg/kg-d)	
	ALPHA-HEXACHLOROCYCLOHEXANE	3.90E-05	mg/kg	1	2.08E-08	mg/kg-day		(mg/kg-d)	
	BETA-HEXACHLOROCYCLOHEXANE	5.80E-05	mg/kg	1	3.09E-08	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN II	1.40E-04	mg/kg	1	7.47E-08	mg/kg-day		(mg/kg-d)	
	ENDOSULFAN SULFATE	6.00E-05	mg/kg	1	3.20E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	4.90E-04	mg/kg	1	2.61E-07	mg/kg-day		(mg/kg-d)	
	2-METHYLNAPHTHALENE	2.50E-03	mg/kg	1	1.33E-06	mg/kg-day	9.00E-03	(mg/kg-d)	1.48E-04
	ACENAPHTHYLENE	3.30E-04	mg/kg	1	1.76E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	8.80E-03	mg/kg	1	4.69E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	1.20E-03	mg/kg	1	6.40E-07	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	2.10E-03	mg/kg	1	1.12E-06	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**2.7E+00**

(1) Intake Ingestion = EPC * (IR * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.33E-04

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, kg/day	Ingestion Rate	0.008
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	6
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Lobsters
Resident -CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Lobsters
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ARSENIC	2.82E+00	mg/kg	1	8.36E-04	mg/kg-day	3.00E-04	(mg/kg-d)	2.79E+00
	COPPER	1.29E+01	mg/kg	1	3.81E-03	mg/kg-day		(mg/kg-d)	
	LEAD	8.15E-02	mg/kg	1	2.41E-05	mg/kg-day		(mg/kg-d)	
	MERCURY	2.10E-01	mg/kg	1	6.22E-05	mg/kg-day	3.00E-04	(mg/kg-d)	2.07E-01
	SODIUM	4.04E+03	mg/kg	1	1.20E+00	mg/kg-day		(mg/kg-d)	
	ALPHA-HEXACHLOROCYCLOHEXANE	2.10E-05	mg/kg	1	6.22E-09	mg/kg-day		(mg/kg-d)	
	DIELDRIN	2.20E-04	mg/kg	1	6.52E-08	mg/kg-day	5.00E-05	(mg/kg-d)	1.30E-03
	ENDOSULFAN SULFATE	1.70E-05	mg/kg	1	5.04E-09	mg/kg-day		(mg/kg-d)	
	4-CHLORO-3-METHYLPHENOL	1.00E-01	mg/kg	1	2.96E-05	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	2.00E-05	mg/kg	1	5.93E-09	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**3.0E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)

= EPC * 2.96E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A

= 2.67E+03

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	9
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Lobsters
Resident -RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Lobsters
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ARSENIC	2.82E+00	mg/kg	1	1.40E-03	mg/kg-day	3.00E-04	(mg/kg-d)	4.66E+00
	COPPER	1.29E+01	mg/kg	1	6.36E-03	mg/kg-day		(mg/kg-d)	
	LEAD	8.15E-02	mg/kg	1	4.04E-05	mg/kg-day		(mg/kg-d)	
	MERCURY	2.10E-01	mg/kg	1	1.04E-04	mg/kg-day	3.00E-04	(mg/kg-d)	3.47E-01
	SODIUM	4.04E+03	mg/kg	1	2.00E+00	mg/kg-day		(mg/kg-d)	
	ALPHA-HEXACHLOROCYCLOHEXANE	2.10E-05	mg/kg	1	1.04E-08	mg/kg-day		(mg/kg-d)	
	DIELDRIN	2.20E-04	mg/kg	1	1.09E-07	mg/kg-day	5.00E-05	(mg/kg-d)	2.18E-03
	ENDOSULFAN SULFATE	1.70E-05	mg/kg	1	8.42E-09	mg/kg-day		(mg/kg-d)	
	4-CHLORO-3-METHYLPHENOL	1.00E-01	mg/kg	1	4.95E-05	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	2.00E-05	mg/kg	1	9.90E-09	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**5.0E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 4.95E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-da	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	30
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Lobsters
Child Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Lobsters
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ARSENIC	2.82E+00	mg/kg	1	1.50E-03	mg/kg-day	3.00E-04	(mg/kg-d)	5.01E+00
	COPPER	1.29E+01	mg/kg	1	6.85E-03	mg/kg-day		(mg/kg-d)	
	LEAD	8.15E-02	mg/kg	1	4.35E-05	mg/kg-day		(mg/kg-d)	
	MERCURY	2.10E-01	mg/kg	1	1.12E-04	mg/kg-day	3.00E-04	(mg/kg-d)	3.73E-01
	SODIUM	4.04E+03	mg/kg	1	2.15E+00	mg/kg-day		(mg/kg-d)	
	ALPHA-HEXACHLOROCYCLOHEXANE	2.10E-05	mg/kg	1	1.12E-08	mg/kg-day		(mg/kg-d)	
	DIELDRIN	2.20E-04	mg/kg	1	1.17E-07	mg/kg-day	5.00E-05	(mg/kg-d)	2.35E-03
	ENDOSULFAN SULFATE	1.70E-05	mg/kg	1	9.07E-09	mg/kg-day		(mg/kg-d)	
	4-CHLORO-3-METHYLPHENOL	1.00E-01	mg/kg	1	5.33E-05	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	2.00E-05	mg/kg	1	1.07E-08	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**5.4E+00**

(1) Intake Ingestion = EPC * (IR * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.33E-04

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, kg/day	Ingestion Rate	0.008
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	6
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Lobster Tomalley
Resident - CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Tomalley
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ARSENIC	4.29	mg/kg	1	1.27E-03	mg/kg-day	3.00E-04	(mg/kg-d)	4.24E+00
	CADMIUM	0.85	mg/kg	1	2.52E-04	mg/kg-day	1.00E-03	(mg/kg-d)	2.52E-01
	COPPER	49.9	mg/kg	1	1.48E-02	mg/kg-day		(mg/kg-d)	
	LEAD	0.04	mg/kg	1	1.19E-05	mg/kg-day		(mg/kg-d)	
	MERCURY	0.09	mg/kg	1	2.67E-05	mg/kg-day	3.00E-04	(mg/kg-d)	8.89E-02
	SELENIUM	1.04	mg/kg	1	3.08E-04	mg/kg-day	5.00E-03	(mg/kg-d)	6.16E-02
	SODIUM	3.16E+03	mg/kg	1	9.36E-01	mg/kg-day		(mg/kg-d)	
	Total PCBs	1.30E-01	mg/kg	1	3.85E-05	mg/kg-day	2.00E-05	(mg/kg-d)	1.93E+00
	4,4'-DDE	3.80E-02	mg/kg	1	1.13E-05	mg/kg-day	3.00E-04	(mg/kg-d)	3.75E-02
	ALPHA-HEXACHLOROCYCLOHEXANE	1.10E-03	mg/kg	1	3.26E-07	mg/kg-day		(mg/kg-d)	
	DIELDRIN	2.60E-03	mg/kg	1	7.70E-07	mg/kg-day	5.00E-05	(mg/kg-d)	1.54E-02
	ENDRIN ALDEHYDE	3.80E-03	mg/kg	1	1.13E-06	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	6.30E-04	mg/kg	1	1.87E-07	mg/kg-day		(mg/kg-d)	
	HEPTACHLOR EPOXIDE	4.70E-04	mg/kg	1	1.39E-07	mg/kg-day	1.30E-05	(mg/kg-d)	1.07E-02
	4-CHLORO-3-METHYLPHENOL	4.40E-01	mg/kg	1	1.30E-04	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	1.90E-03	mg/kg	1	5.63E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	4.90E-03	mg/kg	1	1.45E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	3.30E-03	mg/kg	1	9.78E-07	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	6.70E-03	mg/kg	1	1.99E-06	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**6.6E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.96E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 2.67E+03

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	9
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Lobster Tomalley
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediments
Exposure Medium:	Tomalley
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ARSENIC	4.29	mg/kg	1	2.12E-03	mg/kg-day	3.00E-04	(mg/kg-d)	7.08E+00
	CADMIUM	0.85	mg/kg	1	4.21E-04	mg/kg-day	1.00E-03	(mg/kg-d)	4.21E-01
	COPPER	49.9	mg/kg	1	2.47E-02	mg/kg-day		(mg/kg-d)	
	LEAD	0.04	mg/kg	1	1.98E-05	mg/kg-day		(mg/kg-d)	
	MERCURY	0.09	mg/kg	1	4.46E-05	mg/kg-day	3.00E-04	(mg/kg-d)	1.49E-01
	SELENIUM	1.04	mg/kg	1	5.15E-04	mg/kg-day	5.00E-03	(mg/kg-d)	1.03E-01
	SODIUM	3.16E+03	mg/kg	1	1.56E+00	mg/kg-day		(mg/kg-d)	
	Total PCBs	1.30E-01	mg/kg	1	6.44E-05	mg/kg-day	2.00E-05	(mg/kg-d)	3.22E+00
	4,4'-DDE	3.80E-02	mg/kg	1	1.88E-05	mg/kg-day	3.00E-04	(mg/kg-d)	6.27E-02
	ALPHA-HEXACHLOROCYCLOHEXANE	1.10E-03	mg/kg	1	5.45E-07	mg/kg-day		(mg/kg-d)	
	DIELDRIN	2.60E-03	mg/kg	1	1.29E-06	mg/kg-day	5.00E-05	(mg/kg-d)	2.58E-02
	ENDRIN ALDEHYDE	3.80E-03	mg/kg	1	1.88E-06	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	6.30E-04	mg/kg	1	3.12E-07	mg/kg-day		(mg/kg-d)	
	HEPTACHLOR EPOXIDE	4.70E-04	mg/kg	1	2.33E-07	mg/kg-day	1.30E-05	(mg/kg-d)	1.79E-02
	4-CHLORO-3-METHYLPHENOL	4.40E-01	mg/kg	1	2.18E-04	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	1.90E-03	mg/kg	1	9.41E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	4.90E-03	mg/kg	1	2.43E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	3.30E-03	mg/kg	1	1.63E-06	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	6.70E-03	mg/kg	1	3.32E-06	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**1.1E+01**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 4.95E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-da	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	30
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Lobster Tomalley
Child Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Lobster Tomalley
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ARSENIC	4.29	mg/kg	1	2.29E-03	mg/kg-day	3.00E-04	(mg/kg-d)	7.63E+00
	CADMIUM	0.85	mg/kg	1	4.53E-04	mg/kg-day	1.00E-03	(mg/kg-d)	4.53E-01
	COPPER	49.9	mg/kg	1	2.66E-02	mg/kg-day		(mg/kg-d)	
	LEAD	0.04	mg/kg	1	2.13E-05	mg/kg-day		(mg/kg-d)	
	MERCURY	0.09	mg/kg	1	4.80E-05	mg/kg-day	3.00E-04	(mg/kg-d)	1.60E-01
	SELENIUM	1.04	mg/kg	1	5.55E-04	mg/kg-day	5.00E-03	(mg/kg-d)	1.11E-01
	SODIUM	3.16E+03	mg/kg	1	1.69E+00	mg/kg-day		(mg/kg-d)	
	Total PCBs	1.30E-01	mg/kg	1	6.93E-05	mg/kg-day	2.00E-05	(mg/kg-d)	3.47E+00
	4,4'-DDE	3.80E-02	mg/kg	1	2.03E-05	mg/kg-day	3.00E-04	(mg/kg-d)	6.76E-02
	ALPHA-HEXACHLOROCYCLOHEXANE	1.10E-03	mg/kg	1	5.87E-07	mg/kg-day		(mg/kg-d)	
	DIELDRIN	2.60E-03	mg/kg	1	1.39E-06	mg/kg-day	5.00E-05	(mg/kg-d)	2.77E-02
	ENDRIN ALDEHYDE	3.80E-03	mg/kg	1	2.03E-06	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	6.30E-04	mg/kg	1	3.36E-07	mg/kg-day		(mg/kg-d)	
	HEPTACHLOR EPOXIDE	4.70E-04	mg/kg	1	2.51E-07	mg/kg-day	1.30E-05	(mg/kg-d)	1.93E-02
	4-CHLORO-3-METHYLPHENOL	4.40E-01	mg/kg	1	2.35E-04	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	1.90E-03	mg/kg	1	1.01E-06	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	4.90E-03	mg/kg	1	2.61E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	3.30E-03	mg/kg	1	1.76E-06	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	6.70E-03	mg/kg	1	3.57E-06	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**1.2E+01**

(1) Intake Ingestion = EPC * (IR * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.33E-04

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, kg/day	Ingestion Rate	0.008
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	6
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Clams (Reference Location)
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Clams (Reference)
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	4.27E+02	mg/kg	1	2.11E-01	mg/kg-day	1.00E+00	(mg/kg-d)	2.11E-01
	ANTIMONY	6.40E-02	mg/kg	1	3.17E-05	mg/kg-day		(mg/kg-d)	
	ARSENIC	3.42E+00	mg/kg	1	1.69E-03	mg/kg-day	3.00E-04	(mg/kg-d)	5.65E+00
	COPPER	7.61E+00	mg/kg	1	3.77E-03	mg/kg-day		(mg/kg-d)	
	IRON	1.50E+03	mg/kg	1	7.43E-01	mg/kg-day	3.00E-01	(mg/kg-d)	2.48E+00
	LEAD	1.47E+00	mg/kg	1	7.28E-04	mg/kg-day		(mg/kg-d)	
	MANGANESE	5.74E+01	mg/kg	1	2.84E-02	mg/kg-day	1.40E-01	(mg/kg-d)	2.03E-01
	MERCURY	5.00E-02	mg/kg	1	2.48E-05	mg/kg-day	3.00E-04	(mg/kg-d)	8.25E-02
	SODIUM	4.34E+03	mg/kg	1	2.15E+00	mg/kg-day		(mg/kg-d)	
	VANADIUM	2.17E+00	mg/kg	1	1.07E-03	mg/kg-day	1.00E-03	(mg/kg-d)	1.07E+00
	Total PCBs	8.60E-03	mg/kg	1	4.26E-06	mg/kg-day	2.00E-05	(mg/kg-d)	2.13E-01
	ENDOSULFAN SULFATE	5.90E-05	mg/kg	1	2.92E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	4.60E-04	mg/kg	1	2.28E-07	mg/kg-day		(mg/kg-d)	
	DELTA-BHC	4.10E-05	mg/kg	1	2.03E-08	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	5.20E-04	mg/kg	1	2.58E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	6.00E-03	mg/kg	1	2.97E-06	mg/kg-day		(mg/kg-d)	
	BENZO[G,H,I]PERYLENE	5.00E-03	mg/kg	1	2.48E-06	mg/kg-day		(mg/kg-d)	
	PHENANTHRENE	2.00E-03	mg/kg	1	9.90E-07	mg/kg-day		(mg/kg-d)	
	4-CHLORO-3-METHYLPHENOL	2.00E-01	mg/kg	1	9.90E-05	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**9.9E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 4.95E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-da	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	30
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-10I
Calculation of Non Cancer Hazards
Ingestion of Mussels (Reference Location)
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Mussels (Reference)
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ARSENIC	1.53E+00	mg/kg	1	7.58E-04	mg/kg-day	3.00E-04	(mg/kg-d)	2.53E+00
	CADMIUM	3.16E-01	mg/kg	1	1.56E-04	mg/kg-day	1.00E-03	(mg/kg-d)	1.56E-01
	IRON	1.66E+02	mg/kg	1	8.22E-02	mg/kg-day	3.00E-01	(mg/kg-d)	2.74E-01
	LEAD	4.11E-01	mg/kg	1	2.04E-04	mg/kg-day		(mg/kg-d)	
	MERCURY	5.00E-02	mg/kg	1	2.48E-05	mg/kg-day	3.00E-04	(mg/kg-d)	8.25E-02
	SODIUM	5.27E+03	mg/kg	1	2.61E+00	mg/kg-day		(mg/kg-d)	
	VANADIUM	6.40E-01	mg/kg	1	3.17E-04	mg/kg-day	1.00E-03	(mg/kg-d)	3.17E-01
	ENDOSULFAN SULFATE	8.80E-05	mg/kg	1	4.36E-08	mg/kg-day		(mg/kg-d)	
	ENDRIN KETONE	3.70E-04	mg/kg	1	1.83E-07	mg/kg-day		(mg/kg-d)	
	ACENAPHTHYLENE	6.00E-04	mg/kg	1	2.97E-07	mg/kg-day		(mg/kg-d)	
	BENZO(A)PYRENE equivalent	2.90E-03	mg/kg	1	1.44E-06	mg/kg-day		(mg/kg-d)	
								Total Hazard Index	**3.4E+00**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 4.95E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-da	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	30
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-10A
Comparison of Remedial Action Guidelines to Soil COPCs
115kV Switchyard

Medium	CAS No.	Chemical	Min. Conc.	Max. Conc.	Units	Location of Maximum	Detection Frequency	EPC	RAG Value	RAG Ratio
Soils										
Metals	7429-90-5	ALUMINUM	9600	23900	mg/kg	MY05TP08(6.5-6.8)	3/3	23900		
	7440-38-2	ARSENIC	8.4	11.1	mg/kg	MY05TP06(6.5-6.8)	3/3	11.1	10	1.11
	7439-89-6	IRON	15500	33200	mg/kg	MY05TP08(6.5-6.8)	3/3	33200		
	7439-96-5	MANGANESE	304	660	mg/kg	MY05TP06(6.5-6.8)	3/3	660		
	7440-23-5	SODIUM	106	238	mg/kg	MY05TP08(6.5-6.8)	3/3	238		
	50-32-8	BENZO(A)PYRENE equivalent	NA	493	ug/kg	MY05TP07(5.5-5.8)	1/3	493	2000	0.25
	191-24-2	BENZO[G,H,I]PERYLENE	210	210	ug/kg	MY05TP07(5.5-5.8)	1/3	210		
	85-01-8	PHENANTHRENE	990	990	ug/kg	MY05TP07(5.5-5.8)	1/3	990		

Total RAG Ratio - Surface Soil	**1.4**
RAG Ratio without Arsenic	**0.2**

EPC - Exposure Point Concentration
RAG - Remedial Action Guideline
DRO - Diesel Range Organics
J - estimated concentration

Conc. - Concentration
Min. - Minimum
Max - Maximum

Table 5-10B
Comparison of Remedial Action Guidelines to Soil COPCs
Personnel Buildings and Parking Lot Areas

Medium	CAS No.	Chemical	Min. Conc.	Max. Conc.	Units	Location of Maximum	Detection Frequency	EPC	RAG Value	RAG Ratio
Surface Soils										
Metals	7429-90-5	ALUMINUM	9620	11400	mg/kg	MY05SB17(0-0.5)	3/3	11400		
	7440-38-2	ARSENIC	7.8	12	mg/kg	MY05SS67	3/3	12	10	1.2
	7439-89-6	IRON	15800	17000	mg/kg	MY05SS75(0-0.5)	3/3	17000		
	7439-92-1	LEAD	11.9	969	mg/kg	MY05SS75(0-0.5)	3/3	969	375	2.6
	7439-96-5	MANGANESE	301	362	mg/kg	MY05SS75(0-0.5)	3/3	362		
	7440-23-5	SODIUM	106 J	415 J	mg/kg	MY05SB17(0-0.5)	3/3	415 J		
							Total RAGs Ratio - Surface Soil			**3.8**
							RAG Ratio w/out Arsenic and Lead			**0.0**
Subsurface SoilsSoils										
Metals	7429-90-5	ALUMINUM	8330	30500	mg/kg	MY05SB19(10-12)	8/8	30500		
	7440-38-2	ARSENIC	7.4	12	mg/kg	MY05SS67	8/8	12	10	1.2
	7439-89-6	IRON	9750	39600	mg/kg	MY05SB19(10-12)	9/9	39600		
	7439-92-1	LEAD	5.9	969	mg/kg	MY05SS75(0-0.5)	8/8	969	375	2.6
	7439-96-5	MANGANESE	296	732	mg/kg	MY05SB19(10-12)	8/8	732		
	7440-23-5	SODIUM	106 J	452	mg/kg	MY05SB19(10-12)	6/8	452		
	7440-62-2	VANADIUM	19.8	61.1	mg/kg	MY05SB19(10-12)	8/8	61.1		
	50-32-8	BENZO(A)PYRENE equivalent	NA	394	ug/kg	MY05SB17(4-5)	1/7	394	2000	0.2
	191-24-2	BENZO[G,H,I]PERYLENE	200 J	200 J	ug/kg	MY05SB17(4-5)	1/7	200 J		
	85-01-8	PHENANTHRENE	520	520	ug/kg	MY05SB17(4-5)	1/7	520		
	79-01-6	TRICHLOROETHENE	58	58	ug/kg	MY05SB19(10-12)	1/9	58	19000	0.0031
							Total RAG Ratio - Subsurface Soil			**4.0**
							RAG Ratio without Arsenic and Lead			**0.2**

EPC - Exposure Point Concentration
RAG - Remedial Action Guideline
DRO - Diesel Range Organics
J - estimated concentration

Conc. - Concentration
Min. - Minimum
Max - Maximum

Table 5-10C
Calculation of Non Cancer Hazards
Exposure to Soils - Plant Area
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	1.02E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.02E-02
	ARSENIC	9.84	mg/kg	NA	8.22E-06	mg/kg-day	3.00E-04	(mg/kg-d)	2.74E-02
	COPPER	197.00	mg/kg	NA	1.65E-04	mg/kg-day		(mg/kg-d)	
	IRON	17373.00	mg/kg	NA	1.45E-02	mg/kg-day	3.00E-01	(mg/kg-d)	4.84E-02
	LEAD	13.00	mg/kg	NA	1.09E-05	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	2.46E-04	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	3.51E-07	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	2.63E-05	mg/kg-day	1.00E-03	(mg/kg-d)	2.63E-02
	Total PCBs	0.11	mg/kg	NA	9.44E-08	mg/kg-day	2.00E-05	(mg/kg-d)	4.72E-03
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	3.76E-09	mg/kg-day			
	BENZO(A)PYRENE equivalent	5.340	mg/kg	NA	4.46E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	1.68E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	1.17E-06	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	5.94E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	6.98E-04	mg/kg-day	1.40E-01	(mg/kg-d)	4.98E-03
	2-METHYLNAPTHALENE	1.700	mg/kg	NA	1.42E-06	mg/kg-day	9.00E-03	(mg/kg-d)	1.58E-04
Dermal (2)	ALUMINUM	12170.00	mg/kg	NA			1.00E+00	(mg/kg-d)	
	ARSENIC	9.84	mg/kg	0.03	2.78E-07	mg/kg-day	3.00E-04	(mg/kg-d)	9.26E-04
	COPPER	197.00	mg/kg	NA				(mg/kg-d)	
	IRON	17373.00	mg/kg	NA			3.00E-01	(mg/kg-d)	
	LEAD	13.00	mg/kg	NA					
	SODIUM	294.00	mg/kg	NA					
	THALLIUM	0.42	mg/kg	NA					
	VANADIUM	31.50	mg/kg	NA			1.00E-03	(mg/kg-d)	
	Total PCBs	0.11	mg/kg	0.14	1.47E-08	mg/kg-day	2.00E-05	(mg/kg-d)	7.37E-04
	ENDRIN ALDEHYDE	0.005	mg/kg	NA					
	BENZO(A)PYRENE equivalent	5.340	mg/kg	0.13	6.53E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	2.46E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	1.71E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	8.69E-07	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA			1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	1.700	mg/kg	0.13	2.08E-07	mg/kg-day	9.00E-03	(mg/kg-d)	2.31E-05
								Total Hazard Index Across All Exposure Pathways	**1.2E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 8.36E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF)/(AT * 365 day/yr)
= EPC * ABS * 9.41E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	9
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10C
Calculation of Non Cancer Hazards
Exposure to Soils - Plant Area
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	1.90E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.90E-02
	ARSENIC	9.84	mg/kg	NA	1.54E-05	mg/kg-day	3.00E-04	(mg/kg-d)	5.12E-02
	COPPER	197.00	mg/kg	NA	3.08E-04	mg/kg-day		(mg/kg-d)	
	IRON	17373.00	mg/kg	NA	2.71E-02	mg/kg-day	3.00E-01	(mg/kg-d)	9.04E-02
	LEAD	13.00	mg/kg	NA	2.03E-05	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	4.59E-04	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	6.56E-07	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	4.92E-05	mg/kg-day	1.00E-03	(mg/kg-d)	4.92E-02
	Total PCBs	0.11	mg/kg	NA	1.75E-07	mg/kg-day	2.00E-05	(mg/kg-d)	8.75E-03
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	7.03E-09	mg/kg-day			
	BENZO(A)PYRENE equivalent	5.340	mg/kg	NA	8.34E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	3.14E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	2.19E-06	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	1.11E-05	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	1.30E-03	mg/kg-day	1.40E-01	(mg/kg-d)	9.31E-03
	2-METHYLNAPTHALENE	1.700	mg/kg	NA	2.65E-06	mg/kg-day	9.00E-03	(mg/kg-d)	2.95E-04
Dermal (2)	ALUMINUM	12170.00	mg/kg	NA			1.00E+00	(mg/kg-d)	
	ARSENIC	9.84	mg/kg	0.03	1.46E-06	mg/kg-day	3.00E-04	(mg/kg-d)	4.85E-03
	COPPER	197.00	mg/kg	NA				(mg/kg-d)	
	IRON	17373.00	mg/kg	NA			3.00E-01	(mg/kg-d)	
	LEAD	13.00	mg/kg	NA					
	SODIUM	294.00	mg/kg	NA					
	THALLIUM	0.42	mg/kg	NA					
	VANADIUM	31.50	mg/kg	NA			1.00E-03	(mg/kg-d)	
	Total PCBs	0.11	mg/kg	0.14	7.73E-08	mg/kg-day	2.00E-05	(mg/kg-d)	3.87E-03
	ENDRIN ALDEHYDE	0.005	mg/kg	NA					
	BENZO(A)PYRENE equivalent	5.340	mg/kg	0.13	3.42E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	1.29E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	8.98E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	4.56E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA			1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	1.700	mg/kg	0.13	1.09E-06	mg/kg-day	9.00E-03	(mg/kg-d)	1.21E-04
								Total Hazard Index Across All Exposure Pathways	**2.4E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 1.56E-06

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF)/(AT * 365 day/yr)
= EPC * ABS * 4.93E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	30
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-10C
Calculation of Non Cancer Hazards
Exposure to Soil - Plant Area
Child - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	6.67E-02	mg/kg-day	1.00E+00	(mg/kg-d)	6.67E-02
	ARSENIC	9.84	mg/kg	NA	5.39E-05	mg/kg-day	3.00E-04	(mg/kg-d)	1.80E-01
	COPPER	197.00	mg/kg	NA	1.08E-03	mg/kg-day		(mg/kg-d)	
	IRON	17373.00	mg/kg	NA	9.52E-02	mg/kg-day	3.00E-01	(mg/kg-d)	3.17E-01
	LEAD	13.00	mg/kg	NA	7.12E-05	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	1.61E-03	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	2.30E-06	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	1.73E-04	mg/kg-day	1.00E-03	(mg/kg-d)	1.73E-01
	Total PCBs	0.11	mg/kg	NA	6.14E-07	mg/kg-day	2.00E-05	(mg/kg-d)	3.07E-02
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	2.47E-08	mg/kg-day			
	BENZO(A)PYRENE equivalent	5.340	mg/kg	NA	2.93E-05	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	1.10E-05	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	7.67E-06	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	3.90E-05	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	4.58E-03	mg/kg-day	1.40E-01	(mg/kg-d)	3.27E-02
	2-METHYLNAPTHALENE	1.700	mg/kg	NA	9.32E-06	mg/kg-day	9.00E-03	(mg/kg-d)	1.04E-03
Dermal (2)	ALUMINUM	12170.00	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	9.84	mg/kg	0.03	4.53E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.51E-02
	COPPER	197.00	mg/kg					(mg/kg-d)	
	IRON	17373.00	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg				1.00E-03	(mg/kg-d)	
	Total PCBs	0.11	mg/kg	0.14	2.41E-07	mg/kg-day	2.00E-05	(mg/kg-d)	1.20E-02
	ENDRIN ALDEHYDE	0.005	mg/kg						
	BENZO(A)PYRENE equivalent	5.340	mg/kg	0.13	1.07E-05	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	4.01E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	2.79E-06	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	1.42E-05	mg/kg-day			
	MANGANESE	835.000	mg/kg				1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	1.700	mg/kg	0.13	3.39E-06	mg/kg-day	9.00E-03	(mg/kg-d)	3.77E-04

Total Hazard Index Across All ExposurePathways **8.3E-01**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.48E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF)/(BW*AT * 365 day/yr)
= EPC * ABS * 1.53E-05

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	200
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6
SA cm2	Surface Area	2800
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

Table 5-10C
Calculation of Non Cancer Hazards
Exposure to Soils - Plant Area
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	3.57E-03	mg/kg-day	1.00E+00	(mg/kg-d)	3.57E-03
	ARSENIC	9.84	mg/kg	NA	2.89E-06	mg/kg-day	3.00E-04	(mg/kg-d)	9.63E-03
	COPPER	197.00	mg/kg	NA	5.78E-05	mg/kg-day		(mg/kg-d)	
	IRON	17373.00	mg/kg	NA	5.10E-03	mg/kg-day	3.00E-01	(mg/kg-d)	1.70E-02
	LEAD	13.00	mg/kg	NA	3.82E-06	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	8.63E-05	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	1.23E-07	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	9.25E-06	mg/kg-day	1.00E-03	(mg/kg-d)	9.25E-03
	Total PCBs	0.11	mg/kg	NA	3.29E-08	mg/kg-day	2.00E-05	(mg/kg-d)	1.64E-03
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	1.32E-09	mg/kg-day			
	BENZO(A)PYRENE equivalent	5.340	mg/kg	NA	1.57E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	5.90E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	4.11E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	2.09E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	2.45E-04	mg/kg-day	1.40E-01	(mg/kg-d)	1.75E-03
	2-METHYLNAPTHALENE	1.700	mg/kg	NA	4.99E-07	mg/kg-day	9.00E-03	(mg/kg-d)	5.54E-05
Dermal (2)	ALUMINUM	12170.00	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	9.84	mg/kg	0.03	1.14E-07	mg/kg-day	3.00E-04	(mg/kg-d)	3.81E-04
	COPPER	197.00	mg/kg						
	IRON	17373.00	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg				1.00E-03	(mg/kg-d)	
	Total PCBs	0.11	mg/kg	0.14	6.08E-09	mg/kg-day	2.00E-05	(mg/kg-d)	3.04E-04
	ENDRIN ALDEHYDE	0.005	mg/kg						
	BENZO(A)PYRENE equivalent	5.340	mg/kg	0.13	2.69E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	1.01E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	7.05E-08	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	3.58E-07	mg/kg-day			
	MANGANESE	835.000	mg/kg				1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	1.700	mg/kg	0.13	8.56E-08	mg/kg-day	9.00E-03	(mg/kg-d)	9.51E-06

Total Hazard Index Across All Exposure Pathways **4.4E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.94E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-07

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6.6
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BWadult, kg	Body Weight	70

Table 5-10C
Calculation of Non Cancer Hazards
Exposure to Soils - Plant Area
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	7.14E-03	mg/kg-day	1.00E+00	(mg/kg-d)	7.14E-03
	ARSENIC	9.84	mg/kg	NA	5.78E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.93E-02
	COPPER	197.00	mg/kg	NA	1.16E-04	mg/kg-day		(mg/kg-d)	
	IRON	17373.00	mg/kg	NA	1.02E-02	mg/kg-day	3.00E-01	(mg/kg-d)	3.40E-02
	LEAD	13.00	mg/kg	NA	7.63E-06	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	1.73E-04	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	2.47E-07	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	1.85E-05	mg/kg-day	1.00E-03	(mg/kg-d)	1.85E-02
	Total PCBs	0.11	mg/kg	NA	6.58E-08	mg/kg-day	2.00E-05	(mg/kg-d)	3.29E-03
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	2.64E-09	mg/kg-day			
	BENZO(A)PYRENE equivalent	5.340	mg/kg	NA	3.14E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	1.18E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	8.22E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	4.17E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	4.90E-04	mg/kg-day	1.40E-01	(mg/kg-d)	3.50E-03
	2-METHYLNAPTHALENE	1.700	mg/kg	NA	9.98E-07	mg/kg-day	9.00E-03	(mg/kg-d)	1.11E-04
Dermal (2)	ALUMINUM	12170.00	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	9.84	mg/kg	0.03	1.14E-06	mg/kg-day	3.00E-04	(mg/kg-d)	3.81E-03
	COPPER	197.00	mg/kg					(mg/kg-d)	
	IRON	17373.00	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg				1.00E-03	(mg/kg-d)	
	Total PCBs	0.11	mg/kg	0.14	6.08E-08	mg/kg-day	2.00E-05	(mg/kg-d)	3.04E-03
	ENDRIN ALDEHYDE	0.005	mg/kg						
	BENZO(A)PYRENE equivalent	5.340	mg/kg	0.13	2.69E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	1.01E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	7.05E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	3.58E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg				1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	1.700	mg/kg	0.13	8.56E-07	mg/kg-day	9.00E-03	(mg/kg-d)	9.51E-05
								Total Hazard Index Across All Exposure Pathways	**9.3E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.87E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	25
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BWadult, kg	Body Weight	70

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

Table 5-10C
Calculation of Non Cancer Hazards
Exposure to Soils - Plant Area
Construction Worker - Surface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	2.72E-02	mg/kg-day	2.00E+00	(mg/kg-d)	1.36E-02
	ARSENIC	9.84	mg/kg	NA	2.20E-05	mg/kg-day	5.00E-03	(mg/kg-d)	4.40E-03
	COPPER	197.00	mg/kg	NA	4.40E-04	mg/kg-day	3.00E-02	(mg/kg-d)	1.47E-02
	IRON	17373.00	mg/kg	NA	3.88E-02	mg/kg-day			
	LEAD	13.00	mg/kg	NA	2.90E-05	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	6.57E-04	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	9.38E-07	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	7.04E-05	mg/kg-day			
	Total PCBs	0.11	mg/kg	NA	2.50E-07	mg/kg-day	3.00E-05	(mg/kg-d)	8.34E-03
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	1.01E-08	mg/kg-day	2.00E-03	(mg/kg-d)	5.03E-06
	BENZO(A)PYRENE equivalent	5.340	mg/kg	NA	1.19E-05	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	4.49E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	3.13E-06	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	1.59E-05	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	1.87E-03	mg/kg-day	1.40E-01	(mg/kg-d)	1.33E-02
	2-METHYLNAPTHALENE	1.700	mg/kg	NA	3.80E-06	mg/kg-day	9.00E-03	(mg/kg-d)	4.22E-04
Dermal (2)	ALUMINUM	12170.00	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	9.84	mg/kg	0.03	1.32E-06	mg/kg-day	5.00E-03	(mg/kg-d)	2.64E-04
	COPPER	197.00	mg/kg						
	IRON	17373.00	mg/kg						
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg						
	Total PCBs	0.11	mg/kg	0.14	7.01E-08	mg/kg-day	3.00E-05	(mg/kg-d)	2.34E-03
	ENDRIN ALDEHYDE	0.005	mg/kg						
	BENZO(A)PYRENE equivalent	5.340	mg/kg	0.13	3.10E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	1.17E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	8.13E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	4.13E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg				1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	1.700	mg/kg	0.13	9.88E-07	mg/kg-day	9.00E-03	(mg/kg-d)	1.10E-04
								Total Hazard Index Across All Exposure Pathways	**5.7E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10C
Calculation of Non Cancer Hazards
Exposure to Soils - Plant Area
Construction Worker - Subsurface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	11390.00	mg/kg	NA	2.55E-02	mg/kg-day	2.00E+00	(mg/kg-d)	1.27E-02
	ARSENIC	9.72	mg/kg	NA	2.17E-05	mg/kg-day	5.00E-03	(mg/kg-d)	4.34E-03
	COPPER	151.00	mg/kg	NA	3.37E-04	mg/kg-day	3.00E-02	(mg/kg-d)	1.12E-02
	IRON	18906.00	mg/kg	NA	4.22E-02	mg/kg-day			
	LEAD	13.07	mg/kg	NA	2.92E-05	mg/kg-day			
	SODIUM	353.00	mg/kg	NA	7.89E-04	mg/kg-day			
	THALLIUM	0.49	mg/kg	NA	1.09E-06	mg/kg-day			
	VANADIUM	28.59	mg/kg	NA	6.39E-05	mg/kg-day			
	Total PCBs	0.09	mg/kg	NA	2.10E-07	mg/kg-day	3.00E-05	(mg/kg-d)	7.00E-03
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	1.12E-08	mg/kg-day	2.00E-03	(mg/kg-d)	5.59E-06
	BENZO(A)PYRENE equivalent	4.400	mg/kg	NA	9.83E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.640	mg/kg	NA	3.66E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	3.13E-06	mg/kg-day			
	PHENANTHRENE	5.790	mg/kg	NA	1.29E-05	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	1.87E-03	mg/kg-day	1.40E-01	(mg/kg-d)	1.33E-02
	2-METHYLNAPTHALENE	1.700	mg/kg	NA	3.80E-06	mg/kg-day	9.00E-03	(mg/kg-d)	4.22E-04
Dermal (2)	ALUMINUM	11390.00	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	9.72	mg/kg	0.03	1.30E-06	mg/kg-day	5.00E-03	(mg/kg-d)	2.61E-04
	COPPER	151.00	mg/kg				3.00E-02	(mg/kg-d)	
	IRON	18906.00	mg/kg						
	LEAD	13.07	mg/kg						
	SODIUM	353.00	mg/kg						
	THALLIUM	0.49	mg/kg						
	VANADIUM	28.59	mg/kg						
	Total PCBs	0.09	mg/kg	0.14	5.82E-08	mg/kg-day	3.00E-05	(mg/kg-d)	1.94E-03
	ENDRIN ALDEHYDE	0.005	mg/kg						
	BENZO(A)PYRENE equivalent	4.400	mg/kg	0.13	2.56E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.640	mg/kg	0.13	9.53E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	8.13E-07	mg/kg-day			
	PHENANTHRENE	5.790	mg/kg	0.13	3.36E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg				1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	1.700	mg/kg	0.13	9.88E-07	mg/kg-day	9.00E-03	(mg/kg-d)	1.10E-04
								Total Hazard Index Across All Exposure Pathways	**5.1E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10D
Calculation of Non Cancer Hazards
Exposure to Soils - Warehouse 2/3
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	1.76E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.76E-02
	ARSENIC	13	mg/kg	NA	1.05E-05	mg/kg-day	3.00E-04	(mg/kg-d)	3.49E-02
	IRON	27471	mg/kg	NA	2.30E-02	mg/kg-day	3.00E-01	(mg/kg-d)	7.65E-02
	LEAD	243	mg/kg	NA	2.03E-04	mg/kg-day			
	SODIUM	167	mg/kg	NA	1.40E-04	mg/kg-day			
	MANGANESE	910	mg/kg	NA	7.60E-04	mg/kg-day	1.40E-01	(mg/kg-d)	5.43E-03
	Total PCBs	0.75	mg/kg	NA	6.25E-07	mg/kg-day	2.00E-05	(mg/kg-d)	3.13E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	NA	2.76E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	9.53E-07	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	NA	2.29E-07	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	NA	1.25E-06	mg/kg-day			
Dermal (2)	ALUMINUM	21087	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	13	mg/kg	0.03	3.53E-07	mg/kg-day	3.00E-04	(mg/kg-d)	1.18E-03
	IRON	27471	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	243	mg/kg						
	SODIUM	167	mg/kg						
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	
	Total PCBs	0.75	mg/kg	0.14	9.88E-08	mg/kg-day	2.00E-05	(mg/kg-d)	4.94E-03
	BENZO(A)PYRENE equivalent	3.30	mg/kg	0.13	4.04E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	1.39E-07	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	0.13	3.35E-08	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	0.13	1.83E-07	mg/kg-day			
								Total Hazard Index Across All Exposure Pathways	**1.7E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF*EV)/(AT * 365 day/yr)
= EPC * 8.36E-07
(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 9.41E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	9
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10D
Calculation of Non Cancer Hazards
Exposure to Soils - Warehouse 2/3
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	3.29E-02	mg/kg-day	1.00E+00	(mg/kg-d)	3.29E-02
	ARSENIC	13	mg/kg	NA	1.96E-05	mg/kg-day	3.00E-04	(mg/kg-d)	6.52E-02
	IRON	27471	mg/kg	NA	4.29E-02	mg/kg-day	3.00E-01	(mg/kg-d)	1.43E-01
	LEAD	243	mg/kg	NA	3.79E-04	mg/kg-day			
	SODIUM	167	mg/kg	NA	2.61E-04	mg/kg-day			
	MANGANESE	910	mg/kg	NA	1.42E-03	mg/kg-day	1.40E-01	(mg/kg-d)	1.02E-02
	Total PCBs	0.75	mg/kg	NA	1.17E-06	mg/kg-day	2.00E-05	(mg/kg-d)	5.86E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	NA	5.15E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	1.78E-06	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	NA	4.28E-07	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	NA	2.34E-06	mg/kg-day			
Dermal (2)	ALUMINUM	21087	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	13	mg/kg	0.03	1.85E-06	mg/kg-day	3.00E-04	(mg/kg-d)	6.17E-03
	IRON	27471	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	243	mg/kg						
	SODIUM	167	mg/kg						
	Total PCBs	0.75	mg/kg	0.14	5.18E-07	mg/kg-day	2.00E-05	(mg/kg-d)	2.59E-02
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	
	BENZO(A)PYRENE equivalent	3.30	mg/kg	0.13	2.12E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	7.31E-07	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	0.13	1.76E-07	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	0.13	9.62E-07	mg/kg-day			
								Total Hazard Index Across All Exposure Pathways	**3.4E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF*EV)/(AT * 365 day/yr)
= EPC * 1.56E-06

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 4.93E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	30
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

Table 5-10D
Calculation of Non Cancer Hazards
Exposure to Soil - Warehouse 2/3
Child - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	1.16E-01	mg/kg-day	1.00E+00	(mg/kg-d)	1.16E-01
	ARSENIC	13	mg/kg	NA	6.86E-05	mg/kg-day	3.00E-04	(mg/kg-d)	2.29E-01
	IRON	27471	mg/kg	NA	1.51E-01	mg/kg-day	3.00E-01	(mg/kg-d)	5.02E-01
	LEAD	243	mg/kg	NA	1.33E-03	mg/kg-day			
	SODIUM	167	mg/kg	NA	9.15E-04	mg/kg-day			
	MANGANESE	910	mg/kg	NA	4.99E-03	mg/kg-day	1.40E-01	(mg/kg-d)	3.56E-02
	Total PCBs	0.75	mg/kg	NA	4.11E-06	mg/kg-day	2.00E-05	(mg/kg-d)	2.05E-01
	BENZO(A)PYRENE equivalent	3.30	mg/kg	NA	1.81E-05	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	6.25E-06	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	NA	1.50E-06	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	NA	8.22E-06	mg/kg-day			
Dermal (2)	ALUMINUM	21087	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	13	mg/kg	0.03	5.76E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.92E-02
	IRON	27471	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	243	mg/kg						
	SODIUM	167	mg/kg						
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	
	Total PCBs	0.75	mg/kg	0.14	1.61E-06	mg/kg-day	2.00E-05	(mg/kg-d)	8.05E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	0.13	6.58E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	2.27E-06	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	0.13	5.46E-07	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	0.13	2.99E-06	mg/kg-day			
								Total Hazard Index Across All Exposure Pathways	**1.2E+00**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.48E-06

(2) Intake Dermal = EPC * (SA* AF* CF * ABS * EF)/(AT * BW*365 day/yr)
= EPC * ABS * 1.53E-05

EPC, mg/kg	Exposure Point Concentration	chem-specifi
IR, mg-day	Ingestion Rate	200
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6
SA cm2	Surface Area	2800
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration

Table 5-10D
Calculation of Non Cancer Hazards
Exposure to Soils - Warehouse 2/3
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	6.19E-03	mg/kg-day	1.00E+00	(mg/kg-d)	6.19E-03
	ARSENIC	13	mg/kg	NA	3.68E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.23E-02
	IRON	27471	mg/kg	NA	8.06E-03	mg/kg-day	3.00E-01	(mg/kg-d)	2.69E-02
	LEAD	243	mg/kg	NA	7.13E-05	mg/kg-day			
	SODIUM	167	mg/kg	NA	4.90E-05	mg/kg-day			
	MANGANESE	910	mg/kg	NA	2.67E-04	mg/kg-day	1.40E-01	(mg/kg-d)	1.91E-03
	Total PCBs	0.75	mg/kg	NA	2.20E-07	mg/kg-day	2.00E-05	(mg/kg-d)	1.10E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	NA	9.69E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	3.35E-07	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	NA	8.04E-08	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	NA	4.40E-07	mg/kg-day			
Dermal (2)	ALUMINUM	21087	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	13	mg/kg	0.03	1.46E-07	mg/kg-day	3.00E-04	(mg/kg-d)	4.85E-04
	IRON	27471	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	243	mg/kg						
	SODIUM	167	mg/kg						
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	
	Total PCBs	0.75	mg/kg	0.14	4.07E-08	mg/kg-day	2.00E-05	(mg/kg-d)	2.03E-03
	BENZO(A)PYRENE equivalent	3.30	mg/kg	0.13	1.66E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	5.74E-08	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	0.13	1.38E-08	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	0.13	7.56E-08	mg/kg-day			
								Total Hazard Index Across All Exposure Pathways	**6.1E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.94E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-07

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6.6
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BWadult, kg	Body Weight	70

Table 5-10D
Calculation of Non Cancer Hazards
Exposure to Soils - Warehouse 2/3
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	1.24E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.24E-02
	ARSENIC	13	mg/kg	NA	7.35E-06	mg/kg-day	3.00E-04	(mg/kg-d)	2.45E-02
	IRON	27471	mg/kg	NA	1.61E-02	mg/kg-day	3.00E-01	(mg/kg-d)	5.38E-02
	LEAD	243	mg/kg	NA	1.43E-04	mg/kg-day			
	SODIUM	167	mg/kg	NA	9.80E-05	mg/kg-day			
	MANGANESE	910	mg/kg	NA	5.34E-04	mg/kg-day	1.40E-01	(mg/kg-d)	3.82E-03
	Total PCBs	0.75	mg/kg	NA	4.40E-07	mg/kg-day	2.00E-05	(mg/kg-d)	2.20E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	NA	1.94E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	6.69E-07	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	NA	1.61E-07	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	NA	8.81E-07	mg/kg-day			
Dermal (2)	ALUMINUM	21087	mg/kg			mg/kg-day	1.00E+00	(mg/kg-d)	
	ARSENIC	13	mg/kg	0.03	1.46E-06	mg/kg-day	3.00E-04	(mg/kg-d)	4.85E-03
	IRON	27471	mg/kg			mg/kg-day	3.00E-01	(mg/kg-d)	
	LEAD	243	mg/kg						
	SODIUM	167	mg/kg						
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	
	Total PCBs	0.75	mg/kg	0.14	4.07E-07	mg/kg-day	2.00E-05	(mg/kg-d)	2.03E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	0.13	1.66E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	5.74E-07	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	0.13	1.38E-07	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	0.13	7.56E-07	mg/kg-day			
	Total Hazard Index Across All Exposure Pathways								**1.4E-01**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.87E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	25
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BWadult, kg	Body Weight	70

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

Table 5-10D
Calculation of Non Cancer Hazards
Exposure to Soils - Warehouse 2/3
Construction Worker - Surface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	4.71E-02	mg/kg-day	2.00E+00	(mg/kg-d)	2.36E-02
	ARSENIC	13	mg/kg	NA	2.80E-05	mg/kg-day	5.00E-03	(mg/kg-d)	5.60E-03
	IRON	27471	mg/kg	NA	6.14E-02	mg/kg-day			
	LEAD	243	mg/kg	NA	5.43E-04	mg/kg-day			
	SODIUM	167	mg/kg	NA	3.73E-04	mg/kg-day			
	MANGANESE	910	mg/kg	NA	2.03E-03	mg/kg-day	1.40E-01	(mg/kg-d)	1.45E-02
	Total PCBs	0.75	mg/kg	NA	1.68E-06	mg/kg-day	3.00E-05	(mg/kg-d)	5.59E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	NA	7.37E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	2.55E-06	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	NA	6.03E-07	mg/kg-day			
	PHENANTHRENE	1.500	mg/kg	NA	3.35E-06	mg/kg-day			
Dermal (2)	ALUMINUM	21087	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	13	mg/kg	0.03	1.68E-06	mg/kg-day	5.00E-03	(mg/kg-d)	3.36E-04
	IRON	27471	mg/kg						
	LEAD	243	mg/kg						
	SODIUM	167	mg/kg						
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	
	Total PCBs	0.75	mg/kg	0.14	4.69E-07	mg/kg-day	3.00E-05	(mg/kg-d)	1.56E-02
	BENZO(A)PYRENE equivalent	3.30	mg/kg	0.13	1.92E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	6.62E-07	mg/kg-day			
	CARBAZOLE	0.27	mg/kg	0.13	1.59E-07	mg/kg-day			
	PHENANTHRENE	1.50	mg/kg	0.13	8.71E-07	mg/kg-day			
								Total Hazard Index Across All Exposure Pathways	**1.2E-01**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10D
Calculation of Non Cancer Hazards
Exposure to Soils - Warehouse 2/3
Construction Worker - Subsurface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	22019	mg/kg	NA	4.92E-02	mg/kg-day	2.00E+00	(mg/kg-d)	2.46E-02
	ARSENIC	10	mg/kg	NA	2.31E-05	mg/kg-day	5.00E-03	(mg/kg-d)	4.61E-03
	IRON	31500	mg/kg	NA	7.04E-02	mg/kg-day			
	LEAD	120	mg/kg	NA	2.68E-04	mg/kg-day			
	SODIUM	188	mg/kg	NA	4.20E-04	mg/kg-day			
	VANADIUM	44	mg/kg	NA	9.83E-05	mg/kg-day			
	MANGANESE	910	mg/kg	NA	2.03E-03	mg/kg-day	1.40E-01	(mg/kg-d)	1.45E-02
	2-METHYLNAPTHALENE	3	mg/kg	NA	6.26E-06	mg/kg-day	9.00E-03	(mg/kg-d)	6.95E-04
	ETHYLBENZENE	61	mg/kg	NA	1.36E-04	mg/kg-day	1.00E+00	(mg/kg-d)	1.36E-04
	XYLENE	279	mg/kg	NA	6.23E-04	mg/kg-day	2.00E-01	(mg/kg-d)	3.12E-03
	Total PCBs	0.38	mg/kg	NA	8.49E-07	mg/kg-day	3.00E-05	(mg/kg-d)	2.83E-02
	BENZO(A)PYRENE equivalent	1.36	mg/kg	NA	3.04E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.50	mg/kg	NA	1.12E-06	mg/kg-day			
	CARBAZOLE	0.22	mg/kg	NA	4.92E-07	mg/kg-day			
	PHENANTHRENE	0.61	mg/kg	NA	1.36E-06	mg/kg-day			
Dermal (2)	ALUMINUM	22019	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	10	mg/kg	0.03	1.38E-06	mg/kg-day	5.00E-03	(mg/kg-d)	2.77E-04
	IRON	31500	mg/kg						
	LEAD	120	mg/kg						
	SODIUM	188	mg/kg						
	VANADIUM	44	mg/kg						
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	
	2-METHYLNAPTHALENE	3	mg/kg	0.13	1.63E-06	mg/kg-day	9.00E-03	(mg/kg-d)	1.81E-04
	ETHYLBENZENE	61	mg/kg				1.00E+00	(mg/kg-d)	
	XYLENE	279	mg/kg	0.1	1.25E-04	mg/kg-day	2.00E-01	(mg/kg-d)	6.23E-04
	Total PCBs	0.38	mg/kg	0.14	2.38E-07	mg/kg-day	3.00E-05	(mg/kg-d)	7.92E-03
	BENZO(A)PYRENE equivalent	1.36	mg/kg	0.13	7.90E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.50	mg/kg	0.13	2.90E-07	mg/kg-day			
	CARBAZOLE	0.22	mg/kg	0.13	1.28E-07	mg/kg-day			
	PHENANTHRENE	0.61	mg/kg	0.13	3.54E-07	mg/kg-day			
	Total Hazard Index Across All Exposure Pathways								**8.5E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10E
Calculation of Non Cancer Hazards
Exposure to Soils - 345 kV Transmission Line Area
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	1.48E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.48E-02
	ARSENIC	11	mg/kg	NA	9.42E-06	mg/kg-day	3.00E-04	(mg/kg-d)	3.14E-02
	IRON	27458	mg/kg	NA	2.29E-02	mg/kg-day	3.00E-01	(mg/kg-d)	7.65E-02
	SODIUM	218	mg/kg	NA	1.82E-04	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	5.77E-07	mg/kg-day			
	VANADIUM	41	mg/kg	NA	3.40E-05	mg/kg-day	1.00E-03	(mg/kg-d)	3.40E-02
	MANGANESE	1300	mg/kg	NA	1.09E-03	mg/kg-day	1.40E-01	(mg/kg-d)	7.76E-03
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	3.54E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	1.98E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	1.96E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	4.42E-07	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	11	mg/kg	0.03	3.18E-07	mg/kg-day	3.00E-04	(mg/kg-d)	1.06E-03
	IRON	27458	mg/kg				3.00E-01	(mg/kg-d)	
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg				1.00E-03	(mg/kg-d)	
	MANGANESE	1300	mg/kg				1.40E-01	(mg/kg-d)	
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	5.18E-08	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	2.90E-08	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	2.87E-08	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	6.47E-08	mg/kg-day			

Total Hazard Index Across All Exposure Pathways **1.7E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF * EV)/(AT * 365 day/yr)
= EPC * 8.36E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 9.41E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	9
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10E
Calculation of Non Cancer Hazards
Exposure to Soils - 345 kV Transmission Line Area
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	2.76E-02	mg/kg-day	1.00E+00	(mg/kg-d)	2.76E-02
	ARSENIC	11	mg/kg	NA	1.76E-05	mg/kg-day	3.00E-04	(mg/kg-d)	5.87E-02
	IRON	27458	mg/kg	NA	4.29E-02	mg/kg-day	3.00E-01	(mg/kg-d)	1.43E-01
	SODIUM	218	mg/kg	NA	3.40E-04	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	1.08E-06	mg/kg-day			
	VANADIUM	41	mg/kg	NA	6.36E-05	mg/kg-day	1.00E-03	(mg/kg-d)	6.36E-02
	MANGANESE	1300	mg/kg	NA	2.03E-03	mg/kg-day	1.40E-01	(mg/kg-d)	1.45E-02
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	6.56E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	3.70E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	3.67E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	8.26E-07	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	11	mg/kg	0.03	1.67E-06	mg/kg-day	3.00E-04	(mg/kg-d)	5.56E-03
	IRON	27458	mg/kg				3.00E-01	(mg/kg-d)	
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg				1.00E-03	(mg/kg-d)	
	MANGANESE	1300	mg/kg				1.40E-01	(mg/kg-d)	
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	2.69E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	1.52E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	1.51E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	3.39E-07	mg/kg-day			
								Total Hazard Index Across All Exposure Pathways	**3.1E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF * EV)/(AT * 365 day/yr)
= EPC * 1.56E-06

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 4.93E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	30
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-10E
Calculation of Non Cancer Hazards
Exposure to Soil - 345 kV Transmission Line Area
Child - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	9.70E-02	mg/kg-day	1.00E+00	(mg/kg-d)	9.70E-02
	ARSENIC	11	mg/kg	NA	6.18E-05	mg/kg-day	3.00E-04	(mg/kg-d)	2.06E-01
	IRON	27458	mg/kg	NA	1.50E-01	mg/kg-day	3.00E-01	(mg/kg-d)	5.02E-01
	SODIUM	218	mg/kg	NA	1.19E-03	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	3.78E-06	mg/kg-day			
	VANADIUM	41	mg/kg	NA	2.23E-04	mg/kg-day	1.00E-03	(mg/kg-d)	2.23E-01
	MANGANESE	1300	mg/kg	NA	7.12E-03	mg/kg-day	1.40E-01	(mg/kg-d)	5.09E-02
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	2.30E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	1.30E-06	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	1.29E-06	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	2.90E-06	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	11	mg/kg	0.03	5.19E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.73E-02
	IRON	27458	mg/kg				3.00E-01	(mg/kg-d)	
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg				1.00E-03	(mg/kg-d)	
	MANGANESE	1300	mg/kg				1.40E-01	(mg/kg-d)	
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	8.38E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	4.73E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	4.69E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	1.06E-06	mg/kg-day			
	Total Hazard Index Across All Exposure Pathways								**1.1E+00**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.48E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF)/(AT * BW * 365 day/yr)
= EPC * ABS * 1.53E-05

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-day	Ingestion Rate	200
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6
SA cm2	Surface Area	2800
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

Table 5-10E
Calculation of Non Cancer Hazards
Exposure to Soils - 345 kV Transmission Line Area
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	5.19E-03	mg/kg-day	1.00E+00	(mg/kg-d)	5.19E-03
	ARSENIC	11	mg/kg	NA	3.31E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.10E-02
	IRON	27458	mg/kg	NA	8.06E-03	mg/kg-day	3.00E-01	(mg/kg-d)	2.69E-02
	SODIUM	218	mg/kg	NA	6.40E-05	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	2.03E-07	mg/kg-day			
	VANADIUM	41	mg/kg	NA	1.20E-05	mg/kg-day	1.00E-03	(mg/kg-d)	1.20E-02
	MANGANESE	1300	mg/kg	NA	3.82E-04	mg/kg-day	1.40E-01	(mg/kg-d)	2.73E-03
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	1.23E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	6.96E-08	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	6.90E-08	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	1.55E-07	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	11	mg/kg	0.03	1.31E-07	mg/kg-day	3.00E-04	(mg/kg-d)	4.37E-04
	IRON	27458	mg/kg				3.00E-01	(mg/kg-d)	
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg				1.00E-03	(mg/kg-d)	
	MANGANESE	1300	mg/kg				1.40E-01	(mg/kg-d)	
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	2.12E-08	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	1.19E-08	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	1.18E-08	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	2.66E-08	mg/kg-day			
Total Hazard Index Across All Exposure Pathways									**5.8E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.94E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-07

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6.6
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BWadult, kg	Body Weight	70

Table 5-10E
Calculation of Non Cancer Hazards
Exposure to Soils - 345 kV Transmission Line Area
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	1.04E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.04E-02
	ARSENIC	11	mg/kg	NA	6.62E-06	mg/kg-day	3.00E-04	(mg/kg-d)	2.21E-02
	IRON	27458	mg/kg	NA	1.61E-02	mg/kg-day	3.00E-01	(mg/kg-d)	5.37E-02
	SODIUM	218	mg/kg	NA	1.28E-04	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	4.05E-07	mg/kg-day			
	VANADIUM	41	mg/kg	NA	2.39E-05	mg/kg-day	1.00E-03	(mg/kg-d)	2.39E-02
	MANGANESE	1300	mg/kg	NA	7.63E-04	mg/kg-day	1.40E-01	(mg/kg-d)	5.45E-03
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	2.47E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	1.39E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	1.38E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	3.11E-07	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	11	mg/kg	0.03	1.31E-06	mg/kg-day	3.00E-04	(mg/kg-d)	4.37E-03
	IRON	27458	mg/kg				3.00E-01	(mg/kg-d)	
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg				1.00E-03	(mg/kg-d)	
	MANGANESE	1300	mg/kg				1.40E-01	(mg/kg-d)	
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	2.12E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	1.19E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	1.18E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	2.66E-07	mg/kg-day			
Total Hazard Index Across All Exposure Pathways									**1.2E-01**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.87E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	25
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BWadult, kg	Body Weight	70

Table 5-10E
Calculation of Non Cancer Hazards
Exposure to Soils - 345 kV Transmission Line Area
Construction Worker - Surface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	3.95E-02	mg/kg-day	2.00E+00	(mg/kg-d)	1.98E-02
	ARSENIC	11	mg/kg	NA	2.52E-05	mg/kg-day	5.00E-03	(mg/kg-d)	5.04E-03
	IRON	27458	mg/kg	NA	6.14E-02	mg/kg-day			
	SODIUM	218	mg/kg	NA	4.87E-04	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	1.54E-06	mg/kg-day			
	VANADIUM	41	mg/kg	NA	9.10E-05	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	2.90E-03	mg/kg-day	1.40E-01	(mg/kg-d)	2.07E-02
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	9.38E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	5.30E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	5.25E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	1.18E-06	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	11	mg/kg	0.03	1.51E-06	mg/kg-day	5.00E-03	(mg/kg-d)	3.02E-04
	IRON	27458	mg/kg						
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg						
	MANGANESE	1300	mg/kg				1.40E-01	(mg/kg-d)	
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	2.44E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	1.38E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	1.37E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	3.07E-07	mg/kg-day			
	Total Hazard Index Across All Exposure Pathways								**4.6E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10E
Calculation of Non Cancer Hazards
Exposure to Soils - 345 kV Transmission Line Area
Construction Worker - Subsurface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	19700	mg/kg	NA	4.40E-02	mg/kg-day	2.00E+00	(mg/kg-d)	2.20E-02
	ARSENIC	12	mg/kg	NA	2.61E-05	mg/kg-day	5.00E-03	(mg/kg-d)	5.23E-03
	IRON	30600	mg/kg	NA	6.84E-02	mg/kg-day			
	SODIUM	367	mg/kg	NA	8.20E-04	mg/kg-day			
	THALLIUM	0.53	mg/kg	NA	1.18E-06	mg/kg-day			
	VANADIUM	44	mg/kg	NA	9.83E-05	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	2.90E-03	mg/kg-day	1.40E-01	(mg/kg-d)	2.07E-02
	Total PCBs	0.305	mg/kg	NA	6.82E-07	mg/kg-day	3.00E-05	(mg/kg-d)	2.27E-02
	BENZO(A)PYRENE equivalent	0.63	mg/kg	NA	1.41E-06	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.25	mg/kg	NA	5.56E-07	mg/kg-day			
	CARBAZOLE	0.22	mg/kg	NA	4.92E-07	mg/kg-day			
	PHENANTHRENE	0.39	mg/kg	NA	8.69E-07	mg/kg-day			
Dermal (2)	ALUMINUM	19700	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	12	mg/kg	0.03	1.57E-06	mg/kg-day	5.00E-03	(mg/kg-d)	3.14E-04
	IRON	30600	mg/kg						
	SODIUM	367	mg/kg						
	THALLIUM	0.53	mg/kg						
	VANADIUM	44	mg/kg						
	MANGANESE	1300	mg/kg				1.40E-01	(mg/kg-d)	
	Total PCBs	0.305	mg/kg	0.14	1.91E-07	mg/kg-day	3.00E-05	(mg/kg-d)	6.36E-03
	BENZO(A)PYRENE equivalent	0.63	mg/kg	0.13	3.66E-07	mg/kg-day			
	BENZO[G,H,I]PERYLENE	0.25	mg/kg	0.13	1.45E-07	mg/kg-day			
	CARBAZOLE	0.22	mg/kg	0.13	1.28E-07	mg/kg-day			
	PHENANTHRENE	0.39	mg/kg	0.13	2.26E-07	mg/kg-day			
								Total Hazard Index Across All Exposure Pathways	**7.7E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10F
Calculation of Non Cancer Hazards
Exposure to Soils - Bailey Farmhouse
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	1.94E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.94E-02
	ARSENIC	7.2	mg/kg	NA	6.02E-06	mg/kg-day	3.00E-04	(mg/kg-d)	2.01E-02
	IRON	24300	mg/kg	NA	2.03E-02	mg/kg-day	3.00E-01	(mg/kg-d)	6.77E-02
	LEAD	62.2	mg/kg	NA	5.20E-05	mg/kg-day			
	MANGANESE	522	mg/kg	NA	4.36E-04	mg/kg-day	1.40E-01	(mg/kg-d)	3.12E-03
	SODIUM	141	mg/kg	NA	1.18E-04	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	7.2	mg/kg	0.03	2.03E-07	mg/kg-day	3.00E-04	(mg/kg-d)	6.77E-04
	IRON	24300	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	141	mg/kg						

Total Hazard Index Across All Exposure Pathways **1.1E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF *EV)/(AT * 365 day/yr)
= EPC * 8.36E-07
(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 9.41E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	9
SFSadj, mg-yr/kg-even	Age-weighted Dermal Facto	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

NA = Not Applicable
mg/kg - day = milligram/kilogram - da
mg/kg = milligram/kilogran
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-10F
Calculation of Non Cancer Hazards
Exposure to Soils - Bailey Farmhouse
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	3.62E-02	mg/kg-day	1.00E+00	(mg/kg-d)	3.62E-02
	ARSENIC	7.2	mg/kg	NA	1.12E-05	mg/kg-day	3.00E-04	(mg/kg-d)	3.75E-02
	IRON	24300	mg/kg	NA	3.79E-02	mg/kg-day	3.00E-01	(mg/kg-d)	1.26E-01
	LEAD	62.2	mg/kg	NA	9.71E-05	mg/kg-day			
	MANGANESE	522	mg/kg	NA	8.15E-04	mg/kg-day	1.40E-01	(mg/kg-d)	5.82E-03
	SODIUM	141	mg/kg	NA	2.20E-04	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	7.2	mg/kg	0.03	1.07E-06	mg/kg-day	3.00E-04	(mg/kg-d)	3.55E-03
	IRON	24300	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	141	mg/kg						
								Total Hazard Index Across All Exposure Pathways	**2.1E-01**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF * EV)/(AT * 365 day/yr)
= EPC * 1.56E-06

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 4.93E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	30
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-10F
Calculation of Non Cancer Hazards
Exposure to Soil - Bailey Farmhouse
Child - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	1.27E-01	mg/kg-day	1.00E+00	(mg/kg-d)	1.27E-01
	ARSENIC	7.2	mg/kg	NA	3.95E-05	mg/kg-day	3.00E-04	(mg/kg-d)	1.32E-01
	IRON	24300	mg/kg	NA	1.33E-01	mg/kg-day	3.00E-01	(mg/kg-d)	4.44E-01
	LEAD	62.2	mg/kg	NA	3.41E-04	mg/kg-day			
	MANGANESE	522	mg/kg	NA	2.86E-03	mg/kg-day	1.40E-01	(mg/kg-d)	2.04E-02
	SODIUM	141	mg/kg	NA	7.73E-04	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg				1.00E+00		
	ARSENIC	7.2	mg/kg	0.03	3.31E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.10E-02
	IRON	24300	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	141	mg/kg						
								Total Hazard Index Across All Exposure Pathways	**7.3E-01**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.48E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF)/(AT * BW *365 day/yr)
= EPC * ABS * 1.53E-05

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	200
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6
SA cm2	Surface Area	2800
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

NA = Not Applicable
mg/kg - day = milligram/kilogram - da
mg/kg = milligram/kilogran
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

Table 5-10F
Calculation of Non Cancer Hazards
Exposure to Soils - Bailey Farmhouse
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	6.81E-03	mg/kg-day	1.00E+00	(mg/kg-d)	6.81E-03
	ARSENIC	7.2	mg/kg	NA	2.11E-06	mg/kg-day	3.00E-04	(mg/kg-d)	7.05E-03
	IRON	24300	mg/kg	NA	7.13E-03	mg/kg-day	3.00E-01	(mg/kg-d)	2.38E-02
	LEAD	62.2	mg/kg	NA	1.83E-05	mg/kg-day			
	MANGANESE	522	mg/kg	NA	1.53E-04	mg/kg-day	1.40E-01	(mg/kg-d)	1.09E-03
	SODIUM	141	mg/kg	NA	4.14E-05	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	7.2	mg/kg	0.03	8.37E-08	mg/kg-day	3.00E-04	(mg/kg-d)	2.79E-04
	IRON	24300	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	141	mg/kg						
								Total Hazard Index Across All Exposure Pathways	**3.9E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.94E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-07

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6.6
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BWadult, kg	Body Weight	70

Table 5-10F
Calculation of Non Cancer Hazards
Exposure to Soils - Bailey Farmhouse
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	1.36E-02	mg/kg-day	1.00E+00	(mg/kg-d)	1.36E-02
	ARSENIC	7.2	mg/kg	NA	4.23E-06	mg/kg-day	3.00E-04	(mg/kg-d)	1.41E-02
	IRON	24300	mg/kg	NA	1.43E-02	mg/kg-day	3.00E-01	(mg/kg-d)	4.76E-02
	LEAD	62.2	mg/kg	NA	3.65E-05	mg/kg-day			
	MANGANESE	522	mg/kg	NA	3.06E-04	mg/kg-day	1.40E-01	(mg/kg-d)	2.19E-03
	SODIUM	141	mg/kg	NA	8.28E-05	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg				1.00E+00	(mg/kg-d)	
	ARSENIC	7.2	mg/kg	0.03	8.37E-07	mg/kg-day	3.00E-04	(mg/kg-d)	2.79E-03
	IRON	24300	mg/kg				3.00E-01	(mg/kg-d)	
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	141	mg/kg					(mg/kg-d)	
								Total Hazard Index Across All Exposure Pathways	**8.0E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.87E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 3.87E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	25
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BWadult, kg	Body Weight	70

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

Table 5-10F
Calculation of Non Cancer Hazards
Exposure to Soils - Bailey Farmhouse
Construction Worker - Surface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	5.18E-02	mg/kg-day	2.00E+00	(mg/kg-d)	2.59E-02
	ARSENIC	7.2	mg/kg	NA	1.61E-05	mg/kg-day	5.00E-03	(mg/kg-d)	3.22E-03
	IRON	24300	mg/kg	NA	5.43E-02	mg/kg-day			
	LEAD	62.2	mg/kg	NA	1.39E-04	mg/kg-day			
	MANGANESE	522	mg/kg	NA	1.17E-03	mg/kg-day	1.40E-01	(mg/kg-d)	8.33E-03
	SODIUM	141	mg/kg	NA	3.15E-04	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	7.2	mg/kg	0.03	9.65E-07	mg/kg-day	5.00E-03	(mg/kg-d)	1.93E-04
	IRON	24300	mg/kg						
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	141	mg/kg						
Total Hazard Index Across All Exposure Pathways									**3.8E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10F
Calculation of Non Cancer Hazards
Exposure to Soils - Bailey Farmhouse
Construction Worker - Subsurface Soils

Scenario Timeframe:	Subchronic Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (subchronic)	Reference Dose Units	Hazard Quotient
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	5.18E-02	mg/kg-day	2.00E+00	(mg/kg-d)	2.59E-02
	ARSENIC	8.20	mg/kg	NA	1.83E-05	mg/kg-day	5.00E-03	(mg/kg-d)	3.66E-03
	IRON	24300	mg/kg	NA	5.43E-02	mg/kg-day			
	LEAD	62.20	mg/kg	NA	1.39E-04	mg/kg-day			
	MANGANESE	522	mg/kg	NA	1.17E-03	mg/kg-day	1.40E-01	(mg/kg-d)	8.33E-03
	SODIUM	141	mg/kg	NA	3.15E-04	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg				2.00E+00	(mg/kg-d)	
	ARSENIC	8.20	mg/kg	0.03	1.10E-06	mg/kg-day	5.00E-03	(mg/kg-d)	2.20E-04
	IRON	24300	mg/kg						
	LEAD	62.20	mg/kg						
	MANGANESE	522	mg/kg				1.40E-01	(mg/kg-d)	
	SODIUM	141	mg/kg						
								Total Hazard Index Across All Exposure Pathways	**3.8E-02**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 2.23E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW* AT * 365 day/yr)
= EPC * ABS * 4.47E-06

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
CT -Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	173
AT, yr	Averaging Time	1
SA cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	1
BWadult, kg	Body Weight	70

Table 5-10G
Comparison of Remedial Action Guidelines to Soil COPCs
ISFSI

Medium	CAS No.	Chemical	Min. Conc.	Max. Conc.	Units	Location of Maximum	Detection Frequency	EPC	RAG Value	RAG Ratio
Soils										
Metals	7440-38-2	ARSENIC	7.9	8.1	mg/kg	Trench Sample	2/2	8.1	10	0.81
	192-24-2	BENZO[G,H,I]PERYLENE	0.14	0.14	ug/kg	MY04SS01	1/2	0.14		

Total RAG Ratio - Surface Soil	**0.8**
RAG Ratio without Arsenic	**0**

EPC - Exposure Point Concentration
RAG - Remedial Action Guideline
DRO - Diesel Range Organics
J - estimated concentration
Conc. - Concentration
Min. - Minimum
Max - Maximum

Table 5-11H
Calculation of Cancer Risks
Exposure to Sediment - Shellfisherman -CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Sediment
Receptor Population:	Shellfisherman
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion (1)	ALUMINUM	13505	mg/kg	NA	1.77E-04	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	8.79	mg/kg	NA	1.15E-07	mg/kg-day	1.5	1/(mg/kg-day)	1.72E-07
	IRON	20978	mg/kg	NA	2.74E-04	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	228	mg/kg	NA	2.98E-06	mg/kg-day		1/(mg/kg-day)	
	SODIUM	7935	mg/kg	NA	1.04E-04	mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	0.41	mg/kg	NA	5.36E-09	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	0.03	mg/kg	NA	3.27E-10	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	3.60	mg/kg	NA	4.71E-08	mg/kg-day	7.3	1/(mg/kg-day)	3.44E-07
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	NA	1.64E-08	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.69	mg/kg	NA	9.03E-09	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	5.53	mg/kg	NA	7.24E-08	mg/kg-day		1/(mg/kg-day)	
Dermal (2)	ALUMINUM	13505	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ARSENIC	8.79	mg/kg	0.03	7.86E-08	mg/kg-day	1.5	1/(mg/kg-day)	1.18E-07
	IRON	20978	mg/kg			mg/kg-day		1/(mg/kg-day)	
	MANGANESE	228	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	7935	mg/kg			mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	0.41	mg/kg	0.13	1.59E-08	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	0.03	mg/kg	0.13	9.69E-10	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	3.60	mg/kg	0.13	1.40E-07	mg/kg-day	7.3	1/(mg/kg-day)	1.02E-06
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	0.13	4.87E-08	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.69	mg/kg	0.13	2.68E-08	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	5.53	mg/kg	0.13	2.14E-07	mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Routes/Pathways 1.7E-06

Total Cancer Risks Excluding Arsenic 1.36E-06

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 1.31E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 2.98E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	52
AT, yr	Averaging Time	70
SA, cm2	Surface Area	5700
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	9
BW, kg	Body Weight	70

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

Table 5-11H
Calculation of Cancer Risks
Exposure to Sediment - Shellfisherman -RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Sediment
Receptor Population:	Shellfisherman
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	13505	mg/kg	NA	2.36E-03	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	8.79	mg/kg	NA	1.53E-06	mg/kg-day	1.5	1/(mg/kg-day)	2.30E-06
	IRON	20978	mg/kg	NA	3.66E-03	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	228	mg/kg	NA	3.97E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	7935	mg/kg	NA	1.38E-03	mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	0.41	mg/kg	NA	7.15E-08	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	0.03	mg/kg	NA	4.36E-09	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	3.60	mg/kg	NA	6.28E-07	mg/kg-day	7.3	1/(mg/kg-day)	4.58E-06
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	NA	2.19E-07	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.69	mg/kg	NA	1.20E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	5.53	mg/kg	NA	9.65E-07	mg/kg-day		1/(mg/kg-day)	
								1/(mg/kg-day)	
Dermal (2)	ALUMINUM	13505	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ARSENIC	8.79	mg/kg	0.03	5.24E-07	mg/kg-day	1.5	1/(mg/kg-day)	7.86E-07
	IRON	20978	mg/kg			mg/kg-day		1/(mg/kg-day)	
	MANGANESE	228	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	7935	mg/kg			mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	0.41	mg/kg	0.13	1.06E-07	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	0.03	mg/kg	0.13	6.46E-09	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	3.60	mg/kg	0.13	9.31E-07	mg/kg-day	7.3	1/(mg/kg-day)	6.79E-06
	BENZO[G,H,I]PERYLENE	1.26	mg/kg	0.13	3.25E-07	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.69	mg/kg	0.13	1.78E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	5.53	mg/kg	0.13	1.43E-06	mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Routes/Pathways **1.4E-05**

Total Cancer Risks Excluding Arsenic **1.22E-05**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF* ED)/(BW *AT * 365 day/yr)
= EPC * 1.74E-07

(2) Intake Dermal = EPC * (SA * CF * ABS * EF * ED*AF)/(BW * AT * 365 day/yr)
= EPC * ABS * 1.99E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	104
AT, yr	Averaging Time	70
SA, cm2	Surface Area	5700
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	30
BW, kg	Body Weight	70

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

Table 5-11H
Calculation of Cancer Risks
Exposure to Sediments - Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Sediment
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	13505.00	mg/kg	NA	1.57E-03	mg/kg-day			
	ARSENIC	8.79	mg/kg	NA	1.02E-06	mg/kg-day	1.5	1/(mg/kg-day)	1.53E-06
	IRON	20978.00	mg/kg	NA	2.43E-03	mg/kg-day			
	MANGANESE	228.00	mg/kg	NA	2.64E-05	mg/kg-day			
	SODIUM	7935.00	mg/kg	NA	9.21E-04	mg/kg-day			
	2-METHYLNAPHTHALENE	0.410	mg/kg	NA	4.76E-08	mg/kg-day			
	ACENAPTHALENE	0.025	mg/kg	NA	2.90E-09	mg/kg-day			
	BENZO(A)PYRENE equivalence	3.600	mg/kg	NA	4.18E-07	mg/kg-day	7.3	1/(mg/kg-day)	3.05E-06
	BENZO[G,H,I]PERYLENE	1.260	mg/kg	NA	1.46E-07	mg/kg-day			
	CARBAZOLE	0.690	mg/kg	NA	8.00E-08	mg/kg-day			
	PHENANTHRENE	5.530	mg/kg	NA	6.42E-07	mg/kg-day			
Dermal (2)	ALUMINUM	13505.00	mg/kg						
	ARSENIC	8.79	mg/kg	0.03	9.66E-08	mg/kg-day	1.5	1/(mg/kg-day)	1.45E-07
	IRON	20978.00	mg/kg						
	MANGANESE	228.00	mg/kg						
	SODIUM	7935.00	mg/kg						
	2-METHYLNAPHTHALENE	0.410	mg/kg	0.13	1.95E-08	mg/kg-day			
	ACENAPTHALENE	0.025	mg/kg	0.13	1.19E-09	mg/kg-day			
	BENZO(A)PYRENE equivalence	3.600	mg/kg	0.13	1.71E-07	mg/kg-day	7.3	1/(mg/kg-day)	1.25E-06
	BENZO[G,H,I]PERYLENE	1.260	mg/kg	0.13	6.00E-08	mg/kg-day			
	CARBAZOLE	0.690	mg/kg	0.13	3.29E-08	mg/kg-day			
	PHENANTHRENE	5.530	mg/kg	0.13	2.63E-07	mg/kg-day			
								Total Cancer Risk Across All Exposure Pathways	**6.0E-06**
								Total Cancer Risks Excluding Arsenic	**4.30E-06**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 1.16E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 3.66E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	26
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-11I
Calculation of Cancer Risks
Ingestion of Clams
Resident - CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Clams
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion (1)	ALUMINUM	3.95E+02	mg/kg	1	1.50E-02	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	3.52E+00	mg/kg	1	1.34E-04	mg/kg-day	1.5	1/(mg/kg-day)	2.01E-04
	COPPER	1.03E+01	mg/kg	1	3.92E-04	mg/kg-day		1/(mg/kg-day)	
	IRON	1.41E+03	mg/kg	1	5.38E-02	mg/kg-day		1/(mg/kg-day)	
	LEAD	1.08E+00	mg/kg	1	4.12E-05	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	4.34E+01	mg/kg	1	1.65E-03	mg/kg-day		1/(mg/kg-day)	
	MERCURY	4.56E-02	mg/kg	1	1.74E-06	mg/kg-day		1/(mg/kg-day)	
	SODIUM	5.24E+03	mg/kg	1	1.99E-01	mg/kg-day		1/(mg/kg-day)	
	VANADIUM	1.99E+00	mg/kg	1	7.58E-05	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	4.83E-03	mg/kg	1	1.84E-07	mg/kg-day	2	1/(mg/kg-day)	3.68E-07
	ALPHA-HEXACHLOROCYCLOHEXANE	8.70E-05	mg/kg	1	3.31E-09	mg/kg-day	6.3	1/(mg/kg-day)	2.09E-08
	BETA-HEXACHLOROCYCLOHEXANE	1.95E-04	mg/kg	1	7.42E-09	mg/kg-day	1.8	1/(mg/kg-day)	1.34E-08
	DIELDRIN	1.27E-04	mg/kg	1	4.82E-09	mg/kg-day	16	1/(mg/kg-day)	7.72E-08
	ENDOSULFAN I	3.00E-05	mg/kg	1	1.14E-09	mg/kg-day		1/(mg/kg-day)	
	ENDOSULFAN II	1.60E-04	mg/kg	1	6.10E-09	mg/kg-day		1/(mg/kg-day)	
	ENDOSULFAN SULFATE	5.20E-05	mg/kg	1	1.98E-09	mg/kg-day		1/(mg/kg-day)	
	ENDRIN ALDEHYDE	1.69E-04	mg/kg	1	6.45E-09	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	2.47E-04	mg/kg	1	9.41E-09	mg/kg-day		1/(mg/kg-day)	
	4-CHLORO-3-METHYLPHENOL	3.88E-01	mg/kg	1	1.48E-05	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	4.20E-04	mg/kg	1	1.60E-08	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	3.48E-03	mg/kg	1	1.33E-07	mg/kg-day	7.3	1/(mg/kg-day)	9.68E-07
	BENZO[G,H,I]PERYLENE	3.60E-03	mg/kg	1	1.37E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	2.41E-03	mg/kg	1	9.19E-08	mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**2.0E-04**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 3.81E-05

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 2.67E+03

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Clams
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Clams
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	3.95E+02	mg/kg	1	8.38E-02	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	3.52E+00	mg/kg	1	7.47E-04	mg/kg-day	1.5	1/(mg/kg-day)	1.12E-03
	COPPER	1.03E+01	mg/kg	1	2.19E-03	mg/kg-day		1/(mg/kg-day)	
	IRON	1.41E+03	mg/kg	1	3.00E-01	mg/kg-day		1/(mg/kg-day)	
	LEAD	1.08E+00	mg/kg	1	2.29E-04	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	4.34E+01	mg/kg	1	9.21E-03	mg/kg-day		1/(mg/kg-day)	
	MERCURY	4.56E-02	mg/kg	1	9.68E-06	mg/kg-day		1/(mg/kg-day)	
	SODIUM	5.24E+03	mg/kg	1	1.11E+00	mg/kg-day		1/(mg/kg-day)	
	VANADIUM	1.99E+00	mg/kg	1	4.23E-04	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	4.83E-03	mg/kg	1	1.03E-06	mg/kg-day	2	1/(mg/kg-day)	2.05E-06
	ALPHA-HEXACHLOROCYCLOHEXANE	8.70E-05	mg/kg	1	1.85E-08	mg/kg-day	6.3	1/(mg/kg-day)	1.16E-07
	BETA-HEXACHLOROCYCLOHEXANE	1.95E-04	mg/kg	1	4.14E-08	mg/kg-day	1.8	1/(mg/kg-day)	7.44E-08
	DIELDRIN	1.27E-04	mg/kg	1	2.69E-08	mg/kg-day	16	1/(mg/kg-day)	4.30E-07
	ENDOSULFAN I	3.00E-05	mg/kg	1	6.37E-09	mg/kg-day		1/(mg/kg-day)	
	ENDOSULFAN II	1.60E-04	mg/kg	1	3.40E-08	mg/kg-day		1/(mg/kg-day)	
	ENDOSULFAN SULFATE	5.20E-05	mg/kg	1	1.10E-08	mg/kg-day		1/(mg/kg-day)	
	ENDRIN ALDEHYDE	1.69E-04	mg/kg	1	3.59E-08	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	2.47E-04	mg/kg	1	5.24E-08	mg/kg-day		1/(mg/kg-day)	
	4-CHLORO-3-METHYLPHENOL	3.88E-01	mg/kg	1	8.24E-05	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	4.20E-04	mg/kg	1	8.92E-08	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	3.48E-03	mg/kg	1	7.39E-07	mg/kg-day	7.3	1/(mg/kg-day)	5.39E-06
	BENZO[G,H,I]PERYLENE	3.60E-03	mg/kg	1	7.63E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	2.41E-03	mg/kg	1	5.12E-07	mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Pathways **1.1E-03**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.12E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Mussels
Resident - CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Mussel
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion (1)	ALUMINUM	1.07E+02	mg/kg	1	4.08E-03	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	1.22E+00	mg/kg	1	4.65E-05	mg/kg-day	1.5	1/(mg/kg-day)	6.97E-05
	CADMIUM	2.60E-01	mg/kg	1	9.90E-06	mg/kg-day		1/(mg/kg-day)	
	IRON	1.54E+02	mg/kg	1	5.87E-03	mg/kg-day		1/(mg/kg-day)	
	LEAD	2.90E-01	mg/kg	1	1.10E-05	mg/kg-day		1/(mg/kg-day)	
	MERCURY	5.00E-02	mg/kg	1	1.90E-06	mg/kg-day		1/(mg/kg-day)	
	SODIUM	5.08E+03	mg/kg	1	1.93E-01	mg/kg-day		1/(mg/kg-day)	
	ALPHA-HEXACHLOROCYCLOHEXANE	3.90E-05	mg/kg	1	1.49E-09	mg/kg-day	6.3	1/(mg/kg-day)	9.36E-09
	BETA-HEXACHLOROCYCLOHEXANE	5.80E-05	mg/kg	1	2.21E-09	mg/kg-day	1.8	1/(mg/kg-day)	3.98E-09
	ENDOSULFAN II	1.40E-04	mg/kg	1	5.33E-09	mg/kg-day		1/(mg/kg-day)	
	ENDOSULFAN SULFATE	6.10E-05	mg/kg	1	2.32E-09	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	4.90E-04	mg/kg	1	1.87E-08	mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	2.50E-03	mg/kg	1	9.52E-08	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	3.30E-04	mg/kg	1	1.26E-08	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	8.80E-03	mg/kg	1	3.35E-07	mg/kg-day	7.3	1/(mg/kg-day)	2.45E-06
	BENZO[G,H,I]PERYLENE	1.27E-03	mg/kg	1	4.84E-08	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	2.17E-03	mg/kg	1	8.27E-08	mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**7.2E-05**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 3.81E-05

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 2.67E+03

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Mussels
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Mussels
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	1.1E+02	mg/kg	1	2.27E-02	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	1.2E+00	mg/kg	1	2.59E-04	mg/kg-day	1.5	1/(mg/kg-day)	3.88E-04
	CADMIUM	2.6E-01	mg/kg	1	5.52E-05	mg/kg-day		1/(mg/kg-day)	
	IRON	1.5E+02	mg/kg	1	3.27E-02	mg/kg-day		1/(mg/kg-day)	
	LEAD	2.9E-01	mg/kg	1	6.16E-05	mg/kg-day		1/(mg/kg-day)	
	MERCURY	5.0E-02	mg/kg	1	1.06E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	5.1E+03	mg/kg	1	1.08E+00	mg/kg-day		1/(mg/kg-day)	
	ALPHA-HEXACHLOROCYCLOHEXANE	3.9E-05	mg/kg	1	8.28E-09	mg/kg-day	6.3	1/(mg/kg-day)	5.21E-08
	BETA-HEXACHLOROCYCLOHEXANE	5.8E-05	mg/kg	1	1.23E-08	mg/kg-day	1.8	1/(mg/kg-day)	2.22E-08
	ENDOSULFAN II	1.4E-04	mg/kg	1	2.97E-08	mg/kg-day		1/(mg/kg-day)	
	ENDOSULFAN SULFATE	6.1E-05	mg/kg	1	1.29E-08	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	4.9E-04	mg/kg	1	1.04E-07	mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	2.5E-03	mg/kg	1	5.31E-07	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	3.3E-04	mg/kg	1	7.00E-08	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	8.8E-03	mg/kg	1	1.87E-06	mg/kg-day	7.3	1/(mg/kg-day)	1.36E-05
	BENZO[G,H,I]PERYLENE	1.3E-03	mg/kg	1	2.70E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	2.2E-03	mg/kg	1	4.61E-07	mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**4.0E-04**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.12E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Lobsters
Resident -CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Lobster
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value mg/kg	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion (1)	ARSENIC	2.8E+00	mg/kg	1	1.07E-04	mg/kg-day	1.5	1/(mg/kg-day)	1.61E-04
	COPPER	1.3E+01	mg/kg	1	4.90E-04	mg/kg-day		1/(mg/kg-day)	
	LEAD	8.2E-02	mg/kg	1	3.10E-06	mg/kg-day		1/(mg/kg-day)	
	MERCURY	2.1E-01	mg/kg	1	8.00E-06	mg/kg-day		1/(mg/kg-day)	
	SODIUM	4.0E+03	mg/kg	1	1.54E-01	mg/kg-day		1/(mg/kg-day)	
	ALPHA-HEXACHLOROCYCLOHEXANE	2.1E-05	mg/kg	1	8.00E-10	mg/kg-day	6.3	1/(mg/kg-day)	5.04E-09
	DIELDRIN	2.2E-04	mg/kg	1	8.38E-09	mg/kg-day	16	1/(mg/kg-day)	1.34E-07
	ENDOSULFAN SULFATE	1.7E-05	mg/kg	1	6.48E-10	mg/kg-day		1/(mg/kg-day)	
	4-CHLORO-3-METHYLPHENOL	1.0E-01	mg/kg	1	3.81E-06	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	2.0E-05	mg/kg	1	7.62E-10	mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**1.6E-04**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 3.81E-05

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 2.67E+03

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Lobster
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Lobster
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ARSENIC	2.8E+00	mg/kg	1	5.99E-04	mg/kg-day	1.5	1/(mg/kg-day)	8.98E-04
	COPPER	1.3E+01	mg/kg	1	2.73E-03	mg/kg-day		1/(mg/kg-day)	
	LEAD	8.2E-02	mg/kg	1	1.73E-05	mg/kg-day		1/(mg/kg-day)	
	MERCURY	2.1E-01	mg/kg	1	4.46E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	4.0E+03	mg/kg	1	8.57E-01	mg/kg-day		1/(mg/kg-day)	
	ALPHA-HEXACHLOROCYCLOHEXANE	2.1E-05	mg/kg	1	4.46E-09	mg/kg-day	6.3	1/(mg/kg-day)	2.81E-08
	DIELDRIN	2.2E-04	mg/kg	1	4.67E-08	mg/kg-day	16	1/(mg/kg-day)	7.47E-07
	ENDOSULFAN SULFATE	1.7E-05	mg/kg	1	3.61E-09	mg/kg-day		1/(mg/kg-day)	
	4-CHLORO-3-METHYLPHENOL	1.0E-01	mg/kg	1	2.12E-05	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	2.0E-05	mg/kg	1	4.24E-09	mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**9.0E-04**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.12E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Lobster Tomalley
Resident - CT

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Tomalley
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risks
Ingestion (1)	ARSENIC	4.3E+00	mg/kg	1	1.63E-04	mg/kg-day	1.5E+00	1/(mg/kg-day)	2.45E-04
	CADMIUM	8.5E-01	mg/kg	1	3.24E-05	mg/kg-day		1/(mg/kg-day)	
	COPPER	5.0E+01	mg/kg	1	1.90E-03	mg/kg-day		1/(mg/kg-day)	
	LEAD	4.0E-02	mg/kg	1	1.52E-06	mg/kg-day		1/(mg/kg-day)	
	MERCURY	9.0E-02	mg/kg	1	3.43E-06	mg/kg-day		1/(mg/kg-day)	
	SELENIUM	1.0E+00	mg/kg	1	3.96E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	3.2E+03	mg/kg	1	1.20E-01	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	1.3E-01	mg/kg	1	4.95E-06	mg/kg-day	2.0E+00	1/(mg/kg-day)	9.90E-06
	4,4'-DDE	3.8E-02	mg/kg	1	1.45E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.92E-07
	ALPHA-HEXACHLOROCYCLOHEXANE	1.1E-03	mg/kg	1	4.19E-08	mg/kg-day	6.3E+00	1/(mg/kg-day)	2.64E-07
	DIELDRIN	2.6E-03	mg/kg	1	9.90E-08	mg/kg-day	1.6E+01	1/(mg/kg-day)	1.58E-06
	ENDRIN ALDEHYDE	3.8E-03	mg/kg	1	1.45E-07	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	6.3E-04	mg/kg	1	2.40E-08	mg/kg-day		1/(mg/kg-day)	
	HEPTACHLOR EPOXIDE	4.7E-04	mg/kg	1	1.79E-08	mg/kg-day	9.1E+00	1/(mg/kg-day)	1.63E-07
	4-CHLORO-3-METHYLPHENOL	4.4E-01	mg/kg	1	1.68E-05	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	1.9E-03	mg/kg	1	7.24E-08	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	4.9E-03	mg/kg	1	1.87E-07	mg/kg-day	7.3E+00	1/(mg/kg-day)	1.36E-06
	BENZO[G,H,I]PERYLENE	3.3E-03	mg/kg	1	1.26E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	6.7E-03	mg/kg	1	2.55E-07	mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Pathways **2.6E-04**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 3.81E-05

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 2.67E+03

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	2.67E+03
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	7
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	2
IR-A, kg/day	Ingestion Rate, Adult	0.016
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Lobster Tomalley
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Tomalley
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ARSENIC	4.3E+00	mg/kg	1	9.11E-04	mg/kg-day	1.5E+00	1/(mg/kg-day)	1.37E-03
	CADMIUM	8.5E-01	mg/kg	1	1.80E-04	mg/kg-day		1/(mg/kg-day)	
	COPPER	5.0E+01	mg/kg	1	1.06E-02	mg/kg-day		1/(mg/kg-day)	
	LEAD	4.0E-02	mg/kg	1	8.49E-06	mg/kg-day		1/(mg/kg-day)	
	MERCURY	9.0E-02	mg/kg	1	1.91E-05	mg/kg-day		1/(mg/kg-day)	
	SELENIUM	1.0E+00	mg/kg	1	2.21E-04	mg/kg-day		1/(mg/kg-day)	
	SODIUM	3.2E+03	mg/kg	1	6.71E-01	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	1.3E-01	mg/kg	1	2.76E-05	mg/kg-day	2.0E+00	1/(mg/kg-day)	5.52E-05
	4,4'-DDE	3.8E-02	mg/kg	1	8.07E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.74E-06
	ALPHA-HEXACHLOROCYCLOHEXANE	1.1E-03	mg/kg	1	2.33E-07	mg/kg-day	6.3E+00	1/(mg/kg-day)	1.47E-06
	DIELDRIN	2.6E-03	mg/kg	1	5.52E-07	mg/kg-day	1.6E+01	1/(mg/kg-day)	8.83E-06
	ENDRIN ALDEHYDE	3.8E-03	mg/kg	1	8.07E-07	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	6.3E-04	mg/kg	1	1.34E-07	mg/kg-day		1/(mg/kg-day)	
	HEPTACHLOR EPOXIDE	4.7E-04	mg/kg	1	9.98E-08	mg/kg-day	9.1E+00	1/(mg/kg-day)	9.08E-07
	4-CHLORO-3-METHYLPHENOL	4.4E-01	mg/kg	1	9.34E-05	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	1.9E-03	mg/kg	1	4.03E-07	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	4.9E-03	mg/kg	1	1.04E-06	mg/kg-day	7.3E+00	1/(mg/kg-day)	7.59E-06
	BENZO[G,H,I]PERYLENE	3.3E-03	mg/kg	1	7.00E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	6.7E-03	mg/kg	1	1.42E-06	mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Pathways **1.4E-03**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.12E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Clams (Reference Location)
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Clams (Reference)
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	4.27E+02	mg/kg	1	9.06E-02	mg/kg-day		1/(mg/kg-day)	
	ANTIMONY	6.40E-02	mg/kg	1	1.36E-05	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	3.42E+00	mg/kg	1	7.26E-04	mg/kg-day	1.5	1/(mg/kg-day)	1.09E-03
	COPPER	7.61E+00	mg/kg	1	1.62E-03	mg/kg-day		1/(mg/kg-day)	
	IRON	1.50E+03	mg/kg	1	3.18E-01	mg/kg-day		1/(mg/kg-day)	
	LEAD	1.47E+00	mg/kg	1	3.12E-04	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	5.74E+01	mg/kg	1	1.22E-02	mg/kg-day		1/(mg/kg-day)	
	MERCURY	5.00E-02	mg/kg	1	1.06E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	4.34E+03	mg/kg	1	9.21E-01	mg/kg-day		1/(mg/kg-day)	
	VANADIUM	2.17E+00	mg/kg	1	4.61E-04	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	8.60E-03	mg/kg	1	1.83E-06	mg/kg-day	2	1/(mg/kg-day)	3.65E-06
	ENDOSULFAN SULFATE	5.90E-05	mg/kg	1	1.25E-08	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	4.60E-04	mg/kg	1	9.76E-08	mg/kg-day		1/(mg/kg-day)	
	DELTA-BHC	4.10E-05	mg/kg	1	8.70E-09	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	5.20E-04	mg/kg	1	1.10E-07	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	6.00E-03	mg/kg	1	1.27E-06	mg/kg-day	7.3	1/(mg/kg-day)	9.30E-06
	BENZO[G,H,I]PERYLENE	5.00E-03	mg/kg	1	1.06E-06	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	2.00E-03	mg/kg	1	4.24E-07	mg/kg-day		1/(mg/kg-day)	
	4-CHLORO-3-METHYLPHENOL	2.00E-01	mg/kg	1	4.24E-05	mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**1.1E-03**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)

= EPC * 2.12E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A

= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11I
Calculation of Cancer Risks
Ingestion of Mussels (Reference Location)
Resident - RME

Scenario Timeframe:	Future
Medium:	Sediment
Exposure Medium:	Mussels (Reference)
Receptor Population:	Resident
Receptor Age:	Adult/Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Relative Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ARSENIC	1.53E+00	mg/kg	1	3.25E-04	mg/kg-day	1.5	1/(mg/kg-day)	4.87E-04
	CADMIUM	3.16E-01	mg/kg	1	6.71E-05	mg/kg-day		1/(mg/kg-day)	
	IRON	1.66E+02	mg/kg	1	3.52E-02	mg/kg-day		1/(mg/kg-day)	
	LEAD	4.11E-01	mg/kg	1	8.72E-05	mg/kg-day		1/(mg/kg-day)	
	MERCURY	5.00E-02	mg/kg	1	1.06E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	5.27E+03	mg/kg	1	1.12E+00	mg/kg-day		1/(mg/kg-day)	
	VANADIUM	6.40E-01	mg/kg	1	1.36E-04	mg/kg-day		1/(mg/kg-day)	
	ENDOSULFAN SULFATE	8.80E-05	mg/kg	1	1.87E-08	mg/kg-day		1/(mg/kg-day)	
	ENDRIN KETONE	3.70E-04	mg/kg	1	7.85E-08	mg/kg-day		1/(mg/kg-day)	
	ACENAPHTHYLENE	6.00E-04	mg/kg	1	1.27E-07	mg/kg-day		1/(mg/kg-day)	
	BENZO(A)PYRENE equivalence	2.90E-03	mg/kg	1	6.16E-07	mg/kg-day	7.3	1/(mg/kg-day)	4.49E-06

Total Cancer Risk Across All Exposure Pathways **4.9E-04**

(1) Intake Ingestion = EPC * (IFadj * CF2 * RAF * EF)/(AT * 365 day/yr)
= EPC * 2.12E-04

IFadj = (IR-C * ED-C * CF)/BW-C + (IR-A * ED-A * CF)/BW-A
= 1.49E+04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IFadj, mg-yr/kg-day	Ingestion Rate, age adjusted	1.49E+04
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	365
AT, yr	Averaging Time	70
BW-A, kg	Body Weight, Adult	70
ED-A, years	Exposure Duration, Adult	24
BW-C, kg	Body Weight, Child	15
ED-C, years	Exposure Duration, Child	6
IR-A, kg/day	Ingestion Rate, Adult	0.034
IR-C, kg/day	Ingestion Rate, Child	0.008
CF, mg/kg	Conversion Factor	1.00E+06
CF2, kg/mg	Conversion Factor	1.00E-06

Table 5-11J
Calculation of Cancer and Non Cancer Risks
Residential Exposure to Groundwater - CT

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Point:	Monitoring Wells
Receptor Population:	Residents
Receptor Age:	0-30 years

Exposure Route	Chemical of Potential Concern	EPC mg/l		MEG (mg/L)	Intake (Cancer) mg/kg-day	Intake (Non-Cancer) mg-kg-day	DAevent (mg/cm2 -event)	Oral RfD (mg/kg-day)	Cancer Slope Factor 1/(mg/kg-day)	Non Cancer Risks	Cancer Risks
Ingestion (1)	ALUMINUM	0.51		1.43	1.26E-03	9.78E-03	NA	1.00E+00		0.01	
	ARSENIC	0.006		0.01	1.48E-05	1.15E-04	NA	3.00E-04	1.5	0.38	2.22E-05
	BARIUM	0.055		2	1.36E-04	1.05E-03	NA	7.00E-02		0.02	
	BORON	0.155		0.63	3.82E-04	2.97E-03	NA	2.00E-01		0.01	
	CHROMIUM	0.004	J	0.02	9.86E-06	7.67E-05	NA	1.50E+00		0.0001	
	COPPER	0.015		1.3	3.70E-05	2.88E-04	NA	4.00E-02		0.01	
	IRON	16.5			4.07E-02	3.16E-01	NA	3.00E-01		1.05	
	LEAD	0.002		0.01	4.93E-06	3.84E-05	NA				
	MANGANESE	3.56		0.5	8.78E-03	6.83E-02	NA	1.40E-01		0.49	
	MOLYBDENUM	0.123		0.035	3.03E-04	2.36E-03	NA	5.00E-03		0.47	
	NICKEL	0.022		0.14	5.42E-05	4.22E-04	NA	2.00E-02		0.02	
	SELENIUM	0.0036	J	0.035	8.88E-06	6.90E-05	NA	5.00E-03		0.01	
	SILVER	0.003		0.035	7.40E-06	5.75E-05	NA	5.00E-03		0.01	
	SODIUM	178		20	4.39E-01	3.41E+00	NA				
	THALLIUM	0.00089			2.19E-06	1.71E-05	NA				
	DIELDRIN	0.00009	J	0.00002	2.22E-07	1.73E-06	NA	5.00E-05	16	0.03	3.55E-06
	HEPTACHLOR	0.00052		0.00008	1.28E-06	9.97E-06	NA	5.00E-04	4.5E+00	0.02	5.77E-06
	4-METHYLPHENOL	0.016		0.0035	3.95E-05	3.07E-04	NA	5.00E-03		0.06	
	BIS(2-ETHYLHEXYL)PHTHALATE	0.007	J		1.73E-05	1.34E-04	NA	2.00E-02	1.40E-02	0.007	2.42E-07
	NAPHTHALENE	0.009	J	0.014	2.22E-05	1.73E-04	NA	2.00E-02		0.00863	
	1,1,1-TRICHLOROETHANE	0.225	J	0.2	5.55E-04	4.32E-03	NA	2.80E-01		0.02	
	1,1,2-TRICHLOROETHANE	0.0004	J	0.006	9.86E-07	7.67E-06	NA	4.00E-03	5.7E-02	0.0019	5.62E-08
	1,1-DICHLOROETHANE	0.05		0.07	1.23E-04	9.59E-04	NA	1.00E-01		0.01	
	1,1-DICHLOROETHENE	0.046		0.0006	1.13E-04	8.82E-04	NA	5.00E-02		0.02	
	1,2-DICHLOROETHANE	0.002		0.004	4.93E-06	3.84E-05	NA	3.00E-02	9.1E-02	0.0013	4.49E-07
	BENZENE	0.0014		0.012	3.45E-06	2.68E-05	NA	4.00E-03	5.5E-02	0.01	1.90E-07
	BROMODICHLOROMETHANE	0.002		0.006	4.93E-06	3.84E-05	NA	2.00E-02	6.2E-02	0.0019	3.06E-07
	BROMOMETHANE	0.001	J	0.01	2.47E-06	1.92E-05	NA	1.40E-03		0.01	
	CHLOROFORM	0.006		0.057	1.48E-05	1.15E-04	NA	1.00E-02		0.01	
	CHLOROMETHANE	0.0023		0.003	5.67E-06	4.41E-05	NA				
	ETHYLBENZENE	0.093		0.07	2.29E-04	1.78E-03	NA	1.00E-01		0.02	
	M/P-XYLENE	0.187		14	4.61E-04	3.59E-03	NA	2.00E-01		0.02	
	O-XYLENE	0.075		14	1.85E-04	1.44E-03	NA	2.00E-01		0.01	
	TRICHLOROETHENE	0.002		0.032	4.93E-06	3.84E-05	NA	3.00E-04	4.0E-01	0.13	1.97E-06
	VINYL CHLORIDE	0.00069	J	0.0002	1.70E-06	1.32E-05	NA	3.00E-03	1.5E+00	0.0044	2.55E-06
	NITRATE	1.03		10	2.54E-03	1.98E-02	NA	1.60E+00		0.01	
	DRO		J	0.05	0.00E+00	0.00E+00	NA				
Inhalation (2)	1,1,1-TRICHLOROETHANE	0.225	J							0.02	
	1,1,2-TRICHLOROETHANE	0.0004	J							0.0019	5.62E-08
	1,1-DICHLOROETHANE	0.05								0.01	
	1,1-DICHLOROETHENE	0.046								0.02	
	1,2-DICHLOROETHANE	0.002								0.00128	4.49E-07
	BENZENE	0.001								0.01	1.90E-07
	BROMODICHLOROMETHANE	0.002								0.0019	3.06E-07
	BROMOMETHANE	0.001	J		**The Risk from inhalation exposure is assumed to be the same**					0.01	
	CHLOROFORM	0.006			**as the risk from ingestion exposure (see text)**					0.01	
	CHLOROMETHANE	0.002									
	ETHYLBENZENE	0.093								0.02	
	M/P-XYLENE	0.187								0.02	
	O-XYLENE	0.075								0.01	
	TRICHLOROETHENE	0.002								0.13	1.97E-06
	VINYL CHLORIDE	0.00069	J							0.0044	2.55E-06

Table 5-11J
Calculation of Cancer and Non Cancer Risks
Residential Exposure to Groundwater - CT

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Point:	Monitoring Wells
Receptor Population:	Residents
Receptor Age:	0-30 years

Exposure Route	**Chemical of Potential Concern**	**EPC mg/l**		**MEG (mg/L)**	**Intake (Cancer) mg/kg-day**	**Intake (Non-Cancer) mg-kg-day**	**DAevent (mg/cm2 -event)**	**Oral RfD (mg/kg-day)**	**Cancer Slope Factor 1/(mg/kg-day)**	**Non Cancer Risks**	**Cancer Risks**
Dermal (3)	CHROMIUM	0.004			7.35E-08	5.72E-07	2.32E-09	1.50E+00		0.0000	
	DIELDRIN	0.00009	J		2.25E-07	1.75E-06	7.11E-09	5.00E-05	1.6E+01	0.0351	3.61E-06
	HEPTACHLOR	0.00052			8.74E-07	6.80E-06	2.76E-08	5.00E-04	4.5E+00	0.0136	3.93E-06
	NAPHTHALENE	0.009			2.11E-05	1.64E-04	6.66E-07	2.00E-02		0.0082	
	1,1,1-TRICHLOROETHANE	0.225	J		1.50E-04	1.17E-03	4.73E-06	2.80E-01		0.0042	
	1,1-DICHLOROETHANE	0.05			2.38E-05	1.85E-04	7.50E-07	1.00E-01		0.0018	
	BENZENE	0.001			5.39E-07	4.19E-06	1.70E-08	4.00E-03	5.5E-02	0.0010	2.96E-08
	ETHYLBENZENE	0.093			1.98E-04	1.54E-03	6.23E-06	1.00E-01		0.0154	
	M/P-XYLENE	0.187			4.33E-04	3.37E-03	1.37E-05	2.00E-01		0.0168	
	TRICHLOROETHENE	0.002			1.20E-06	9.37E-06	3.80E-08	3.00E-04	4.0E-01	0.0312	4.82E-07
	BERYLLIUM	0.00041	J		7.54E-09	5.86E-08	2.38E-10	2.00E-03		0.0000	
	CADMIUM	0.00039			7.17E-09	5.58E-08	2.26E-10	2.50E-05		0.0022	
	VANADIUM	0.0065			1.20E-07	9.30E-07	3.77E-09	1.00E-03		0.0009	
	DI-N-BUTYLPHTHALATE	0.001			2.85E-06	2.22E-05	9.00E-08	1.00E-01		0.0002	
	TOLUENE	0.001			1.24E-06	9.62E-06	3.90E-08	2.00E-01		0.0000	

Total NON CANCER Risk Across All Exposure Routes/Pathways **4.0**

Total CANCER Risk Across All Exposure Routes/Pathways **5.1E-05**

(1) Intake Ingestion Cancer =	EPC * (IR * EF * ED)/(BW * AT * 365 day/yr)	EPC, mg/l	Exposure Point Concentration	chem-specific
= EPC *	2.47E-03	IR, l/day	Ingestion Rate	1.4
(3) Intake Dermal Cancer=	(DAevent * EV * ED *EF * SA)/(BW * AT * 365 days/yr)	EF, day/yr	Exposure Frequency	350
= DAevent *	3.17E+01	ED, yr	Exposure Duration	9
(1) Intake Ingestion Noncancer=	EPC * (IR * EF * ED)/(BW * AT * 365 day/yr)	ATcancer, yr	Averaging Time cancer	70
= EPC *	1.92E-02	ATnoncancer,yr	Averaging Time noncancer	9
(3) Intake Dermal Non Cancer =	(DAevent * EV * ED *EF * SA)/(BW * AT * 365 days/yr)	BW, kg	Body Weight	70
= DAevent *	2.47E+02	DAevent, mg/cm2-event	Absorbed Dose/event	chem-specific
(2) Inhalation risks from exposure to VOCs are assumed to be equal to ingestion risks from exposure to VOCs.		EV, events/day	Event Frequency	1
DAevent - obtained from Appendix B-3 (USEPA, 2001a)		SA, cm2	Skin Surface Area	18,000

mg/l = milligram/liter

mg/kg - day = milligram/kilogram - day

NA = Not Applicable

EPC = Exposure Point Concentration

Table 5-11J
Calculation of Cancer and Non Cancer Risks
Residential Exposure to Groundwater - RME

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Point:	Wells
Receptor Population:	Residents
Receptor Age:	0-30 years

Exposure Route	Chemical of Potential Concern	EPC mg/l		MEG (mg/L)	Intake (Cancer) (mg/kg-day)	Intake (Non-Cancer) (mg-kg-day)	DAevent (mg/cm2 -event)	Oral RfD (mg/kg-day)	Cancer Slope Factor 1/(mg/kg-day)	Non Cancer Risks	Cancer Risks
Ingestion (1)	ALUMINUM	3.85		1.43	4.52E-02	1.05E-01	NA	1.00E+00		0.11	
	ARSENIC	0.023		0.01	2.70E-04	6.30E-04	NA	3.00E-04	1.5	2.1	4.05E-04
	BARIUM	0.266		2	3.12E-03	7.29E-03	NA	7.00E-02		0.10	
	BORON	2.45		0.63	2.88E-02	6.71E-02	NA	2.00E-01		0.34	
	CHROMIUM	0.022	J	0.02	2.58E-04	6.03E-04	NA	1.50E+00		0.0004	
	COPPER	0.296		1.3	3.48E-03	8.11E-03	NA	4.00E-02		0.20	
	IRON	543			6.38E+00	1.49E+01	NA	3.00E-01		50	
	LEAD	0.018		0.01	2.11E-04	4.93E-04	NA				
	MANGANESE	41.8		0.5	4.91E-01	1.15E+00	NA	1.40E-01		8.2	
	MOLYBDENUM	3.17		0.035	3.72E-02	8.68E-02	NA	5.00E-03		17	
	NICKEL	0.139		0.14	1.63E-03	3.81E-03	NA	2.00E-02		0.19	
	SELENIUM	0.021	J	0.035	2.47E-04	5.75E-04	NA	5.00E-03		0.12	
	SILVER	0.049		0.035	5.75E-04	1.34E-03	NA	5.00E-03		0.27	
	SODIUM	4280		20	5.03E+01	1.17E+02	NA				
	THALLIUM	0.0033			3.87E-05	9.04E-05	NA				
	DIELDRIN	0.00011	J	0.00002	1.29E-06	3.01E-06	NA	5.00E-05	16	0.060	2.07E-05
	HEPTACHLOR	0.00052		0.00008	6.11E-06	1.42E-05	NA	5.00E-04	4.5E+00	0.028	2.75E-05
	4-METHYLPHENOL	0.016		0.0035	1.88E-04	4.38E-04	NA	5.00E-03		0.088	
	BIS(2-ETHYLHEXYL)PHTHALATE	0.007	J		8.22E-05	1.92E-04	NA	2.00E-02	1.40E-02	0.010	1.15E-06
	NAPHTHALENE	0.009	J	0.014	1.06E-04	2.47E-04	NA	2.00E-02		0.012	
	1,1,1-TRICHLOROETHANE	0.535	J	0.2	6.28E-03	1.47E-02	NA	2.80E-01		0.052	
	1,1,2-TRICHLOROETHANE	0.0004	J	0.006	4.70E-06	1.10E-05	NA	4.00E-03	5.7E-02	0.003	2.68E-07
	1,1-DICHLOROETHANE	0.24		0.07	2.82E-03	6.58E-03	NA	1.00E-01		0.066	
	1,1-DICHLOROETHENE	0.19		0.0006	2.23E-03	5.21E-03	NA	5.00E-02		0.104	
	1,2-DICHLOROETHANE	0.002		0.004	2.35E-05	5.48E-05	NA	3.00E-02	9.1E-02	0.002	2.14E-06
	BENZENE	0.0037		0.012	4.34E-05	1.01E-04	NA	4.00E-03	5.5E-02	0.025	2.39E-06
	BROMODICHLOROMETHANE	0.002		0.006	2.35E-05	5.48E-05	NA	2.00E-02	6.2E-02	0.003	1.46E-06
	BROMOMETHANE	0.001	J	0.01	1.17E-05	2.74E-05	NA	1.40E-03		0.020	
	CHLOROFORM	0.038		0.057	4.46E-04	1.04E-03	NA	1.00E-02		0.104	
	CHLOROMETHANE	0.003		0.003	3.52E-05	8.22E-05	NA				
	ETHYLBENZENE	0.16		0.07	1.88E-03	4.38E-03	NA	1.00E-01		0.044	
	M/P-XYLENE	0.34		14	3.99E-03	9.32E-03	NA	2.00E-01		0.047	
	O-XYLENE	0.17		14	2.00E-03	4.66E-03	NA	2.00E-01		0.023	
	TRICHLOROETHENE	0.004		0.032	4.70E-05	1.10E-04	NA	3.00E-04	4.0E-01	0.365	1.88E-05
	VINYL CHLORIDE	0.002	J	0.0002	2.35E-05	5.48E-05	NA	3.00E-03	1.5E+00	0.018	3.52E-05
	DRO	5810	J	0.05	6.82E+01	1.59E+02	NA				
	NITRATE	3.135		10	3.68E-02	8.59E-02	NA	1.60E+00		0.05	
Inhalation (2)	1,1,1-TRICHLOROETHANE	0.535	J							0.052	
	1,1,2-TRICHLOROETHANE	0.0004	J							0.003	2.68E-07
	1,1-DICHLOROETHANE	0.24								0.066	
	1,1-DICHLOROETHENE	0.19								0.104	
	1,2-DICHLOROETHANE	0.002								0.002	2.14E-06
	BENZENE	0.0037								0.025	2.39E-06
	BROMODICHLOROMETHANE	0.002								0.003	1.46E-06
	BROMOMETHANE	0.001	J		**The Risk from inhalation exposure is assumed to be the same**					0.020	
	CHLOROFORM	0.038			**as the risk from ingestion exposure (see text)**					0.104	
	CHLOROMETHANE	0.003									
	ETHYLBENZENE	0.16								0.044	
	M/P-XYLENE	0.34								0.047	
	O-XYLENE	0.17								0.023	
	TRICHLOROETHENE	0.004								0.365	1.88E-05
	VINYL CHLORIDE	0.002	J							0.0180	3.52E-05

Table 5-11J
Calculation of Cancer and Non Cancer Risks
Residential Exposure to Groundwater - RME

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Point:	Wells
Receptor Population:	Residents
Receptor Age:	0-30 years

Exposure Route	Chemical of Potential Concern	EPC mg/l		MEG (mg/L)	Intake (Cancer) (mg/kg-day)	Intake (Non-Cancer) (mg-kg-day)	DAevent (mg/cm2 -event)	Oral RfD (mg/kg-day)	Cancer Slope Factor 1/(mg/kg-day)	Non Cancer Risks	Cancer Risks
Dermal (3)	CHROMIUM	0.022			1.35E-06	3.15E-06	1.28E-08	1.50E+00		0.0000	
	DIELDRIN	0.00011	J		9.18E-07	2.14E-06	8.69E-09	5.00E-05	1.6E+01	0.0429	1.47E-05
	HEPTACHLOR	0.00052			2.91E-06	6.80E-06	2.76E-08	5.00E-04	4.5E+00	0.0136	1.31E-05
	NAPHTHALENE	0.009			7.04E-05	1.64E-04	6.66E-07	2.00E-02		0.0082	
	1,1,1-TRICHLOROETHANE	0.535	J		1.19E-03	2.77E-03	1.12E-05	2.80E-01		0.0099	
	1,1-DICHLOROETHANE	0.19			3.01E-04	7.03E-04	2.85E-06	1.00E-01		0.0070	
	BENZENE	0.0037			6.65E-06	1.55E-05	6.29E-08	4.00E-03	5.5E-02	0.0039	3.66E-07
	ETHYLBENZENE	0.16			1.13E-03	2.64E-03	1.07E-05	1.00E-01		0.0264	
	M/P-XYLENE	0.34			2.62E-03	6.12E-03	2.48E-05	2.00E-01		0.0306	
	TRICHLOROETHENE	0.004			8.03E-06	1.87E-05	7.60E-08	3.00E-04	4.0E-01	0.0625	3.21E-06
	BERYLLIUM	0.0012			7.35E-08	1.72E-07	6.96E-10	2.00E-03		0.0001	
	CADMIUM	0.0017			1.04E-07	2.43E-07	9.86E-10	2.50E-05		0.0097	
	VANADIUM	0.0208			1.27E-06	2.97E-06	1.21E-08	1.00E-03		0.0030	
	DI-N-BUTYLPHTHALATE	0.001			9.51E-06	2.22E-05	9.00E-08	1.00E-01		0.0002	
	TOLUENE	0.002			8.24E-06	1.92E-05	7.80E-08	2.00E-01		0.0001	
	Total NON CANCER Risk Across All Exposure Routes/Pathways									**80.0**	
	Total CANCER Risk Across All Exposure Routes/Pathways										**6.1E-04**

(1) Intake Ingestion Cancer = EPC * (IR * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 1.17E-02
(3) Intake Dermal Cancer= (DAevent * EV * ED *EF * SA)/(BW * AT * 365 days/yr)
= DAevent * 1.06E+02
(1) Intake Ingestion Noncancer= EPC * (IR * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.74E-02
(3) Intake Dermal Non Cancer = (DAevent * EV * ED *EF * SA)/(BW * AT * 365 days/yr)
= DAevent * 2.47E+02
(2) Inhalation risks from exposure to VOCs are assumed to be equal to ingestion risks from exposure to VOCs

EPC, mg/l	Exposure Point Concentration	chem-specific
IR, l/day	Ingestion Rate	2
EF, day/yr	Exposure Frequency	350
ED, yr	Exposure Duration	30
ATcancer, yr	Averaging Time cancer	70
ATnoncancer,yr	Averaging Time noncancer	30
BW, kg	Body Weight	70
DAevent, mg/cm2-event	Dermal Absorbed Dose	chem-specific
EV, events/day	Event Frequency	1
SA, cm2	Skin Surface Area	18,000

DAevent - obtained from Appendix B-3 (USEPA, 2001a)
mg/l = milligram/liter
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

Table 5-11KC
Calculation of Cancer and Noncancer Risks
Residential Exposure to Produce
Plant Area

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Produce
Receptor Population:	Resident
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Concentration in Produce (mg/kg - DW)	Medium EPC Units	Intake (Cancer) mg/kg-day	Intake (Noncancer) mg/kg-day	Oral RfD	Cancer Slope Factor 1/(mg/kg-day)	Noncancer Risks	Cancer Risks
Ingestion (1)									
	ALUMINUM	BCF - NA	mg/kg			1.0E+00			
	ARSENIC	6.5E-02	mg/kg	2.7E-05	6.3E-05	3.0E-04	1.5E+00	2.1E-01	4.1E-05
	BENZO(A)ANTHRACENE	7.8E-02	mg/kg	3.3E-05	7.6E-05		7.3E-01		2.4E-05
	BENZO(A)PYRENE	3.9E-02	mg/kg	1.6E-05	3.8E-05		7.3E+00		1.2E-04
	BENZO(B)FLUORANTHENE	4.8E-02	mg/kg	2.0E-05	4.7E-05		7.3E-01		1.5E-05
	BENZO(K)FLUORANTHENE	4.3E-02	mg/kg	1.8E-05	4.2E-05		7.3E-02		1.3E-06
	BENZO[G,H,I]PERYLENE	2.2E-02	mg/kg	9.2E-06	2.1E-05				
	CARBAZOLE	BCF - NA	mg/kg						
	CHRYSENE	3.6E-02	mg/kg	1.5E-05	3.5E-05		7.3E-03		1.1E-07
	COPPER	BCF - NA	mg/kg						
	DIBENZO(A,H)ANTHRACENE	5.8E-03	mg/kg	2.4E-06	5.6E-06		7.3E+00		1.8E-05
	ENDRIN ALDEHYDE	BCF - NA							
	INDENO(1,2,3-CD)PYRENE	1.2E-02	mg/kg	4.9E-06	1.1E-05		7.3E-01		3.6E-06
	IRON	BCF - NA	mg/kg			3.0E-01			
	LEAD	BCF - NA	mg/kg						
	MANGANESE	BCF - NA	mg/kg			1.4E-01			
	Total PCBs	3.2E-03	mg/kg	1.3E-06	3.1E-06	2.0E-05	2.0E+00	1.6E-01	2.7E-06
	2-METHYLNAPTHALENE	BCF - NA	mg/kg						
	PHENANTHRENE	5.6E-01	mg/kg	2.3E-04	5.4E-04				
	SODIUM	BCF - NA	mg/kg						
	THALLIUM	3.3E-04	mg/kg	1.4E-07	3.2E-07				
	VANADIUM	BCF - NA	mg/kg			1.0E-03			
							Total Noncancer Risk	**3.7E-01**	
								Total Cancer Risk	**2.2E-04**

(1) Cancer Intake Ingestion = EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 4.2E-04

(2) Noncancer Intake Ingestion EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 9.7E-04

DW - dry weight
mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
BCF - NA -Bioconcentration Factors are not available

EPC	Concentration in Produce, mg/kg	chem-specific
IR	Ingestion Rate g/day	7.1E+01
CF	Conversion Factor, kg/g	1.0E-03
RAF	Relative Absorption Factor	1.0E+00
EF	Exposure Frequency, days/year	3.5E+02
AT	Averaging Time (Cancer), days	2.6E+04
AT	Averaging Time (Noncancer), days	1.1E+04
BW	Body Weight, kg	7.0E+01
ED	Exposure Duration, years	3.0E+01

Table 5-11KD
Calculation of Cancer and Noncancer Risks
Residential Exposure to Produce
Warehouse 2/3

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Produce
Receptor Population:	Resident
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Concentration in Produce (mg/kg-dry weight)	Medium EPC Units	Intake (Cancer) mg/kg-day	Intake (Noncancer) mg/kg-day	Oral RfD	Cancer Slope Factor 1/(mg/kg-day)	Noncancer Risks	Cancer Risks
Ingestion (1)									
	ALUMINUM	BCF - NA	mg/kg			1.0E+00			
	ARSENIC	8.2E-02	mg/kg	3.4E-05	8.0E-05	3.0E-04	1.5E+00	2.7E-01	5.1E-05
	BENZO(A)ANTHRACENE	5.5E-02	mg/kg	2.3E-05	5.3E-05		7.3E-01		1.7E-05
	BENZO(A)PYRENE	2.4E-02	mg/kg	1.0E-05	2.4E-05		7.3E+00		7.4E-05
	BENZO(B)FLUORANTHENE	3.8E-02	mg/kg	1.6E-05	3.7E-05		7.3E-01		1.2E-05
	BENZO(K)FLUORANTHENE	2.5E-02	mg/kg	1.0E-05	2.4E-05		7.3E-02		7.6E-07
	BENZO[G,H,I]PERYLENE	1.2E-02	mg/kg	5.0E-06	1.2E-05				
	CARBAZOLE	BCF - NA	mg/kg						
	CHRYSENE	2.1E-02	mg/kg	8.9E-06	2.1E-05		7.3E-03		6.5E-08
	DIBENZO(A,H)ANTHRACENE	2.3E-03	mg/kg	9.8E-07	2.3E-06		7.3E+00		7.1E-06
	INDENO(1,2,3-CD)PYRENE	7.3E-03	mg/kg	3.0E-06	7.1E-06		7.3E-01		2.2E-06
	IRON	BCF - NA	mg/kg			3.0E-01			
	LEAD	BCF - NA	mg/kg						
	MANGANESE	BCF - NA	mg/kg						
	total PCBs	2.1E-02	mg/kg	8.8E-06	2.0E-05	2.0E-05	2.0E+00	1.0E+00	1.8E-05
	PHENANTHRENE	1.2E-01	mg/kg	5.0E-05	1.2E-04				
	SODIUM	BCF - NA	mg/kg						
							Total Noncancer Risk	**1.3E+00**	
							Total Cancer Risk		**1.8E-04**

(1) Cancer Intake Ingestion = EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 4.2E-04

(2) Noncancer Intake Ingestion EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 9.7E-04

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
BCF - NA - Bioconcentration Factor not available

EPC	Concentration in Produce, mg/kg	chem-specific
IR	Ingestion Rate g/day	7.1E+01
CF	Conversion Factor, kg/g	1.0E-03
RAF	Relative Absorption Factor	1.0E+00
EF	Exposure Frequency, days/year	3.5E+02
AT	Averaging Time (Cancer), days	2.6E+04
AT	Averaging Time (Noncancer), days	1.1E+04
BW	Body Weight, kg	7.0E+01
ED	Exposure Duration, years	3.0E+01

Table 5-11KE
Calculation of Cancer and Noncancer Risks
Residential Exposure to Produce
345 kV Transmission Line Area

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Produce
Receptor Population:	Resident
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Concentration in Produce (mg/kg - DW)	Medium EPC Units	Intake (Cancer) mg/kg-day	Intake (Noncancer) mg/kg-day	Oral RfD	Cancer Slope Factor 1/(mg/kg-day)	Noncancer Risks	Cancer Risks
Ingestion (1)									
	ALUMINUM	BCF - NA	mg/kg			1.0E+00			
	ARSENIC	7.4E-02	mg/kg	3.1E-05	7.2E-05	3.0E-04	1.5E+00	2.4E-01	4.6E-05
	BENZO(A)PYRENE	3.8E-03	mg/kg	1.6E-06	3.7E-06		7.3E+00		1.2E-05
	BENZO(K)FLUORANTHENE	4.1E-03	mg/kg	1.7E-06	4.0E-06		7.3E-02		1.2E-07
	BENZO[G,H,I]PERYLENE	2.6E-03	mg/kg	1.1E-06	2.5E-06				
	BENZO(A)ANTHRACENE	6.1E-03	mg/kg	2.5E-06	5.9E-06		7.3E-01		1.9E-06
	BENZO(B)FLOURANTHENE	3.3E-03	mg/kg	1.4E-06	3.2E-06		7.3E-01		1.0E-06
	CARBAZOLE	BCF - NA	mg/kg						
	CHRYSENE	4.8E-03	mg/kg	2.0E-06	4.7E-06		7.3E-03		1.5E-08
	INDENO(1,2,3-CD)PYRENE	1.2E-03	mg/kg	5.0E-07	1.2E-06		7.3E-01		3.7E-07
	IRON	BCF - NA	mg/kg			3.0E-01			
	MANGANESE	BCF - NA	mg/kg						
	PHENANTHRENE	4.2E-02	mg/kg	1.8E-05	4.1E-05				
	SODIUM	BCF - NA	mg/kg						
	THALLIUM	5.5E-04	mg/kg	2.3E-07	5.3E-07				
	VANADIUM	BCF - NA	mg/kg			1.0E-03			
							Total Noncancer Risk	**2.4E-01**	
							Total Cancer Risk		**6.1E-05**

(1) Cancer Intake Ingestion = EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 4.2E-04

(2) Noncancer Intake Ingestion EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 9.7E-04

DW - Dry Weight
mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
BCF - NA - Bioconcentration Factor not available

EPC	Concentration in Produce, mg/kg	chem-specific
IR	Ingestion Rate g/day	7.1E+01
CF	Conversion Factor, kg/g	1.0E-03
RAF	Relative Absorption Factor	1.0E+00
EF	Exposure Frequency, days/year	3.5E+02
AT	Averaging Time (Cancer), days	2.6E+04
AT	Averaging Time (Noncancer), days	1.1E+04
BW	Body Weight, kg	7.0E+01
ED	Exposure Duration, years	3.0E+01

Table 5-11KF
Calculation of Cancer and Noncancer Risks
Residential Exposure to Produce
Bailey Farmhouse

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Produce
Receptor Population:	Resident
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Concentration in Produce (mg/kg - DW)	Medium EPC Units	Intake (Cancer) mg/kg-day	Intake (Noncancer) mg/kg-day	Oral RfD	Cancer Slope Factor 1/(mg/kg-day)	Noncancer Risks	Cancer Risks
Ingestion (1)	ALUMINUM	BCF - NA	mg/kg			1.0E+00			
	ARSENIC	4.7E-02	mg/kg	2.0E-05	4.6E-05	3.0E-04	1.5E+00	1.5E-01	2.9E-05
	IRON	BCF - NA	mg/kg			3.0E-01			
	LEAD	BCF - NA	mg/kg						
	MANGANESE	BCF - NA	mg/kg			1.4E-01			
	SODIUM	BCF - NA	mg/kg						
							Total Noncancer Risk	**1.5E-01**	
							Total Cancer Risk		**2.9E-05**

(1) Cancer Intake Ingestion = EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 4.2E-04

(2) Noncancer Intake Ingestion EPC * (IF * CF * ED * EF)/(BW * AT)
= EPC * 9.7E-04

DW - Dry Weight
mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
BCF - NA - Bioconcentration Factor not available

EPC	Concentration in Produce, mg/kg	chem-specific
IR	Ingestion Rate g/day	7.1E+01
CF	Conversion Factor, kg/g	1.0E-03
RAF	Relative Absorption Factor	1.0E+00
EF	Exposure Frequency, days/year	3.5E+02
AT	Averaging Time (Cancer), days	2.6E+04
AT	Averaging Time (Noncancer), days	1.1E+04
BW	Body Weight, kg	7.0E+01
ED	Exposure Duration, years	3.0E+01

Table 5-11C
Calculation of Cancer Risks
Exposure to Soils - Plant Area
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	1.31E-03	mg/kg-day			
	ARSENIC	9.84	mg/kg	NA	1.06E-06	mg/kg-day	1.5	1/(mg/kg-day)	1.59E-06
	COPPER	197.00	mg/kg	NA	2.12E-05	mg/kg-day			
	IRON	17373.00	mg/kg	NA	1.87E-03	mg/kg-day			
	LEAD	13.00	mg/kg	NA	1.40E-06	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	3.16E-05	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	4.51E-08	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	3.38E-06	mg/kg-day			
	Total PCBs	0.11	mg/kg	NA	1.20E-08	mg/kg-day	2	1/(mg/kg-day)	2.41E-08
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	4.83E-10	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.340	mg/kg	NA	5.74E-07	mg/kg-day	7.3	1/(mg/kg-day)	4.19E-06
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	2.16E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	1.50E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	7.64E-07	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	8.97E-05	mg/kg-day			
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	1.83E-07	mg/kg-day			
Dermal (2)	ALUMINUM	12170.00	mg/kg						
	ARSENIC	9.84	mg/kg	0.03	3.57E-08	mg/kg-day	1.5	1/(mg/kg-day)	5.36E-08
	COPPER	197.00	mg/kg						
	IRON	17373.00	mg/kg						
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg						
	Total PCBs	0.11	mg/kg	0.14	1.86E-09	mg/kg-day	2	1/(mg/kg-day)	3.72E-09
	ENDRIN ALDEHYDE	0.005	mg/kg						
	BENZO(A)PYRENE equivalence	5.340	mg/kg	0.13	8.40E-08	mg/kg-day	7.3	1/(mg/kg-day)	6.13E-07
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	3.16E-08	mg/kg-day			
	MANGANESE	835.000	mg/kg						
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	2.67E-08	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	2.20E-08	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	1.12E-07	mg/kg-day			
								Total Cancer Risk Across All Exposure Pathways	**6.47E-06**
								Total Cancer Risks Excluding Arsenic	**4.83E-06**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 1.07E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 1.21E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT = Central Tendency

Table 5-11C
Calculation of Cancer Risks
Exposure to Soils - Plant Area
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	8.15E-03	mg/kg-day			
	ARSENIC	9.84	mg/kg	NA	6.59E-06	mg/kg-day	1.5	1/(mg/kg-day)	9.88E-06
	COPPER	197.00	mg/kg	NA	1.32E-04	mg/kg-day			
	IRON	17373.00	mg/kg	NA	1.16E-02	mg/kg-day			
	LEAD	13.00	mg/kg	NA	8.70E-06	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	1.97E-04	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	2.81E-07	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	2.11E-05	mg/kg-day			
	Total PCBs	0.11	mg/kg	NA	7.50E-08	mg/kg-day	2	1/(mg/kg-day)	1.50E-07
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	3.01E-09	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.340	mg/kg	NA	3.57E-06	mg/kg-day	7.3	1/(mg/kg-day)	2.61E-05
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	1.35E-06	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	9.37E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	4.76E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	5.59E-04	mg/kg-day			
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	1.14E-06	mg/kg-day			
Dermal (2)	ALUMINUM	12170.00	mg/kg						
	ARSENIC	9.84	mg/kg	0.03	6.24E-07	mg/kg-day	1.5	1/(mg/kg-day)	9.36E-07
	COPPER	197.00	mg/kg						
	IRON	17373.00	mg/kg						
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg						
	Total PCBs	0.11	mg/kg	0.14	3.25E-08	mg/kg-day	2	1/(mg/kg-day)	6.51E-08
	ENDRIN ALDEHYDE	0.005	mg/kg						
	BENZO(A)PYRENE equivalence	5.340	mg/kg	0.13	1.47E-06	mg/kg-day	7.3	1/(mg/kg-day)	1.07E-05
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	5.52E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	3.85E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	1.95E-06	mg/kg-day			
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	4.67E-07	mg/kg-day			
	MANGANESE	835.000	mg/kg						

Total Cancer Risk Across All Exposure Pathways **4.8E-05**

Total Cancer Risks Excluding Arsenic **3.70E-05**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 6.69E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 2.11E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-11C
Calculation of Cancer Risks
Exposure to Soil - Plant Area
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer)	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	3.37E-04	mg/kg-day			
	ARSENIC	9.84	mg/kg	NA	2.72E-07	mg/kg-day	1.5	1/(mg/kg-day)	4.09E-07
	COPPER	197.00	mg/kg	NA	5.45E-06	mg/kg-day			
	IRON	17373.00	mg/kg	NA	4.81E-04	mg/kg-day			
	LEAD	13.00	mg/kg	NA	3.60E-07	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	8.14E-06	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	1.16E-08	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	8.72E-07	mg/kg-day			
	Total PCBs	0.11	mg/kg	NA	3.04E-09	mg/kg-day	2	1/(mg/kg-day)	6.09E-09
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	1.25E-10	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.340	mg/kg	NA	1.48E-07	mg/kg-day	7.3	1/(mg/kg-day)	1.08E-06
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	5.56E-08	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	3.87E-08	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	1.97E-07	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	2.31E-05	mg/kg-day			
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	4.71E-08	mg/kg-day			
Dermal (2)	ALUMINUM	12170.00	mg/kg						
	ARSENIC	9.84	mg/kg	0.03	1.08E-08	mg/kg-day	1.5	1/(mg/kg-day)	1.62E-08
	COPPER	197.00	mg/kg						
	IRON	17373.00	mg/kg						
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg						
	Total PCBs	0.11	mg/kg	0.14	5.63E-10	mg/kg-day	2	1/(mg/kg-day)	1.13E-09
	ENDRIN ALDEHYDE	0.005	mg/kg						
	MANGANESE	835.000	mg/kg						
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	8.07E-09	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.340	mg/kg	0.13	2.54E-08	mg/kg-day	7.3	1/(mg/kg-day)	1.85E-07
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	9.55E-09	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	6.65E-09	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	3.38E-08	mg/kg-day			
							Total Cancer Risk Across All Exposure Pathways		**1.70E-06**
							Total Cancer Risks Excluding Arsenic		**1.27E-06**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.77E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 3.65E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BW, kg	Body Weight	70

Table 5-11C
Calculation of Cancer Risks
Exposure to Soils - Plant Area
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	2.55E-03	mg/kg-day			
	ARSENIC	9.84	mg/kg	NA	2.06E-06	mg/kg-day	1.5	1/(mg/kg-day)	3.09E-06
	COPPER	197.00	mg/kg	NA	4.13E-05	mg/kg-day			
	IRON	17373.00	mg/kg	NA	3.64E-03	mg/kg-day			
	LEAD	13.00	mg/kg	NA	2.73E-06	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	6.16E-05	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	8.81E-08	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	6.60E-06	mg/kg-day			
	Total PCBs	0.11	mg/kg	NA	2.31E-08	mg/kg-day	2	1/(mg/kg-day)	4.61E-08
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	9.44E-10	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.300	mg/kg	NA	1.11E-06	mg/kg-day	7.3	1/(mg/kg-day)	8.11E-06
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	4.21E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	2.94E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	1.49E-06	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	1.75E-04	mg/kg-day			
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	3.56E-07	mg/kg-day			
Dermal (2)	ALUMINUM	12170.00	mg/kg						
	ARSENIC	9.84	mg/kg	0.03	4.09E-07	mg/kg-day	1.5	1/(mg/kg-day)	6.13E-07
	COPPER	197.00	mg/kg						
	IRON	17373.00	mg/kg						
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg						
	Total PCBs	0.11	mg/kg	0.14	2.13E-08	mg/kg-day	2	1/(mg/kg-day)	4.26E-08
	ENDRIN ALDEHYDE	0.005	mg/kg						
	MANGANESE	835.000	mg/kg						
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	3.06E-07	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.300	mg/kg	0.13	9.53E-07	mg/kg-day	7.3	1/(mg/kg-day)	6.96E-06
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	3.62E-07	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	2.52E-07	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	1.28E-06	mg/kg-day			

Total Cancer Risk Across All Exposure Pathways 1.9E-05

Total Cancer Risks Excluding Arsenic 1.5E-05

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF* ED)/(BW *AT * 365 day/yr)
= EPC * 2.10E-07

(2) Intake Dermal = EPC * (SA *AF * CF * ABS * EF * ED)/(AT * BW * 365 day/yr)
= EPC * ABS * 1.38E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure
DRO = Diesel Range Organics

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BW, kg	Body Weight	70

Table 5-11C
Calculation of Cancer Risks
Exposure to Surface Soils - Plant Area
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	12170.00	mg/kg	NA	3.59E-04	mg/kg-day			
	ARSENIC	9.84	mg/kg	NA	2.90E-07	mg/kg-day	1.5	1/(mg/kg-day)	4.36E-07
	COPPER	197.00	mg/kg	NA	5.82E-06	mg/kg-day			
	IRON	17373.00	mg/kg	NA	5.13E-04	mg/kg-day			
	LEAD	13.00	mg/kg	NA	3.84E-07	mg/kg-day			
	SODIUM	294.00	mg/kg	NA	8.68E-06	mg/kg-day			
	THALLIUM	0.42	mg/kg	NA	1.24E-08	mg/kg-day			
	VANADIUM	31.50	mg/kg	NA	9.30E-07	mg/kg-day			
	Total PCBs	0.11	mg/kg	NA	3.25E-09	mg/kg-day	2	1/(mg/kg-day)	6.49E-09
	ENDRIN ALDEHYDE	0.005	mg/kg	NA	1.33E-10	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.340	mg/kg	NA	1.58E-07	mg/kg-day	7.3	1/(mg/kg-day)	1.15E-06
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	NA	5.93E-08	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	4.13E-08	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	NA	2.10E-07	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	2.47E-05	mg/kg-day			
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	5.02E-08	mg/kg-day			
Dermal (2)	ALUMINUM	12170.00	mg/kg						
	ARSENIC	9.84	mg/kg	0.03	1.74E-08	mg/kg-day	1.5	1/(mg/kg-day)	2.61E-08
	COPPER	197.00	mg/kg						
	IRON	17373.00	mg/kg						
	LEAD	13.00	mg/kg						
	SODIUM	294.00	mg/kg						
	THALLIUM	0.42	mg/kg						
	VANADIUM	31.50	mg/kg						
	Total PCBs	0.11	mg/kg	0.14	9.09E-10	mg/kg-day	2	1/(mg/kg-day)	1.82E-09
	ENDRIN ALDEHYDE	0.005	mg/kg						
	MANGANESE	835.000	mg/kg						
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	1.30E-08	mg/kg-day			
	BENZO(A)PYRENE equivalence	5.340	mg/kg	0.13	4.10E-08	mg/kg-day	7.3	1/(mg/kg-day)	2.99E-07
	BENZO[G,H,I]PERYLENE	2.010	mg/kg	0.13	1.54E-08	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	1.07E-08	mg/kg-day			
	PHENANTHRENE	7.110	mg/kg	0.13	5.46E-08	mg/kg-day			

Total Cancer Risk Across All Exposure Pathways 1.9E-06

Total Cancer Risks Excluding Arsenic 1.46E-06

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * EV)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70

Table 5-11C
Calculation of Cancer Risks
Exposure to Subsurface Soils - Plant Area
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	11390.00	mg/kg	NA	3.36E-04	mg/kg-day			
	ARSENIC	9.72	mg/kg	NA	2.87E-07	mg/kg-day	1.5	1/(mg/kg-day)	4.30E-07
	COPPER	151.00	mg/kg	NA	4.46E-06	mg/kg-day			
	IRON	18906.00	mg/kg	NA	5.58E-04	mg/kg-day			
	LEAD	13.07	mg/kg	NA	3.86E-07	mg/kg-day			
	SODIUM	353.00	mg/kg	NA	1.04E-05	mg/kg-day			
	THALLIUM	0.49	mg/kg	NA	1.45E-08	mg/kg-day			
	VANADIUM	28.59	mg/kg	NA	8.44E-07	mg/kg-day			
	Total PCBs	0.09	mg/kg	NA	2.75E-09	mg/kg-day	2	1/(mg/kg-day)	5.49E-09
	ENDRIN ALDEHYDE	0.0040	mg/kg	NA	1.18E-10	mg/kg-day			
	BENZO(A)PYRENE equivalence	4.370	mg/kg	NA	1.29E-07	mg/kg-day	7.3	1/(mg/kg-day)	9.42E-07
	BENZO[G,H,I]PERYLENE	1.640	mg/kg	NA	4.84E-08	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	NA	4.13E-08	mg/kg-day			
	PHENANTHRENE	5.790	mg/kg	NA	1.71E-07	mg/kg-day			
	MANGANESE	835.000	mg/kg	NA	2.47E-05	mg/kg-day			
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	5.02E-08	mg/kg-day			
Dermal (2)	ALUMINUM	11390.00	mg/kg						
	ARSENIC	9.72	mg/kg	0.03	1.72E-08	mg/kg-day	1.5	1/(mg/kg-day)	2.58E-08
	COPPER	151.00	mg/kg						
	IRON	18906.00	mg/kg						
	LEAD	13.07	mg/kg						
	SODIUM	353.00	mg/kg						
	THALLIUM	0.49	mg/kg						
	VANADIUM	28.59	mg/kg						
	Total PCBs	0.09	mg/kg	0.14	7.69E-10	mg/kg-day	2	1/(mg/kg-day)	1.54E-09
	ENDRIN ALDEHYDE	0.0040	mg/kg						
	MANGANESE	835.000	mg/kg						
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	1.30E-08	mg/kg-day			
	BENZO(A)PYRENE equivalence	4.370	mg/kg	0.13	3.35E-08	mg/kg-day	7.3	1/(mg/kg-day)	2.45E-07
	BENZO[G,H,I]PERYLENE	1.640	mg/kg	0.13	1.26E-08	mg/kg-day			
	CARBAZOLE	1.400	mg/kg	0.13	1.07E-08	mg/kg-day			
	PHENANTHRENE	5.790	mg/kg	0.13	4.44E-08	mg/kg-day			

Total Cancer Risk Across All Exposure Pathways 1.6E-06

Total Cancer Risks Excluding Arsenic 1.19E-06

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * EV)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
DRO = Diesel Range Organics

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70

Table 5-11D
Calculation of Cancer Risks
Exposure to Soils - Warehouse 2/3
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	2.27E-03	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	NA	1.35E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	2.02E-06
	IRON	27471	mg/kg	NA	2.95E-03	mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg	NA	2.61E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg	NA	1.79E-05	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	NA	8.06E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	1.61E-07
	BENZO(A)PYRENE equivalent	3.27	mg/kg	NA	3.51E-07	mg/kg-day	7.30E+00	1/(mg/kg-day)	2.56E-06
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	1.22E-07	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	NA	2.94E-08	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	NA	1.61E-07	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg	NA	7.99E-05	mg/kg-day		1/(mg/kg-day)	
Dermal (2)	ALUMINUM	21087	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	0.03	4.54E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	6.81E-08
	IRON	27471	mg/kg			mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg			mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	0.14	1.27E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2.54E-08
	BENZO(A)PYRENE equivalent	3.27	mg/kg	0.13	5.14E-08	mg/kg-day	7.30E+00	1/(mg/kg-day)	3.75E-07
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	1.79E-08	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	0.13	4.31E-09	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	0.13	2.36E-08	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg			mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Pathways 5.21E-06

Total Cancer Risks Excluding Arsenic 3.13E-06

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 1.07E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 1.21E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT = Central Tendency

Table 5-11D
Calculation of Cancer Risks
Exposure to Soils - Warehouse 2/3
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	1.41E-02	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	NA	8.38E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	1.26E-05
	IRON	27471	mg/kg	NA	1.84E-02	mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg	NA	1.63E-04	mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg	NA	1.12E-04	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	NA	5.02E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	1.00E-06
	BENZO(A)PYRENE equivalent	3.27	mg/kg	NA	2.19E-06	mg/kg-day	7.30E+00	1/(mg/kg-day)	1.60E-05
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	7.63E-07	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	NA	1.83E-07	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	NA	1.00E-06	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg	NA	4.98E-04	mg/kg-day		1/(mg/kg-day)	
Dermal (2)	ALUMINUM	21087	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	0.03	7.94E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	1.19E-06
	IRON	27471	mg/kg			mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg			mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	0.14	2.22E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	4.44E-07
	BENZO(A)PYRENE equivalent	3.27	mg/kg	0.13	8.98E-07	mg/kg-day	7.30E+00	1/(mg/kg-day)	6.56E-06
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	3.13E-07	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	0.13	7.53E-08	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	0.13	4.12E-07	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg			mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**3.8E-05**
								Total Cancer Risks Excluding Arsenic	**2.40E-05**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 6.69E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 2.11E-06

	EPC, mg/kg	Exposure Point Concentration	chem-specific
	IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
mg/kg = milligram/kilogram	CF, kg/mg	Conversion Factor	0.000001
mg/kg - day = milligram/kilogram - day	RAF, unitless	Relative Absorption Factor	1
NA = Not Applicable	EF, day/yr	Exposure Frequency	150
EPC = Exposure Point Concentration	AT, yr	Averaging Time	70
RME - Realistic Maximum Exposure	SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
	ABS, unitless	Dermal Absorption Factor	chem-specific
	EV, event/day	Event Frequency	1

Table 5-11D
Calculation of Cancer Risks
Exposure to Soil - Warehouse 2/3
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer)	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	5.84E-04	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	NA	3.47E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	5.20E-07
	IRON	27471	mg/kg	NA	7.60E-04	mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg	NA	6.73E-06	mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg	NA	4.62E-06	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	NA	2.08E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	4.15E-08
	BENZO(A)PYRENE equivalent	3.27	mg/kg	NA	9.05E-08	mg/kg-day	7.30E+00	1/(mg/kg-day)	6.61E-07
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	3.16E-08	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	NA	7.58E-09	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	NA	4.15E-08	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg	NA	2.06E-05	mg/kg-day		1/(mg/kg-day)	
Dermal (2)	ALUMINUM	21087	mg/kg						
	ARSENIC	13	mg/kg	0.03	1.37E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	2.06E-08
	IRON	27471	mg/kg			mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg			mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	0.14	3.84E-09	mg/kg-day	2.00E+00	1/(mg/kg-day)	7.67E-09
	BENZO(A)PYRENE equivalent	3.27	mg/kg	0.13	1.55E-08	mg/kg-day	7.30E+00	1/(mg/kg-day)	1.13E-07
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	5.41E-09	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	0.13	1.30E-09	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	0.13	7.12E-09	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg			mg/kg-day		1/(mg/kg-day)	
								Total Cancer Risk Across All Exposure Pathways	**1.36E-06**
								Total Cancer Risks Excluding Arsenic	**8.23E-07**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.77E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 3.65E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BW, kg	Body Weight	70

Table 5-11D
Calculation of Cancer Risks
Exposure to Soils - Warehouse 2/3
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	4.42E-03	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	NA	2.63E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	3.9E-06
	IRON	27471	mg/kg	NA	5.76E-03	mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg	NA	5.10E-05	mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg	NA	3.50E-05	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	NA	1.57E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	3.1E-07
	BENZO(A)PYRENE equivalent	3.27	mg/kg	NA	6.86E-07	mg/kg-day	7.30E+00	1/(mg/kg-day)	5.0E-06
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	2.39E-07	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	NA	5.75E-08	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	NA	3.15E-07	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg	NA	1.56E-04	mg/kg-day		1/(mg/kg-day)	
Dermal (2)	ALUMINUM	21087	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	0.03	5.20E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	7.8E-07
	IRON	27471	mg/kg			mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg			mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	0.14	1.45E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	2.9E-07
	BENZO(A)PYRENE equivalent	3.27	mg/kg	0.13	5.88E-07	mg/kg-day	7.30E+00	1/(mg/kg-day)	4.3E-06
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	2.05E-07	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	0.13	4.93E-08	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	0.13	2.70E-07	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg			mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Pathways 1.5E-05

Total Cancer Risks Excluding Arsenic 9.90E-06

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF* ED)/(BW *AT * 365 day/yr)
= EPC * 2.10E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(AT * BW *365 day/yr)
= EPC * ABS * 1.38E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BW, kg	Body Weight	70

Table 5-11D
Calculation of Cancer Risks
Exposure to Surface Soils - Warehouse 2/3
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	21087	mg/kg	NA	6.23E-04	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	NA	3.70E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	5.54E-07
	IRON	27471	mg/kg	NA	8.11E-04	mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg	NA	7.17E-06	mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg	NA	4.93E-06	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	NA	2.21E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	4.43E-08
	BENZO(A)PYRENE equivalent	3.27	mg/kg	NA	9.65E-08	mg/kg-day	7.30E+00	1/(mg/kg-day)	7.05E-07
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	NA	3.37E-08	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	NA	8.09E-09	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	NA	4.43E-08	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg	NA	2.20E-05	mg/kg-day		1/(mg/kg-day)	
Dermal (2)	ALUMINUM	21087	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ARSENIC	13	mg/kg	0.03	2.22E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	3.33E-08
	IRON	27471	mg/kg			mg/kg-day		1/(mg/kg-day)	
	LEAD	243	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	167	mg/kg			mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.75	mg/kg	0.14	6.20E-09	mg/kg-day	2.00E+00	1/(mg/kg-day)	1.24E-08
	BENZO(A)PYRENE equivalent	3.27	mg/kg	0.13	2.51E-08	mg/kg-day	7.30E+00	1/(mg/kg-day)	1.83E-07
	BENZO[G,H,I]PERYLENE	1.14	mg/kg	0.13	8.75E-09	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.27	mg/kg	0.13	2.10E-09	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	1.50	mg/kg	0.13	1.15E-08	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	744	mg/kg			mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Pathways 1.5E-06

Total Cancer Risks Excluding Arsenic 9.45E-07

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70

Table 5-11D
Calculation of Cancer Risks
Exposure to Subsurface Soils - Warehouse 2/3
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	22019	mg/kg	NA	6.50E-04	mg/kg-day		1/(mg/kg-day)	
	ARSENIC	10	mg/kg	NA	3.05E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	4.57E-07
	IRON	31500	mg/kg	NA	9.30E-04	mg/kg-day		1/(mg/kg-day)	
	LEAD	120	mg/kg	NA	3.54E-06	mg/kg-day		1/(mg/kg-day)	
	VANADIUM	44	mg/kg	NA	1.29E-06	mg/kg-day			
	SODIUM	188	mg/kg	NA	5.55E-06	mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.38	mg/kg	NA	1.12E-08	mg/kg-day	2.00E+00	1/(mg/kg-day)	2.24E-08
	BENZO(A)PYRENE equivalent	1.36	mg/kg	NA	4.01E-08	mg/kg-day	7.30E+00	1/(mg/kg-day)	2.93E-07
	BENZO[G,H,I]PERYLENE	0.50	mg/kg	NA	1.48E-08	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.22	mg/kg	NA	6.49E-09	mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	0.61	mg/kg	NA	1.80E-08	mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	2.81	mg/kg	NA	8.30E-08	mg/kg-day			
	XYLENE	279.00	mg/kg	NA	8.24E-06	mg/kg-day			
	ETHYLBENZENE	61.00	mg/kg	NA	1.80E-06	mg/kg-day			
	MANGANESE	910	mg/kg	NA	2.69E-05	mg/kg-day		1/(mg/kg-day)	
Dermal (2)	ALUMINUM	22019	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ARSENIC	10	mg/kg	0.03	1.83E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	2.74E-08
	IRON	31500	mg/kg			mg/kg-day		1/(mg/kg-day)	
	LEAD	120	mg/kg			mg/kg-day		1/(mg/kg-day)	
	SODIUM	188	mg/kg			mg/kg-day		1/(mg/kg-day)	
	VANADIUM	44	mg/kg			mg/kg-day		1/(mg/kg-day)	
	Total PCBs	0.38	mg/kg	0.14	3.14E-09	mg/kg-day	2.00E+00	1/(mg/kg-day)	6.28E-09
	BENZO(A)PYRENE equivalent	1.36	mg/kg	0.13	1.04E-08	mg/kg-day	7.30E+00	1/(mg/kg-day)	7.62E-08
	BENZO[G,H,I]PERYLENE	0.50	mg/kg	0.13	3.84E-09	mg/kg-day		1/(mg/kg-day)	
	CARBAZOLE	0.22	mg/kg	0.13	1.69E-09	mg/kg-day		1/(mg/kg-day)	
	2-METHYLNAPHTHALENE	2.81	mg/kg	0.13	2.16E-08	mg/kg-day		1/(mg/kg-day)	
	XYLENE	279.00	mg/kg			mg/kg-day		1/(mg/kg-day)	
	ETHYLBENZENE	61.00	mg/kg			mg/kg-day		1/(mg/kg-day)	
	PHENANTHRENE	0.61	mg/kg	0.13	4.68E-09	mg/kg-day		1/(mg/kg-day)	
	MANGANESE	910	mg/kg			mg/kg-day		1/(mg/kg-day)	

Total Cancer Risk Across All Exposure Pathways 8.8E-07

Total Cancer Risks Excluding Arsenic 3.98E-07

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70

Table 5-11E
Calculation of Cancer Risks
Exposure to Soils - 345 kV Transmission Line Area
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	1.90E-03	mg/kg-day			
	ARSENIC	11	mg/kg	NA	1.21E-06	mg/kg-day	1.5	1/(mg/kg-day)	1.82E-06
	IRON	27458	mg/kg	NA	2.95E-03	mg/kg-day			
	SODIUM	218	mg/kg	NA	2.34E-05	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	7.41E-08	mg/kg-day			
	VANADIUM	41	mg/kg	NA	4.38E-06	mg/kg-day			
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	4.51E-08	mg/kg-day	7.3	1/(mg/kg-day)	3.29E-07
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	2.55E-08	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	2.52E-08	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	5.68E-08	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	1.40E-04	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg						
	ARSENIC	11	mg/kg	0.03	4.09E-08	mg/kg-day	1.5	1/(mg/kg-day)	6.13E-08
	IRON	27458	mg/kg						
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg						
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	6.60E-09	mg/kg-day	7.3	1/(mg/kg-day)	4.82E-08
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	3.73E-09	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	3.69E-09	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	8.32E-09	mg/kg-day			
	MANGANESE	1300	mg/kg						
								Total Cancer Risk Across All Exposure Pathways	**2.26E-06**
								Total Cancer Risks Excluding Arsenic	**3.78E-07**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 1.07E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 1.21E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT = Central Tendence

Table 5-11E
Calculation of Cancer Risks
Exposure to Soils - 345 kV Transmission Line Area
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	1.18E-02	mg/kg-day			
	ARSENIC	11	mg/kg	NA	7.54E-06	mg/kg-day	1.5	1/(mg/kg-day)	1.13E-05
	IRON	27458	mg/kg	NA	1.84E-02	mg/kg-day			
	SODIUM	218	mg/kg	NA	1.46E-04	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	4.62E-07	mg/kg-day			
	VANADIUM	41	mg/kg	NA	2.73E-05	mg/kg-day			
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	2.81E-07	mg/kg-day	7.3	1/(mg/kg-day)	2.05E-06
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	1.59E-07	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	1.57E-07	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	3.54E-07	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	8.70E-04	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg						
	ARSENIC	11	mg/kg	0.03	7.15E-07	mg/kg-day	1.5	1/(mg/kg-day)	1.07E-06
	IRON	27458	mg/kg						
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg						
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	1.15E-07	mg/kg-day	7.3	1/(mg/kg-day)	8.42E-07
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	6.51E-08	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	6.46E-08	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	1.45E-07	mg/kg-day			
	MANGANESE	1300	mg/kg						
								Total Cancer Risk Across All Exposure Pathways	**1.5E-05**
								Total Cancer Risks Excluding Arsenic	**2.89E-06**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 6.69E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 2.11E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

Table 5-11E
Calculation of Cancer Risks
Exposure to Soil - 345 kV Transmission Line Area
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer)	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	4.90E-04	mg/kg-day			
	ARSENIC	11	mg/kg	NA	3.12E-07	mg/kg-day	1.5	1/(mg/kg-day)	4.68E-07
	IRON	27458	mg/kg	NA	7.60E-04	mg/kg-day			
	SODIUM	218	mg/kg	NA	6.03E-06	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	1.91E-08	mg/kg-day			
	VANADIUM	41	mg/kg	NA	1.13E-06	mg/kg-day			
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	1.16E-08	mg/kg-day	7.3	1/(mg/kg-day)	8.49E-08
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	6.56E-09	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	6.50E-09	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	1.46E-08	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	3.60E-05	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg						
	ARSENIC	11	mg/kg	0.03	1.24E-08	mg/kg-day	1.5	1/(mg/kg-day)	1.85E-08
	IRON	27458	mg/kg						
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg						
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	1.99E-09	mg/kg-day	7.3	1/(mg/kg-day)	1.46E-08
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	1.13E-09	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	1.12E-09	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	2.51E-09	mg/kg-day			
	MANGANESE	1300	mg/kg						

Total Cancer Risk Across All Exposure Pathways **5.86E-07**

Total Cancer Risks Excluding Arsenic **9.94E-08**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.77E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 3.65E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BW, kg	Body Weight	70

Table 5-11E
Calculation of Cancer Risks
Exposure to Soils - 345 kV Transmission Line Area
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	3.71E-03	mg/kg-day			
	ARSENIC	11	mg/kg	NA	2.36E-06	mg/kg-day	1.5	1/(mg/kg-day)	3.54E-06
	IRON	27458	mg/kg	NA	5.76E-03	mg/kg-day			
	SODIUM	218	mg/kg	NA	4.57E-05	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	1.45E-07	mg/kg-day			
	VANADIUM	41	mg/kg	NA	8.54E-06	mg/kg-day			
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	8.81E-08	mg/kg-day	7.3	1/(mg/kg-day)	6.43E-07
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	4.97E-08	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	4.93E-08	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	1.11E-07	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	2.73E-04	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg						
	ARSENIC	11	mg/kg	0.03	4.68E-07	mg/kg-day	1.5	1/(mg/kg-day)	7.02E-07
	IRON	27458	mg/kg						
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg						
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	7.56E-08	mg/kg-day	7.3	1/(mg/kg-day)	5.52E-07
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	4.26E-08	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	4.23E-08	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	9.52E-08	mg/kg-day			
	MANGANESE	1300	mg/kg						

Total Cancer Risk Across All Exposure Pathways 5.4E-06

Total Cancer Risks Excluding Arsenic 1.19E-06

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF* ED)/(BW *AT * 365 day/yr)
= EPC * 2.10E-07

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(AT * BW * 365 day/yr)
= EPC * ABS * 1.38E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BW, kg	Body Weight	70

Table 5-11E
Calculation of Cancer Risks
Exposure to Surface Soils - 345 kV Transmission Line Area
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	17697	mg/kg	NA	5.22E-04	mg/kg-day			
	ARSENIC	11	mg/kg	NA	3.33E-07	mg/kg-day	1.5	1/(mg/kg-day)	4.99E-07
	IRON	27458	mg/kg	NA	8.11E-04	mg/kg-day			
	SODIUM	218	mg/kg	NA	6.44E-06	mg/kg-day			
	THALLIUM	0.69	mg/kg	NA	2.04E-08	mg/kg-day			
	VANADIUM	41	mg/kg	NA	1.20E-06	mg/kg-day			
	BENZO(A)PYRENE equivalent	0.42	mg/kg	NA	1.24E-08	mg/kg-day	7.3	1/(mg/kg-day)	9.05E-08
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	NA	7.00E-09	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	NA	6.94E-09	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	NA	1.56E-08	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	3.84E-05	mg/kg-day			
Dermal (2)	ALUMINUM	17697	mg/kg						
	ARSENIC	11	mg/kg	0.03	2.00E-08	mg/kg-day	1.5	1/(mg/kg-day)	2.99E-08
	IRON	27458	mg/kg						
	SODIUM	218	mg/kg						
	THALLIUM	0.69	mg/kg						
	VANADIUM	41	mg/kg						
	BENZO(A)PYRENE equivalent	0.42	mg/kg	0.13	3.22E-09	mg/kg-day	7.3	1/(mg/kg-day)	2.35E-08
	BENZO[G,H,I]PERYLENE	0.24	mg/kg	0.13	1.82E-09	mg/kg-day			
	CARBAZOLE	0.24	mg/kg	0.13	1.80E-09	mg/kg-day			
	PHENANTHRENE	0.53	mg/kg	0.13	4.06E-09	mg/kg-day			
	MANGANESE	1300	mg/kg						
								Total Cancer Risk Across All Exposure Pathways	**6.4E-07**
								Total Cancer Risks Excluding Arsenic	**1.14E-07**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70

Table 5-11E
Calculation of Cancer Risks
Exposure to Subsurface Soils - 345 kV Tranmission Line Area
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	19700	mg/kg	NA	5.82E-04	mg/kg-day			
	ARSENIC	12	mg/kg	NA	3.45E-07	mg/kg-day	1.5	1/(mg/kg-day)	5.18E-07
	IRON	30600	mg/kg	NA	9.03E-04	mg/kg-day			
	SODIUM	367	mg/kg	NA	1.08E-05	mg/kg-day			
	THALLIUM	0.53	mg/kg	NA	1.56E-08	mg/kg-day			
	VANADIUM	44	mg/kg	NA	1.30E-06	mg/kg-day			
	Total PCBs	0.31	mg/kg	NA	9.00E-09	mg/kg-day	2	1/(mg/kg-day)	1.80E-08
	BENZO(A)PYRENE equivalent	0.63	mg/kg	NA	1.86E-08	mg/kg-day	7.3	1/(mg/kg-day)	1.36E-07
	BENZO[G,H,I]PERYLENE	0.25	mg/kg	NA	7.35E-09	mg/kg-day			
	CARBAZOLE	0.22	mg/kg	NA	6.49E-09	mg/kg-day			
	PHENANTHRENE	0.39	mg/kg	NA	1.15E-08	mg/kg-day			
	MANGANESE	1300	mg/kg	NA	3.84E-05	mg/kg-day			
Dermal (2)	ALUMINUM	19700	mg/kg	NA					
	ARSENIC	12	mg/kg	0.03	2.07E-08	mg/kg-day	1.5	1/(mg/kg-day)	3.11E-08
	IRON	30600	mg/kg	NA					
	SODIUM	367	mg/kg	NA					
	THALLIUM	0.53	mg/kg	NA					
	VANADIUM	44	mg/kg	NA					
	Total PCBs	0.31	mg/kg	0.14	2.52E-09	mg/kg-day	2	1/(mg/kg-day)	5.04E-09
	BENZO(A)PYRENE equivalent	0.63	mg/kg	0.13	4.84E-09	mg/kg-day	7.3	1/(mg/kg-day)	3.53E-08
	BENZO[G,H,I]PERYLENE	0.25	mg/kg	0.13	1.91E-09	mg/kg-day			
	CARBAZOLE	0.22	mg/kg	0.13	1.69E-09	mg/kg-day			
	PHENANTHRENE	0.39	mg/kg	0.13	2.99E-09	mg/kg-day			
	MANGANESE	1300	mg/kg	NA					

Total Cancer Risk Across All Exposure Pathways 7.4E-07

Total Cancer Risks Excluding Arsenic 1.94E-07

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70

Table 5-11F
Calculation of Cancer Risks
Exposure to Soils - Bailey Farmhouse
Resident - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	2.49E-03	mg/kg-day			
	ARSENIC	7.2	mg/kg	NA	7.74E-07	mg/kg-day	1.5	1/(mg/kg-day)	1.16E-06
	IRON	24300	mg/kg	NA	2.61E-03	mg/kg-day			
	LEAD	62.2	mg/kg	NA	6.68E-06	mg/kg-day			
	MANGANESE	522	mg/kg	NA	5.61E-05	mg/kg-day			
	SODIUM	141	mg/kg	NA	1.51E-05	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg						
	ARSENIC	7.2	mg/kg	0.03	2.61E-08	mg/kg-day	1.5	1/(mg/kg-day)	3.92E-08
	IRON	24300	mg/kg						
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg						
	SODIUM	141	mg/kg						
Total Cancer Risk Across All Exposure Pathways									**1.20E-06**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 1.07E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 1.21E-07

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	18.3
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	20.6
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT = Central Tendency

Table 5-11F
Calculation of Cancer Risks
Exposure to Soils - Bailey Farmhouse
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk
Ingestion (1	ALUMINUM	23200	mg/kg	NA	1.55E-02	mg/kg-day			
	ARSENIC	7.2	mg/kg	NA	4.82E-06	mg/kg-day	1.5	1/(mg/kg-day)	7.23E-06
	IRON	24300	mg/kg	NA	1.63E-02	mg/kg-day			
	LEAD	62.2	mg/kg	NA	4.16E-05	mg/kg-day			
	MANGANESE	522	mg/kg	NA	3.49E-04	mg/kg-day			
	SODIUM	141	mg/kg	NA	9.44E-05	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg						
	ARSENIC	7.2	mg/kg	0.03	4.57E-07	mg/kg-day	1.5	1/(mg/kg-day)	6.85E-07
	IRON	24300	mg/kg						
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg						
	SODIUM	141	mg/kg						
Total Cancer Risk Across All Exposure Pathways									**7.9E-06**

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 6.69E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 2.11E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table 5-11F
Calculation of Cancer Risks
Exposure to Soil - Bailey Farmhouse
On-Site Worker - CT

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer)	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	6.42E-04	mg/kg-day			
	ARSENIC	7.2	mg/kg	NA	1.99E-07	mg/kg-day	1.5	1/(mg/kg-day)	2.99E-07
	IRON	24300	mg/kg	NA	6.73E-04	mg/kg-day			
	LEAD	62.2	mg/kg	NA	1.72E-06	mg/kg-day			
	MANGANESE	522	mg/kg	NA	1.44E-05	mg/kg-day			
	SODIUM	141	mg/kg	NA	3.90E-06	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg						
	ARSENIC	7.2	mg/kg	0.03	7.89E-09	mg/kg-day	1.5	1/(mg/kg-day)	1.18E-08
	IRON	24300	mg/kg						
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg						
	SODIUM	141	mg/kg						
Total Cancer Risk Across All Exposure Pathways									**3.11E-07**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.77E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 3.65E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
CT - Central Tendency

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate	50
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.02
ED, years	Exposure Duration	6.6
BW, kg	Body Weight	70

Table 5-11F
Calculation of Cancer Risks
Exposure to Soils - Bailey Farmhouse
On-Site Worker - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	On-Site Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	4.86E-03	mg/kg-day			
	ARSENIC	7.2	mg/kg	NA	1.51E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	2.26E-06
	IRON	24300	mg/kg	NA	5.10E-03	mg/kg-day			
	LEAD	62.2	mg/kg	NA	1.30E-05	mg/kg-day			
	MANGANESE	522	mg/kg	NA	1.09E-04	mg/kg-day			
	SODIUM	141	mg/kg	NA	2.96E-05	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg						
	ARSENIC	7.2	mg/kg	0.03	2.99E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	4.48E-07
	IRON	24300	mg/kg						
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg						
	SODIUM	141	mg/kg						
Total Cancer Risk Across All Exposure Pathways									**2.7E-06**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF* ED)/(BW *AT * 365 day/yr)
= EPC * 2.10E-07
(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(AT *BW * 365 day/yr)
= EPC * ABS * 1.38E-06

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure

EPC, mg/kg	Exposure Point Concentratio	chem-specific
IR, mg/day	Ingestion Rate	100
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	25
BW, kg	Body Weight	70

Table 5-11F
Calculation of Cancer Risks
Exposure to Surface Soils - Bailey Farmhouse
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	ALUMINUM	23200	mg/kg	NA	6.85E-04	mg/kg-day			
	ARSENIC	7.2	mg/kg	NA	2.13E-07	mg/kg-day	1.50E+00	1/(mg/kg-day)	3.19E-07
	IRON	24300	mg/kg	NA	7.17E-04	mg/kg-day			
	LEAD	62.2	mg/kg	NA	1.84E-06	mg/kg-day			
	MANGANESE	522	mg/kg	NA	1.54E-05	mg/kg-day			
	SODIUM	141	mg/kg	NA	4.16E-06	mg/kg-day			
Dermal	ALUMINUM	23200	mg/kg						
	ARSENIC	7.2	mg/kg	0.03	1.28E-08	mg/kg-day	1.50E+00	1/(mg/kg-day)	1.91E-08
	IRON	24300	mg/kg						
	LEAD	62.2	mg/kg						
	MANGANESE	522	mg/kg						
	SODIUM	141	mg/kg						
								Total Cancer Risk Across All Exposure Pathways	**3.4E-07**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70

Table 5-11F
Calculation of Cancer Risks
Exposure to Subsurface Soils - Bailey Farmhouse
Construction Worker

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Subsurface Soils
Receptor Population:	Construction Worker
Receptor Age:	Adult

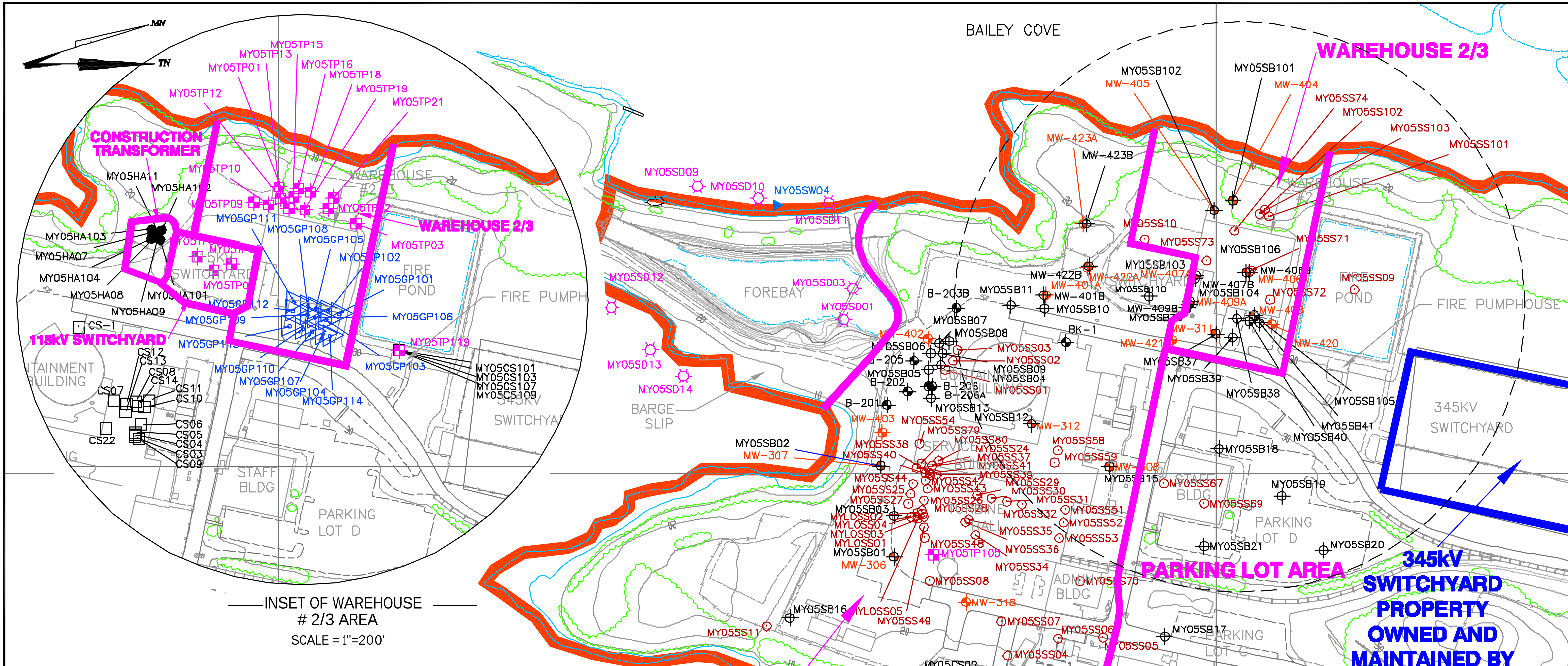
Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion (1)	ALUMINUM	23200	mg/kg	NA	6.85E-04	mg/kg-day			
	ARSENIC	8	mg/kg	NA	2.45E-07	mg/kg-day	1.5	1/(mg/kg-day)	3.67E-07
	IRON	24300	mg/kg	NA	7.17E-04	mg/kg-day			
	LEAD	62	mg/kg	NA	1.82E-06	mg/kg-day			
	SODIUM	141	mg/kg	NA	4.16E-06	mg/kg-day			
	MANGANESE	522	mg/kg	NA	1.54E-05	mg/kg-day			
Dermal (2)	ALUMINUM	23200	mg/kg						
	ARSENIC	8	mg/kg	0.03	1.47E-08	mg/kg-day	1.5	1/(mg/kg-day)	2.20E-08
	IRON	24300	mg/kg						
	SODIUM	141	mg/kg						
	LEAD	62	mg/kg						
	MANGANESE	522	mg/kg						
Total Cancer Risk Across All Exposure Pathways									**3.9E-07**

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF * ED)/(BW * AT * 365 day/yr)
= EPC * 2.95E-08

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF * ED)/(BW *AT * 365 day/yr)
= EPC * ABS * 5.90E-08

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentratior chem-specific	
IR, mg/day	Ingestion Rate, age weighted	330
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	160
AT, yr	Averaging Time	70
SA, cm2	Surface Area	3300
AF, mg/cm2-event	Adherence Factor	0.2
ED, years	Exposure Duration	1
BW, kg	Body Weight	70



LEGEND:

- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- STUDY AREA DESIGNATIONS
- MY05SD10 SOIL SEDIMENT SAMPLE LOCATION
- MY05SS76 SURFACE SOIL SAMPLE LOCATION
- MY05SB47 SOIL BORING SAMPLE LOCATION
- MY05TP104 TEST PIT LOCATION
- MW-318 MONITORING WELL LOCATION
- MY05SW04 SURFACE WATER SAMPLE LOCATION
- MY05GP111 GEOPROBE LOCATION
- MY05CS01 CONCRETE SAMPLE LOCATION
- MY05HA08 HAND AUGER SAMPLE LOCATION

SCALE IN FEET
100 0 200 400

ORIGINAL BASE MAP INFO OBTAINED FROM:
JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:
CH2MHILL, STRATEX
JACQUES WHITFORD COMPANY

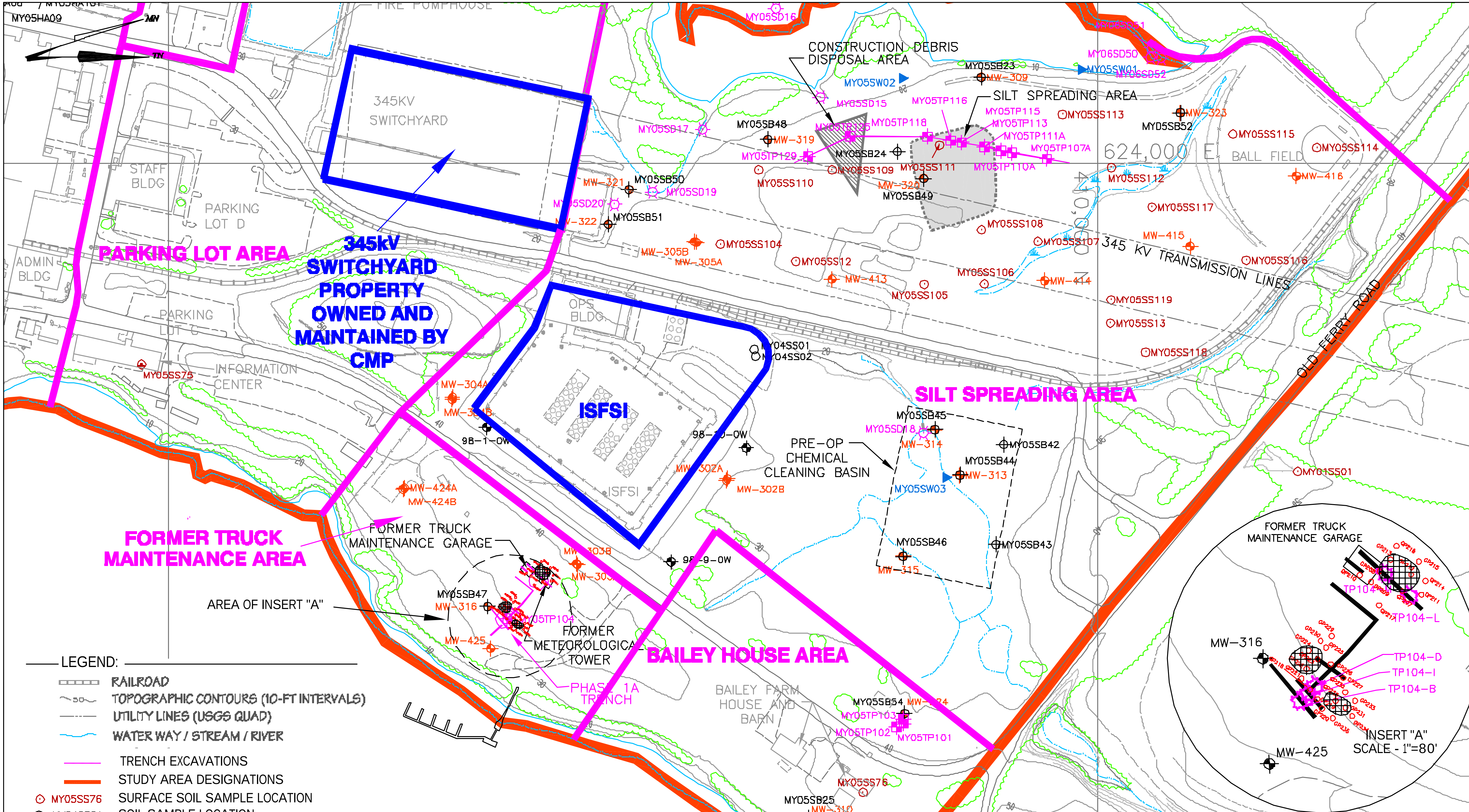
DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:
BAILEY/BPRCRA	MEP02167/BA	1"=200'

DRAWING TITLE:
SOIL EXPOSURE AREAS
(Plant Area South)

PREPARED FOR:
MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. 5-1A



LEGEND:

- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER
- TRENCH EXCAVATIONS
- STUDY AREA DESIGNATIONS
- MY05SS76 SURFACE SOIL SAMPLE LOCATION
- MY04SS01 SOIL SAMPLE LOCATION
- MY05SB47 SOIL BORING SAMPLE LOCATION
- MY05SD18 SEDIMENT SAMPLE LOCATION
- MY05TP104 TEST PIT LOCATION
- MW-324 MONITORING WELL LOCATION
- MY05SW02 SURFACE WATER SAMPLE LOCATION
- PROPOSED TESTPIT LOCATION

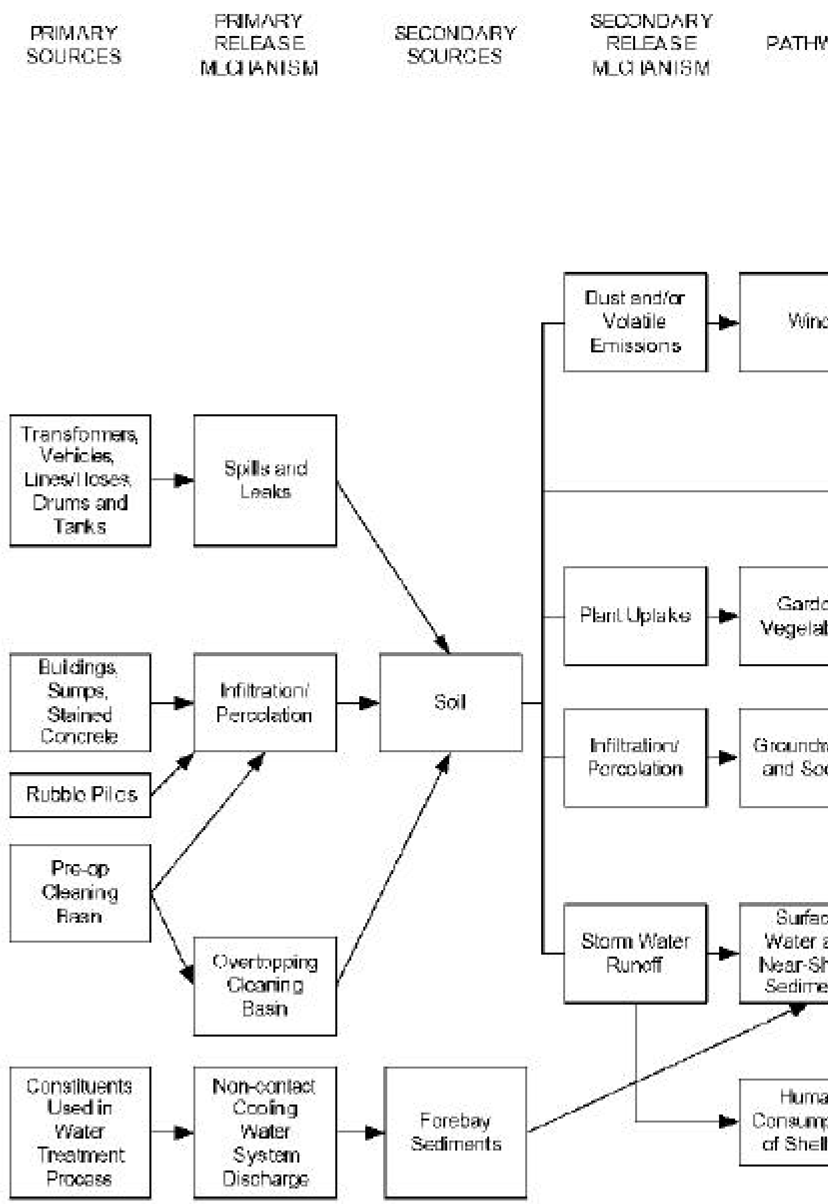
SCALE IN FEET: 100 0 200 400

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: SOIL EXPOSURE AREAS (Plant Area North)
DATE PREPARED: 09-02-05	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/BA		SCALE: 1"=200'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. 5-1B



Pathway	Exposure Route	Area Residents	Commercial Fisherman	Construction Worker	On-Site Worker	Terrestrial	Aquatic
Wind	Ingestion						
	Inhalation	●	●	●	●	●	
	Dermal Contact						
Soil (direct)	Ingestion	●	●	●	●	●	
	Dermal Contact	●	●	●	●	●	
Garden Vegetables	Ingestion	●				●	
Groundwater and Seeps	Ingestion	●				●	●
	Inhalation	●					
	Dermal Contact	●				●	●
Surface Water and Near-Shore Sediments	Ingestion	●	●	●	●	●	●
	Inhalation						
	Dermal Contact	●	●	●	●	●	●
Human Consumption of Shellfish	Ingestion	●	●				

Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DRAWING TITLE:

SITE CONCEPTUAL MODEL

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

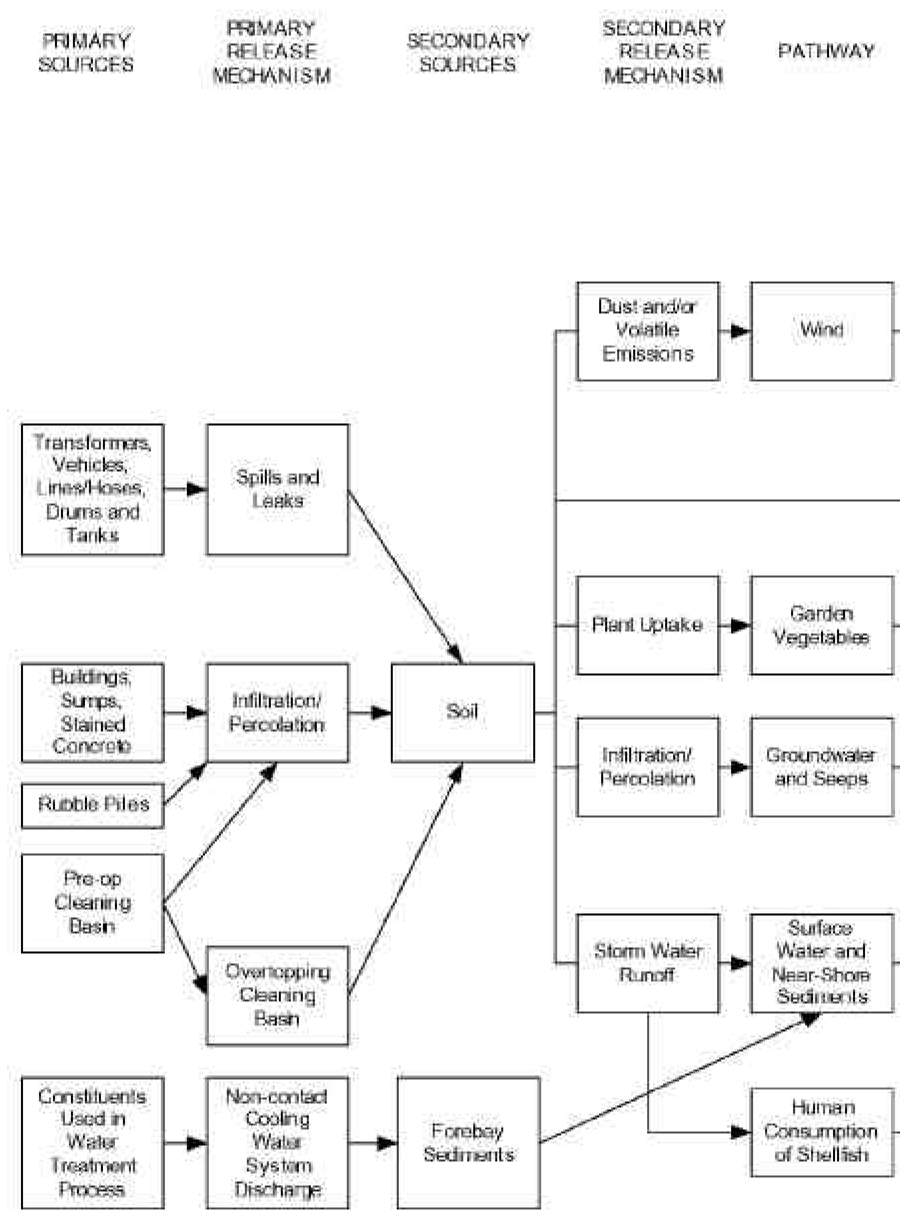
PROJECT NAME/FILE NAME: BAILEY/BPRCRA

PROJECT NUMBER/PHASE: MEPO2167/BA

SCALE: NA

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME

FIGURE NO. 5-1



RECEPTOR

Pathway	Exposure Route	HUMAN: Area Residents	HUMAN: Commercial Fisherman	HUMAN: Construction Worker	HUMAN: On-Site Worker	BIOTA: Terrestrial	BIOTA: Aquatic
Wind	Ingestion						
	Inhalation	●	●	●	●	●	
	Dermal Contact						
Soil	Ingestion	●	●	●	●	●	
	Dermal Contact	●	●	●	●	●	
Garden Vegetables	Ingestion	●				●	
Groundwater and Seeps	Ingestion	●				●	●
	Inhalation	●					
	Dermal Contact	●				●	●
Surface Water and Near-Shore Sediments	Ingestion	●	●	●	●	●	●
	Inhalation						
	Dermal Contact	●	●	●	●	●	●
Human Consumption of Shellfish	Ingestion	●	●				

Maine Yankee

CH2MHILL

STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:
CH2MHILL, STRATEX
JACQUES WHITFORD COMPANY

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

PROJECT NAME/FILE NAME: BAILEY/BPRCRA
PROJECT NUMBER/PHASE: MEP02167/8A
SCALE: NA

DRAWING TITLE:
SITE CONCEPTUAL MODEL

PREPARED FOR:
MAINE YANKEE ATOMIC POWER CO, *Wiscasset* ME

FIGURE NO. **5-2**

SECTION 6 – ECOLOGICAL RISK ASSESSMENT

LIST OF TABLES

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6.1 INTRODUCTION

This Ecological Risk Assessment (ERA) was prepared to evaluate the potential risk to ecological receptors associated with the marine habitat surrounding the Maine Yankee Atomic Power Station (Maine Yankee). The ERA was prepared as part of the decommissioning of Maine Yankee, specifically as part of the Resource Conservation and Recovery Act (RCRA) process associated with closure of the site-related stormwater outfalls. In addition to assessing the potential baseline ecological risk, the ERA was prepared to develop sufficient information to make informed risk management decisions on an outfall-specific basis.

The framework and approach for the ERA follows the general guidelines outlined in the United States Environmental Protection Agency's (USEPA*) Guidelines for Ecological Risk Assessment*, EPA/630/R-95/002F, dated April 1998. In addition, the following documents, which provide risk assessment guidance and/or technical information, were used in the development of the ERA:

- *Risk Assessment Guidance for Superfund:Process for Designing and Conducting Ecological Risk Assessments*, EPA/540/R-97/006;
- *Supplemental Risk Assessment Guidance for the Superfund Program*, USEPA, OSWER 9285.7-081 Vol. 1, No. 1, May 1992;
- Intermittent "ECO Update Bulletins" of USEPA; and
- USEPA Region 1 Risk Updates.

The ERA discusses the potential for environmental impacts from site-related chemicals in the event that no remedial action is taken. Specifically, the ERA discusses the potential for existing site-related chemicals to impact near-shore intertidal and subtidal habitats of the Back River and Bailey Cove in the vicinity of outfalls 005, 006, 008, 009, 010, 011, and 012. The outfalls are related to areas of the site drained by storm drain systems, as listed in **Table 3-1**. Potential risks to the environment are assessed for each outfall individually, with the exception of outfalls 005 and 006, which were evaluated together due to their close proximity. The ERA only assesses potential risks to the marine environment since the outfalls discharge to these habitats. Terrestrial or freshwater wetland risks that may be associated with other potential sources on the site were not evaluated in the ERA.

In addition to the outfalls described above, another area of potential concern was identified by Maine DEP midway through the ERA process. The additional area was the silt spreading area west of the 345 kV Transmission Line. This area is an intertidal mudflat surrounded by a salt marsh and is also evaluated in the ERA.

A work plan for the ERA (*Approach for Offshore Ecological Risk Assessment at Maine Yankee*) was included as Appendix E of the Quality Assurance Project Plans (QAPP) for the Maine Yankee Decommissioning Project, RCRA Facility Investigation. During development of the work plan and discussions with regulators, it was determined that the ERA would be limited to the stormwater outfall areas, since no other exposure pathways were identified.

The work plan was generally followed, but close discussion, consultation, and coordination with the state and federal ecological risk assessors on this project occurred throughout the ERA process. As a result, some modifications to the approach were made in coordination with the state and federal risk assessors.

The fundamental change to the work plan was to employ a phased approach in the ERA. The phased approach consisted of an initial screening stage where chemical concentrations in sediment where screened to identify areas of concern where further investigation was warranted. The work plan called for sediment toxicity testing and benthic community structure analysis (BCSA) in addition to chemical analysis at all of the proposed sediment sampling locations. Through the phased approach, the number of locations requiring further investigation was narrowed down to three.

The results and conclusions of the initial sediment screening were presented in a technical memorandum to the Maine DEP in November 2001 (CH2M HILL, 2001b). The conclusion that only three of the sampling locations required further investigation in the form of sediment toxicity testing and BCSA were discussed and agreed upon by both the state and federal ecological risk assessors.

The second phase of the ERA was to collect further information from bulk sediment toxicity testing and benthic community structure from the three outfall locations identified as posing potential ecological risk to the benthic community. The same information was obtained from a reference location to aid in interpreting the results. The results of this phase of the ERA investigation were summarized in a technical memorandum (May 2002) addressing the ecological risk to the benthic community near each outfall (CH2M HILL, 2002a).

The third phase of the ERA was to assess the potential risk posed by bioaccumulative chemicals in the sediments. This phase was accomplished through a combination of chemical residue analysis of blue mussel, soft-shell clam, and mummichog tissue, and through modeling of potential uptake of these chemicals through the food web. The results of this phase of the ERA were presented in a technical memorandum to the Maine DEP in July 2002 (CH2M HILL, 2002b).

The results of the second and third phase of the ERA process were discussed with the state and federal regulators during a conference call on October 3, 2002. The general conclusions presented in the technical memoranda were agreed upon. It was determined that further assessment of the potential risk posed by polycyclic aromatic hydrocarbons (PAHs) to fishes was warranted, based on the nature of these chemicals. It was agreed that the results of all three memoranda and the additional PAH evaluation would be combined and used in the risk characterization phase of the full ERA.

6.2 PRELIMINARY PROBLEM FORMULATION

Problem formulation is the initial step of the ERA process. Problem formulation includes the preparation of an ecological site model, the identification of potential exposure pathways and ecological receptors, and the selection of the assessment and measurement endpoints to evaluate those receptors for which complete and potentially significant exposure pathways are likely to exist.

6.2.1 Ecological Site Model

Information on the habitat features of the site, and the fate and transport mechanisms of chemicals detected at the site, were used to build the ecological site model (**Figure 6-1**). The ecological site model addresses complete exposure pathways, ecological receptors, assessment endpoints, and measurement endpoints.

Environmental Setting

Maine Yankee is located on a peninsula that is bounded by the Back River to the east, mainland to the north, and Bailey Cove to the west (**Figure 6-3**). The site is approximately 13 miles inland from the open ocean. The coastline around the site varies between salt marsh and mudflat, with some rocky areas where the surface gradient is steepest. The eastern side of the site, where outfalls 008 through 012 are located, is characterized predominantly by a rocky shoreline with a moderately steep gradient; small patches of salt marsh are found along the immediate shoreline and mud flats are found in the vicinity of outfalls 008, 011, and 012. Little to no mudflat is present at outfalls 009 and 010, which are located on either side of the cooling water intake channel, because the shoreline is comprised of large boulders and rip-rap. Outfalls 005 and 006 are located on Bailey Cove, which is characterized by extensive mudflats.

The benthic invertebrate community of Montsweag Bay, which occurs south of the site, and Back River is both abundant and diverse. The invertebrate species of commercial or food value include the American lobster, the soft-shelled clam, the blue mussel, the blood worm, and the sand worm.

In summer, the most abundant finfish species in the area include the migratory alewives, blueback herring, and menhaden. Smaller but appreciable numbers of smelt, mackerel, and striped bass are also found in the area in summer. In winter, all of the above species leave the area except for smelt, which remain widely distributed throughout the estuary and are found at all depths. In spring and fall, large numbers of juvenile sea herring appear, but this species is completely absent in summer and winter.

The most abundant demersal (bottom-living) fish is the tomcod, which occurs in large numbers in lower Montsweag Bay in summer, but does not extend into the northern end of the Bay or in to the Back River during that time of year. Of secondary importance in abundance are winter flounder and smooth flounder. The grubby sculpin is a weak fourth in numerical importance. The last three species are more evenly distributed throughout the area than are the tomcod.

Most of the adult fish are concentrated in the central channel areas of the Bay and Back River. Juvenile flounder, alewives, and bluefish are found in flooded flats and a few species, such as mummichogs, silversides, and sticklebacks, are restricted to the shallow areas.

There are many nesting osprey in the area, including several nests on the site itself. In addition, Montsweag Bay, the Back River, and the surrounding areas provide abundant waterfowl habitat. Previous baseline surveys of migratory waterfowl in the area identified American black duck, bufflehead, and goldeneye as the three most abundant waterfowl species using the area (Maine Department of Inland Fisheries and Game, 1971). Other migratory waterfowl known to use the area include mallard, teal, scaup, scoters, common merganser, Canada geese, and oldsquaw. The area also provides plentiful habitat for wading birds and shorebirds, such as great blue heron, snowy egret, and various sandpipers. In addition to osprey, other piscivorous birds, such as the belted kingfisher, frequently use the area, and it is also likely that bald eagles occasionally forage there as well. Finally, herring gulls and other gulls are also abundant in the area.

Chemicals at the Site and Their Fate and Transport

The Maine Yankee facility operated from 1972 to 1997. Over that time, minor spills and releases (primarily petroleum) and a few significant releases have occurred. Four significant releases have occurred including: (1) a release of an unknown amount of chromated water from the primary component cooling system to a storm drain in 1985, (2) a release of approximately 12,000 gallons of de-mineralized water containing sodium chromate in 1988, (3) an accidental release of approximately 200 gallons of low viscosity transformer oil (non-PCB) to the Back River in 1991, and (4) a release of kerosene to subsurface soils in the former Spare Generator Storage Building in 1994. These four releases were studied and remediated to the satisfaction of the Maine Department of Environmental Protection (DEP).

Previous site investigation activities have included sediment sampling at the stormwater outfalls located along the Back River and Bailey Cove. These outfalls receive discharge from roof drains and catch basins. Sediment samples collected at these outfalls have contained primarily petroleum products. Volatile organic compounds (VOCs) and metals were detected at low concentrations.

Based on a review of the previous sampling data, metals, semi-volatile organic compounds (SVOCs), and VOCs are the chemical classes of most potential concern. Several metals were detected in the sediments at Maine Yankee. Of these, arsenic, chromium, lead, mercury, and selenium will bioaccumulate to some degree; mercury (and in some cases selenium) is also known to biomagnify in aquatic food webs.

Most of the SVOCs detected in the sediments at Maine Yankee are PAHs. PAHs in aquatic sediments generally degrade more slowly than PAHs in the atmosphere. As the level of organic carbon in sediments increases, however, PAHs tend to become strongly adsorbed and thus have limited bioavailability. Biodegradation and biotransformation by benthic organisms are the most important biological fate processes for PAHs in sediments. Most animals and microorganisms can metabolize and transform PAHs to breakdown products that may ultimately experience complete degradation. PAHs with high molecular weights are degraded slowly by microbes and readily by multicellular organisms. Biodegradation probably occurs more slowly in aquatic systems than in soil.

6.2.2 Exposure Pathways and Potential Receptors

Exposure routes are the specific mechanism by which a chemical contacts or enters the body of a receptor. Exposure routes can include ingestion of water, sediment or prey with chemical body burdens, inhalation, and dermal absorption. Dermal and inhalation exposures for upper trophic level receptor species were not considered significant relative to ingestion exposures because of the general fate properties (e.g., relatively high adsorption to solids) of the chemicals previously detected at the site and the protection offered by feathers. Surface water ingestion was not considered as an exposure route due to the salinity of the water in the

Back River. Incidental ingestion of sediment during feeding, preening, or grooming activities is, however, considered in the risk estimates.

Exposure Pathways

The exposure pathways proposed for the ERA are conservative ones based on the environmental setting and potential habitat. The exposure pathways for four groups of ecological receptors (epibenthic, infaunal, fish, and avian predators) were identified during regulatory discussions and development of the work plan (Appendix E, Stratex, 2001d). These exposure pathways are shown in the ecological site model **Figure 6-1**. The model indicates that site-related chemicals have historically discharged from primary sources (outfalls) to the sediment at each outfall area. Sediment and animal tissue (biota) were identified as the primary media of concern to the ecological receptors. Potential routes of exposure leading to receptors are presented in **Figure 6-1** and explained as follows:

Aquatic Biota. Aquatic receptors (including mussels, clams, benthic invertebrates, and fish) may be exposed to chemicals in water, sediments, and pore water via partitioning across cell membranes, ingestion of sediments, and consumption of contaminated prey.

Aquatic Avian Wildlife. Avian receptors may be exposed to chemicals through the ingestion of food items that contain bioaccumulated chemicals from the sediment, and through incidental ingestion of contaminated sediment during foraging.

Potential Receptors

Ecological receptors are selected based on environmental sensitivity, trophic level/guild representation, societal value, likely exposure routes, and site use. The site characterization provided above identifies a number of estuarine communities and species located near the site that could be exposed to site-related chemicals from the outfalls, including:

- epibenthic communities in intertidal/subtidal areas;
- infaunal benthic communities in intertidal/subtidal areas;
- estuarine fishes; and
- aquatic predatory birds

Based on the estuarine communities and species potentially present and for which complete and potentially significant exposure pathways exist, the species/communities described below were selected as representative receptors for the ERA (Appendix E, Stratex, 2001d):

- The blue mussel (*Mytilus edulis*) - The blue mussel is a sessile invertebrate that attaches itself to its substrate by means of byssal threads. It lives in both intertidal and subtidal zones, attached to wharf pilings, sea walls, and rocks, often in great numbers. Subtidal beds are located almost exclusively in areas with good currents, especially around offshore islands and in the mouths of estuaries. The blue mussel feeds on phytoplankon by siphoning the seawater and suspended sediments. Blue mussels are the representative epibenthic species in the intertidal/subtidal environments that are potentially exposed to water-borne and particulate-bound contaminants.

- The soft shell clam (*Mya arenaria*) – The soft shell clam is a soft bottom burrower which inhabits shallow subtidal (10 m) estuarine waters and intertidal areas. Soft shell clams inhabit stiff sands and muds that will not collapse against the shell valves when they are closed. Adult clams burrow deeply (as far as 30 cm), feeding through a long extensible siphon. Soft shell clams represent infaunal species in the intertidal/subtidal environment potentially exposed to bulk sediment and pore water contaminants.

- Benthic community – The benthic community, including mollusks, segmented worms, crustaceans, and fish, is an ecologically important collection of species. It is an important food source for birds, fish, and benthic and epibenthic invertebrates. The benthic community is potentially exposed to contaminants in bulk sediments, pore water, and the water column.

- The mummichog (*Fundulus heteroclitus*) – The mummichog is a small fish that lives in shallow, estuarine intertidal waters. It is found mainly in salt marshes and tidal creeks. Its entire life cycle is completed within the estuary and its diet consists mainly of benthic invertebrates. Therefore, it is a species that is potentially highly exposed to sediment-associated contaminants.

- The shortnose sturgeon (*Acipenser brevirostrum*) – The shortnose sturgeon is a federally-listed endangered species. It is an anadromous, bottom-feeding fish whose diet consists mainly of mollusks, supplemented by polychaetes, small benthic fish, benthic crustaceans and insect larvae. It is an indiscriminate-feeder that feels along the bottom using its barbels and "vacuums" up food items buried in the bottom sediments. The shortnose sturgeon feeds mostly at night or on windy days when turbidity is high and visibility low. At these times, it moves into shallow water (1-5 m) to forage. Feeding occurs in deeper water during the late summer (5-10 m) and winter (10-30 m) (Gilbert, 1989). The shortnose sturgeon requires temperatures less than approximately 22°C, and salinity less than 30 or 31 ppt (Gilbert, 1989). The shortnose sturgeon is potentially highly exposed to sediment-associated contaminants because of its feeding behavior (i.e., "vacuuming" the sediments for prey).

- The osprey (*Pandion haleaetus*) – The osprey is an avian predator whose major food is fish. The osprey feeds by hovering above water and diving for its prey. The osprey is a natural resource species of aesthetic importance. Osprey represent avian predators potentially exposed to contaminants through the aquatic food web.

- The belted kingfisher (*Ceryle alcyon*) – The belted kingfisher is an avian predator whose major food is fish. There is some overlap in food source between the osprey and the kingfisher; however, kingfishers generally feed on fish less than 7 inches in length, whereas ospreys generally feed on larger fish (USEPA, 1993b). Kingfishers typically feed in shallower areas where overhanging perches are available and over a much smaller range and, thus, might be more exposed to site-related chemicals. Therefore, the kingfisher was included to represent a second avian predator potentially exposed to contaminants through the aquatic food web.

- The herring gull (*Larus argentatus*) - The herring gull feeds on fish and shellfish at the surface and shorelines of waterbodies. The herring gull is the representative avian omnivore for the site.

6.2.3 Assessment and Measurement Endpoints

The conclusion of the problem formulation stage includes the selection of assessment and measurement endpoints, based on the ecological site model. Endpoints in the ERA define ecological attributes that are to be protected (assessment endpoints) and measurable characteristics of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or could occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by chemicals from the site (USEPA, 1998b). Assessment endpoints contain an entity (e.g., fish-eating birds) and an attribute of that entity (e.g., survival rate).

Because of the complexity of natural systems, it is generally not possible to directly assess the potential impacts to all ecological receptors present within an area. Therefore, receptor species (e.g., belted kingfisher) are often selected as surrogates to evaluate potential risks to larger components of the ecological community (guilds; e.g., piscivorous birds) represented in the assessment endpoints (e.g., survival and reproduction of piscivorous birds).

Assessment endpoints for the ERA are as follows:

<u>Growth, survival, and reproduction of the benthic invertebrate community</u> - Benthic invertebrates serve as a forage base for many aquatic and semi-aquatic species. They also play an important role in the processing and breakdown of organic matter in aquatic systems. Because they have significant direct contact with, and may even consume sediment, benthic invertebrates may be highly exposed to site-related chemicals and develop body burdens. A benthic invertebrate community limited by chemical contamination would support fewer aquatic birds and fish. For the purposes of the ERA, the benthic invertebrate community was divided into two groups, epibenthic receptors (e.g., blue mussel) and infaunal (e.g., soft-shell clam) receptors.

<u>Growth, survival, and reproduction of fish communities</u> – Fish are susceptible to direct chemical exposure from contaminated sediments. Fish communities also serve as a prey base for many aquatic and semi-aquatic organisms. The assessment endpoint selected for fish is adverse effects on the maintenance of fish populations within the habitats present. The mummichog and shortnose sturgeon were chosen as surrogate species to represent this endpoint. The mummichog is a common species in the area and the shortnose sturgeon is an endangered species known to occur in the area.

<u>Growth, survival, and reproduction of aquatic bird communities</u> – Aquatic birds are most susceptible to bioaccumulated chemicals in prey organisms. The assessment endpoint selected for avian receptors is adverse effects on the maintenance of avian populations within the habitats present. The osprey, belted kingfisher, and herring gull were chosen as surrogate species to represent this assessment endpoint. The osprey and belted kingfisher are common species in the area and feed mainly on fish, making them appropriate choices to represent this assessment endpoint. The herring gull is a common omnivorous species in the area that feeds primarily on fish and shellfish along the shoreline, making it an appropriate surrogate species for this assessment endpoint.

Measurement Endpoints

Measurement endpoints are a measurable ecological characteristic that is related to each respective assessment endpoint (USEPA, 1997a). Each measurement endpoint is a measure of biological effects (e.g., laboratory toxicity test results). Commonly, biological responses in laboratory toxicity tests or in-field ecological measurements can be compared to reference data to determine whether there is an adverse effect associated with the observed chemical concentrations. The measurement endpoints chosen for each assessment endpoint are presented below.

Assessment Endpoints		Measurement Endpoints
Epibenthic invertebrate growth, survival, and reproduction.	⇨	Comparison of hazard quotients for benthic invertebrates to a target HQ of 1.0. HQs are calculated by dividing sediment chemical concentrations by sediment screening benchmarks. Comparison of blue mussel tissue residues at the Maine Yankee site with blue mussel tissue residues from a reference site. The following endpoints were are also employed, where warranted (based on the results of the sediment and tissue screening process): Statistical comparison of results of 28-day sediment laboratory toxicity tests (growth, survival, and reproduction) with the amphipod, *Leptocheirus plumulosus*, using Maine Yankee and reference sediment. Comparison of benthic community structure at the Maine Yankee site with the benthic community structure at a reference site.
Infaunal invertebrate growth, survival, and reproduction.	⇨	Comparison of hazard quotients for benthic invertebrates to a target HQ of 1.0 Comparison of soft-shell clam tissue residues at the Maine Yankee site with soft-shell clam tissue residues from a reference site. The following endpoints were are also employed, where warranted (based on the results of the sediment and tissue screening process): Statistical comparison of results of 10-day sediment laboratory toxicity tests (growth and survival) with the polychaete *Nereis virens*, using Maine Yankee and reference sediment. Comparison of benthic community structure at the Maine Yankee site with the benthic community structure at a reference site.
Growth, survival, and reproduction of fish.	⇨	Comparison of mean exposure HQs for shortnose sturgeon (derived using estimated tissue residues and literature-based critical tissue residue values) and mummichog (derived from measured tissue residues), to a reference HQ of 1. Comparison of maximum sediment PAH concentrations with sediment concentrations linked with carcinogenic effects in fish.
Growth, survival, and reproduction of aquatic birds.	⇨	Comparison of mean exposure HQ for osprey, belted kingfisher, and herring gull (derived using literature-based toxicological data and site-specific chemical concentrations in fish and invertebrate tissue), to a reference HQ of 1. Exposure estimates include the chemical contribution from sediment

Assessment Endpoints		Measurement Endpoints
		ingestion.

6.2.4 Summary of Available Data

Although limited sediment data were available from a previous site investigation, it was determined early in the ERA process that those data were of insufficient quality and quantity to prepare a thorough ERA or even a complete problem formulation. Therefore, additional surficial sediment (0-3.5 inches) samples were deemed necessary to properly assess the potential ecological risk posed by chemicals in the sediments. Subsequently, three intertidal and three subtidal sediment samples were collected at each outfall, where possible. Specific physical conditions at some outfalls required variations to this sampling plan, as follows:

- Due to the close proximity of Outfalls 005 and 006, and the extent of mudflats in this area, four intertidal samples were collected from the mudflats, and two subtidal samples were collected in the area of Outfalls 005 and 006 (**Figure 2-10**).
- Due to the close proximity of Outfalls 012 and N12, samples were collected at Outfall 012 only.
- No sediment was present in the intertidal area below Outfall 009, therefore intertidal sediment could not be collected.
- At Outfall 010 it was not possible to collect subtidal samples due to the scoured substrate next to the cooling water intake channel.

Sediment samples were analyzed for target compound list (TCL) SVOCs and VOCs, target analyte list (TAL) metals, grain size, total organic carbon (TOC), and percent moisture. Additional sediment was collected at each location for bulk sediment toxicity testing, if warranted based on the results of the chemical analyses. Four petite Ponar grab samples were also collected at each sampling location. The Ponar grab samples were sieved (0.5 mm), and preserved with formalin for future BCSA, if warranted.

In addition to sediment, biota samples were collected for tissue residue analysis. Blue mussels were collected from subtidal or low intertidal locations, and soft-shell clams were collected from intertidal mud flat locations. Mummichog were collected for tissue analysis along the shoreline adjacent to the facility. Biota were analyzed for metals, pesticides, PCBs, SVOCs, and percent lipids.

Sediment samples and biota samples were also collected at a reference site in Brookings Bay, beyond the influence of the Maine Yankee facility (**Figure 2-4**). This site was selected and approved by the regulators, after the original reference site identified in the work plan, which was located on the Damariscotta River, was determined to be unsuitable after an initial site visit. The Damariscotta River site was characterized by a primarily sandy bottom with few mudflats, and a higher salinity than is present in the Back River adjacent to Maine Yankee. Therefore, several sites in the Montsweag Bay area were visited to find an area containing substantial mudflats and salinity similar to that in the Back River. The Brookings Bay site was selected as the reference site because the substrate and salinity were very similar to those at Maine Yankee and there were no obvious signs of potential sources of chemical contamination in the vicinity (e.g., industrial facilities or major roads).

At the reference site, sediment and biota samples were collected at three intertidal and three subtidal locations. Sediment and biota samples were analyzed for the same suite of parameters as the site samples.

Preliminary evaluations and discussions with the regulators during work plan development concluded that there were no surface water exposure pathways of concern. This is reflected in the ecological site model. Thus surface water was not sampled. The rationale for this relates to the small size of the outfall areas relative to the receiving water bodies (Back River and Bailey Cove), and the low volume and intermittent flow from the outfalls. The Back River and Bailey Cove are tidally influenced, which results in mixing and flushing of potential site-related chemicals.

6.3 SCREENING PHASE OF THE ECOLOGICAL RISK ASSESSMENT

The purpose of the screening phase of the ERA is to make an initial determination of the potential for risks based on conservative assumptions and methodologies. If such risks are possible, the results of the screening phase are then used to focus subsequent steps of the ERA process on the areas, chemicals, media, and receptors with the highest risk potential.

6.3.1 Sediment Benchmarks

The purpose of screening benchmarks is to establish chemical exposure levels that represent conservative thresholds for adverse ecological effects. The chronic screening values used for selection of chemicals of potential concern (COPCs) in sediment are presented in **Table 6-1**. The following hierarchy was used to select sediment screening values (Appendix E, Stratex, 2001d):

(1) If an effect range-low (ER-L) saltwater sediment screening value from the National Oceanographic and Atmospheric Administration (NOAA, 1999 and Long *et al*., 1995) was available, it was used preferentially;

(2) If saltwater ER-L values were not available, the saltwater threshold effect levels (TEL) from Environment Canada's Interim Sediment Quality Guidelines (1995) were used;

(3) If saltwater ER-L or TEL values were not available, a freshwater sediment screening value (e.g., a lowest effect level) from the Ontario Ministry of the Environment (OMOE) (Persaud, *et al*., 1993), was used; and

(4) If none of the above screening values were available, then a variety of other literature sources were used to obtain screening values for selection of sediment COPCs.

For the purpose of adjusting TOC-dependent sediment quality criteria for selection of COPCs, sample-specific TOC values were used.

6.3.2 Sediment Benchmark Screening

The full data set was evaluated and analytes not detected in any samples were eliminated. Compounds detected in blanks and common laboratory contaminants (i.e. acetone and methylene chloride) were also eliminated from consideration. The next step was a comparison of results from individual samples to sediment screening values. Chemicals with concentrations less than the sediment screening values were eliminated from further consideration.

Comparison of detected chemicals to screening benchmarks are shown in **Tables 6-2 through 6-8**. The data for each habitat (i.e. subtidal or intertidal) at each outfall is represented in a separate table. Only chemicals that exceeded the benchmark in one or more samples in the group are presented in the table. There were no benchmark exceedences for intertidal sediments at Outfalls 008 and 012 or for subtidal sediments at Outfall 012. Therefore, no screening tables are presented for these areas. The data in the table are represented as "Benchmark Quotients" (BQ) or the sediment concentration divided by the benchmark. Thus a quotient of 1.0 represents a sediment concentration equal to the benchmark, a value greater than 1.0 represents a sediment concentration greater than the benchmark, and a value less than 1.0 represents a sediment concentration less than the benchmark.

6.3.3 Relationship to Reference Area

Naturally-occurring chemicals (i.e., metals) above sediment screening benchmarks were compared to concentrations present in the reference area. The chemicals present at the outfall stations at concentrations comparable to the reference stations were identified. Unless they were found to have a distinct distribution pattern, (e.g., highest chemical concentration immediately in front of the discharge and declining to the sides and offshore) these chemicals were eliminated from further consideration.

The BQ of four metals (arsenic, iron, mercury, and nickel) exceeded 1.0 at many stations, but with an average BQ for all outfall stations of 0.9 or less (**Table 6-9**). Two other metals (barium and zinc) slightly exceeded the screening benchmarks at a few locations. The concentrations of all of these metals at the reference site generally exceeded the concentration at the outfall stations. As indicated in **Table 6-9**, the mean "Reference Quotient" (site chemical concentration divided by the appropriate reference chemical concentration) was 0.8 or less for all of the metals with a maximum Reference Quotient of 2.4 and only 23% of the stations with a quotient above one. Based upon this analysis, the concentration of the metals at the outfall stations were considered to be at regional background levels and eliminated as possible COPCs.

6.3.4 Identification of Preliminary Chemicals of Potential Concern

After comparison to benchmarks and reference concentrations (inorganics), there were only a limited number of sampling stations and chemicals with Benchmark Quotients greater than 1.0. Consideration of other factors indicated that additional sediment sampling at some of these stations was not warranted, as summarized below:

- The benchmark for several SVOCs (anthracene, benzo(a)anthracene, indeno(1,2,3-cd)pyrene and fluorene) were exceeded at Stations 1 (Outfall 005/006 intertidal), 3

(Outfall 005/006 intertidal), 6 (Outfall 005/006 subtidal) and 18 (Outfall 009 subtidal). The exceedences were minimal (BQ of 1.3 or less). Based on this evaluation, there does not appear to be an elevated risk associated with these chemicals because the exceedences are minimal.

- Four SVOCs (benzo(a)anthracene, bis(2-ethylhexyl)phthalate, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene) exceeded screening benchmarks at Station 26 (Outfall 011, center intertidal) with BQs ranging from 1.1 to 1.5. The exceedences of benchmarks were minimal. Therefore minimal potential risk exists to the benthic community and further sampling was not recommended for this station.

Based upon the results of the sediment screening, no further sediment sampling or testing was deemed necessary at Outfalls 008, 011 and 012. Except for metals with higher concentrations at the reference site and a limited number of SVOCs as noted above, no chemicals exceeded benchmarks at these outfalls. Thus potential risk could be fully evaluated at these three outfalls using the bulk sediment chemistry results and biota tissue residue analysis without the need for further data collection.

There were 12 SVOCs detected at Station 20 (Outfall 010, center intertidal) that exceeded the screening benchmark by 3 to 23 times (**Table 6-10**). The ecological risk at this station could not be characterized from bulk sediment chemistry alone and toxicity testing at this site was warranted. Station 20 was located within the visible drainage channel leading from Outfall 010, whereas the other two intertidal stations were located outside of the channel on either side of Station 20. The concentrations at the other Outfall 010 stations were all well below benchmarks and/or comparable to concentrations at the reference area. Therefore, potential risk could be characterized based on bulk sediment chemistry at these two stations.

There were exceedences of SVOC benchmarks at four of the six stations at Outfall 005/006 (**Table 6-10**). At three of the four stations, there were two or fewer chemicals that exceeded the benchmarks (BQs of 1.2 or less); however, at Station 4 (intertidal), there were 8 exceedences, with BQs ranging from 1.2 to 5.8. Therefore, potential risk could not be adequately characterized at this station without additional information, and toxicity testing was conducted at this station. No toxicity testing was recommended for the other stations at Outfall 005/006 because of the limited number and magnitude of exceedences.

Station 16 (Outfall 009, subtidal) had the highest concentrations of SVOCs. Fourteen SVOCs exceeded the sediment screening benchmarks with BQs ranging from 4 to 44 (**Table 6-10**). Consequently, toxicity testing was recommended for this station. There was only one SVOC exceedence of a benchmark at other Outfall 009 stations (Station 18) and it was relatively minor (BQ=1.3).

6.3.5 Sediment Investigation at the Transmission Line (Silt Spreading) Area

An additional area was identified for investigation after the stormwater outfall samples were collected and evaluated. This area is the silt spreading area adjacent to the 345 kV Transmission Line. The area is a small intertidal mudflat surrounded by salt marsh. Three sediment samples were collected from the mudflat area and analyzed for SVOCs, PCBs, pesticides, and TAL metals. These data were compared with the sediment screening benchmarks used in the outfall evaluation and the maximum reference concentrations. **Table**

6-11 shows the BQs and RQs for those chemicals that exceeded the sediment screening values. The evaluation showed that several metals and two PAHs (acenaphthene and benzo(a)anthracene) were present in the sediment at concentrations exceeding the screening values. The metal concentrations were similar (less than 2 times reference) to the corresponding reference concentrations, with RQs ranging from 0.6 to 2.5 and only one RQ greater than 2.0. The highest RQ of 2.5 was for manganese, which had a corresponding BQ of only 1.3. Although benzo(a)anthracene was detected above the screening value, the concentrations of this chemical are consistent with those detected at Outfall 011 and at the reference site. Acenaphthene was detected above the screening value in one of the three samples, but was not detected in the other two samples, or in the duplicate sample at the same location. Therefore, it is unlikely that the isolated occurrence of this chemical represents a source of elevated ecological risk. Additional evidence to support this conclusion can be drawn an alternative screening value for this chemical. A marine equilibrium partitioning (EqP)-based value of 1,100 µg/kg at 1 percent TOC is available from the EcoTox Thresholds (USEPA, 1996a). Since the concentration of this chemical is below the EqP value, the chemical is not likely to be bioavailable in sufficient quantities to present an ecological risk. Therefore, this evaluation suggests that there is minimal ecological risk in the sediments of the silt spreading area; therefore, no further investigation was recommended for this area.

6.3.6 Biota Tissue COPC Concentrations Relative to Reference and Screening Values

As part of the risk evaluation for the marine benthic community near the outfalls, soft-shelled clam, blue mussel, and mummichog samples were collected and their tissues were analyzed for chemical residues to assess potential risk from bioaccumulative chemicals.

Tissue Residue Screening Values

Since ingestion-based toxicity values for fish species are lacking for many chemicals, the critical body residue (CBR) approach was used instead of food web models to evaluate potential risk to the shortnose sturgeon and mummichog. Similarly, the CBR approach was used to evaluate the chemical residues measured in the clam and blue mussel samples as well. The CBR approach has several advantages, including: the integration of bioavailability and exposure from all routes by the exposed organism, and assumptions regarding steady state, equilibrium, or uptake kinetics are not required (USEPA, 2000a).

For many chemicals, the measured tissue residues were compared with tissue screening concentrations (TSCs) calculated using the methodology described in Shepard (1998). This method is based on the assumption that the USEPA's ambient water quality criteria (AWQC), which are protective of 95% of all aquatic genera, can be used to calculate bioconcentrated tissue residues that, if not exceeded, should also be protective of 95% of all aquatic genera. The method is based on a one-compartment first-order kinetic toxicological model, using BCF values and the AWQC to calculate the TSCs. The validity of the calculated TSCs was confirmed by the author by comparing the TSCs with literature-derived effects concentrations. The author found that 94% of the literature values indicated that adverse effects only occur at tissue concentrations higher than the TSCs (USEPA, 1998b). Therefore the TSCs were deemed appropriate for a conservative screening evaluation.

Additional tissue benchmarks were compiled from tissue residue effects levels found in the literature for chemicals without a TSC.

Clam and Mussel Tissue

Clams and mussels were collected for tissue analysis from locations co-located with the sediment sampling locations at each outfall, except Outfalls 005/006 and Outfall 009. At Outfall 005/006, there was no mussel habitat close to the outfalls and corresponding with the sediment sampling locations. Therefore three additional clam samples were collected instead. At Outfall 009, there was no intertidal habitat present, so only mussels could be collected there. Clam and mussel tissues were also collected from the reference site. Potential risk attributable to the Maine Yankee facility was assessed by comparing tissue residue concentrations from the outfall locations with tissue residue concentrations at the reference location. This comparison resulted in Tissue Concentration Ratios (TCRs), which were calculated by dividing the tissue concentrations for a given outfall location by the maximum reference tissue concentration.

Potential risk was also evaluated by comparing chemical residue concentrations with tissue screening values. A hazard quotient (HQ) was calculated for each chemical by dividing the tissue concentration by the appropriate screening value. For many chemicals, the measured tissue residues were compared withTSCs calculated using the methodology described in (USEPA, 1998b). Summary tables of the tissue residue results for clams and mussels are presented in **Tables 6-12 through 6-15**. These tables present TCRs and HQs for the maximum chemical concentrations detected in each tissue type at each outfall (**Tables 6-12 and 6-14**). **Tables 6-13 and 6-15** present TCR values for individual biota samples at each outfall. Chemicals that were not detected in any of the samples, or that had TCRs and HQs less than 1.0, are not shown in the tables.

For clam tissue, the majority of the metals, four pesticides, and several SVOCs were detected at concentrations corresponding to TCRs or HQs greater than 1.0 at one or more outfall locations (**Table 6-12**). Outfall 005/006 had the greatest number of TCRs above 1.0, with most of the metals, two pesticides, and nine SVOCs detected at maximum concentrations greater than the reference tissue concentrations. The majority of the TCRs greater than 1.0 were for clam tissue from locations MY06SD01 (closest to Outfall 006) and MY06SD02 (closest to Outfall 005). The other four sampling locations at this outfall had few TCRs greater than 1.0 (**Table 6-13**). Although many chemicals were detected at concentrations greater than the reference concentrations, most of these chemicals were below their tissue screening values or exceeded the screening value in the reference tissue as well. Most of the TCRs were between 1.0 and 2.0 and all but one TCR was below 3.5 (dieldrin). Clams collected at Outfall 008 had the lowest tissue chemical concentrations, with no chemicals detected at concentrations higher than the reference tissue concentrations (**Table 6-13**). Outfalls 011 and 012 had several TCRs greater than 1.0, but only one TCR greater than 2.0. Several SVOCs were detected in clam tissue from Outfall 010 at concentrations higher than the reference tissue concentrations (TCRs ranging from 1.1 to 1.8). As previously mentioned, no clams were collected at Outfall 009 because of the lack of intertidal habitat there.

For mussel tissue, several metals, pesticides, and SVOCs were detected at concentrations exceeding those in the reference tissue. Outfall 008 had the fewest chemicals with TCRs above 1.0, with only three metals and two pesticides detected above reference tissue concentrations (**Table 6-14**). Of these chemicals, only chromium also exceeded the tissue screening value. The aluminum, chromium, and nickel tissue screening values were exceeded in all the tissue samples, including the reference. Therefore, it is likely that the screening value is overly conservative and the concentrations detected do not pose a significant risk to mussels.

Mussel tissue from Outfall 009 showed bioaccumulation of several SVOCs, with TCRs ranging from 1.3 to 4.3 (**Table 6-15**). In contrast, no SVOCs were detected above reference mussel tissue concentrations at Outfall 008, and only two SVOCs were detected at concentrations slightly above the reference tissue concentrations at Outfalls 010 and 011 and one SVOC at Outfall 012 (TCRs ranging from 1.03 to 1.3).

A few pesticides were detected at concentrations higher than reference concentrations in mussel tissue from each of the outfalls. However, none of the pesticide concentrations exceeded tissue screening values.

Although several metals were detected in mussel tissue at concentrations higher than in the reference tissue, only five metals also exceeded their tissue screening values (**Table 6-14**). Four of the five metals also exceeded the screening value in the reference tissue. Only mercury was detected in the reference mussel tissue at a concentration below the screening value (HQ of 0.8), but in the site mussel tissue (Outfall 012) at a concentration slightly higher than the screening value (HQ of 1.3). No mussels were collected at Outfall 005/006 because of the lack of mussel habitat close to the outfalls and sediment sampling locations.

Overall, the evaluation of the chemical residue in the clam and mussel tissue suggests that no elevated chemical residues (relative to the reference site) exist in clams and mussels at Outfalls 008, 011, and 012. The results further suggest that there are slightly elevated chemical concentrations in biota at Outfalls 005/006 and 010, and substantially elevated chemical concentrations in blue mussels at Outfall 009, compared with the reference site.

Few chemicals at a given outfall were found to have TCRs greater than 2.0 and also have HQs greater than 1.0. For soft-shell clams, only three chemicals exceeded these criteria; arsenic at Outfall 005/006, copper at Outfalls 005/006 and 012, and nickel at Outfalls 010 and 011. There were also five chemicals (cobalt, manganese, vanadium, anthracene, and phenanthrene) that had TCRs greater than 2.0, but for which there were no screening values available. For blue mussels, only one chemical, chromium, had a TCR greater than 2.0 and an HQ greater than 1.0. There were also several PAHs with TCRs greater than 2.0, but for which there were no screening values.

Mummichog Tissue

Since mummichog are a mobile receptor, samples of this species could not be collected from outfall-specific areas. Therefore, composite samples were collected from each side of Bailey Point using minnow traps placed along the shoreline. Mummichog were also collected at the reference site for comparative tissue concentrations. The chemical residues measured in the mummichog tissue samples were compared with reference mummichog chemical residues from the reference site in Brookings Bay. Tissue residues were measured from whole body composite samples of many individual fish. Care was taken to ensure that composite samples were comprised of similar proportions of different sized fish [i.e., Reference Site: 50 percent large fish (6-8 cm), 50 percent small fish (4-6 cm); west side: 50 percent large, 50 percent small; east side: 36 percent large, 64 percent small (sample 1), and 37 percent large, 63 percent small (sample 2)]. The results of the chemical residue analyses for mummichog tissue are presented in **Table 6-16**. Tissue chemical residues from samples collected at the facility were compared with reference tissue concentrations by calculating TCRs. A TCR value greater than 1.0 indicates that the tissue residue for a given chemical is greater in the mummichog sample collected at the facility than in the reference mummichog sample. This evaluation revealed that many of the metals detected in mummichog tissue from the site were present at higher concentrations than in the reference tissue. However, in two of the mummichog samples, most of the metal concentrations were only slightly (less than two times) higher than in the reference sample. The third mummichog sample, one of the composite samples collected on the east side of the facility (Back River) contained several metals (barium, chromium, cobalt, iron, nickel, and vanadium) at concentrations substantially higher than those in the reference tissue.

When compared with the tissue screening effects values, the concentrations of two metals (copper and zinc) in the mummichog tissue slightly exceeded screening values (**Table 6-16**). However, since the magnitude of the exceedences was low (HQs ranging from 1.01 to 1.06) and the concentrations in the reference tissue were similar (HQs of 0.84 for copper and 0.99 for zinc), it is unlikely that these metals pose an elevated risk to mummichog and similar fishes in the area.

Several pesticides, two PCBs, and several PAHs were detected in all of the mummichog samples (**Table 6-16**). Three pesticides (DDT, alpha-BHC, and alpha-chlordane) and several PAHs were detected at concentrations slightly higher than reference concentrations in some of the samples. However, only two PAHs (acenaphthene and anthracene) were detected at concentrations higher than reference concentrations in all the samples (TCRs ranging from 1.2 to 1.7). Five other PAHs were present at concentrations slightly higher than reference concentrations in the mummichog sample from the west side of the facility (Bailey's Cove). None of the pesticides or PCBs detected exceeded screening values and thus are unlikely to pose a risk to mummichog and similar fishes.

Screening values were not available for most of the PAHs detected. However, screening values for acenaphthene and naphthalene were available and all the detected PAH concentrations were below these screening values. Thus, the PAHs detected in the mummichog tissue likely do not pose a significant ecological risk. However, there is some uncertainty in using tissue chemical residues to evaluate potential risk from this group of compounds. PAHs are generally metabolized and depurated rapidly by fish. Thus, tissue chemical residues may underestimate potential effects from PAHs, particularly their carcinogenic properties. Therefore, additional evaluation was undertaken to evaluate the potential risk posed to fishes from PAH contamination. This discussion is presented in the Risk Characterization section of the ERA.

There were no chemicals detected in mummichog tissue with both TCRs > 2.0 and HQs > 1.0. However, there were four chemicals with TCRs > 2.0, but for which there were no screening values available. These chemicals were barium, cobalt, iron, and manganese.

6.3.7 Baseline Ecological Risk Assessment Data Collection Activities

Based upon the results of the screening phase, it was determined that additional information, including bulk sediment toxicity and benthic community structure, was warranted for some of the stations to support a baseline risk characterization. The decision as to where additional investigation was warranted was arrived at through coordination and concurrence with the state and federal regulators. The outfalls where additional study was deemed necessary included Outfall 005/006, Outfall 009, and Outfall 010, for the stations listed below:

- Station 16 (Outfall 009, subtidal)
- Station 4 (Outfall 005/006, intertidal)
- Station 20 (Outfall 010, center intertidal)
- Intertidal Reference Station 2 (for comparison). In order to fully evaluate and compare the toxicity testing results at the stations recommended above, it was necessary to perform toxicity testing on an intertidal station at the reference area.

A second round (November 2001) of sediment samples was collected for chemical analysis and toxicity testing at the stations listed above. Benthic grab samples, archived during the first round of sediment sampling (September 2001), were analyzed for BCSA at these stations as well. The results of the November 2001 analyses were compared with the initial chemistry results (**Table 6-17**). This comparison shows that the chemical concentrations in the sediment collected for the toxicity testing were generally similar to the concentrations in the first round of sediment sampling. However, the concentrations of SVOCs at MY06SD04 (Outfall 005/006) were generally lower in the second round, with none of the SVOCs exceeding benchmarks. Additionally, the two SVOCs, acenapthene and fluorene, which exceeded the screening benchmarks at only Outfall 005/006, Station MY06SD04, in the first round of sampling were not detected in the second round of sampling at this location. Fluorene was also detected at MY06SD16 (Outfall 009) at the highest concentration observed at any of the stations, although it was not detected there in the first round of sampling.

6.4 BASELINE PROBLEM FORMULATION

The final (baseline) problem formulation is a refinement of the preliminary (screening) problem formulation and is focused on defining the issues associated with the primary COPCs identified in the screening phase. The final problem formulation consists of an evaluation of the toxicity of key COPCs and a refined ecological site model.

6.4.1 Toxicity Evaluation

The classes of compounds represented by COPCs are limited to SVOCs. Based upon the screening results several SVOCs may pose a risk to populations of benthic invertebrates inhabiting certain areas near the facility.

Most of the SVOCs detected in the sediments at Maine Yankee are PAHs. PAHs were detected at concentrations exceeding the screening benchmarks at Outfalls 005/006, 009, 010, and 011. In aquatic environments, PAHs rapidly become adsorbed to organic and inorganic particulate materials and are deposited in sediments (Neff, 1985). Once adsorbed to sediment, PAHs can have limited bioavailability to aquatic organisms (Neff, 1985). However, PAHs deposited in sediments can be toxic to benthic invertebrates.

In aquatic environments, exposure to ultraviolet light can result in photomodification of some PAHs to products with increased polarity, water solubility, and toxicity compared to the parent compound (Duxbury *et al*., 1997). Ireland *et al*. (1996) showed that the photoinduced toxicity of PAHs to the daphnid, *Ceriodaphnia dubia*, occurred frequently during low-flow conditions and wet weather runoff, and was reduced in turbid conditions. In studies on the marine amphipod, *Rhepoxynius abronius*, ultraviolet radiation exposure enhanced the toxicity of fluoranthene and pyrene in sediments, but did not affect the toxicity of acenaphthene and phenanthrene (Swartz *et al*., 1997). Pelletier *et al*. (1997) found that the phototoxicity of individual PAHs (anthracene, fluoranthene, pyrene) to marine bivalves (*Mulinia lateralis*) and marine shrimp (*Mysidopsis bahia*) were 12 to >50,000 times that of conventional toxicity.

Fish may be at risk from chronic exposure to PAHs. PAH contamination in sediments has been shown to be correlated with histopathological abnormalities at a number of sites (Baumann *et al*., 1982; Malins *et al*.,1984 *cited in* Pastorok *et al*.,1994). Reductions in fish populations from acute exposures to areas of high PAH contamination is less likely; avoidance of areas with high PAH contamination has been demonstrated in some fish species (North *et al*., 1964 and Rice, 1973, cited in Pastorok *et al*., 1994).

The capacity to metabolize PAHs varies among organisms. Varanasi *et al*. (1985 *cited in* ATSDR, 1995) ranked the extent of benzo(a)pyrene metabolism by aquatic organisms as follows: fish > shrimp > amphipods > crustaceans > mussels. The fact that mussels are ranked last may be because mussels show no or limited mixed function oxidase (MFO) activity. MFO is an enzyme system responsible for the initiation of metabolism of various lipophilic organic compounds, including PAHs (Neff, 1985).

6.4.2 Refined Ecological Site Model

Results of the sediment screening indicated that metals and SVOCs pose a potential risk to the benthic community at some of the outfalls. The sources of these site-related chemicals are likely from historical spills and runoff from the facility, and subsequent discharge through the stormwater outfalls to the sediments in the vicinity of the outfalls. Receptors potentially at risk include benthic invertebrates, fish, and aquatic birds (**Figure 6-1**). Benthic invertebrates and fish may be exposed to chemicals via direct contact with chemicals in the sediment. Piscivorous birds and fish may be exposed through direct contact with the sediments as well, but are more likely exposed through ingestion of prey that contain bioaccumulative chemicals in their tissue. Fish may be at risk from the carcinogenic properties of PAHs in the sediments. This risk may not be apparent from tissue residues or ingestion-based toxicity values because these compounds are rapidly metabolized and their degradation products are most responsible for carcinogenic effects.

6.5 ECOLOGICAL EXPOSURE AND EFFECTS ASSESSMENT

Ecological exposure assessment is the process of estimating or measuring the amount of a COPC in environmental media (sediment, food items) to which an ecological receptor may be exposed.

COPC exposures were assessed for ecological receptors using the following methods:

- Measurement of chemical concentrations in sediments adjacent to outfalls.
- Dose calculations for upper trophic level receptors using food web models.

Ecological effects assessment is the process of estimating or measuring the potential adverse effects to ecological receptors associated with the COPCs.

Potential COPC effects were assessed for ecological receptors using the following methods (measurement endpoints):

- Comparisons of sediment COPC concentrations with sediment benchmarks;
- Evaluation of site tissue COPC concentrations relative to the reference location;
- Evaluation of biota tissue COPC concentrations relative to tissue screening values;
- Comparison of calculated COPC dosages for upper trophic level receptors to toxicity reference values;
- Assessment of bulk sediment toxicity test results and comparison of these results with the reference location results; and
- Analysis of the benthic community structure and comparison to the benthic community structure of the reference location.

6.5.1 Comparison of COPC Concentrations with Sediment Benchmarks

Concentrations of COPCs in sediment were compared to effects-based sediment screening benchmarks in Section 6.3.2 (**Tables 6-2 through 6-8, and 6-10**). The results of the sediment screening for each outfall were ranked, as described below, in relation to the reference site to produce a Weight of Evidence for exposure and effect assessment for the benthic community. The results of this ranking are used in the Risk Characterization phase of the ERA.

Risk Ranking	**Criteria**
Baseline	Chemical concentrations similar to the reference location.
Low	Minor exceedences of benchmarks (i.e., few mean BQs greater than 5), but subsequent tests showed no effects.
Intermediate	Several minor exceedences of benchmarks, and subsequent tests showed adverse effects.
High	Substantial exceedences of benchmarks (i.e., several mean BQs greater than 5), and subsequent tests showed adverse effects.

Outfall 005/006

For Outfall 005/006, the potential ecological risk relative to the reference site was ranked as low based on the results of the sediment screening. Although toxicity testing was recommended for station MY06SD04, the exceedences were relatively minor and there were few benchmark exceedences at the other sampling locations.

Outfall 008

The potential ecological risk relative to the reference site at Outfall 008 was ranked as baseline, based on the results of the sediment screening. No further sampling or testing was recommended for sediment at Outfall 008. Except for metals with higher concentrations at the reference site, no chemicals exceeded benchmarks at this outfall.

Outfall 009

Based upon the results of the sediment screening, toxicity testing was recommended for Station MY06SD16. Toxicity testing was limited to this station, which is located directly in front of the outfall, because the sediment screening indicated little to no risk was present at the other two subtidal sampling locations. However, the magnitude of the benchmark exceedences at this station warranted a risk ranking of high for the outfall, relative to the reference site.

Outfall 010

Potential ecological risk at Outfall 010 was ranked as low, relative to the reference site. This ranking was based on the sediment screening, which determined that toxicity testing was warranted for Station MY06SD20. Toxicity testing was limited to this station, which is located directly in front of the outfall, because the sediment screening indicated little to no risk was present at the other sampling locations.

Outfall 011

The potential ecological risk relative to the reference site at Outfall 011 was ranked as baseline, based on the results of the sediment screening. No further sampling or testing was recommended for sediment at Outfall 011.

Outfall 012

The potential ecological risk relative to the reference site at Outfall 012 was ranked as baseline, based on the results of the sediment screening. No further sampling or testing was recommended for sediment at Outfall 012.

6.5.2 Evaluation of Chemical Residues in Tissue of Target Receptors

This section describes how chemical residues in the tissue of soft-shell clams, blue mussels, and mummichog were used as indicators of COPC exposure. COPC exposure was assessed by evaluating outfall vs. reference tissue concentration ratios, or TCRs, as outlined in the work plan (Appendix E, Stratex, 2001d). The maximum TCR for each chemical at each outfall was used for this evaluation. To focus the risk characterization on the chemical of most concern, only those chemicals that were identified in the tissue screening as having a

TCR > 2.0 and a HQ > 1.0 in the same samples were carried forward into the risk characterization phase and are summarized in **Tables 6-18 and 6-19**.

The TCRs were ranked as follows to allow a weight of evidence approach for the Risk Characterization phase of the ERA:

- "-" Target species tissue concentration is less than or equal to reference location tissue concentration (TCR ≤ 1);
- "+" TCR > 1;
- "++" TCR > 10; and
- "+++" TCR > 20.

The HQs were ranked as follows to allow a weight of evidence approach for the Risk Characterization phase of the ERA:

- "-" Target species tissue concentration is less than or equal to the tissue screening value (HQ ≤ 1);
- "+" HQ > 1;
- "++" HQ > 10; and
- "+++" HQ > 20.

6.5.3 Exposure Estimation for Upper Trophic Level Receptors

Chemical exposure to upper trophic level fish receptors was evaluated by comparing estimated tissue residues in shortnose sturgeon with critical residue values from the literature associated with adverse ecological effects. Whole body chemical concentrations in shortnose sturgeon were estimated by taking a weighted average of prey item tissue concentrations as described below, and multiply by bioaccumulation factor of ten. A factor of ten was used for a conservative estimate of potential long-term exposure and the high likelihood of exposure due to the life span and foraging behavior of shortnose sturgeon. The average chemical concentrations in mummichog, soft-shell clam, and blue mussel tissues from each side of the facility and the reference area were used in the exposure estimation. Only bioaccumulative chemicals as described in USEPA (2000a) were used in the evaluation.

Since shortnose sturgeon feed on primarily on crustaceans, insect larvae, worms, mollusks, and small fishes (NMFS, 1998; Gilbert, 1989), a dietary input of 40 percent soft-shell clam, 40 percent blue mussel, and 20 percent mummichog was assumed in calculating predicted tissue chemical concentrations. No blue mussels were collected from the west side of the facility (Outfall 005/006); therefore, a dietary input of 80 percent soft-shell clam and 20 percent mummichog was used for this area. Since shortnose sturgeon are long-lived and potentially highly exposed to sediment associated contaminants, a multiplier of 10 was used to conservatively predict tissue chemical concentrations in the sturgeon.

Chemical exposure to aquatic bird receptors was evaluated by estimating daily dosages based on dietary composition and food ingestion rates for each receptor. Only bioaccumulating chemicals, as described in USEPA (2000a), were evaluated for potential exposure to upper trophic level avian receptors.

COPC concentrations from clam, mussel, and mummichog tissue samples were used to calculate the dose to the herring gull. Incidental ingestion of sediment was also included when calculating the total level of exposure for the herring gull. For the kingfisher, mummichog tissue chemical concentrations were used to calculate dose, since the kingfisher feeds primarily on small fishes. For the osprey, estimated fish tissue concentrations for the shortnose sturgeon were used in calculating daily chemical exposure dosages, since osprey feed on larger fishes. The body weights and food ingestion rates shown in **Table 6-20** were used to develop exposure estimates for the avian receptor species.

Dietary intakes for each receptor species were calculated using the following formula (modified from USEPA [1993b]):

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]]]}{BW}$$

where:

DIx	=	Dietary intake for chemical x (mg chemical/kg body wt./day)
FIR	=	Food ingestion rate (kg/day, dry-weight)
FCxi	=	Concentration of chemical x in food item i (mg/kg, dry weight)
PDFi	=	Proportion of diet composed of food item i (dry weight basis)
SCx	=	Concentration of chemical x in sediment (mg/kg, dry weight)
PDS	=	Proportion of diet composed of sediment (dry weight basis)
BW	=	Body weight (kg, wet weight)

For carnivorous wading birds, represented by the herring gull, which feeds on prey in the sediments, potential risk was evaluated for each individual outfall area, since these receptors could potentially be exposed to localized contamination at each outfall. However, for osprey, belted kingfisher, and shortnose sturgeon, potential risk was evaluated for each side of the facility (east and west), since these receptors likely forage over much larger areas and are potentially exposed to chemicals from each outfall area.

6.5.4 Effects Assessment for Upper Trophic Level Receptors

The purpose of the effects evaluation is to establish chemical exposure levels (screening values) that represent conservative thresholds for adverse ecological effects. For fish receptors, tissue chemical residues were estimated (shortnose sturgeon) and compared with critical tissue residue values from the literature associated with adverse effects. Literature values for sturgeon were typically not available, so values for other fish species were used. Critical residue values from studies using dietary exposures were used preferentially over other types of exposure routes. Residue values for whole body concentrations were used preferentially over tissue residues from individual organs. Lowest Observed Adverse Effect Levels (LOAELs) were used as screening values. If LOAEL values were not available, then No Observed Adverse Effect Levels (NOAELs) were converted to LOAELs using an uncertainty factor of ten. The screening values derived from the critical residue values for mummichog and shortnose sturgeon are presented in **Tables 6-21 and 6-22**, respectively.

Ingestion screening values for dietary exposures were derived for each avian receptor species and chemical evaluated. Toxicological information from the literature for wildlife species most closely related to the receptor species was used, where available, but was supplemented by laboratory studies of non-wildlife species (e.g., chicken) where necessary. The ingestion screening values are expressed as milligrams of the chemical per kilogram body weight (wet) of the receptor per day (mg/kg-BW/day).

NOAELs and LOAELs from chronic studies with endpoints of growth or reproduction were selected preferentially. When chronic values were unavailable, estimates were derived or extrapolated from acute values as follows:

- When values for chronic toxicity were not available, the median lethal dose (LD_{50}) was used. An uncertainty factor of 100 was used to convert the acute LD_{50} to a chronic NOAEL (i.e., the LD_{50} was multiplied by 0.01 to obtain the chronic NOAEL).
- An uncertainty factor of 10 was used to convert a reported LOAEL to a NOAEL.

Ingestion screening values for avian receptors are summarized in **Table 6-23**.

A comparison of exposure with effect levels is used to characterize potential ecological risk. The comparison is expressed as a HQ or the ratio of the exposure to the effect level. If the two are equal, the HQ is 1.0. If the concentration at the point of exposure is greater than the effect level, the quotient is greater than one, suggesting a potential risk.

HQs for ecological receptors were calculated as:

$$HQ = Dose_{total} \ / LOAEL \text{ or NOAEL}$$

Chemicals with HQs in excess of 1 for the LOAEL HQ calculation were selected as COPCs. HQs were ranked according to the following method for use in Risk Characterization (**Tables 6-24 through 6-27**):

"-" Dose is less than or equal to the TRV (HQ ≤ 1);
"+" Dose exceeds the TRV (HQ > 1);
"++" Dose exceeds the TRV by a factor of 10 (HQ > 10); and
"+++" Dose exceeds the TRV by a factor of 20 (HQ > 20).

This hazard ranking scheme, while evaluating potential ecological effects to individual organisms, also attempts to evaluate potential population-wide effects. Exposure to COPCs may cause population reductions by affecting birth and mortality rates, immigration, and emigration (USEPA, 1989). In many circumstances, lethal or sub-lethal effects may occur to individual organisms with little population or community level impacts; however, as the number of individual organisms experiencing toxic effects increases, the probability that population effects will occur also increases.

6.5.5 Risk to Upper Trophic Level Receptors

Carnivorous Fish

Risk was evaluated for carnivorous fishes, represented by the shortnose sturgeon, by conservatively estimating chemical residues in whole body tissue and comparing these estimates with adverse effect screening values (**Table 6-24**). This evaluation revealed that several bioaccumulative metals (arsenic, cadmium, copper, lead, selenium, and silver) are present in the prey of benthic-feeding carnivorous fishes at concentrations that may pose a potential ecological risk. However, all of these metals were also predicted to pose a potential risk at the reference area and predicted HQs were similar between the facility and the reference area, with one exception (arsenic). Therefore, if there is any elevated risk, it does not appear to be associated with the Maine Yankee facility. The one possible exception is for arsenic on the west side of the facility (Bailey's Cove). The predicted HQ for arsenic was 12.18 here, compared with HQs of 6.51 at the reference area and 4.76 on the east side of the facility (Back River). Therefore, a potential risk to shortnose sturgeon and similar fishes from arsenic cannot be dismissed for this area based upon the data collected; however, there is uncertainty in this conclusion because of the assumptions used in the food web calculations (e.g., multiplier of ten to estimate long-term exposure and accumulation may not be appropriate for arsenic).

Although several pesticides, two PCBs, and several PAHs were detected in food items from each of the areas, none of these chemicals were present at concentrations predicted to pose a risk to shortnose sturgeon and similar fishes (**Table 6-24**).

Carnivorous Wading Birds

The herring gull was selected as a representative species for evaluating potential risk to carnivorous wading birds. Daily dosages of each bioaccumulative chemical were estimated and compared with NOAEL and LOAEL values for each chemical and each outfall (**Table 6-25**). This evaluation showed that although many bioaccumulative chemicals were detected in mummichog, clams, and mussels, only the two PCBs (Aroclors 1254 and 1260) and one pesticide (Endrin ketone) detected in these prey items, were predicted to exceed daily NOAEL values (HQs ranging from 1.9 to 3.8 at the site and from 4.7 to 7.5 at the reference area). However, none of the estimated dosages of these chemicals exceeded their daily LOAEL values. Therefore, there is little to no elevated risk to carnivorous wading birds that may forage in the outfall areas around Maine Yankee. In addition, relative to the reference area in Brookings Bay, there is no elevated potential risk from any of the chemicals detected, since the two Aroclors and the pesticide were present at higher concentrations in prey items from the reference area, and thus represent a pervasive presence throughout Montsweag Bay.

Piscivorous Birds

The potential risk to two groups of piscivorous birds was evaluated, birds that feed primarily on small estuarine fishes, such as the belted kingfisher, and birds that feed on larger predaceous fishes, such as the osprey. The potential risk to these groups of birds was evaluated by comparing estimated daily dosages of the bioaccumulative chemicals detected in prey items with NOAEL and LOAEL values for the chemicals (**Tables 6-26 and 6-27**, for the kingfisher and osprey, respectively).

This evaluation revealed that for the kingfisher and similar birds, the dosages of only two chemicals, mercury and zinc, exceeded their NOAEL values at both the site and the reference area. The estimated daily dosages of all the other bioaccumulative chemicals were below their NOAEL values. The dosages of these metals did not exceed their LOAEL values. Since the NOAEL exceedences were similar between the site and the reference area for both mercury and zinc, and the dosages did not exceed their LOAEL values, it is unlikely that either of these metals poses an elevated site-related risk to piscivorous birds such as the belted kingfisher.

The evaluation for piscivorous birds, such as the osprey, that feed on larger predaceous fishes, revealed that the dosages of five bioaccumulative metals (arsenic, chromium, mercury, selenium, and zinc) exceeded their NOAEL values on each side of the facility and at the reference site (**Table 6-27**). The daily dosage of arsenic was also predicted to exceed the NOAEL value at only one location, the west side of the facility (Bailey's Cove). However, the dosage was only slightly above the NOAEL value (HQ of 1.49) and the LOAEL value was not exceeded. Although the NOAELs were exceeded for chromium, selenium, and zinc at all the areas, none of the estimated dosages of these metals exceeded their LOAEL values and the exceedences were similar to those at the reference site. Therefore, it is likely that these metals do not pose an elevated, site-related risk to piscivorous birds. The one metal that exceeded both the NOAEL and LOAEL values at all of the locations was mercury. However, the HQs were similar between the site (east side HQ of 1.59, west side HQ of 1.09) and the reference area (HQ of 1.54). Therefore, although a potential risk from mercury cannot be dismissed for piscivorous birds that feed on larger predaceous fishes, the potential risk appears to be pervasive throughout Montsweag Bay and thus is likely unrelated to activities at the Maine Yankee facility. No other bioaccumulative chemicals were predicted to pose potential ecological risk, since all calculated dosages were below their respective NOAEL values.

6.5.6 Toxicity of Site Sediment Versus Reference Sediment

Bulk sediment toxicity tests were conducted with sediment collected in November, 2001 from Station 16 (Outfall 009), Station 4 (Outfall 005/006), Station 20 (Outfall 010), and Reference Station 2. These stations were identified as locations where further study was needed to characterize the potential ecological risk based on the comparison to sediment screening values. The sediment screening results alone were deemed sufficient to assess the potential risk at the other outfall locations (CH2M HILL, 2001b). An intertidal reference station was included to compare test results for site sediments with results from comparable reference sediments. Sediment chemical analyses were performed, as well, to check for comparability with earlier sediment chemistry results. Toxicity tests included a 10-day test (growth and survival) with the polychaete *Neanthes arenaceodentata* and a chronic 28-day test (growth, survival, and reproduction) with the amphipod *Leptocheirus plumulosus*. *Neanthes arenaceodentata* is widely distributed throughout the world (ASTM, 1994) while *Leptocheirus plumulosus* is an Atlantic coast estuarine species, found from Cape Cod, Massachusetts to northern Florida (USEPA, 2001). Results from each of these tests were compared to the reference location. The test results were statistically analyzed according to ASTM (1994) and USEPA guidance (USEPA, 2001d) to determine if any of the three test sediments were significantly different (alpha level of 0.05) from the reference sediment, with respect to survival or growth (*N. arenaceodenta* and *L. plumulosus*) or reproduction *(L. plumulosus*). The results of these tests are summarized in **Table 6-28**. The raw data and laboratory report is provided in **Appendix I**

As shown in **Table 6-28**, for the 10-day test with *Neanthes arenaceodentata* there were no statistical differences in survival or growth of this organism in any of the outfall sediments, compared with the reference sediments. The control sample exhibited 100 percent survival for this test , which met test performance criteria.

The results of the 28-day test with *Leptocheirus plumulosus* showed similar results for Outfalls 009 and 010, with no statistical differences in survival, growth, or reproduction of this organism in the outfall sediments, compared with the reference sediments. However, for the Outfall 005/006 sediment, significantly less survival (43%) was measured compared with the reference sediment (67%). However, only 75% of the organisms survived in the control sample for this test, which is slightly less than the 80% performance criteria for this test (USEPA, 2001d). Therefore, there is uncertainty associated with these results. There were no significant differences measured for growth or reproduction of this organism in the Outfall 005/006 sediments, in comparison to the reference sediments.

Overall the results of the sediment toxicity testing suggest that there is no risk of toxicity to benthic invertebrates from the sediments at Outfalls 009 and 010. The results for Outfall 005/006 suggest some amphipod toxicity in the laboratory test with *L. plumulosus*. There is uncertainty in this conclusion, however, since there was also mortality in the controls and there were no statistically significant differences measured in *L. plumulosus* growth and reproduction.

These measures, one from each toxicity test, were ranked as follows for use in the Risk Characterization phase of the ERA:

- "-" no effects for all tests;
- "+" low (+) effects observed for one or more tests or intermediate (++) effects for one test;
- "++" intermediate (++) effects observed for two or more tests or high (+++) effects for one test; and
- "+++" intermediate (++) or higher effects observed for two or more tests, one of which indicates high (+++) effects.

Ranking of Toxicity Test Results

	Outfall 005/006	**Outfall 008**	**Outfall 009**	**Outfall 010**	**Outfall 011**	**Outfall 012**
Sediment Toxicity Testing	Low (+)	–	No Effects (-)	No Effects(-)	–	–

Outfall 005/006

Based on the results of the sediment screening, toxicity testing was recommended for station MY06SD04 (mid-intertidal, in drainage channel). The results of the toxicity testing revealed low potential toxicity at this location, but these results were uncertain.

The toxicity testing showed possible toxicity from the sediment at this outfall. BCSA was performed for this sampling location to gather more information on the health of the benthic community at this outfall.

Outfall 009

Based on the results of the sediment screening, toxicity testing was recommended for Station MY06SD16 (subtidal). Toxicity testing was limited to this station, which is located directly in front of the outfall, because the sediment screening indicated little to no risk was present at the other two subtidal sampling locations.

The toxicity testing showed no apparent toxicity from the sediment at this outfall. However, several SVOCs were detected above sediment screening values, so BCSA was performed for this sampling location to gather more information on the health of the benthic community at this outfall.

Outfall 010

Based on the results of the sediment screening, toxicity testing was recommended for Station MY06SD20 (middle intertidal station). Toxicity testing was limited to this station, which is located directly in front of the outfall, because the sediment screening indicated little to no risk was present at the other sampling locations.

Toxicity testing indicated no toxicity from this sediment. However, since there were several exceedences of sediment screening values at this location, BCSA was performed to aid in assessing whether the chemicals present may have impaired the benthic community and thus pose a potential risk.

6.5.7 Benthic Community Structure

The benthic community structure was analyzed at the outfall locations where toxicity testing was performed:

- Station 16 - Outfall 009, subtidal
- Station 4 - Outfall 005/006, intertidal
- Station 20 -Outfall 010, center intertidal
- Intertidal Reference Station 2 (for comparison)

These stations were identified as locations were further study was needed to characterize the potential ecological risk. The sediment screening results alone were deemed sufficient to assess the potential risk at the other outfall locations (CH2M HILL, 2001b). The BCSA was performed to gather additional information to assist in evaluating the health of the benthic community. BCSA was also conducted for stations MY06SD01, MY06SD02, and MY06SD03 at Outfall 005/006 because the results of the toxicity testing suggested potential toxicity at location MY06SD04. Additionally, one intertidal and one subtidal station at the reference location was analyzed for comparative purposes.

Four petite Ponar grab samples (6" x 6 ") were collected in September, 2001 at each sampling location. The samples were sieved (0.5mm), preserved with formalin, and archived pending the results of the sediment chemical screening and toxicity testing. Macroinvertebrates were identified to the lowest practical taxonomic level (generally, species). Abundance was identified by the total number of individuals at each station (**Table 6-29**). Diversity was measured by the number of taxa at each station and by calculating the Shannon-Weiner Index (H'), calculated as follows (Pielou, 1977):

<u>Shannon-Weiner Index (H')</u>

$$H' = \{-\sum (n_i/N \log (n_i/N))\}$$

N_i = number of the i^{th} taxon individuals in the sample
N = total number of individuals in the sample

Since natural physical and chemical factors can affect community structure in addition to chemical stress from contamination, total organic carbon (TOC) and sediment grain size was considered in evaluating the benthic community structure at each location. TOC and percent sand/silt/clay/gravel for the sampling locations are presented in **Table 6-30**.

The benthic community data revealed that overall abundance was generally lower in samples collected at the site, than it was in reference site samples. However the average number of taxa in the samples was consistent among all the locations and diversity, as measured by the Shannon-Weiner Index, was generally higher at the outfall locations (**Table 6-31**). The raw BCSA data and laboratory report is provided in **Appendix J**

The sediment where the BCSA samples were collected varied somewhat in TOC and grain size composition. The reference samples contained 2.6 and 3.2 percent TOC (reference station 2 and reference station 5, respectively), whereas the samples from Outfalls 009 and 010 contained only about 1.4 percent TOC. The Outfall 005/006 samples were closer to the reference samples, with values ranging from 1.4 to 2.6 percent TOC. The reference site samples were dominated by silt and clay, with less than 10 percent sand. Samples 3 and 4 collected at Outfall 005/006 were the closest in physical composition to the reference samples. The substrate at Outfall 009 is considerably different than the substrate at the reference site, being characterized by mostly sand and gravel. Stations 1 and 2 at Outfall 005/006 and Station 20 at Outfall 010 also contained much more sand than the reference samples.

To aid in interpreting the benthic community structure, the six overall most abundant species were identified, among both the intertidal and subtidal stations combined. The six species comprised 80 percent of the total number of individuals found and included, in order of overall abundance, *Streblospio benedicti*, *Heteromastus filiformis*, *Neanthes virens*, *Tharyx acutus*, Tubificidae (individuals identified only to family), and *Gemma gemma*. The first four species are polychaetes, segmented marine worms that comprised the bulk of the individuals collected. The family Tubificidae are oligochaetes and *Gemma gemma* are small marine clams. The rank of most abundant species varied somewhat between intertidal (**Table 6-31**) and subtidal stations (**Table 6-32**), with Tubificid worms found in greater abundance in the subtidal samples than in the intertidal samples.

Streblospio benedicti was the most abundant species at five of the eight stations (both reference stations and at three of the four locations at Outfall 005/006). At Outfall 009, Tubificidae were the most abundant organisms, followed closely by *Streblospio benedicti*, while at Outfall 010 *Neanthes virens* was the most abundant species, followed by Tubificidae, with *Streblospio benedicti* being the fourth in abundance. *Heteromastus filiformis* was also relatively abundant (second or third in abundance) at all the stations except Station 16 at Outfall 009, where this species was sixth in abundance. *Tharyx acutus* was second in abundance at both reference stations, but relatively scarce at all the other stations.

Since *Streblospio benedicti* was the numerically dominant species (approximately 42 percent of all individuals) in both the site and reference samples, and the reference site was verified to be relatively free of pollution, this species was not particularly useful as a potential pollution-tolerant indicator species. Therefore, the abundance of the six most abundant species was compared between the reference and site samples. The abundance of these species are compared for the intertidal locations in **Figures 6-2 through 6-7** and for the subtidal stations in **Figures 6-8 through 6-13**.

The results of this evaluation suggest that although there are differences in the abundance of *Streblospio benedicti* (**Figures 6-2 and 6-8**) and *Tharyx acutus* (**Figures 6-5 and 6-11**) between the reference location and the outfall locations, this difference can possibly be explained by the abundance of the predatory species *Neanthes virens* at the outfall locations and its relative scarcity at the reference location (**Figures 6-3 and 6-9**). *Neanthes virens* is a relatively large invertebrate that feeds on smaller relatively immobile invertebrates, such as *Streblospio benedicti* and *Tharyx acutus*. The relative scarcity of *Neanthes virens* at the reference site may be explained by worm harvesting. It is likely that the outfall locations receive little or no worm harvesting pressure, because while the general area is harvested, the areas immediately in front of the outfalls generally are not. In contrast, the reference site is an active worm harvesting area (based on field observations and discussions with the landowner).

Heteromastus filiformis abundance was similar among both the reference and outfall intertidal stations (**Figure 6-4**). At Outfall 009, this species was considerably less abundant than at the reference subtidal station (**Figure 6-10**). This difference is likely related to some degree by the differences in substrates between the reference site and Outfall 009. The sediment at the Outfall 009 location was dominated by sand and gravel, whereas the reference subtidal area was dominated by silt and clay, which is a more favorable habitat for this species.

The relative abundance of Tubificid worms at Outfalls 009 and 010 (**Figures 6-6 and 6-12**) compared with the reference site locations and the Outfall 005/006 locations, combined with the presence of *Capitella capitata* (**Table 6-32**) suggests possible impairment of the benthic community at Outfall 009 and, to a lesser extent, at Outfall 010. *Capitella capitata* is perhaps the best known benthic indicator species for pollution tolerance, and an abundance of Tubificid worms is generally an indication of an organically enriched or oxygen-deficient environment. However, some genera such as *Spirosperma* and *Varichaetradrilus* are contaminant sensitive (Engle and Summers, 1998). Polychaetes of the genus *Eteone* are often present in contaminated sediments and can often be found along with *Capitella* (Engle and Summers, 1998).

These results were used in the overall ranking of benthic community structure to produce a Weight of Evidence used in the Risk Characterization phase of the ERA:

- "-" no effects for all indicators;
- "+" low (+) effects observed for one or more indicators or intermediate (++) effects for one indicator;

“++” intermediate (++) effects observed for two or more indicators or high (+++) effects for one indicator; and

“+++” intermediate (++) or higher effects observed for two or more indicators, one of which indicates high (+++) effects.

Ranking of the Benthic Community Structure Analysis

	Outfall 005/006	Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012
Benthic Community Structure Analysis	No Effects (-)	–	Intermediate (++)	Low (+)	–	–

6.6 RISK CHARACTERIZATION

This section characterizes the ecological risk posed by chemicals in the sediments at Maine Yankee based upon the information presented in previous sections. Risk is characterized for each outfall. A weight of evidence approach was used to combine the results from each endpoint and present an integrated risk characterization. The lines of evidence used in the risk characterization are described below for each assessment endpoint and outfall.

6.6.1 Ecological Risk at Each Outfall Based on the Weight of Evidence

A weight of evidence approach was used to characterize offshore ecological risk associated with Maine Yankee. The weight of evidence was based on the analysis of exposures and effects. The weights of evidence for exposure were namely tissue concentration ratios and sediment benchmark quotients; likewise, the weights of evidence for effects were namely laboratory toxicity testing, benthic community structure, and receptor food web modeling.

Each line of evidence was evaluated and ranked, according to the following criteria, for use in the characterization of overall potential risk at each outfall.

- Baseline: No elevated risk (-) relative to the reference site;
- Low: Low (+) ranking for one or more indicators relative to the reference site, or intermediate (++) ranking for only one indicator;
- Intermediate: Intermediate (++) ranking relative to the reference site in two or more indicators, or high (+++) for only one indicator;
- High: High (+++) ranking for two or more indicators.

Important to the interpretation of risk is the extent to which elevated exposure relative to reference conditions and adverse effects occur concurrently. Where this concurrence exists, there is strong evidence that there is a complete exposure pathway between the contaminants and the receptors of concern. The joint probability of exposure and effects will be used to presume the probability of risk for each outfall, as follows:

- Baseline Risk: No greater than Baseline ranking for both exposure or effects, relative to the reference site ranking;

- Low Risk: No greater than Low ranking for both exposure and effects relative to the reference site;
- Intermediate Risk: Intermediate ranking for both exposure and effects, or High or intermediate ranking for one and no greater than Low ranking for the other, relative to the reference site; and
- High Risk: High ranking for either exposure or effects, and Intermediate or High ranking for the other, relative to the reference site.

Summary of the Weight of Evidence and the Overall Potential Ecological Risk Relative to the Reference Site for each Outfall

	Outfall 005/006	Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012
Sediment Screening*	Low	Baseline	High	Low	Baseline	Baseline
Sediment Toxicity Testing	Intermediate	–	Baseline	Baseline	–	–
Benthic Community Structure Analysis	Baseline	–	Intermediate	Low	–	–
Clam / Mussel Tissue Screening*	Low	Low	Intermediate	Low	Low	Low
Mummichog Tissue Screening*	Low	Low	Low	Low	Low	Low
Shortnose Sturgeon Exposure	Low	Baseline	Baseline	Baseline	Baseline	Baseline
Avian Receptors Exposure	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Overall Potential Risk	**Low**	**Low**	**Intermediate**	**Low**	**Low**	**Low**

* Risk determinations based on the location of maximum concentrations at each outfall.

6.6.2 Benthic Community

Outfall 005/006

Based on the lines of evidence gathered, there appears to be some effect on the benthic community near Outfall 005/006. This is indicated by the apparent toxicity of the sediment at Station MY06SD04 to the amphipod *Leptocheirus plumulosus* and the occurrence of several chemicals above reference levels in clam tissue at some of the Outfall 005/006 stations. However, there is some uncertainty regarding the toxicity test results, and the BCSA and sediment chemical screening suggest minimal to no impairment or risk in the overall area. Therefore, although the potential for risk to the benthic community cannot be dismissed entirely, the potential risk appears to be limited spatially and in magnitude, and will likely diminish once the outfalls are removed and future tidal flushing and sedimentation occur. Based on the bulk sediment chemistry (including review of the chromatographs for non-target compounds) any impairment to the benthic community that might exist does not appear to be related to any chemical stressor.

Outfall 008

Since no organic chemicals exceeded the sediment benchmarks, metals concentrations were consistent with the concentrations at the reference site, and clam and mussel tissue residues were generally similar to those at the reference location, there is likely no risk to the benthic community from chemicals in the sediments at Outfall 008.

Outfall 009

The results of the BCSA revealed that the benthic community is likely impaired to some degree, as the pollution indicator species *Capitella capitata* was found here, as well as an abundance of Tubificid worms. This is in contrast to the reference site and Outfall 005/006 where these organisms were absent or scarce. Additional evidence suggesting impairment included substantial exceedence of the screening benchmarks and the results of the mussel tissue analysis. Several SVOCs were detected in the mussel tissue at concentrations in excess of those observed in the reference tissue. These results suggest substantial bioaccumulation of organic chemicals from the sediment at this outfall.

Outfall 010

Overall, there appears to be a very localized area in the drainage channel immediately in front of Outfall 010, where there are potential effects to the benthic community. No direct toxicity was apparent from the toxicity tests. However, the sediment screening, BCSA, and clam tissue analysis all suggest some SVOC contamination at this location. Once the outfall is removed, it is likely that the concentrations will diminish substantially as the area is subjected to tidal flushing and no further chemical loading.

Outfall 011

The results of the clam and mussel tissue analyses showed no elevated risk from bioaccumulated chemicals in either type of tissue in relation to the reference site. Based upon the results of the sediment screening and the clam and mussel tissue analyses, it can be concluded that there is minimal to no risk to the benthic community from chemicals in the sediment near Outfall 011.

Outfall 012

The results of the clam and mussel tissue analyses showed no elevated risk from bioaccumulated chemicals in either type of tissue in relation to the reference site. Based upon the results of the sediment screening and clam and mussel tissue analyses, there appears to be minimal risk to the benthic community from chemicals in the sediments at Outfall 012.

6.6.3 Fish

This section characterizes potential risk to fishes from chemicals in the sediments at Maine Yankee.

Small Benthic Fishes (mummichog)

The concentrations of two metals (copper and zinc) in the mummichog tissue slightly exceeded screening values. However, since the concentrations in the reference tissue were similar, it is unlikely that these metals pose an elevated risk to mummichog and similar fishes in the area. None of the pesticides or PCBs detected in mummichog tissue exceeded screening values and thus are unlikely to pose a risk to mummichog and similar fishes. Screening values were not available for most of the PAHs detected, but tissue concentrations were below screening values for those that were available. Therefore, PAHs in the sediments likely do not pose a significant risk to mummichog and similar fishes. However, given the carcinogenic properties of these chemicals and their rapid depuration in fishes, further discussion of the potential risk posed by PAHs to fish is presented below.

Carnivorous Fishes (shortnose sturgeon)

Although several bioaccumulative metals (arsenic, cadmium, copper, lead, selenium, and silver) are present in the prey of benthic-feeding carnivorous fishes at concentrations that may pose a potential risk, these metals were also present at similar concentrations in prey from the reference area as well, with one exception (arsenic). Arsenic on the west side of the facility (Bailey's Cove) was identified as a COPC for carnivorous fishes. The predicted HQ for arsenic was 12.18, compared with HQs of 6.51 at the reference area and 4.76 on the east side of the facility (Back River). Therefore, a potential risk to shortnose sturgeon and similar fishes from arsenic cannot be dismissed for this area based upon the data collected; however, there is uncertainty in this conclusion because of the assumptions used in the food web calculations (e.g., multiplier of ten to estimate long-term exposure and accumulation may not be appropriate for arsenic).

Although several pesticides, two PCBs, and several PAHs were detected in food items from each of the areas, none of these chemicals were present at concentrations predicted to pose a risk to shortnose sturgeon or similar fishes.

Evaluation of Potential Effects from PAH Exposure to Fish

Since PAHs are rapidly metabolized by fishes, additional evaluation was undertaken to assess potential risk to fishes from these chemicals that might not be identified by tissue chemical residues. A discussion of sediment PAH concentrations found to be linked to mutagenic and carcinogenic effects in fishes is presented below.

Baumann and Harshbarger (1998) published the results of approximately 20 years of monitoring the effects of PAH contamination on brown bullhead in the Black River, Ohio. Their study presents evidence linking PAH sediment concentrations with varying rates of cancerous liver lesions in brown bullhead. The sediment concentrations linked with causing cancer in brown bullhead are presented in **Table 6-33** along with the maximum PAH concentrations detected in sediments at the outfalls identified for further study in the screening phase (**Table 6-10**). As the table shows, a total PAH concentration of 4,850 μg/kg was associated with a 7 percent liver cancer rate in brown bullhead. However, a higher concentration of 10,669 µg/kg total PAH in 1994, following a remedial dredging operation in 1990, was associated with no liver cancer in brown bullhead.

Another study of cancerous liver lesions in mummichog was published by Vogelbein *et al*. (1990). This study found that 93 percent (56 of 60) of the individuals from a highly PAH contaminated site (total PAHs 2,200,000 µg/kg) had grossly visible hepatic lesions. However, they also reported that no hepatic lesions were found in individuals from two less contaminated sites. Mummichog from a site with 61,000 µg/kg total PAHs exhibited no hepatic lesions, but did show some changes in liver histology. Individuals from a relatively uncontaminated site (3,000 µg/kg total PAHs) were histologically normal.

The maximum total PAH concentration initially measured at Outfall 005/006, 009, and 010 were 4,671, 91,950, and 43,900 µg/kg, respectively (**Table 6-33**). Subsequent sampling at Outfall 9 revealed maximum total PAH concentrations of 177,570 ug/kg. These data suggest that there is no cancer risk to fish from PAH exposure at Outfall 005/006, since the concentration is less than the concentration associated with the zero percent cancer rate presented in Baughmann and Harshbarger (1998) and close to the no effect concentration of 3,000 µg/kg presented in Vogelbein *et al*. (1990).

The total PAH concentration at Outfall 010 (43,900 µg/kg) suggests a possibility of risk to fish. However, since the concentration is less than the 61,000 µg/kg associated with no hepatic lesions in mummichog (Vogelbein *et al*., 1990), it is unlikely that this concentration represents a significant risk to fish. This conclusion is also supported by the nature and extent of PAH contamination at the outfall. PAHs were mostly limited to the center, intertidal sampling location. The substrate at Outfall 010 consists of shallow sediments interspersed with and overlaying rock outcrops. Therefore, the contamination is limited in spatial and vertical extent and thus is unlikely to pose a significant risk to mobile receptors, such as fish.

The maximum total PAH concentration detected at Outfall 009 was 177,570 µg/kg. Although this concentration is less than the sediment concentrations in the literature associated with carcinogenic effects in fish (i.e., 1,226,400 and 2,200,000 µg/kg) the concentration is higher than the 61,000 µg/kg reported to affect liver histology in mummichog (Volgelbein *et al*., 1990). Therefore, a potential risk to fish from PAHs in the sediment at Outfall 009 cannot be ruled out.

6.6.4 Aquatic Birds

This section characterizes the potential ecological risk posed by bioaccumulative chemicals in the sediments at Maine Yankee to aquatic birds in the area.

Carnivorous Wading Birds

Although many bioaccumulative chemicals were detected in mummichog, clams, and mussels, only the two PCBs and one pesticide detected in these prey items, Aroclors 1254 and 1260 and Endrin ketone, were predicted to exceed daily NOAEL values. However, none of the estimated dosages of these chemicals exceeded their daily LOAEL values. Therefore, there is little to no elevated risk to carnivorous wading birds that may forage in the outfall areas around Maine Yankee. In addition, relative to the reference area in Brookings Bay, there is no elevated potential risk from any of the chemicals detected, since the chemicals were present at higher concentrations in prey items from the reference area, and thus represent a pervasive presence throughout Montsweag Bay.

Piscivorous Birds

The potential risk to two groups of piscivorous birds was evaluated, birds that feed primarily on small estuarine fishes, such as the belted kingfisher, and birds that feed on larger predaceous fishes, such as the osprey.

This evaluation revealed that for the kingfisher and similar birds, the dosages of only two chemicals, mercury and zinc, pose a potential risk. Although mercury and zinc were found to potentially pose a risk, the concentrations of these metals in mummichog tissue were similar between the site and the reference area. Therefore, it is unlikely that either of these metals poses an elevated risk to piscivorous birds such as the belted kingfisher.

The evaluation for piscivorous birds that feed on larger predaceous fishes revealed that only one chemical (mercury) may pose a potential risk. Mercury was the only chemical that exceeded both the NOAEL and LOAEL values. However, the HQs were similar between the site (east side HQ of 1.59, west side HQ of 1.09) and the reference area (HQ of 1.54). Therefore, although a potential risk from mercury cannot be dismissed for piscivorous birds that feed on larger fishes, the potential risk appears to be pervasive throughout Montsweag Bay and thus is likely unrelated to activities at the Maine Yankee facility.

6.6.5 Uncertainty

Uncertainty is inherent in risk assessment and limits the applicability of the results. The lack of site-, species-, and COPC- specific data is common, leading to situations where assumptions and substitutions must be made in order to arrive at a reasonable estimate of risk. Use of these assumptions and substitutions leads to uncertainties in the conclusions of the risk assessment. Where uncertainty cannot be avoided, best professional judgment was used to guide decisions, and reasonable levels of conservatism were applied to risk estimates to ensure that risk was neither underestimated nor grossly overestimated. The uncertainties inherent in the risk assessment process, and therefore with the outfall-specific ERAs, were discussed and quantified, in terms of overestimating or underestimating risk, to the extent possible in the ERA report.

Uncertainties are present in all risk assessments because of the limitations of the available data and the need to make certain assumptions and extrapolations based on incomplete information. The uncertainty in this risk evaluation is mainly attributable to the following factors:

- Ingestion Screening Values - Data on the toxicity of many chemicals to the receptor species were sparse or lacking, requiring the extrapolation of data from other wildlife species or from laboratory studies with non-wildlife species. This is a typical limitation and extrapolation for ecological risk assessments because so few wildlife species have been tested directly for most chemicals. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. The factors considered in selecting a test species to represent a receptor species included taxonomic relatedness, trophic level, foraging method, and similarity of diet.

A second uncertainty related to the derivation of ingestion screening values applies to metals. Most of the toxicological studies on which the ingestion screening values for metals were based used forms of the metal (such as salts) that have high water solubility and high bioavailability to receptors. Since the analytical samples on which site-specific exposure estimates were based measured total metal concentrations, regardless of form, and these highly bioavailable forms are expected to compose only a fraction of the total metal concentration, this is likely to result in an overestimation of potential risks for these chemicals.

A third source of uncertainty associated with the derivation of ingestion screening values concerns the use of uncertainty factors. For example, NOAELs were extrapolated to LOAELs using an uncertainty factor of ten. This approach is likely to be conservative since Dourson and Stara (1983) determined that 96 percent of the chemicals included in a data review had LOAEL/NOAEL ratios of five or less. The use of an uncertainty factor of 10, although potentially conservative, also serves to counter some of the uncertainty associated with interspecies extrapolations, for which a specific uncertainty factor was not used.

- Critical Tissue Residue Screening Values – Data on the toxicity of many chemicals to the fish species evaluated were sparse or lacking, requiring the extrapolation of data from other species. This is a typical limitation and extrapolation for ecological risk assessments because so few species have been tested directly for most chemicals. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. Critical residue values from whole body were used as much as possible over data collected from individual organs, and data from studies using dietary exposure were used over other routes of exposure (e.g., water or direct injection). Studies involving long-term, chronic exposures were used preferentially over short-term, acute studies where possible. If chronic exposure data were not available, then uncertainty factors were used to convert from acute to chronic. Similar species or guilds were used to select surrogate species as much as possible in the selection of toxicity information. However, there remains some uncertainty in extrapolating toxicity data between species.

- Chemical Mixtures - Information on the ecotoxicological effects of chemical interactions is generally lacking, which required (as is standard for ecological risk assessments) that the chemicals be evaluated on a compound-by-compound basis during the comparison to screening values. This could result in an underestimation of risk (if there are additive or synergistic effects among chemicals) or an overestimation of risks (if there are antagonistic effects among chemicals). However, exposure to chemical mixtures was accounted for in several of the lines of evidence collected, sediment toxicity testing and benthic community analyses.

- Mean Versus Maximum Media Concentrations - As is typical in an ERA, a finite number of samples of environmental media are used to develop the exposure estimates. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are immobile or have limited home ranges) are those based on the mean chemical concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in the Wildlife Exposure Factors Handbook (USEPA 1993b), which specify the use of average media concentrations.

- Control Survival in the Bulk Sediment Toxicity Tests – The percent survival of the control organisms in the 28-day bulk sediment toxicity tests with the amphipod *Leptocheirus plumulosus* did not achieve the 80 percent survival test criterion. Although this introduces some uncertainty in the results of the tests, the control survival was 75 percent, only slightly less than the criterion. Although there is uncertainty with the test, the control survival for the 10-day test with Neanthes arenaceodentata was 100 percent. Therefore, the results of the 10-day test provided additional information with little uncertainty on the potential toxicity of the sediments tested.

6.7 CONCLUSIONS

Based on the weight of evidence from the various studies and evaluations conducted for the ecological risk assessment, there are potentially significant risks to fish and benthic invertebrates from site-related chemicals in the sediments at Outfall 009. Although site-related chemicals were detected in the sediments at some of the other outfall locations, the weight of evidence suggests that the potential ecological risk at the other outfalls is minimal.

Table 6-1
Sediment Screening Values

Analyte	Screening Value	Type of Screening Value
Metals (mg/kg)		
Aluminum	18000	NOAA Marine Sed AET
Antimony	2	NOAA Marine Sed ERL
Arsenic	8.2	NOAA Marine Sed ERL
Barium	48	NOAA Marine Sed AET
Beryllium	NSV	NSV
Boron	NSV	NSV
Cadmium	1.2	NOAA Marine Sed ERL
Calcium	NSV	NSV
Chromium	81	NOAA Marine Sed ERL
Cobalt	50	OME; Ontario open water disposal guideline.
Copper	34	NOAA Marine Sed ERL
Iron	20000	OME; LEL value based on Ontario sediments and benthic species
Lead	46.7	NOAA Marine Sed ERL
Magnesium	NSV	NSV
Manganese	460	OME; LEL value based on Ontario sediments and benthic species
Mercury	0.15	NOAA Marine Sed ERL
Molybdenum	NSV	NSV
Nickel	20.9	NOAA Marine Sed ERL
Potassium	NSV	NSV
Selenium	1	NOAA Marine Sed AET
Silver	1	NOAA Marine Sed ERL
Sodium	NSV	NSV
Thallium	NSV	NSV
Vanadium	57	NOAA Marine Sed AET
Zinc	150	NOAA Marine Sed ERL
Pesticides (ug/kg)		
4,4'-DDD	2	NOAA Marine Sed ERL
4,4'-DDE	2.2	NOAA Marine Sed ERL
4,4'-DDT	1.58	NOAA Marine Sed ERL
Aldrin	2	OME; LEL value based on Ontario sediments and benthic species
alpha-BHC	6	OME; LEL value based on Ontario sediments and benthic species
alpha-Chlordane	7	OME; LEL value based on Ontario sediments and benthic species
beta-BHC	5	OME; LEL value based on Ontario sediments and benthic species
delta-BHC	120	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Dieldrin	0.02	NOAA Marine Sed ERL
Endosulfan I	2.9	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
Endosulfan II	14	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
Endosulfan sulfate	5.5	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Endrin	0.02	NOAA Marine Sed ERL
Endrin aldehyde	NSV	NSV
Endrin ketone	NSV	NSV
gamma-BHC (Lindane)	3	OME; LEL value based on Ontario sediments and benthic species
gamma-Chlordane	7	OME; LEL value based on Ontario sediments and benthic species

Table 6-1
Sediment Screening Values

Analyte	Screening Value	Type of Screening Value
Heptachlor	0.3	NOAA Marine Sed AET
Heptachlor Epoxide	0.6	ECISQG (1999)
Methoxychlor	19	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Toxaphene	0.1	ECISQG (1999)
PCBs		
Aroclor-1016	7	OME; LEL value based on Ontario sediments and benthic species
Aroclor-1221	120	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Aroclor-1232	600	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Aroclor-1242	170	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Aroclor-1248	30	OME; LEL value based on Ontario sediments and benthic species
Aroclor-1254	63.3	ECISQG (1999)
Aroclor-1260	5	OME; LEL value based on Ontario sediments and benthic species
PCBS	22.7	NOAA Marine Sed ERL
SVOCs (ug/kg)		
1,2,4-Trichlorobenzene	4.8	NOAA Marine Sed AET
1,2-Dichlorobenzene	13	NOAA Marine Sed AET
1,3-Dichlorobenzene	1700	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,4-Dichlorobenzene	110	NOAA Marine Sed AET
2,4,5-Trichlorophenol	3	NOAA Marine Sed AET
2,4,6-Trichlorophenol	6	NOAA Marine Sed AET
2,4-Dichlorophenol	5	NOAA Marine Sed AET
2,4-Dimethylphenol	18	NOAA Marine Sed AET
2,4-Dinitrophenol	NSV	NSV
2,4-Dinitrotoluene	NSV	NSV
2,6-Dinitrotoluene	NSV	NSV
2-Chloronaphthalene	NSV	NSV
2-Chlorophenol	8	NOAA Marine Sed AET
2-Methylnaphthalene	70	NOAA Marine Sed ERL
2-Methylphenol	8	NOAA Marine Sed AET
2-Nitroaniline	NSV	NSV
2-Nitrophenol	NSV	NSV
3,3'-Dichlorobenzidine	NSV	NSV
3-Nitroaniline	NSV	NSV
4,6-Dinitro-2-methylphenol	NSV	NSV
4-Bromophenyl phenylether	1300	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
4-Chloro-3-methylphenol	NSV	NSV

Table 6-1
Sediment Screening Values

Analyte	Screening Value	Type of Screening Value
4-Chloroaniline	NSV	NSV
4-Chlorophenyl phenyl ether	NSV	NSV
4-Methylphenol	100	NOAA Marine Sed AET
4-Nitroaniline	NSV	NSV
4-Nitrophenol	NSV	NSV
Acenaphthene	16	NOAA Marine Sed ERL
Acenaphthylene	44	NOAA Marine Sed ERL
Anthracene	85.3	NOAA Marine Sed ERL
Benzo(a)anthracene	261	NOAA Marine Sed ERL
Benzo(a)pyrene	430	NOAA Marine Sed ERL
Benzo(b)fluoranthene	1800	NOAA Marine Sed AET
Benzo(g,h,i)perylene	170	OME; LEL value based on Ontario sediments and benthic species
Benzo(k)fluoranthene	240	OME; LEL value based on Ontario sediments and benthic species
bis(2-Chloroethoxy)methane	NSV	NSV
bis(2-Chloroethyl)ether	NSV	NSV
bis(2-Chloroisopropyl)ether	NSV	NSV
bis(2-Ethylhexyl)phthalate	182	NOAA Marine Sed TEL
Butyl benzyl phthalate	63	NOAA Marine Sed AET
Carbazole	NSV	NSV
Chrysene	384	NOAA Marine Sed ERL
Dibenz(a,h)anthracene	63.4	NOAA Marine Sed ERL
Dibenzofuran	110	NOAA Marine Sed AET
Diethylphthalate	6	NOAA Marine Sed AET
Dimethylphthalate	6	NOAA Marine Sed AET
Di-n-butyl phthalate	58	NOAA Marine Sed AET
Di-n-octyl phthalate	61	NOAA Marine Sed AET
Fluoranthene	600	NOAA Marine Sed ERL
Fluorene	19	
Hexachlorobenzene	20	OME; LEL value based on Ontario sediments and benthic species
Hexachlorobutadiene	1.3	NOAA Marine Sed AET
Hexachlorocyclopentadiene	NSV	NSV
Hexachloroethane	73	NOAA Marine Sed AET
Indeno(1,2,3-cd)pyrene	200	OME; LEL value based on Ontario sediments and benthic species
Isophorone	NSV	NSV
Naphthalene	160	NOAA Marine Sed ERL
Nitrobenzene	21	NOAA Marine Sed AET
N-Nitrosodiphenylamine	28	NOAA Marine Sed AET
N-Nitroso-dipropylamine	NSV	NSV
Pentachlorophenol	17	NOAA Marine Sed AET
Phenanthrene	240	NOAA Marine Sed ERL
Phenol	130	NOAA Marine Sed AET
Pyrene	665	NOAA Marine Sed ERL

Table 6-1
Sediment Screening Values

Analyte	Screening Value	Type of Screening Value
VOCs (ug/kg)		
1,1,1-Trichloroethane	170	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
1,1,2,2-Tetrachloroethane	940	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,1,2-Trichloroethane	31	Sediment Fauna (Marine- NOAA Screening)
1,1-Dichloroethane	27	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,1-Dichloroethene	31	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,2-Dichloroethane	250	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
1,2-Dichloropropane	NSV	NSV
2-Butanone	270	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
2-Hexanone	22	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
4-Methyl-2-pentanone	33	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Acetone	8.7	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Benzene	57	EcoTox; Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value is based on 1% TOC)
Bromodichloromethane	NSV	NSV
Bromoform	NSV	NSV
Bromomethane	NSV	NSV
Carbon disulfide	0.85	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Carbon tetrachloride	1200	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Chlorobenzene	820	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Chloroethane	NSV	NSV
Chloroform	22	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)

Table 6-1
Sediment Screening Values

Analyte	Screening Value	Type of Screening Value
Chloromethane	NSV	NSV
cis-1,2-Dichloroethene	400	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
cis-1,3-Dichloropropene	0.051	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Dibromochloromethane	NSV	NSV
Ethylbenzene	4	NOAA Marine Sed AET
Methylene chloride	370	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
m-Xylene/p-Xylene	4	NOAA Marine Sed AET
Styrene	NSV	NSV
Tetrachloroethene	57	NOAA Marine Sed AET
Toluene	670	EcoTox; value is the Sediment Quality Benchmark calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
trans-1,2-Dichloroethene	400	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
trans-1,3-Dichloropropene	0.051	ORNL; Alternate value is calculated using the Tier II water value and equilibrium partitioning (value shown is based on 1% TOC but will be adjusted based on site-specific TOC values)
Trichloroethene	41	NOAA Marine Sed AET
Vinyl Chloride	NSV	NSV

Notes:
NOAA - National Oceanic and Atmospheric Administration
OME - Ontario Ministry of the Environment
ORNL - Oak Ridge National Laboratory
NSV - No Screening Value
AET - Apparent Effects Threshold
ERL - Effects Range Low
TEL - Threshold Effects Level
LEL - Lowest Effects Level
TOC - Total Organic Carbon
ECISQG - Environment Canada Interim Sediment Quality Guidelines

Table 6-2
Benchmark Quotients at Outfall 005/006 Intertidal Sediments

Analyte	MY06SD01 Benchmark Quotient	MY06SD02 Benchmark Quotient	MY06SD03 Benchmark Quotient	MY06SD04 Benchmark Quotient	Mean Benchmark Quotient
Metals					
Aluminum	0.9	0.8	1.1	1.2	1.0
Arsenic	1.3	1.0	1.3	1.6	1.3
Barium	0.9	0.7	0.9	1.0	0.9
Iron	1.2	1.0	1.4	1.6	1.3
Mercury	1.0	0.5	1.8	1.6	1.2
Nickel	1.2	1.1	1.4	1.5	1.3
SVOCs					
Acenaphthene	ND	ND	ND	4.9	4.9
Anthracene	1.1	ND	0.4	2.0	1.2
Benzo(a)anthracene	1.2	0.2	0.8	2.4	1.2
Benzo(g,h,i)perylene	0.8	0.2	0.8	1.2	0.8
Fluoranthene	0.8	0.1	0.4	1.3	0.6
Fluorene	ND	ND	1.2	5.8	3.5
Indeno(1,2,3-cd)pyrene	1.0	0.3	1.1	1.7	1.0
Phenanthrene	0.5	ND	0.6	1.2	0.8

Benchmark Quotient = Media Concentration / Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

ND- Contaminant not detected at the sample location

Table 6-3
Benchmark Quotients at Outfall 005/006 Subtidal Sediments

Analyte	MY06SD05 Benchmark Quotient	MY06SD06 Benchmark Quotient	Mean Benchmark Quotient
Metals			
Arsenic	1.9	1.6	1.8
Iron	1.5	1.4	1.4
Mercury	2.3	2.3	2.3
Nickel	1.3	1.2	1.3
SVOCs			
Indeno(1,2,3-cd)pyrene	0.6	1.1	0.9

Benchmark Quotient = Media Concentration / Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-4
Benchmark Quotients at Outfall 008 Subtidal Sediments

Analyte	MY06SD10 Benchmark Quotient	MY06SD11 Benchmark Quotient	MY06SD12 Benchmark Quotient	Mean Benchmark Quotient
Metals				
Arsenic	1.1	1.0	1.1	1.1
Iron	1.1	1.1	1.2	1.1
Mercury	1.2	0.9	0.9	1.0
Nickel	1.1	1.0	1.1	1.1

Benchmark Quotient = Media Concentration / Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-5
Benchmark Quotients at Outfall 009 Subtidal Sediments

Analyte	MY06SD16 Benchmark Quotient	MY06SD17 Benchmark Quotient	MY06SD18 Benchmark Quotient	Mean Benchmark Quotient
Metals				
Arsenic	0.7	1.5	1.4	1.2
Barium	0.9	1.1	0.9	1.0
Iron	1.3	1.4	1.4	1.4
Nickel	1.0	1.2	1.3	1.2
Zinc	1.3	0.6	0.5	0.8
SVOCs				
2-Methylnaphthalene	8.9	ND	ND	8.9
Anthracene	44.5	ND	0.4	22.5
Benzo(a)anthracene	26.4	0.6	1.3	9.5
Benzo(a)pyrene	14.2	0.2	0.5	5.0
Benzo(b)fluoranthene	4.3	0.1	0.2	1.5
Benzo(g,h,i)perylene	17.6	0.4	0.6	6.2
Benzo(k)fluoranthene	15.0	0.2	0.4	5.2
Chrysene	21.9	0.2	0.5	7.5
Dibenzofuran	17.3	ND	ND	17.3
Fluoranthene	40.0	0.5	0.2	13.6
Indeno(1,2,3-cd)pyrene	20.0	0.5	0.8	7.1
Naphthalene	5.0	ND	ND	5.0
Phenanthrene	28.8	0.5	0.4	9.9
Pyrene	24.1	0.2	0.8	8.4

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

ND- Contaminant not detected at the sample location

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-6
Benchmark Quotients at Outfall 010 Intertidal Sediments

Analyte	MY06SD19 Benchmark Quotient	MY06SD20 Benchmark Quotient	MY06SD21 Benchmark Quotient	Mean Benchmark Quotient
SVOCs				
Anthracene	0.2	17.6	0.3	6.0
Benzo(a)anthracene	0.3	14.9	0.3	5.2
Benzo(a)pyrene	0.1	8.1	0.2	2.8
Benzo(b)fluoranthene	0.0	2.4	0.1	0.8
Benzo(g,h,i)perylene	0.2	13.5	0.2	4.7
Benzo(k)fluoranthene	0.1	8.8	0.1	3.0
Chrysene	0.1	8.6	0.1	3.0
Dibenzofuran	ND	3.0	ND	3.0
Fluoranthene	0.2	13.3	0.2	4.6
Indeno(1,2,3-cd)pyrene	0.2	14.5	0.3	5.0
Phenanthrene	0.3	23.3	0.4	8.0
Pyrene	0.1	9.8	0.2	3.4

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

ND- Contaminant not detected at the sample location

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-7
Benchmark Quotients at Outfall 011 Intertidal Sediments

Analyte	MY06SD25 Benchmark Quotient	MY06SD26 Benchmark Quotient	MY06SD27 Benchmark Quotient	Mean Benchmark Quotient
SVOCs				
Benzo(a)anthracene	0.4	1.5	0.4	0.7
Benzo(g,h,i)perylene	0.3	1.1	0.3	0.6
bis(2-Ethylhexyl)phthalate	ND	1.5	ND	1.5
Indeno(1,2,3-cd)pyrene	0.3	1.2	0.3	0.6

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

ND- Contaminant not detected at the sample location

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-8
Benchmark Quotients at Outfall 011 Subtidal Sediments

Analyte	MY06SD28 Benchmark Quotient	MY06SD29 Benchmark Quotient	MY06SD30 Benchmark Quotient	Mean Benchmark Quotient
Metals				
Barium	1.2	0.3	0.9	0.8
Iron	1.2	0.4	0.7	0.7
Nickel	1.3	0.4	0.7	0.8

Benchmark Quotient = Media Concentration / Adjusted Screening Value

Note: Compounds highlighted indicate screening value is not a NOAA Marine Sediment ERL.

Benchmark Quotients that exceed 1.0 are highlighted.

Table 6-9
Comparison of Metal Concentrations at the Outfalls with the Reference Site

Analyte	Mean Benchmark Quotient	Standard Deviation	Maximum Reference Quotient	Mean Reference Quotient	Frequency of Exceedance (RQ > 1)	Standard Deviation
Metals						
Aluminum	0.7	0.4	1.3	0.7	7	0.3
Arsenic	0.9	0.4	1.5	0.8	7	0.3
Barium	0.7	0.2	1.5	0.9	12	0.4
Iron	0.9	0.4	1.4	0.8	8	0.3
Mercury	0.8	0.6	0.9	0.3	0	0.2
Nickel	0.9	0.3	1.4	0.8	8	0.3
Zinc	0.4	0.2	2.4	0.8	7	0.5

Benchmark Quotient = Media Concentration / Screening Value
Reference Quotient = Media Concentration / Reference Concentration

Table 6-10
Summary of Sediment Screening Benchmark Quotients

	Outfall 5/6				Outfall 9			Outfall 10	Outfall 11		Reference	
Analyte	**Intertidal (01)[1]**	**Intertidal (03)**	**Intertidal (04)**	**Subtidal (06)**	**Subtidal (16)**	**Subtidal (17)**	**Subtidal (18)**	**Intertidal (20)**	**Intertidal (26)**	**Subtidal (28)**	**Maximum Intertidal**	**Maximum Subtidal**
SVOCs												
2-Methylnaphthalene	<	<	<	<	8.9	<	<	<	<	<	ND	ND
Acenaphthene	<	<	4.9	<	<	<	<	<	<	<	ND	ND
Anthracene	1.1	<	2.0	<	44.5	<	<	17.6	<	<	0.3	ND
Benzo(a)anthracene	1.2	<	2.4	<	26.4	<	1.3	14.9	1.5	<	0.8	0.9
Benzo(a)pyrene	<	<	<	<	14.2	<	<	8.1	<	<	0.4	0.4
Benzo(b)fluoranthene	<	<	<	<	4.3	<	<	2.4	<	<	0.1	0.1
Benzo(g,h,i)perylene	<	<	1.2	<	17.6	<	<	13.5	1.1	<	0.8	0.7
Benzo(k)fluoranthene	<	<	<	<	15.0	<	<	8.8	<	<	0.4	ND
bis(2-Ethylhexyl)phthalate	<	<	<	<	<	<	<	<	1.5	<	ND	ND
Chrysene	<	<	<	<	21.9	<	<	8.6	<	<	0.4	ND
Dibenzofuran	<	<	<	<	17.3	<	<	3.0	<	<	ND	ND
Fluoranthene	<	<	1.3	<	40.0	<	<	13.3	<	<	0.5	0.4
Fluorene	<	1.2	5.8	<	<	<	<	<	<	<	ND	ND
Indeno(1,2,3-cd)pyrene	<	1.1	1.7	1.1	20.0	<	<	14.5	1.2	<	1.0	0.9
Naphthalene	<	<	<	<	5.0	<	<	<	<	<	ND	ND
Phenanthrene	<	<	1.2	<	28.8	<	<	23.3	<	<	0.2	0.3
Pyrene	<	<	<	<	24.1	<	<	9.8	<	<	0.3	0.3

Notes:

[1]Intertidal (01) = Sample MY06SD01

"<" = Benchmark quotient less than 1.0

ND = Not Detected

Outfalls 008 and 012 did not have any benchmark quotients greater than 1.0 and are therefore not listed.

Table 6-11

Benchmark and Reference Quotients at the Transmission Line (Silt Spreading) Area

Analyte	Benchmark Quotients			Reference Quotients		
	BQ 50	BQ 51	BQ 52/53	RQ 50	RQ 51	RQ 52/53
Metals (mg/kg)						
Aluminum	1.1	1.3	1.4	1.3	1.5	1.6
Arsenic	1.8	1.8	2.0	1.7	1.7	1.9
Barium	1.0	1.2	1.3	1.5	1.7	1.8
Iron	1.5	1.6	2.1	1.3	1.4	1.9
Manganese	0.7	0.7	1.3	1.3	1.3	2.5
Mercury	1.4	2.3	1.5	0.6	0.9	0.6
Nickel	1.4	1.7	2.0	1.3	1.6	1.8
Vanadium	0.9	1.0	1.1	1.3	1.4	1.6
SVOCs (ug/kg)						
Acenaphthene	ND	ND	15.6			
Benzo(a)anthracene	1.2	1.3	ND			

Notes:
Benchmark Quotient = Media Concentration / Screening Value
Reference Quotient = Media Concentration / Maximum Reference Concentration
Highlighted Benchmark Quotients Exceed 1.0
ND = Not Detected

Table 6-12
Screening of Maximum Detected Residues in Clam Tissue

Chemical[3]	Screening Value	Tissue Concentration Ratios[1]					Tissue Hazard Quotients[2]					
		Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Reference Site
Inorganics (mg/kg)												
Aluminum	4.4	1.53	0.96	0.89	0.63	0.45	148.64	92.73	86.59	60.91	43.64	97.05
Arsenic	1.6	2.08	0.71	0.93	0.92	0.39	4.44	1.53	1.98	1.98	0.83	2.14
Barium	NA	1.70	0.85	0.88	0.65	0.42	NSV[4]	NSV	NSV	NSV	NSV	NSV
Beryllium	0.1	1.87	0.96	0.91	0.78	2.74	0.43	0.22	0.21	0.18	0.63	0.23
Cadmium	0.042	1.26	0.98	1.04	1.02	0.92	1.50	1.17	1.24	1.21	1.10	1.19
Chromium	0.18	1.22	0.80	0.68	0.53	0.46	9.28	6.06	5.17	4.06	3.50	7.61
Cobalt	NA	3.33	0.87	0.97	1.13	0.78	NSV	NSV	NSV	NSV	NSV	NSV
Copper	0.17	3.47	0.60	1.56	1.34	3.50	8.80	1.50	4.00	3.40	8.90	2.50
Iron	NA	1.90	0.66	0.89	0.45	0.27	NSV	NSV	NSV	NSV	NSV	NSV
Lead	0.064	1.33	0.57	0.67	0.58	0.85	30.63	13.00	15.50	13.31	19.53	22.97
Manganese	NA	3.12	0.25	0.36	0.75	0.16	NSV	NSV	NSV	NSV	NSV	NSV
Mercury	0.06	0.80	1.00	1.20	0.80	1.00	0.67	0.83	1.00	0.67	0.83	0.83
Nickel	0.33	1.99	0.81	3.45	2.32	1.79	5.48	2.24	9.52	6.39	4.94	2.76
Vanadium	NA	2.20	0.77	0.76	0.61	0.40	NSV	NSV	NSV	NSV	NSV	NSV
Zinc	2.8	1.56	0.83	1.09	1.11	1.54	1.40	0.70	0.99	1.00	1.40	0.90
Pesticide/Polychlorinated Biphenyls (ug/kg)												
4,4'-DDT	0.054	0.29	0.29	1.48	1.69	-	<0.01	<0.01	<0.01	<0.01	-	<0.01
Dieldrin	0.0089	5.27	0.64	0.80	1.00	0.81	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	0.052	0.50	0.80	1.20	1.10	0.75	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-Chlordane	0.056	1.07	0.86	0.79	0.51	0.86	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Semi-volatile Organic Compounds (ug/kg)												
2,4,5-Trichlorophenol	1.2	1.10	-	-	-	-	0.09	-	-	-	-	0.08
2,4,6-Trichlorophenol	146	1.18	-	-	-	-	<0.01	-	-	-	-	<0.01
2,4-Dichlorophenol	15	1.26	-	-	-	-	<0.01	-	-	-	-	<0.01
2-Methylphenol	NA	1.06	0.37	0.49	0.29	0.15	NSV	NSV	NSV	NSV	NSV	NSV
4-Chloro-3-methylphenol	0.11	1.10	0.30	1.70	0.18	-	2.00	0.55	3.09	0.33	-	1.82
Anthracene	1	2.28	0.88	1.83	1.05	3.00	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(g,h,i)perylene	1	0.86	0.70	1.08	0.54	0.72	NSV	NSV	NSV	NSV	NSV	NSV
Fluoranthene	18	1.10	0.74	1.22	0.69	1.23	NSV	NSV	NSV	NSV	NSV	NSV
Fluorene	1	0.73	0.55	1.06	-	-	NSV	NSV	NSV	NSV	NSV	NSV
Pentachlorophenol	2.5	1.88	-	0.82	-	-	0.13	-	0.06	-	-	0.07
Phenanthrene	12	2.00	0.60	1.65	1.00	2.80	NSV	NSV	NSV	NSV	NSV	NSV

Notes:

[1]Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

[2] Hazard Quotient = Concentration / Screening Value

[3] Only chemicals with at least one TCR > 1.0 are shown.

NSV = No Screening Value

Shading indicates > 1.0

Table 6-13
Tissue Concentration Ratios for Clam Tissue

	Tissue Concentration Ratios[1]									Tissue Concentration Ratios[1]								
	Outfall 005 / 006						Outfall 008			Outfall 010			Outfall 011			Outfall 012		
Chemical[2]	**BC01[3]**	**BC02**	**BC03**	**BC04**	**BC05**	**BC06**	**BC07**	**BC08**	**BC09**	**BC10**	**BC11**	**BC12**	**BC13**	**BC14**	**BC15**	**BC16**	**BC17**	**BC18**
Inorganics																		
Aluminum	1.50	1.18	0.75	1.30	0.85	0.76	0.84	0.96	0.73	0.45	0.89	0.85	0.59	0.52	0.63	0.45	0.44	0.39
Arsenic	2.08	1.28	0.70	1.29	1.38	0.94	0.56	0.71	0.59	0.55	0.93	0.52	0.92	0.62	0.68	0.39	0.37	0.35
Barium	1.70	1.18	0.73	1.30	0.92	0.91	0.77	0.85	0.66	0.41	0.88	0.74	0.65	0.47	0.58	0.42	0.42	0.37
Beryllium	1.87	1.26	0.78	1.13	1.00	0.87	0.83	0.96	0.74	0.43	0.91	0.91	0.52	0.65	0.78	0.48	2.74	0.52
Cadmium	1.26	1.12	0.64	0.68	0.56	0.76	0.78	0.82	0.98	0.92	1.04	0.94	1.02	0.90	0.86	0.82	0.80	0.92
Chromium	1.22	0.82	1.05	0.97	0.70	0.61	0.80	0.64	0.53	0.35	0.68	0.58	0.53	0.37	0.44	0.46	0.38	0.31
Cobalt	3.33	1.33	0.48	0.99	0.53	0.58	0.83	0.87	0.77	0.68	0.97	0.82	1.01	0.82	1.13	0.64	0.78	0.73
Copper	0.33	3.47	0.32	0.21	0.18	0.70	0.26	0.60	0.35	0.31	1.56	0.49	0.24	1.05	1.34	3.50	0.82	0.76
Iron	1.90	1.16	0.72	1.41	1.39	1.09	0.49	0.66	0.47	0.32	0.89	0.46	0.41	0.42	0.45	0.27	0.23	0.21
Lead	1.22	1.33	0.58	0.73	0.67	0.83	0.38	0.57	0.42	0.29	0.67	0.35	0.26	0.44	0.58	0.85	0.35	0.27
Manganese	3.12	0.43	0.12	0.61	0.11	0.12	0.20	0.25	0.20	0.35	0.27	0.36	0.38	0.45	0.75	0.10	0.16	0.15
Mercury	0.80	0.80	0.40	0.60	0.60	0.60	1.00	1.00	1.00	0.60	1.20	0.80	0.80	0.80	0.80	1.00	1.00	1.00
Nickel	1.74	1.99	0.52	0.75	0.47	0.98	0.54	0.76	0.81	0.46	3.45	0.71	0.48	2.32	0.82	1.79	0.80	0.67
Vanadium	2.20	1.09	0.61	1.15	0.75	0.65	0.64	0.77	0.58	0.41	0.76	0.65	0.52	0.52	0.61	0.38	0.40	0.34
Zinc	1.01	1.56	0.52	0.81	0.54	0.94	0.66	0.83	0.76	0.68	1.09	0.81	0.66	0.98	1.11	1.54	0.90	0.76
Pesticide/Polychlorinated Biphenyls																		
4,4'-DDT	0.15	0.29	-	-	-	-	0.25	0.29	0.26	0.72	1.11	1.48	1.69	1.69	0.46	-	-	-
Dieldrin	5.27	1.76	1.27	2.03	0.96	1.62	0.51	0.50	0.64	0.72	0.80	0.70	1.00	0.89	0.86	0.64	0.81	0.81
Heptachlor epoxide	0.50	-	-	-	-	-	0.70	0.75	0.80	1.20	-	1.05	0.50	1.10	1.00	0.75	0.47	-
alpha-Chlordane	1.00	1.07	0.49	0.58	-	1.07	0.61	0.63	0.86	0.70	0.59	0.79	0.51	0.39	0.34	0.61	0.86	0.45
Semi-volatile Organic Compounds																		
2,4,5-Trichlorophenol	-	1.10	-	-	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	1.18	-	-	-	1.03	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	1.26	0.35	0.16	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	0.22	1.06	0.43	0.40	0.27	0.94	0.37	0.31	0.31	0.34	0.49	0.34	0.29	0.21	0.29	0.13	0.15	0.12
4-Chloro-3-methylphenol	-	1.10	0.45	0.32	0.17	0.60	0.30	0.19	0.18	0.22	1.70	0.70	0.18	0.09	0.18	-	-	-
Anthracene	0.78	1.05	0.85	2.28	0.98	1.23	0.58	0.60	0.88	0.53	1.83	0.98	1.05	1.00	1.05	0.55	3.00	0.78
Benzo(g,h,i)perylene	0.86	0.72	0.54	0.76	0.62	0.80	0.70	0.58	0.68	0.50	1.08	0.72	0.48	0.54	0.48	0.34	0.72	0.48
Fluoranthene	0.86	0.69	0.62	1.10	0.64	0.83	0.58	0.60	0.74	0.53	1.22	0.78	0.69	0.55	0.69	0.35	1.23	0.49
Fluorene	0.73	-	-	-	-	-	0.45	0.52	0.55	0.39	1.06	0.61	-	-	-	-	-	-
Pentachlorophenol	-	-	-	-	-	1.88	-	-	-	-	0.82	0.19	-	-	-	-	-	-
Phenanthrene	0.80	0.70	0.70	2.00	0.80	0.75	0.55	0.60	0.60	0.45	1.65	0.85	0.90	1.00	0.90	-	2.80	0.70

Notes:

[1] Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

[2] Only chemicals with at least one TCR > 1.0 are shown.

[3] BC01 (Cooresponds to Benthic Clam, Station 01)

Shading indicates > 1.0

Table 6-14
Screening of Maximum Detected Residues in Mussel Tissue

Chemical[3]	Screening Value	Tissue Concentration Ratios[1] Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	Tissue Hazard Quotients[2] Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	Reference Site
Inorganics (mg/kg)												
Aluminum	4.4	0.96	1.54	1.66	1.04	1.04	20.45	32.73	35.23	22.20	22.18	21.27
Arsenic	1.6	0.91	0.77	0.88	0.85	1.03	0.87	0.74	0.84	0.81	0.98	0.96
Barium	NA	1.06	1.51	1.58	1.06	1.04	NSV[4]	NSV	NSV	NSV	NSV	NSV
Beryllium	0.1	0.83	1.33	1.33	1.17	0.83	0.05	0.08	0.08	0.07	0.05	0.06
Chromium	0.18	1.62	0.98	0.92	3.32	1.13	5.39	3.28	3.06	11.06	3.78	3.33
Copper	3	0.69	0.42	0.42	0.71	1.06	0.88	0.53	0.53	0.90	1.35	1.27
Iron	NA	0.77	1.17	1.14	1.00	1.22	NSV	NSV	NSV	NSV	NSV	NSV
Manganese	NA	0.61	1.25	0.53	0.49	0.51	NSV	NSV	NSV	NSV	NSV	NSV
Mercury	0.06	1.20	1.20	1.20	1.20	1.60	1.00	1.00	1.00	1.00	1.33	0.83
Nickel	0.33	0.98	0.67	0.75	1.92	1.59	1.52	1.03	1.15	2.97	2.45	1.55
Zinc	20	0.93	0.77	0.87	0.94	1.05	0.65	0.54	0.61	0.66	0.74	0.70
Pesticide/Polychlorinated Biphenyls (ug/kg)												
Dieldrin	8.9	0.82	0.96	0.88	0.79	1.08	0.01	0.01	0.01	0.01	0.01	0.01
Endrin ketone	9.1	1.08	1.30	1.24	1.46	1.70	0.04	0.05	0.05	0.06	0.07	0.04
Heptachlor epoxide	52	1.27	-	-	1.36	1.36	0.00	-	-	0.00	0.00	0.00
alpha-BHC	4.9	0.88	1.00	1.15	0.74	1.09	0.01	0.01	0.01	0.01	0.01	0.01
gamma-BHC (Lindane)	10	0.77	0.89	1.02	0.73	0.95	0.00	0.00	0.00	0.00	0.00	0.00
Semi-volatile Organic Compounds (ug/kg)												
Anthracene	NA	0.77	4.29	1.04	1.34	0.93	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(a)anthracene	NA	0.58	2.58	0.62	0.81	0.58	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(a)pyrene	NA	0.53	3.53	0.71	0.94	0.57	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(b)fluoranthene	NA	0.54	1.83	0.65	0.63	0.54	NSV	NSV	NSV	NSV	NSV	NSV
Benzo(k)fluoranthene	NA	0.63	2.00	0.63	0.81	0.69	NSV	NSV	NSV	NSV	NSV	NSV
Chrysene	NA	0.58	2.13	0.70	0.73	0.65	NSV	NSV	NSV	NSV	NSV	NSV
Dibenz(a,h)anthracene	NA	0.56	2.59	0.67	0.70	0.52	NSV	NSV	NSV	NSV	NSV	NSV
Fluoranthene	NA	0.78	3.00	1.00	1.03	0.93	NSV	NSV	NSV	NSV	NSV	NSV
Indeno(1,2,3-cd)pyrene	NA	0.56	2.80	0.73	0.80	0.59	NSV	NSV	NSV	NSV	NSV	NSV
Isophorone	1400	0.64	1.29	1.32	1.00	1.04	0.01	0.03	0.03	0.02	0.02	0.02
Pyrene	NA	0.62	1.92	0.76	0.74	0.74	NSV	NSV	NSV	NSV	NSV	NSV

Notes:

[1]Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

[2] Hazard Quotient = Concentration / Screening Value

[3] Only chemicals with at least one TCR > 1.0 are shown.

NSV = No Screening Value

Shading indicates > 1.0

Table 6-15
Tissue Concentration Ratios for Mussel Tissue

Chemical[2]	Tissue Concentration Ratios[1]						Tissue Concentration Ratios[1]								
	Outfall 008			Outfall 009			Outfall 010			Outfall 011			Outfall 012		
	BM01[3]	BM02	BM03	BM04	BM05	BM06	BM07	BM08	BM09	BM10	BM11	BM12	BM13	BM14	BM15
Inorganics															
Aluminum	0.59	0.57	0.96	1.54	1.36	0.79	0.69	1.66	0.58	1.03	0.94	1.04	0.84	1.04	0.88
Arsenic	0.65	0.47	0.91	0.66	0.58	0.77	0.76	0.88	0.63	0.73	0.72	0.85	0.76	1.03	0.74
Barium	0.58	0.60	1.06	1.19	1.51	0.83	0.70	1.58	0.58	0.94	1.00	1.06	0.81	1.04	0.87
Beryllium	-	-	0.83	1.33	0.83	-	-	1.33	-	1.17	-	-	-	0.83	-
Chromium	0.57	1.62	0.77	0.90	0.92	0.98	0.55	0.92	0.48	3.32	1.10	0.78	0.62	1.13	0.63
Copper	0.57	0.27	0.69	0.42	0.23	0.32	0.29	0.42	0.24	0.49	0.23	0.71	1.06	0.64	0.27
Iron	0.52	0.41	0.77	1.11	1.17	0.67	0.54	1.14	0.53	0.85	0.80	1.00	0.63	1.22	0.82
Manganese	0.54	0.54	0.61	1.25	0.55	0.58	0.29	0.53	0.28	0.37	0.43	0.49	0.51	0.43	0.51
Mercury	0.80	0.80	1.20	1.00	0.80	1.20	1.00	1.20	0.80	0.80	0.80	1.20	1.00	1.60	1.00
Nickel	0.53	0.37	0.98	0.67	0.57	0.55	0.45	0.75	0.39	0.55	0.61	1.92	0.47	1.59	0.59
Vanadium	0.41	0.34	0.66	0.78	0.81	0.45	0.45	0.78	0.39	0.63	0.55	0.70	0.50	1.02	0.56
Zinc	0.64	0.52	0.93	0.77	0.49	0.72	0.80	0.87	0.52	0.69	0.50	0.94	0.84	1.05	0.63
Pesticide/Polychlorinated Biphenyls															
Dieldrin	0.62	0.81	0.82	0.84	0.96	0.74	0.88	0.75	0.77	0.79	0.70	0.71	0.64	1.08	0.77
Endrin ketone	1.08	-	1.00	1.30	0.81	1.24	1.24	-	0.89	1.24	0.97	1.46	1.70	1.19	1.70
Heptachlor epoxide	-	-	1.27	-	-	-	-	-	-	1.36	-	-	-	1.36	-
alpha-BHC	0.56	0.59	0.88	0.50	0.65	1.00	1.15	-	0.88	0.71	0.74	0.62	0.71	1.09	0.68
gamma-BHC (Lindane)	0.70	0.55	0.77	0.64	0.52	0.89	0.93	1.02	0.73	0.73	0.68	0.59	0.55	0.84	0.95
Semi-volatile Organic Compounds															
Anthracene	0.77	0.54	0.75	4.29	0.57	0.75	0.95	1.04	0.63	0.73	1.34	0.71	0.57	0.93	0.64
Benzo(a)anthracene	0.58	0.38	0.58	2.58	0.54	0.62	0.50	0.62	0.50	0.50	0.81	0.50	0.42	0.58	0.58
Benzo(a)pyrene	0.52	0.38	0.53	3.53	0.48	0.58	0.41	0.71	0.44	0.47	0.94	0.49	0.35	0.57	0.47
Benzo(b)fluoranthene	0.54	0.35	0.54	1.83	0.50	0.58	0.46	0.65	0.46	0.38	0.63	0.42	0.35	0.54	0.46
Benzo(k)fluoranthene	0.63	0.46	0.62	2.00	0.54	0.63	0.36	0.54	0.63	0.44	0.81	0.55	0.40	0.69	0.53
Chrysene	0.55	0.40	0.58	2.13	0.53	0.58	0.60	0.70	0.50	0.48	0.73	0.53	0.40	0.65	0.55
Dibenz(a,h)anthracene	0.56	0.32	0.44	2.59	0.41	0.48	0.44	0.67	0.41	0.36	0.70	0.37	0.33	0.52	0.44
Fluoranthene	0.72	0.53	0.78	3.00	0.65	0.77	0.88	1.00	0.65	0.72	1.03	0.73	0.58	0.93	0.73
Indeno(1,2,3-cd)pyrene	0.51	0.37	0.56	2.80	0.49	0.58	0.45	0.73	0.48	0.43	0.80	0.45	0.35	0.59	0.47
Isophorone	0.54	0.36	0.64	0.33	1.29	0.89	0.86	1.32	0.57	0.68	0.79	1.00	0.82	1.04	0.93
Pyrene	0.58	0.44	0.62	1.92	0.51	0.58	0.65	0.76	0.54	0.54	0.74	0.54	0.46	0.74	0.56

Notes:

[1] Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

[2] Only chemicals with at least one TCR > 1.0 are shown.

[3] BM01 (Cooresponds to Blue Mussel, Station 01)

Shading indicates > 1.0

Table 6-16
Screening of Maximum Detected Residues in Mummichog Tissue

Chemical	Screening Value (mg/kg, wet)	Tissue Residue Concentrations (mg/kg, wet)				Tissue Concentration Ratios[1]			Tissue Hazard Quotients[2]			
		West Side of Facility	East Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility	East Side of Facility	West Side of Facility	East Side of Facility	East Side of Facility	Reference Site
Inorganics												
Antimony	50	0.006	0.033	0.011	0.009	0.7	3.7	1.2	<0.01	<0.01	<0.01	<0.01
Arsenic	1.6	0.78	0.76	0.78	0.65	1.2	1.2	1.2	0.49	0.48	0.49	0.41
Barium	NA	0.4	1.51	0.4	0.23	1.7	6.6	1.7	NA	NA	NA	NA
Beryllium	0.1	ND	0.024	ND	ND	-	>1.0	-	-	0.24	-	-
Chromium	19.8	0.14	0.74	0.13	0.14	1.0	5.3	0.9	<0.01	0.04	<0.01	<0.01
Cobalt	NA	0.018	0.118	0.017	0.016	1.1	7.4	1.1	NA	NA	NA	NA
Copper	34	3.51	34.5	19.4	28.4	0.1	1.2	0.7	0.10	1.01	0.57	0.84
Iron	NA	36	616	37	29	1.2	21.2	1.3	NA	NA	NA	NA
Lead	26.2	0.102	0.356	0.281	0.484	0.2	0.7	0.6	<0.01	0.01	0.01	0.02
Manganese	NA	4.87	10.3	4.16	4.18	1.2	2.5	1.0	NA	NA	NA	NA
Mercury	1.36	0.04	0.05	0.05	0.04	1.0	1.3	1.3	0.03	0.04	0.04	0.03
Nickel	29.2	0.81	3.33	0.58	0.48	1.7	6.9	1.2	0.03	0.11	0.02	0.02
Selenium	0.56	0.46	0.51	0.52	0.43	1.1	1.2	1.2	0.82	0.91	0.93	0.77
Silver	1.3	0.047	0.043	0.052	0.044	1.1	1.0	1.2	0.04	0.03	0.04	0.03
Thallium	4.6	ND	0.007	ND	ND	-	>1.0	-	-	<0.01	-	-
Vanadium	24	0.18	1.26	0.18	0.12	1.5	10.5	1.5	<0.01	0.05	<0.01	<0.01
Zinc	40	41.5	37.2	42.5	39.4	1.1	0.9	1.1	1.04	0.93	1.06	0.99
Pesticide/Polychlorinated Biphenyls												
4,4'-DDD	19	0.0011	0.0015	0.0012	0.002	0.6	0.8	0.6	<0.01	<0.01	<0.01	<0.01
4,4'-DDE	19	0.003	0.0049	0.0043	0.0051	0.6	1.0	0.8	<0.01	<0.01	<0.01	<0.01
4,4'-DDT	19	0.000099	0.00019	0.00013	0.00018	0.6	1.1	0.7	<0.01	<0.01	<0.01	<0.01
Aroclor-1254	36	0.02	0.03	0.028	0.042	0.5	0.7	0.7	<0.01	<0.01	<0.01	<0.01
Aroclor-1260	3500	0.02	0.029	0.024	0.037	0.5	0.8	0.6	<0.01	<0.01	<0.01	<0.01
Dieldrin	21.3	0.00043	0.0006	0.00056	0.00061	0.7	1.0	0.9	<0.01	<0.01	<0.01	<0.01
Endosulfan sulfate	0.03	0.00006	0.00012	0.000095	0.00017	0.4	0.7	0.6	<0.01	<0.01	<0.01	<0.01
Endrin aldehyde	0.94	ND	ND	ND	0.0016	-	-	-	-	-	-	<0.01
Endrin ketone	0.94	0.00085	0.00072	0.00096	0.003	0.3	0.2	0.3	<0.01	<0.01	<0.01	<0.01
Heptachlor	53	0.00001	ND	ND	ND	>1.0	-	-	<0.01	-	-	-
Heptachlor epoxide	37	0.000079	0.00012	0.000094	0.00016	0.5	0.8	0.6	<0.01	<0.01	<0.01	<0.01
alpha-BHC	4.86	0.00016	0.00032	0.00022	0.00024	0.7	1.3	0.9	<0.01	<0.01	<0.01	<0.01
alpha-Chlordane	31.8	0.00027	0.00049	0.00036	0.00046	0.6	1.1	0.8	<0.01	<0.01	<0.01	<0.01
beta-BHC	4.86	ND	ND	0.000018	ND	-	-	>1.0	-	-	<0.01	-

Table 6-16
Screening of Maximum Detected Residues in Mummichog Tissue

Chemical	Screening Value (mg/kg, wet)	Tissue Residue Concentrations (mg/kg, wet)				Tissue Concentration Ratios[1]			Tissue Hazard Quotients[2]			
		West Side of Facility	East Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility	East Side of Facility	West Side of Facility	East Side of Facility	East Side of Facility	Reference Site
delta-BHC	4.86	ND	ND	0.000027	ND	-	-	>1.0	-	-	<0.01	-
gamma-BHC (Lindane)	4.86	0.000059	0.0001	0.000072	0.00015	0.4	0.7	0.5	<0.01	<0.01	<0.01	<0.01
gamma-Chlordane	31.8	0.00015	0.00026	0.00032	0.00028	0.5	0.9	1.1	<0.01	<0.01	<0.01	<0.01
Semi-volatile Organic Compounds												
1,2,4-Trichlorobenzene	465	ND	ND	ND	0.00001	-	-	-	-	-	-	<0.01
2,4,5-Trichlorophenol	1000	ND	ND	ND	0.00023	-	-	-	-	-	-	<0.01
2,4,6-Trichlorophenol	0.052	ND	ND	ND	0.000094	-	-	-	-	-	-	<0.01
2,4-Dichlorophenol	2300	ND	ND	ND	0.00012	-	-	-	-	-	-	<0.01
2,4-Dimethylphenol	15300	ND	ND	ND	0.00036	-	-	-	-	-	-	<0.01
2-Chlorophenol	128	0.000044	ND	ND	0.00038	0.1	-	-	<0.01	-	-	<0.01
2-Methylphenol	765	0.000017	0.000019	0.000031	0.00017	0.1	0.1	0.2	<0.01	<0.01	<0.01	<0.01
4-Chloro-3-methylphenol	110	0.00046	0.0002	0.00012	0.0042	0.1	0.0	0.0	<0.01	<0.01	<0.01	<0.01
4-Methylphenol	765	ND	ND	ND	0.00026	-	-	-	-	-	-	<0.01
4-Nitrophenol	35	ND	ND	ND	ND	-	-	-	-	-	-	-
Acenaphthene	35000	0.00025	0.00036	0.00027	0.00021	1.2	1.7	1.3	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	NA	0.00024	0.00017	0.00014	0.00022	1.1	0.8	0.6	NA	NA	NA	NA
Anthracene	NA	0.00019	0.00017	0.00018	0.00014	1.4	1.2	1.3	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	0.00024	0.00011	0.00014	0.00018	1.3	0.6	0.8	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	0.00013	0.000043	0.000066	0.000097	1.3	0.4	0.7	NA	NA	NA	NA
Chrysene	NA	0.0002	0.00011	0.00018	0.00021	1.0	0.5	0.9	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	0.00013	0.000023	0.000027	0.000081	1.6	0.3	0.3	NA	NA	NA	NA
Fluoranthene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
Fluorene	NA	0.00029	0.0004	0.00031	0.00032	0.9	1.3	1.0	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	0.00018	0.000044	0.000061	0.000077	2.3	0.6	0.8	NA	NA	NA	NA
Naphthalene	1700	ND	0.0016	0.0014	0.0017	-	0.9	0.8	-	<0.01	<0.01	<0.01
Pentachlorophenol	65	ND	ND	ND	0.0022	-	-	-	-	-	-	<0.01
Phenanthrene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
Pyrene	NA	ND	ND	ND	ND	-	-	-	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	390	0.000051	0.00005	0.000049	ND	*	*	*	<0.01	<0.01	<0.01	-

Notes:

[1] Site Concentration / Reference Concentration

[2] Tissue Concentration / Screening Value

Table 6-17

Comparison of Sediment Benchmark Quotients Between First and Second Rounds of Sampling

Analyte	Outfall 5/6- Intertidal Station 04		Outfall 9- Subtidal Station 16		Outfall 10- Intertidal Station 20		Intertidal Reference Station (SS02)	
	Sept-01 Sampling	Nov-01 Sampling	Sept-01 Sampling	Nov-01 Sampling	Sept-01 Sampling	Nov-01 Sampling	Sept-01 Sampling	Nov-01 Sampling
Metals								
Aluminum	1.2	0.1	0.5	0.6	0.5	0.5	0.8	0.8
Arsenic	1.6	1.5	0.7	0.7	0.7	0.6	1.1	1.1
Barium	1.0	0.9	0.9	0.9	0.6	0.6	0.7	0.9
Cadmium	0.2	ND	0.2	0.1	0.1	0.1	0.2	0.2
Chromium	0.7	0.7	0.5	0.4	0.3	0.3	0.6	0.6
Cobalt	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2
Copper	0.7	0.6	0.7	0.7	0.5	0.4	0.6	0.5
Iron	1.6	1.4	1.3	0.8	0.7	0.7	1.1	1.0
Lead	0.6	0.6	0.3	0.4	0.2	0.2	0.5	0.5
Manganese	0.7	0.7	0.5	0.5	0.4	0.4	0.5	0.6
Mercury	1.6	1.1	0.6	0.5	0.8	0.3	2.4	1.8
Nickel	1.5	1.4	1.0	0.8	0.6	0.6	1.1	1.1
Selenium	0.8	ND	ND	ND	ND	0.1	0.6	0.7
Silver	0.2	ND	0.1	0.1	0.1	ND	0.2	0.2
Vanadium	0.9	0.8	0.5	0.5	0.5	0.5	0.7	0.7
Zinc	0.7	0.6	1.3	0.8	0.4	0.4	0.5	0.5
SVOCs								
2-Methylnaphthalene	ND	ND	8.9	ND	ND	ND	ND	ND
Acenaphthene	4.9	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	0.7	ND
Anthracene	2.0	ND	44.5	35.2	17.6	ND	0.3	ND
Benzo(a)anthracene	2.4	0.6	26.4	28.0	14.9	10.7	0.7	0.8
Benzo(a)pyrene	0.9	0.3	14.2	11.9	8.1	4.7	0.4	0.4
Benzo(b)fluoranthene	0.3	0.1	4.3	3.9	2.4	1.7	0.1	0.1
Benzo(g,h,i)perylene	1.2	0.5	17.6	17.6	13.5	ND	0.8	0.6
Benzo(k)fluoranthene	0.7	0.2	15.0	8.8	8.8	ND	0.4	0.3
Chrysene	0.9	0.3	21.9	14.3	8.6	6.3	0.4	0.4
Dibenz(a,h)anthracene	1.0	ND	ND	ND	ND	ND	0.5	ND
Dibenzofuran	ND	ND	17.3	5.0	3.0	6.8	ND	ND
Dimethylphthalate	ND	ND	ND	86.7	ND	ND	ND	ND
Fluoranthene	1.3	0.4	40.0	41.7	13.3	12.3	0.2	0.4
Fluorene	5.8	ND	ND	110.5	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	1.7	0.7	20.0	22.0	14.5	8.0	1.0	0.7
Naphthalene	ND	ND	5.0	ND	ND	ND	ND	ND
Phenanthrene	1.2	0.6	28.8	75.0	23.3	26.7	0.2	0.4
Pyrene	0.9	0.3	24.1	16.5	9.8	6.6	0.3	0.4
Bulk Chemistry								
Total Organic Carbon (%)	2.2	2.4	1.4	0.87	1.4	1.3	2.6	2.1

Notes:

Shading indicates exceedence of screening value

Table 6-18
Risk Ranking for Biota Tissue Concentration Ratios

Chemical[2]	Soft-shell Clam Tissue Concentration Ratios[1]					Blue Mussel Tissue Concentration Ratios[1]					Mummichog Tissue Concentration Ratios[1]		
	Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	West Side of Facility	East Side of Facility	East Side of Facility
Inorganics													
Arsenic	2.08 (+)	0.71 (-)	0.93 (-)	0.92 (-)	0.39 (-)	0.91 (-)	0.77 (-)	0.88 (-)	0.85 (-)	1.03 (+)	1.2 (+)	1.17 (+)	1.20 (+)
Barium	1.70 (+)	0.85 (-)	0.88 (-)	0.65 (-)	0.42 (-)	1.06 (+)	1.51 (+)	1.58 (+)	1.06 (+)	1.04 (+)	1.74 (+)	6.57 (+)	1.74 (+)
Chromium	1.22 (+)	0.80 (-)	0.68 (-)	0.53 (-)	0.46 (-)	1.62 (+)	0.98 (-)	0.92 (-)	3.32 (+)	1.13 (+)	1.00 (-)	5.29 (+)	0.93 (-)
Cobalt	3.33 (+)	0.87 (-)	0.97 (-)	1.13 (+)	0.78 (-)	0.93 (-)	0.90 (-)	0.91 (-)	0.76 (-)	0.79 (-)	1.13 (+)	7.38 (+)	1.07 (+)
Copper	3.47 (+)	0.60 (-)	1.56 (+)	1.34 (+)	3.50 (+)	0.69 (-)	0.42 (-)	0.42 (-)	0.71 (-)	1.06 (+)	0.12 (-)	1.21 (+)	0.68 (-)
Iron	1.90 (+)	0.66 (-)	0.89 (-)	0.45 (-)	0.27 (-)	0.77 (-)	1.17 (+)	1.14 (+)	1.00 (-)	1.22 (+)	1.24 (+)	21 (+)	1.28 (+)
Manganese	3.12 (+)	0.25 (-)	0.36 (-)	0.75 (-)	0.16 (-)	0.61 (-)	1.25 (+)	0.53 (-)	0.49 (-)	0.51 (-)	1.17 (+)	2.46 (+)	1.00 (-)
Nickel	1.99 (+)	0.81 (-)	3.45 (+)	2.31 (+)	1.79 (+)	0.98 (-)	0.67 (-)	0.75 (-)	1.92 (+)	1.59 (+)	1.69 (+)	6.94 (+)	1.21 (+)
Vanadium	2.20 (+)	0.77 (-)	0.76 (-)	0.61 (-)	0.40 (-)	0.66 (-)	0.81 (-)	0.78 (-)	0.70 (-)	1.02 (+)	1.50 (+)	10.5 (+)	1.50 (+)
Semi-volatile Organic Compounds													
Anthracene	2.28 (+)	0.88 (-)	1.83 (+)	1.05 (+)	3.00 (+)	0.77 (-)	4.29 (+)	1.04 (+)	1.34 (+)	0.93 (-)	1.36 (+)	1.21 (+)	1.29 (+)
Benzo(a)anthracene	0.90 (-)	0.58 (-)	0.93 (-)	0.45 (-)	0.90 (-)	0.58 (-)	2.58 (+)	0.62 (-)	0.81 (-)	0.58 (-)	-	-	-
Benzo(a)pyrene	0.85 (-)	0.44 (-)	0.76 (-)	0.37 (-)	0.68 (-)	0.53 (-)	3.53 (+)	0.71 (-)	0.94 (-)	0.57 (-)	-	-	-
Benzo(k)fluoranthene	0.80 (-)	0.48 (-)	0.84 (-)	0.44 (-)	0.68 (-)	0.63 (-)	2.00 (+)	0.63 (-)	0.81 (-)	0.69 (-)	1.34 (+)	0.44 (-)	0.68 (-)
Chrysene	0.73 (-)	0.55 (-)	0.82 (-)	0.44 (-)	0.66 (-)	0.58 (-)	2.13 (+)	0.70 (-)	0.73 (-)	0.65 (-)	0.95 (-)	0.52 (-)	0.86 (-)
Dibenz(a,h)anthracene	0.74 (-)	0.42 (-)	0.74 (-)	0.34 (-)	0.52 (-)	0.56 (-)	2.59 (+)	0.67 (-)	0.70 (-)	0.52 (-)	1.60 (+)	0.28 (-)	0.33 (-)
Fluoranthene	1.10 (+)	0.74 (-)	1.22 (+)	0.69 (-)	1.23 (+)	0.78 (-)	3.00 (+)	1.00 (-)	1.03 (+)	0.93 (-)	-	-	-
Indeno(1,2,3-cd)pyrene	0.84 (-)	0.47 (-)	0.75 (-)	0.38 (-)	0.56 (-)	0.56 (-)	2.80 (+)	0.73 (-)	0.80 (-)	0.59 (-)	2.34 (+)	0.57 (-)	0.79 (-)

Notes:

[1] Tissue Concentration Ratio = Concentration at Facility / Concentration at Reference Site

[2] Only chemicals with at least one TCR > 1.0 are shown

Table 6-19
Risk Ranking of Biota Tissue Hazard Quotients

Chemical	Soft-shell Clam Tissue Hazard Quotients[1]						Blue Mussel Tissue Hazard Quotients[1]						Mummichog Tissue Hazard Quotients[1]			
	Outfall 005 / 006	Outfall 008	Outfall 010	Outfall 011	Outfall 012	Reference Site	Outfall 008	Outfall 009	Outfall 010	Outfall 011	Outfall 012	Reference Site	West Side of Facility	East Side of Facility	East Side of Facility	Reference Site
Inorganics																
Arsenic	4.44 (+)	1.53 (+)	1.98 (+)	1.98 (+)	0.83 (-)	2.14 (+)	0.87 (-)	0.74 (-)	0.84 (-)	0.81 (-)	0.98 (-)	0.96 (-)	0.49 (-)	0.48 (-)	0.49 (-)	0.41 (-)
Barium	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Chromium	9.28 (+)	6.06 (+)	5.17 (+)	4.06 (+)	3.50 (+)	7.61 (+)	5.39 (+)	3.28 (+)	3.06 (+)	11 (++)	3.78 (+)	3.33 (+)	<0.01 (-)	0.04 (-)	<0.01 (-)	<0.01 (-)
Cobalt	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-	-	-	NA	NA	NA	NA
Copper	8.80 (+)	1.50 (+)	4.00 (+)	3.40 (+)	8.90 (+)	2.50 (+)	0.88 (-)	0.53 (-)	0.53 (-)	0.90 (-)	1.35 (+)	1.27 (+)	0.10 (-)	1.01 (+)	0.57 (-)	0.84 (-)
Iron	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Manganese	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Nickel	5.48 (+)	2.24 (+)	9.52 (+)	6.39 (+)	4.94 (+)	2.76 (+)	1.52 (+)	1.03 (+)	1.15 (+)	2.97 (+)	2.45 (+)	1.55 (+)	0.03 (-)	0.11 (-)	0.02 (-)	0.02 (-)
Vanadium	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-	-	-	<0.01 (-)	0.05 (-)	<0.01 (-)	<0.01 (-)
Semi-volatile Organic Compounds																
Anthracene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Benzo(a)anthracene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-
Benzo(a)pyrene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	-	-	-	-
Benzo(k)fluoranthene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Chrysene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Dibenz(a,h)anthracene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Fluoranthene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NSV	NA	NA	NA	NA

Notes:

[1] Hazard Quotient = Concentration / Screening Value

NSV = No Screening Value

Table 6-20
Exposure Parameters for Avian Receptor Species

Receptor Species	Body Weight (kg)	Assumed Diet (% of diet)			Food Ingestion Rate (kg/day, dry)	Area Use Factor (unitless)
		Mussels	Fish	Sediment		
Herring gull *(Larus argentatus)*	0.999 [a]	40% [b]	50% [b]	10% [c]	0.04301 [a]	1 [d]
Osprey *(Pandion haliaetus)*	1.403 [a]	---	100% [a]	0% [c]	0.07365 [a]	1 [d]
Belted kingfisher (*Ceryle alcyon*)	0.136 [a]	---	100% [a]	0% [c]	0.01700 [a]	1 [d]

[a] USEPA, 1993b.

[b] Assumed for purposes of risk assessment.

[c] Assumption based on feeding habits.

[d] Conservative assumption that receptor feeds exclusively at site.

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
Inorganics								
Aluminum	4.4	4.4	TSC					
Antimony	50	5	NOAEL	*Oncorhynchus mykiss*	Rainbow trout	Survival - no effect	Whole body	Water
Arsenic	1.6	1.6	TSC					
Barium	NA	NA						
Beryllium	0.1	0.1	TSC					
Cadmium	0.042	0.042	TSC					
Chromium	19.8	1.98	NOAEL	*Oncorhyncus mykiss*	Rainbow trout	Survival- no effect	Whole Body	Water
Cobalt	NA	NA						
Copper	34	3.4	NOAEL	*Salvelinus fontinalis*	Brook trout	Survival, Growth, Reproduction - no effect	Muscle	Water
Cyanide	NA	NA						
Iron	NA	NA						
Lead	26.2	26.2	LOAEL	*Pimephales promelas*	Fathead minnow	Behavior	Whole body	Water
Manganese	NA	NA						
Mercury	1.36	1.36	LOAEL	*Pimephales promelas*	Fathead minnow	Reduced Growth	Whole body	Water
Nickel	29.2	2.92	NOAEL	*Oncorhyncus mykiss*	Rainbow trout	Survival- no effect	Liver	Water
Selenium	0.56	0.56	TSC					
Silver	1.3	0.13	NOAEL	*Oncorhynchus mykiss*	Rainbow trout	Survival - no effect	Whole body	Water
Thallium	4.6	4.6	TSC					
Vanadium	24	2.4	NOAEL	*Jordanella floridae*	Flagfish	Survival - no effect	Whole body	Water
Zinc	40	40	LOAEL	*Jordanella floridae*	Flagfish	Survival - no effect; Growth - reduced	Whole body	Water

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
Inorganics			
Aluminum		Shepard 1998	Derived using AWQC and BCF values
Antimony	Fingerling	Jarvinen and Ankley, 1999	
Arsenic		Shepard 1998	Derived using AWQC and BCF values
Barium			
Beryllium		Shepard 1998	Derived using AWQC and BCF values
Cadmium		Shepard 1998	Derived using AWQC and BCF values
Chromium	150g	Jarvinen and Ankley, 1999	
Cobalt			
Copper	Embryo-Adult	Jarvinen and Ankley, 1999	720 day exposure
Cyanide			
Iron			
Lead	Juvenile	Environmental Residues Effects Database (ACOE)	Significant reduction in feeding rate and ability to capture and eat prey.
Manganese			
Mercury	Adult	Spry and Wiener, 1991	41-week exposure; aqueous mercuric chloride
Nickel		Jarvinen and Ankley, 1999	
Selenium		Shepard 1998	Derived using AWQC and BCF values
Silver	Embryo	Guadagnolo et al. 2001	32 day exposure ($AgNO_3$, hardness 120); Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Thallium		Shepard 1998	Derived using AWQC and BCF values
Vanadium	Larvae	Jarvinen and Ankley, 1999	28 day exposure
Zinc	Larvae - Adult	Jarvinen and Ankley, 1999	100 day exposure

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
Pesticide/Polychlorinated Biphenyls								
4,4'-DDD	19	19	LOAEL	*Pimephales promelas*	Fathead minnow	Survival - reduced 25%	Whole body	Diet
4,4'-DDE	19	19	LOAEL	*Pimephales promelas*	Fathead minnow	Survival - reduced 25%	Whole body	Diet
4,4'-DDT	19	19	LOAEL	*Pimephales promelas*	Fathead minnow	Survival - reduced 25%	Whole body	Diet
Aroclor-1254	36	36	LOAEL	*Pimephales promelas*	Fathead minnow	Reproduction	Whole body	Sediment
Aroclor-1260	3500	350	NOAEL	*Pimephales promelas*	Fathead minnow	Survival, Growth, Reproduction - no	Whole body	Water
Dieldrin	21.3	2.13	NOAEL	*Oncorhynchus mykiss*	Rainbow trout	Survival, Growth - no effect	Whole body	Diet
Endosulfan sulfate	0.03	0.03	LOAEL	*Leiostomus xanthurus*	Spot	Survival - reduced	Whole body	Water
Endrin aldehyde	0.94	0.94	LOAEL	*Cyprinodon variegatus*	Sheepshead minnow	Reproduction - reduced	Whole body	Water
Endrin ketone	0.94	0.94	LOAEL	*Cyprinodon variegatus*	Sheepshead minnow	Reproduction - reduced	Whole body	Water
Heptachlor	53	5.3	NOAEL	*Leiostomus xanthurus*	Spot	Survival - no effect	Whole body	Water
Heptachlor epoxide	37	3.7	NOAEL	*Leiostomus xanthurus*	Spot	Survival - no effect	Whole body	Water
alpha-BHC	4.86	0.486	NOAEL	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water
alpha-Chlordane	31.8	3.18	NOAEL	*Cyprinodon variegatus*	Sheepshead minnow	Reproduction - fry hatching success reduced	Whole body	Combined
beta-BHC	4.86	0.486	NOAEL	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
Pesticide/Polychlorinated Biphenyls			
4,4'-DDD	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDE	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDT	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
Aroclor-1254	Adult	ACOE 1988	16 week exposure
Aroclor-1260	Adult / embryo	Jarvinen and Ankley, 1999	Females has highest residues; Reported value NOAEL (converted to LOAEL with uncertainty factor
Dieldrin	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Endosulfan sulfate	Juvenile	Jarvinen and Ankley, 1999	Residues in surving organisms (control 10% morality)
Endrin aldehyde	Adult	Jarvinen and Ankley, 1999	Value for Endrin (used as surrogate)
Endrin ketone	Adult	Jarvinen and Ankley, 1999	Value for Endrin (used as surrogate)
Heptachlor	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Heptachlor epoxide	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
alpha-BHC	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
alpha-Chlordane	Adult	Environmental Residues Effects Database (ACOE)	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
beta-BHC	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
delta-BHC	4.86	0.486	NOAEL	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water
gamma-BHC (Lindane)	4.86	0.486	NOAEL	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg	Whole body	Water
gamma-Chlordane	31.8	3.18	NOAEL	*Cyprinodon variegatus*	Sheepshead minnow	Reproduction - fry hatching success reduced	Whole body	Combined
Semi-volatile Organic Compounds								
1,2,4-Trichlorobenzene	465	465	LOAEL	*Pimephales promelas*	Fathead minnow	Survival, Growth - reduced	Whole body	Water
2,4,5-Trichlorophenol	1000	100	NOAEL	*Pimephales promelas*	Fathead minnow	Survival - no effect	Whole body	Water
2,4,6-Trichlorophenol	0.052	0.052	LOAEL	*Poecilia reticulata*	Guppy	Reproduction - reduced 50%	Whole body	Water
2,4-Dichlorophenol	2300	230	NOAEL	*Carassius auratus*	Goldfish	Survival - reduced	Whole body	Water
2,4-Dimethylphenol	15300	1530	NOAEL	*Lepomis macrochirus*	Bluegill	Survival - no effect	Whole body	Water
2-Chlorophenol	128	128	LOAEL	*Carassius auratus*	Goldfish	Survival - reduced	Whole body	Water
2-Methylphenol	765	765	LOAEL	*Oncorhynchus mykiss*	Rainbow trout	Survival - reduced	Whole body	Injection
4-Chloro-3-methylphenol	110	110	TSC					

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
delta-BHC	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
gamma-BHC (Lindane)	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
gamma-Chlordane	Adult	Environmental Residues Effects Database (ACOE)	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Semi-volatile Organic Compounds			
1,2,4-Trichlorobenzene	Embryo-Juvenile	Jarvinen and Ankley, 1999	DO: 8.1 mg/L; (NOAEL = 170 ug/g)
2,4,5-Trichlorophenol	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
2,4,6-Trichlorophenol	Adult	Jarvinen and Ankley, 1999	Maternal exposure (0.052-1.22 ug/g)
2,4-Dichlorophenol	Juvenile	Jarvinen and Ankley, 1999	Value for 2,6-Dichlorophenol used as surrogate; LOAEL = 321-431 ug/g (residue in dead fish); Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
2,4-Dimethylphenol	Juvenile	Environmental Residues Effects Database (ACOE)	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
2-Chlorophenol	Juvenile	Jarvinen and Ankley, 1999	NOAEL = 50-250 ug/g; different study (residue in surviving fish)
2-Methylphenol	NA	Environmental Residues Effects Database (ACOE)	Value for 4-methylphenol used as surrogate; based on LD50 of 76,500 ug/g with safety factor of 100 applied.
4-Chloro-3-methylphenol			

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Screening Value (mg/kg, wet)	Tissue Benchmark (mg/kg, wet)	Benchmark Type	Species Scientific Name	Species Common Name	Effect	Tissue	Exposure Route
4-Methylphenol	765	765	LOAEL	*Oncorhynchus mykiss*	Rainbow trout	Survival - reduced	Whole body	Injection
4-Nitrophenol	35	35	LOAEL	*Cyprinodon variegatus*	Sheepshead minnow	Survival - reduced 50%	Whole body	Water
Acenaphthene	35000	3500	NOAEL	*Lepomis macrochirus*	Bluegill	Survival - no effect	Whole body	Water
Acenaphthylene	NA							
Anthracene	NA							
Benzo(b)fluoranthene	NA							
Benzo(g,h,i)perylene	NA							
Benzo(k)fluoranthene	NA							
Chrysene	NA							
Dibenz(a,h)anthracene	NA							
Fluoranthene	NA							
Fluorene	NA							
Indeno(1,2,3-cd)pyrene	NA							
Naphthalene	1700	1700	LOAEL	*Fundulus heteroclitus*	Mummichog	Survival - reduced	Whole body	Water
Pentachlorophenol	65	65	LOAEL	*Oryzias latipes*	Killifish	Survival -reduced	Whole body	Water
Phenanthrene	NA							
Pyrene	NA							
bis(2-Ethylhexyl)phthalate	390	390	TSC					
n-Nitrosodiphenylamine	20000	2000	NOAEL	*Lepomis macrochirus*	Bluegill	Survival - no effect	Whole body	Water

Table 6-21
Tissue Residue Screening Values for Mummichog

Chemical	Life-Stage	Reference	Comments
4-Methylphenol	NA	Environmental Residues Effects Database (ACOE)	Based on LD50 of 76,500 ug/g with safety factor of 100 applied.
4-Nitrophenol	Juvenile	Jarvinen and Ankley, 1999	NOAEL = 25.1 ug/g, different study
Acenaphthene	Juvenile	Environmental Residues Effects Database (ACOE)	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Acenaphthylene			
Anthracene			
Benzo(b)fluoranthene			
Benzo(g,h,i)perylene			
Benzo(k)fluoranthene			
Chrysene			
Dibenz(a,h)anthracene			
Fluoranthene			
Fluorene			
Indeno(1,2,3-cd)pyrene			
Naphthalene	Adult	Environmental Residues Effects Database (ACOE)	
Pentachlorophenol	Juvenile	Jarvinen and Ankley, 1999	NOAEL = 35 ug/g
Phenanthrene			
Pyrene			
bis(2-Ethylhexyl)phthalate			
n-Nitrosodiphenylamine	Juvenile	Environmental Residues Effects Database (ACOE)	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Screening Value	Benchmark Type	Tissue Benchmark mg/kg wet	Species Scientific Name	Species Common Name	Effect
Inorganics						
Arsenic	3.00	LOAEL	3.00	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced
Cadmium	0.40	LOAEL	0.40	*Salmo salar*	Atlantic salmon	Growth - reduced
Chromium	19.80	NOAEL	1.98	*Oncorhyncus mykiss*	Rainbow trout	Survival- no effect
Copper	1.84	LOAEL	1.84	*Ictalurus punctatus*	Channel catfish	Growth - reduced
Lead	4.00	LOAEL	4.00	*Salvelinus fontinalis*	Brook trout	Growth - reduced
Mercury	1.35	NOAEL	0.14	*Perca flavescens*	Yellow perch	Growth - no effect
Nickel	29.20	NOAEL	2.92	*Oncorhyncus mykiss*	Rainbow trout	Survival- no effect
Selenium	0.80	LOAEL	0.80	*Oncorhyncus tshawytscha*	Chinook salmon	Growth - reduced
Silver	0.60	NOAEL	0.06	*Lepomis macrochirus*	Bluegill	Growth - no effect
Zinc	600.00	NOAEL	60.00	*Salmo salar*	Atlantic salmon	Growth - no effect
Pesticide/PCBs						
4,4'-DDD	19.00	LOAEL	19.00	*Pimephales promelas*	Fathead minnow	Survival - reduced 25%
4,4'-DDE	19.00	LOAEL	19.00	*Pimephales promelas*	Fathead minnow	Survival - reduced 25%
4,4'-DDT	19.00	LOAEL	19.00	*Pimephales promelas*	Fathead minnow	Survival - reduced 25%
alpha-BHC	4.86	NOAEL	0.49	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg
alpha-Chlordane	31.80	NOAEL	3.18	*Cyprinodon variegatus*	Sheepshead minnow	Reproduction - fry hatching success reduced
Aroclor-1254	210.00	NOAEL	21.00	*Ictalurus punctatus*	Channel Catfish	Survival, Growth - no effect
Aroclor-1260	320.00	NOAEL	32.00	*Ictalurus punctatus*	Channel Catfish	Survival, Growth - no effect
beta-BHC	4.86	LOAEL	4.86	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Tissue	Exposure Route	Life-Stage	Reference	Comments
Inorganics					
Arsenic	Whole Body	Water	Fingerling	Jarvinen and Ankley, 1999	
Cadmium	Whole Body	Water	Embryo - alevin	Jarvinen and Ankley, 1999	
Chromium	Whole Body	Water	150g	Jarvinen and Ankley, 1999	
Copper	Liver	Water	Fingerling	Jarvinen and Ankley, 1999	
Lead	Whole Body	Water	Egg-embryo	Holcombe, et al., 1976	
Mercury	Whole Body	Water	Adult	Weiner, et al., 1990	
Nickel	Liver	Water		Jarvinen and Ankley, 1999	
Selenium	Whole Body	Water	Larvae	Jarvinen and Ankley, 1999	
Silver	Whole Body	Water	Young of year	Jarvinen and Ankley, 1999	
Zinc	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	
Pesticide/PCBs					
4,4'-DDD	Whole body	Diet	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDE	Whole body	Diet	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
4,4'-DDT	Whole body	Diet	Juvenile-Adult	Jarvinen and Ankley, 1999	Test Duration: 266 days (Residue: 57mg/kg, DDT,DDD, and DDE combined)
alpha-BHC	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL
alpha-Chlordane	Whole body	Combined	Adult	Environmental Residues Effects Database	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Aroclor-1254	Whole Body	Diet	Fingerling	Jarvinen and Ankley, 1999	
Aroclor-1260	Whole Body	Diet	Fingerling	Jarvinen and Ankley, 1999	
beta-BHC	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Screening Value	Benchmark Type	Tissue Benchmark mg/kg wet	Species Scientific Name	Species Common Name	Effect
delta-BHC	4.86	LOAEL	4.86	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg
Dieldrin	21.30	LOAEL	21.30	*Oncorhynchus mykiss*	Rainbow trout	Survival, Growth - no effect
Endosulfan I	0.03	LOAEL	0.03	*Leiostomus xanthurus*	Spot	Survival - reduced
Endosulfan II	0.03	LOAEL	0.03	*Leiostomus xanthurus*	Spot	Survival - reduced
Endosulfan Sulfate	0.03	LOAEL	0.03	*Leiostomus xanthurus*	Spot	Survival - reduced
Endrin	3.10	NOAEL	0.31	*Ictalurus punctatus*	Channel Catfish	Survival, Growth - no effect
Endrin Aldehyde	3.10	NOAEL	0.31	*Ictalurus punctatus*	Channel Catfish	Survival, Growth - no effect
Endrin Ketone	3.10	NOAEL	0.31	*Ictalurus punctatus*	Channel Catfish	Survival, Growth - no effect
Gamma-BHC (Lindane)	4.86	LOAEL	4.86	*Lagodon rhomboides*	Pinfish	Survival - reduced >50% at 48.6 ug/kg
Gamma-Chlordane	31.80	NOAEL	3.18	*Cyprinodon variegatus*	Sheepshead minnow	Reproduction - fry hatching success reduced
Heptachlor	53.00	NOAEL	5.30	*Leiostomus xanthurus*	Spot	Survival - no effect
Heptachlor Epoxide	37.00	NOAEL	3.70	*Leiostomus xanthurus*	Spot	Survival - no effect
SVOCs						
Acenaphthene	35.00	NOAEL	3.50	*Lepomis macrochirus*	Bluegill	Survival - no effect
Acenaphthylene	35.00	NOAEL	3.50	*Lepomis macrochirus*	Bluegill	Survival - no effect
Anthracene	300.00	NOAEL	30.00	*Oncorhyncus mykiss*	Rainbow trout	Biochemical- no effect
Benzo(a)anthracene	12.30	LOAEL	12.30	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced
Benzo(a)pyrene	12.30	LOAEL	12.30	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Tissue	Exposure Route	Life-Stage	Reference	Comments
delta-BHC	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Dieldrin	Whole body	Diet	Juvenile	Jarvinen and Ankley, 1999	Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Endosulfan I	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	
Endosulfan II	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	Value for Endosulfan used as surrogate
Endosulfan Sulfate	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	Value for Endosulfan used as surrogate
Endrin	Whole Body	Diet	Juvenile	Jarvinen and Ankley, 1999	
Endrin Aldehyde	Whole Body	Diet	Juvenile	Jarvinen and Ankley, 1999	Value for Endrin used as surrogate
Endrin Ketone	Whole Body	Diet	Juvenile	Jarvinen and Ankley, 1999	Value for Endrin used as surrogate
Gamma-BHC (Lindane)	Whole body	Water	Adult	Jarvinen and Ankley, 1999	Sum of alpha, gamma, beta, and delta isomers (residues in surviving organisms); An uncertainty factor of 100 was used to convert the acute LC50 to a chronic NOAEL; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Gamma-Chlordane	Whole body	Combined	Adult	Environmental Residues Effects Databas	NOAEL = 3180 ug/g; Parents exposed; Reported value NOAEL (converted to LOAEL with uncertainty factor of 10).
Heptachlor	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	24 day exposure
Heptachlor Epoxide	Whole Body	Water	Juvenile	Jarvinen and Ankley, 1999	24 day exposure
SVOCs					
Acenaphthene	Whole Body	Water	Subadult	Barrows, et al., 1980	
Acenaphthylene	Whole Body	Water	Subadult	Barrows, et al., 1980	Value for Acenaphthene used as surrogate
Anthracene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	Value for Phenanthrene used as surrogate
Benzo(a)anthracene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Benzo(a)pyrene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Screening Value	Benchmark Type	Tissue Benchmark mg/kg wet	Species Scientific Name	Species Common Name	Effect
Benzo(b)fluoranthene	12.30	LOAEL	12.30	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced
Benzo(g,h,i)perylene	12.30	LOAEL	12.30	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced
Benzo(k)fluoranthene	12.30	LOAEL	12.30	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced
Chrysene	30.00	LOAEL	30.00	*Oncorhyncus mykiss*	Rainbow trout	Biochemical- no effect
Dibenz(a,h)anthracene	12.30	LOAEL	12.30	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced
Fluoranthene	300.00	NOAEL	30.00	*Oncorhyncus mykiss*	Rainbow trout	Biochemical- no effect
Fluorene	300.00	NOAEL	30.00	*Oncorhyncus mykiss*	Rainbow trout	Biochemical- no effect
Indeno(1,2,3-cd)pyrene	12.30	LOAEL	12.30	*Oncorhyncus mykiss*	Rainbow trout	Growth - reduced
Pentachlorophenol	22.10	LOAEL	22.10	*Pimephales promelas*	Fathead minnow	Growth - reduced
Phenanthrene	300.00	NOAEL	30.00	*Oncorhyncus mykiss*	Rainbow trout	Biochemical- no effect
Pyrene	30	LOAEL	30	*Oncorhyncus mykiss*	Rainbow trout	Biochemical- reduced effect

Table 6-22
Tissue Chemical Residue Screening Values for Shortnose Sturgeon

Chemical	Tissue	Exposure Route	Life-Stage	Reference	Comments
Benzo(b)fluoranthene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Benzo(g,h,i)perylene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Benzo(k)fluoranthene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Chrysene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	
Dibenz(a,h)anthracene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Fluoranthene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	
Fluorene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	Value for Phenanthrene used as surrogate
Indeno(1,2,3-cd)pyrene	Whole Body	Water	Alevin	Jarvinen and Ankley, 1999	Value for Benzo(a)pyrene used as surrogate
Pentachlorophenol	Whole Body	Water	Larvae-Juvenile	Jarvinen and Ankley, 1999	
Phenanthrene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	
Pyrene	Whole Body	Water	Immature	Gerhart, E.H. and R.H. Carlson, 1978	

Table 6-23

Ingestion Screening Values for Birds

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Arsenic	mallard	1	128 days	oral in diet	mortality	12.84	5.14	Sample et al. 1996
Cadmium	mallard	1.153	90 days	oral in diet	reproduction	20	1.45	Sample et al. 1996
Chromium	American black duck	1.25	10 months	oral in diet	reproduction	5	1	Sample et al. 1996
Copper	chicks	0.534	10 weeks	oral in diet	growth/mortality	61.7	47	Sample et al. 1996
Lead	American kestrel	0.13	7 months	oral in diet	reproduction	38.5	3.85	Sample et al. 1996
Mercury	mallard	1	3 generations	oral in diet	reproduction	0.064	0.0064	Sample et al. 1996
Nickel	mallard	0.782	90 days	oral in diet	growth/mortality	107	77.4	Sample et al. 1996
Selenium	mallard	1	100 days	oral in diet	reproduction	0.8	0.4	Sample et al. 1996
Silver	mallard	?	14 days	oral	?	1780	178	USEPA 1999b
Zinc	chicken	1.935	44 weeks	oral in diet	reproduction	131	14.5	Sample et al. 1996
Pesticides/PCBs								
4,4'-DDD	mallard	1.134	chronic	oral	reproduction	5.2	0.52	Stickel 1973
4,4'-DDE	brown pelican	3.5	chronic	oral	reproduction	1.31	0.131	Beyer et al. 1996
4,4'-DDT	mallard	1.134	chronic	oral	reproduction	1.04	0.104	Davison and Sell 1974
Aldrin	mallard	1.134	chronic	oral	mortality	5	0.5	Tucker and Crabtree
alpha-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
alpha-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Aroclor-1016	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1221	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1232	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1242	screech owl	0.181	2 generations	oral in diet	reproduction	4.1	0.41	Sample et al. 1996
Aroclor-1248	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1254	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
Aroclor-1260	ring-necked pheasant	1	17 weeks	oral	reproduction	1.8	0.18	Sample et al. 1996
PCBs (total)	--	--	--	--	--	NA	NA	--
beta-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
delta-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
Dieldrin	barn owl	0.466	2 years	oral in diet	reproduction	0.77	0.077	Sample et al. 1996
Endosulfan I	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endosulfan II	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endosulfan Sulfate	gray partridge	0.4	4 weeks	oral in diet	reproduction	100	10	Sample et al. 1996
Endrin	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996
Endrin Aldehyde	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996

Table 6-23
Ingestion Screening Values for Birds

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Endrin Ketone	mallard	1.15	>200 days	oral in diet	reproduction	3	0.3	Sample et al. 1996
Endrin Ketone	screech owl	0.181	>83 days	oral in diet	reproduction	0.1	0.01	Sample et al. 1996
Gamma-BHC (Lindane)	mallard	1	8 weeks	oral (intubation)	reproduction	20	2	Sample et al. 1996
Gamma-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	mortality	10.7	2.14	Sample et al. 1996
Heptachlor	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Heptachlor Epoxide	quail	0.191	5 days	oral in diet	mortality	4.05	0.405	Hill et al. 1975
Methoxychlor	quail	0.191	5 days	oral in diet	mortality	4050	405	Hill and Camardese 1986
Toxaphene	mallard	1.043	5 days	oral in diet	mortality	3.07	0.307	Hill and Camardese 1986
Semivolatile Organic Compounds								
Acenaphthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Acenaphthylene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Anthracene	mallard	1.043	7 months	oral in diet	hepatic	228	22.8	Patton and Dieter 1980
Benzo(a)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(a)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(b)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(g,h,i)perylene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(k)fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Chrysene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Dibenz(a,h)anthracene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluoranthene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluorene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Indeno(1,2,3-cd)pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pentachlorophenol	chicken	1.5	8 weeks	oral	growth	200	100	Eisler 1989
Phenanthrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pyrene	chicken	1.5	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963

Table 6-24
Screening of Estimated Chemical Residues in Shortnose Sturgeon Tissue

Chemical	Screening Value (mg/kg, wet)	Estimated Tissue Residues (mg/kg, wet)			Hazard Quotients		
		Reference Site	West Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility
Inorganics							
Arsenic	3.00	19.527	36.547	14.293	6.51 (+)	12 (++)	4.76 (+)
Cadmium	0.40	1.281	0.335	1.143	3.20 (+)	0.84 (-)	2.86 (+)
Chromium	19.80	6.580	10.080	6.082	0.33 (-)	0.51 (-)	0.31 (-)
Copper	1.84	86.717	59.833	89.499	47 (+++)	33 (++)	49 (+++)
Lead	4.00	7.047	10.711	4.331	1.76 (+)	2.68 (+)	1.08 (+)
Mercury	1.35	0.470	0.333	0.486	0.35 (-)	0.25 (-)	0.36(-)
Nickel	29.20	5.310	9.433	9.537	0.18 (-)	0.32 (-)	0.33 (-)
Selenium	0.80	3.000	3.880	4.205	3.75 (+)	4.85 (+)	5.26 (+)
Silver	0.60	0.777	0.978	0.125	1.29 (+)	1.63 (+)	0.21 (-)
Zinc	600.00	195.680	212.253	185.172	0.33 (-)	0.35 (-)	0.31 (-)
Pesticides/PCBs							
4,4'-DDD	19.00	0.006	0.003	0.004	<0.01 (-)	<0.01 (-)	<0.01 (-)
4,4'-DDE	19.00	0.015	0.008	0.012	<0.01 (-)	<0.01 (-)	<0.01 (-)
4,4'-DDT	19.00	0.001	0.000	0.001	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aldrin	-	ND	ND	ND	-	-	-
alpha-BHC	4.86	0.001	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-Chlordane	31.80	0.002	0.001	0.002	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1016	-	ND	ND	ND	-	-	-
Aroclor-1221	-	ND	ND	ND	-	-	-
Aroclor-1232	-	ND	ND	ND	-	-	-
Aroclor-1242	-	ND	ND	ND	-	-	-
Aroclor-1248	-	ND	ND	ND	-	-	-
Aroclor-1254	210.00	0.100	0.059	0.066	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1260	320.00	0.089	0.062	0.061	<0.01 (-)	<0.01 (-)	<0.01 (-)
beta-BHC	4.86	0.001	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
delta-BHC	4.86	0.000	0.000	0.001	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dieldrin	21.30	0.002	0.002	0.002	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan I	0.03	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan II	0.03	0.000	0.001	0.001	<0.01 (-)	0.04 (-)	0.02 (-)
Endosulfan Sulfate	0.03	0.001	0.000	0.001	0.03 (-)	0.02 (-)	0.02 (-)
Endrin	3.10	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-24
Screening of Estimated Chemical Residues in Shortnose Sturgeon Tissue

Chemical	Screening Value (mg/kg, wet)	Estimated Tissue Residues (mg/kg, wet)			Hazard Quotients		
		Reference Site	West Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility
Endrin Aldehyde	3.10	0.003	0.001	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin Ketone	3.10	0.009	0.002	0.005	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-BHC (Lindane)	4.86	0.001	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	31.80	0.001	0.001	0.001	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	53.00	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor Epoxide	37.00	0.000	0.000	0.000	<0.01 (-)	<0.01 (-)	<0.01 (-)
Methoxychlor	-	ND	ND	ND	-	-	-
Toxaphene	-	ND	ND	ND	-	-	-
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	-	ND	ND	ND	-	-	-
1,2-Dichlorobenzene	-	ND	ND	ND	-	-	-
1,3-Dichlorobenzene	-	ND	ND	ND	-	-	-
1,4-Dichlorobenzene	-	ND	ND	ND	-	-	-
4-Bromophenyl-Phenylether	-	ND	ND	ND	-	-	-
4-Chlorophenyl-Phenylether	-	ND	ND	ND	-	-	-
Acenaphthene	35.00	0.000	0.001	0.007	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	35.00	0.004	0.004	0.003	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	300.00	0.004	0.004	0.004	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)anthracene	12.30	0.024	0.020	0.016	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)pyrene	12.30	0.022	0.021	0.012	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	12.30	0.044	0.038	0.025	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(g,h,i)perylene	12.30	0.019	0.029	0.029	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	12.30	0.015	0.013	0.009	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chrysene	30.00	0.035	0.030	0.023	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	12.30	0.003	0.003	0.002	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluoranthene	300.00	0.048	0.049	0.044	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	300.00	0.002	0.003	0.005	<0.01 (-)	<0.01 (-)	<0.01 (-)
Hexachlorobutadiene	-	ND	ND	ND	-	-	-
Hexachlorobenzene	-	ND	ND	ND	-	-	-
Hexachlorocyclopentadiene	-	ND	ND	ND	-	-	-
Hexachloroethane	-	ND	ND	ND	-	-	-
Indeno(1,2,3-cd)pyrene	12.30	0.018	0.017	0.010	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-24
Screening of Estimated Chemical Residues in Shortnose Sturgeon Tissue

Chemical	Screening Value (mg/kg, wet)	Estimated Tissue Residues (mg/kg, wet)			Hazard Quotients		
		Reference Site	West Side of Facility	East Side of Facility	Reference Site	West Side of Facility	East Side of Facility
Pentachlorophenol	22.10	0.442	2.560	0.346	0.02 (-)	0.12 (-)	0.02 (-)
Phenanthrene	300.00	0.008	0.015	0.020	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pyrene	30	0.060	0.050	0.021	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-25
Summary of Hazard Quotients for Herring Gull

Chemical	Outfall 005/006		Outfall 008		Outfall 009		Outfall 010		Outfall 011		Outfall 012		Reference Site	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics														
Arsenic	0.03 (-)	0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Cadmium	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chromium	0.03 (-)	<0.01 (-)	0.03 (-)	<0.01 (-)	0.03 (-)	<0.01 (-)	0.03 (-)	<0.01 (-)	0.05 (-)	0.01 (-)	0.03 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
Copper	0.01 (-)	<0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)	0.02 (-)	0.01 (-)
Lead	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Mercury	0.25 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.35 (-)	0.03 (-)	0.40 (-)	0.04 (-)	0.28 (-)	0.03 (-)
Nickel	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Selenium	0.04 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.04 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.05 (-)	0.01 (-)	0.05 (-)	0.01 (-)
Silver	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Zinc	0.10 (-)	0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)	0.08 (-)	<0.01 (-)
Pesticides/PCBs														
4,4'-DDD	0.08 (-)	<0.01 (-)	0.16 (-)	0.02 (-)	0.16 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.17 (-)	0.02 (-)	0.20 (-)	0.02 (-)	0.23 (-)	0.02 (-)
4,4'-DDE	0.56 (-)	0.06 (-)	0.93 (-)	0.09 (-)	0.92 (-)	0.09 (-)	0.95 (-)	0.10 (-)	0.94 (-)	0.09 (-)	0.96 (-)	0.10 (-)	1.00 (-)	0.10 (-)
4,4'-DDT	0.50 (-)	0.05 (-)	0.70 (-)	0.07 (-)	0.70 (-)	0.07 (-)	0.69 (-)	0.07 (-)	0.69 (-)	0.07 (-)	0.70 (-)	0.07 (-)	0.91 (-)	0.09 (-)
alpha-BHC	<0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
alpha-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1254	2.82 (+)	0.28 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	3.77 (+)	0.38 (-)	5.28 (+)	0.53 (-)
Aroclor-1260	2.86 (+)	0.29 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	3.65 (+)	0.36 (-)	4.65 (+)	0.47 (-)
beta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	NA	NA
delta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	NA	NA
Dieldrin	0.22 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.19 (-)	0.02 (-)	0.20 (-)	0.02 (-)	0.20 (-)	0.02 (-)
Endosulfan I	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin Aldehyde	0.33 (-)	0.03 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.62 (+)	0.36 (-)
Endrin Ketone	1.92 (+)	0.19 (-)	2.90 (+)	0.29 (-)	3.04 (+)	0.30 (-)	3.01 (+)	0.30 (-)	3.15 (+)	0.32 (-)	3.31 (+)	0.33 (-)	7.46 (+)	0.75 (-)
Gamma-BHC (Lindane)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Semivolatile Organic Compounds														
Acenaphthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(g,h,i)perylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)

Table 6-25
Summary of Hazard Quotients for Herring Gull

Chemical	Outfall 005/006		Outfall 008		Outfall 009		Outfall 010		Outfall 011		Outfall 012		Reference Site	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Chrysene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Indeno(1,2,3-cd)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pentachlorophenol	0.06 (-)	0.03 (-)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.01 (-)	<0.01 (-)
Phenanthrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)

Notes:
ND = Not Detected

Table 6-26
Summary of Hazard Quotients for Belted Kingfisher

Chemical	Reference Area		East Side of Facility		West Side of Facility	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics						
Arsenic	0.06 (-)	0.03 (-)	0.07 (-)	0.03 (-)	0.08 (-)	0.03 (-)
Chromium	0.07 (-)	0.01 (-)	0.22 (-)	0.04 (-)	0.07 (-)	0.01 (-)
Copper	0.30 (-)	0.23 (-)	0.29 (-)	0.22 (-)	0.04 (-)	0.03 (-)
Lead	0.06 (-)	<0.01 (-)	0.04 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
Mercury	3.13 (+)	0.31 (-)	3.91 (+)	0.39 (-)	3.13 (-)	0.31 (-)
Nickel	<0.01 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01
Selenium	0.54 (-)	0.27 (-)	0.64 (-)	0.32 (-)	0.58 (-)	0.29 (-)
Silver	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Zinc	1.36 (+)	0.15 (-)	1.37 (+)	0.15 (-)	1.43 (+)	0.16 (-)
Pesticides/PCBs						
4,4'-DDD	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
4,4'-DDE	0.02 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)	0.01	<0.01 (-)
4,4'-DDT	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-BHC	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1254	0.12 (-)	0.01 (-)	0.08 (-)	<0.01 (-)	0.06 (-)	<0.01 (-)
Aroclor-1260	0.10 (-)	0.01 (-)	0.07 (-)	<0.01 (-)	0.06 (-)	<0.01 (-)
beta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	ND	ND
delta-BHC	ND	ND	<0.01 (-)	<0.01 (-)	ND	ND
Dieldrin	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan Sulfate	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin Aldehyde	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND
Endrin Ketone	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-BHC (Lindane)	<0.01 (-)	<0.01 (-)	ND	ND	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	ND	ND	ND	ND	<0.01 (-)	<0.01 (-)
Heptachlor Epoxide	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Semivolatile Organic Compounds						
Acenaphthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chrysene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Indeno(1,2,3-cd)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pentachlorophenol	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND

Notes:
ND = Not Detected
Chemicals not detected in any prey tissue at any location are not shown.

Table 6-27
Summary of Hazard Quotients for Osprey

Chemical	Reference		East Side		West Side	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics						
Arsenic	0.80 (-)	0.32 (-)	0.58 (-)	0.23 (-)	1.49 (+)	0.60 (-)
Cadmium	0.19 (-)	0.01 (-)	0.17 (-)	0.01 (-)	0.05 (-)	<0.01 (-)
Chromium	1.38 (+)	0.28 (-)	1.28 (+)	0.26 (-)	2.12 (+)	0.42 (-)
Copper	0.39 (-)	0.30 (-)	0.40 (-)	0.30 (-)	0.27 (-)	0.20 (-)
Lead	0.38 (-)	0.04 (-)	0.24 (-)	0.02 (-)	0.58 (-)	0.06 (-)
Mercury	15 (++)	1.54 (+)	16 (++)	1.59 (+)	10.9 (++)	1.09 (+)
Nickel	0.01 (-)	0.01 (-)	0.03 (-)	0.02 (-)	0.03 (-)	0.02 (-)
Selenium	1.43 (+)	0.42 (-)	2.01 (+)	0.59 (-)	1.85 (+)	0.54 (-)
Silver	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Zinc	2.83 (+)	0.31 (-)	2.68 (+)	0.30 (-)	3.07 (+)	0.34 (-)
Pesticides/PCBs						
4,4'-DDD	0.02 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
4,4'-DDE	0.02 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)	0.01 (-)	<0.01 (-)
4,4'-DDT	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-BHC	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
alpha-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Aroclor-1254	0.12 (-)	0.01 (-)	0.08 (-)	<0.01 (-)	0.07 (-)	<0.01 (-)
Aroclor-1260	0.10 (-)	0.01 (-)	0.07 (-)	<0.01 (-)	0.07 (-)	<0.01 (-)
beta-BHC	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	ND	ND
delta-BHC	<0.01 (-)	<0.01 (-)	ND	ND	ND	ND
Dieldrin	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endosulfan Sulfate	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Endrin	ND	ND	<0.01 (-)	<0.01 (-)	ND	ND
Endrin Aldehyde	0.07 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	0.02 (-)	<0.01 (-)
Endrin Ketone	0.19 (-)	0.02 (-)	0.10 (-)	0.01 (-)	0.04 (-)	<0.01 (-)
Gamma-BHC (Lindane)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Gamma-Chlordane	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Heptachlor	ND	ND	ND	ND	<0.01 (-)	<0.01 (-)
Heptachlor Epoxide	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Semivolatile Organic Compounds						
Acenaphthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Acenaphthylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(a)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(b)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(g,h,i)perylene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Benzo(k)fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Chrysene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Dibenz(a,h)anthracene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluoranthene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Fluorene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Indeno(1,2,3-cd)pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pentachlorophenol	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Phenanthrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)
Pyrene	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)	<0.01 (-)

Notes:
ND = Not Detected
Chemicals not detected in any prey tissue at any location are not shown.

Table 6-33

Comparison of Sediment PAH Concentrations (ug/kg) with Concentrations Linked to Cancer in Fish

Chemical	1982[1] Cancer Rate[3] (31%)	1987[2] Cancer Rate[3] (7%)	1994[2] Cancer Rate[3] (0%)	Maximum Sediment Concentrations Outfall 005/006	Outfall 009	Outfall 010
Acenapthene	36,000	140	55	78	ND	ND
Acenapthylene	40,000	80	13	22	ND	ND
Anthracene	NA	NA	NA	170	3800	1500
Benzo(a)anthracene	51,000	370	313	620	6900	3900
Benzo(a)pyrene	43,000	240	237	400	6100	3500
Benzo(b)fluoranthene	75,000	580	838	530	7800	4300
Benzo(g,h,I)perylene	24,000	30	NA	210	3000	2300
Benzo(k)fluoranthene	75,000	580	838	160	3600	2100
Chrysene	51,000	370	NA	340	8400	3300
Dibenz(a,h)anthracene	9,400	NA	NA	61	30	ND
Fluoranthene	220,000	790	3,460	750	24000	8000
Fluorene	NA	NA	NA	110	ND	ND
Indeno(1,2,3-cd)pyrene	26,000	10	195	330	4000	2900
2-Methylnaphthalene	15,000	NA	NA	ND	620	ND
Naphthalene	31,000	NA	NA	ND	800	ND
Phenanthrene	390,000	730	1,860	290	6900	5600
Pyrene	140,000	930	2,860	600	16000	6500
Total PAHs	1,226,400	4,850	10,669	4,671	91,950	43,900

Notes:

[1]Baumann, et al., 1982

[2]Baumann and Harshbarger, 1998

[3] Percentage of age 3 brown bullhead having cancerous hepatic lesions

NA - Not Available (value for chemical not reported in the study)

ND - Not Detected

Table 6-28
Sediment Toxicity Test Results

Station	Survival (percent)	Growth (mg/organism dry wt.)	Reproduction (mean young per adult)
***Neanthes arenaceodentata* (10-day test)**			
Control	100	0.574 (± 0.130)	NA
Reference, Station 2	95	0.753 (±0.072)	NA
Outfall 5/6, Station 4	80	0.667 (± 0.169)	NA
Outfall 9, Station 16	100	0.797 (± 0.157)	NA
Outfall 10, Station 20	100	1.211 (± 0.321)	NA
***Leptocheirus plumulosus* (28-day test)**			
Control	75	0.517 (±0.130)	0.719 (±0.805)
Reference, Station 2	67	0.590 (±0.072)	0.229 (±0.436)
Outfall 5/6, Station 4	43*	0.634 (±0.169)	0.252 (±0.327)
Outfall 9, Station 16	73	0.557 (±0.157)	0.482 (±0.541)
Outfall 10, Station 20	68	0.752 (±0.321)	0.490 (±0.492)

* Significantly different (p=0.05) from reference

Table 6-29
Benthic Community Structure Analysis

Station	Average Number of Individuals	Average Number of Taxa	Shannon-Weiner Index of Diversity
Reference station 2 (intertidal)	980	16.5	1.51
Outfall 005/006 station 1 (intertidal)	250	16.5	1.69
Outfall 005/006 station 2 (intertidal)	491	16.5	1.39
Outfall 005/006 station 3 (intertidal)	671	16.5	1.88
Outfall 005/006 station 4 (intertidal)	445	16.5	1.71
Outfall 010 station 20 (intertidal)	389	16.5	1.97
Reference station 5 (subtidal)	721	16.5	1.68
Outfall 009 station 16 (subtidal)	578	16.5	1.75

Table 6-30
Physical Characteristics of the BCSA Locations

Station	TOC (%)	% clay	%silt	%sand	% gravel
Reference station 2 (intertidal)	2.62	16	78	6	-
Outfall 005/006 station 1 (intertidal)	2.52	18	34	46	2
Outfall 005/006 station 2 (intertidal)	1.40	14	16	68	2
Outfall 005/006 station 3 (intertidal)	2.59	23	65	12	-
Outfall 005/006 station 4 (intertidal)	2.24	24	56	19	1
Outfall 010 station 20 (intertidal)	1.35	3	52	45	-
Reference station 5 (subtidal)	3.21	18	73	9	-
Outfall 009 station 16 (subtidal)	1.43	5	10	65	20

Table 6-31
Species Abundance in Intertidal Samples

Species Rank	Species	Number of Individuals	% of fauna by number	Cumulative % by number
1	*Streblospio benedicti*	5329	41.6	41.6
2	*Heteromastus filiformis*	2277	17.8	59.3
3	*Neanthes virens*	926	7.2	66.5
4	*Tharyx acutus*	805	6.3	72.8
5	*Gemma gemma*	763	6.0	78.8
6	*Scoloplos fragilis*	465	3.6	82.4
7	*Eteone heteropoda*	450	3.5	85.9
8	*Tubificidae*	323	2.5	88.4
9	*Cyathura polita*	313	2.4	90.9
10	*Macoma tenta*	290	2.3	93.1
11	*Hydrobia sp.*	200	1.6	94.7
12	*Macoma balthica*	142	1.1	95.8
13	*Tubificoides sp.*	121	0.9	96.7
14	*Tubificoides benedeni*	79	0.6	97.4
15	*Pygospio elegans*	78	0.6	98.0
16	*Capitella capitata*	66	0.5	98.5
17	*Polydora ligni*	54	0.4	98.9
18	*Nassarius obsoletus*	51	0.4	99.3
19	*Prostoma graecense*	22	0.2	99.5
20	Other species	68	0.5	100

Table 6-32
Species Abundance in Subtidal Samples

Species Rank	Species	Number of Individuals	% of fauna by number	Cumulative % by number
1	*Streblospio benedicti*	2190	42.2	42.2
2	*Tubificidae*	636	12.2	54.4
3	*Tubificoides benedeni*	441	8.5	62.9
4	*Heteromastus filiformis*	376	7.2	70.1
5	*Neanthes virens*	298	5.7	75.9
6	*Tharyx acutus*	295	5.7	81.6
7	*Capitella capitata*	166	3.2	84.8
8	*Eteone heteropoda*	145	2.8	87.5
9	*Hydrobiidae*	139	2.7	90.2
10	*Gemma gemma*	119	2.3	92.5
11	*Macoma tenta*	76	1.5	94.0
12	*Polydora ligni*	58	1.1	95.1
13	*Pygospio elegans*	57	1.1	96.2
14	*Byblis serrata*	55	1.1	97.2
15	*Scoloplos fragilis*	54	1.0	98.3
16	*Cyathura polita*	27	0.5	98.8
17	*Macoma balthica*	18	0.3	99.2
18	*Nematoda*	13	0.3	99.4
19	*Prostoma graecense*	9	0.2	99.6
20	Other species	22	0.4	100

Figure 6-2: Abundance of *Streblospio benedicti* per sample at the Intertidal Stations

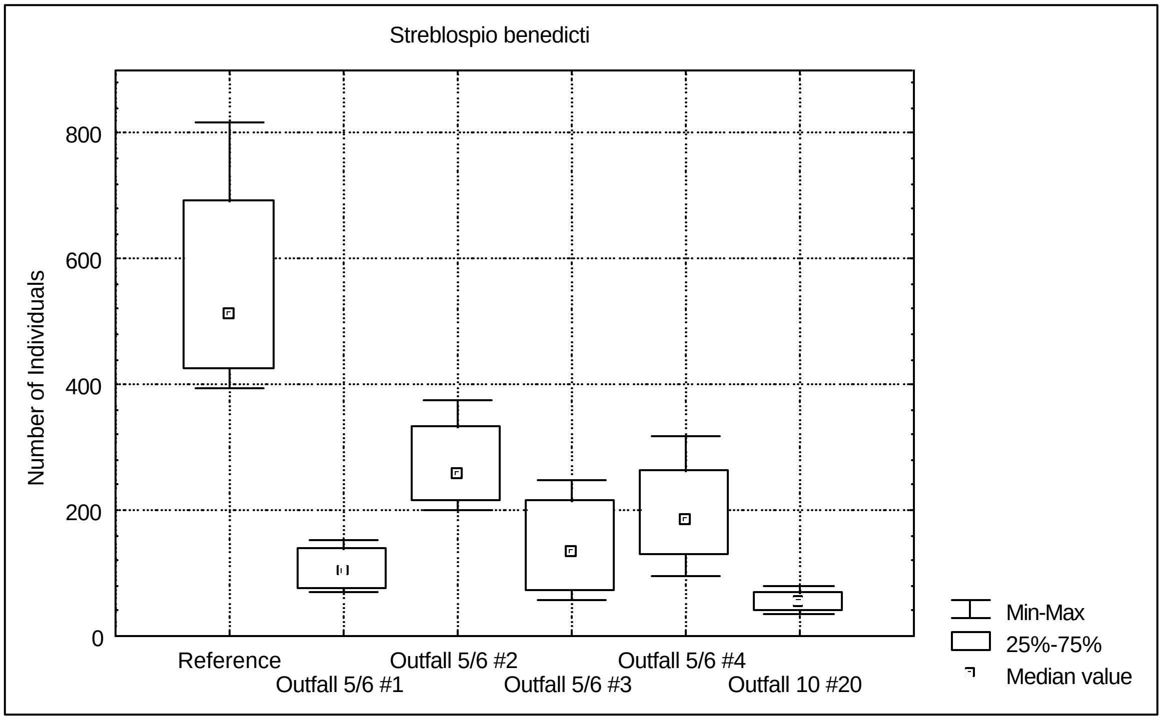


Figure 6-3: Abundance of *Neanthes virens* per sample at the Intertidal Stations

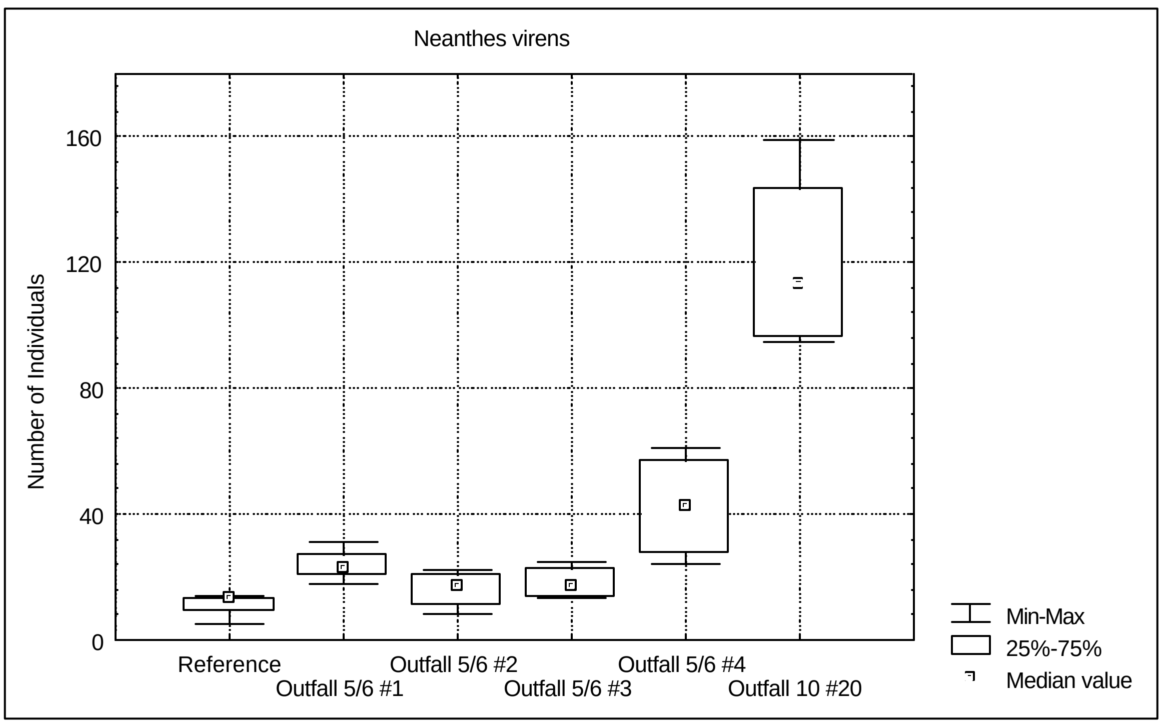


Figure 6-4: Abundance of *Heteromastus filiformis* per sample at the Intertidal Stations

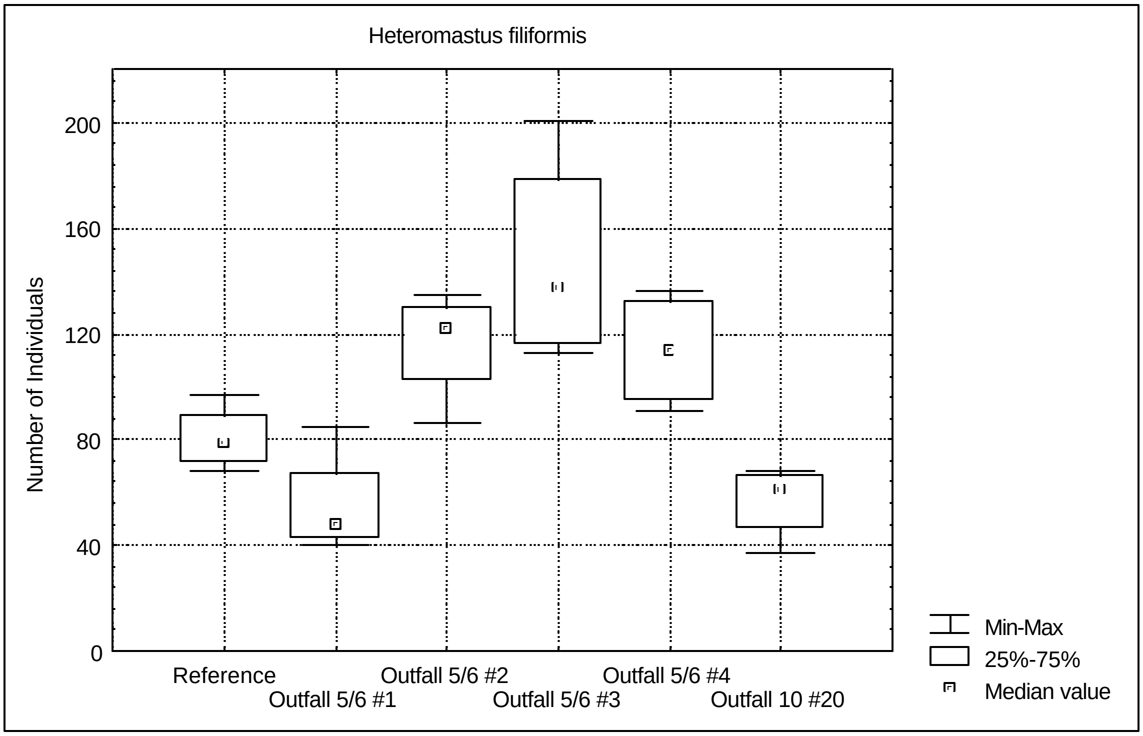


Figure 6-5: Abundance of *Tharyx acutus* per sample at the Intertidal Stations

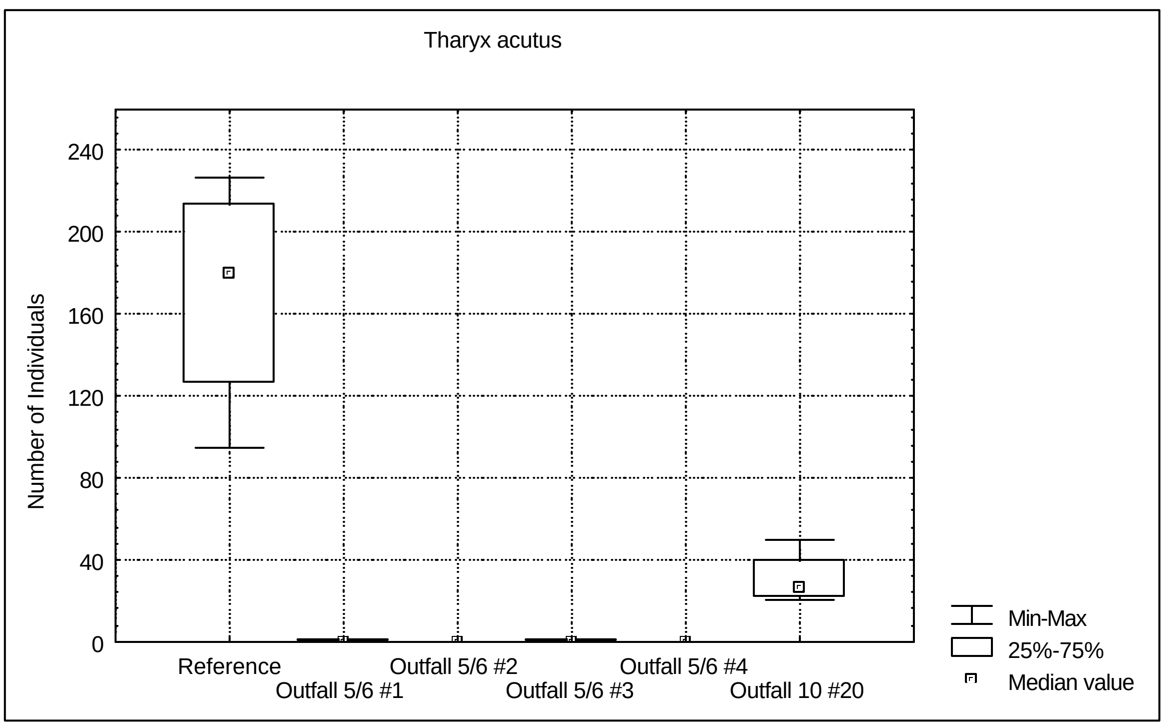


Figure 6-6: Abundance of Tubificidae per sample at the Intertidal Stations

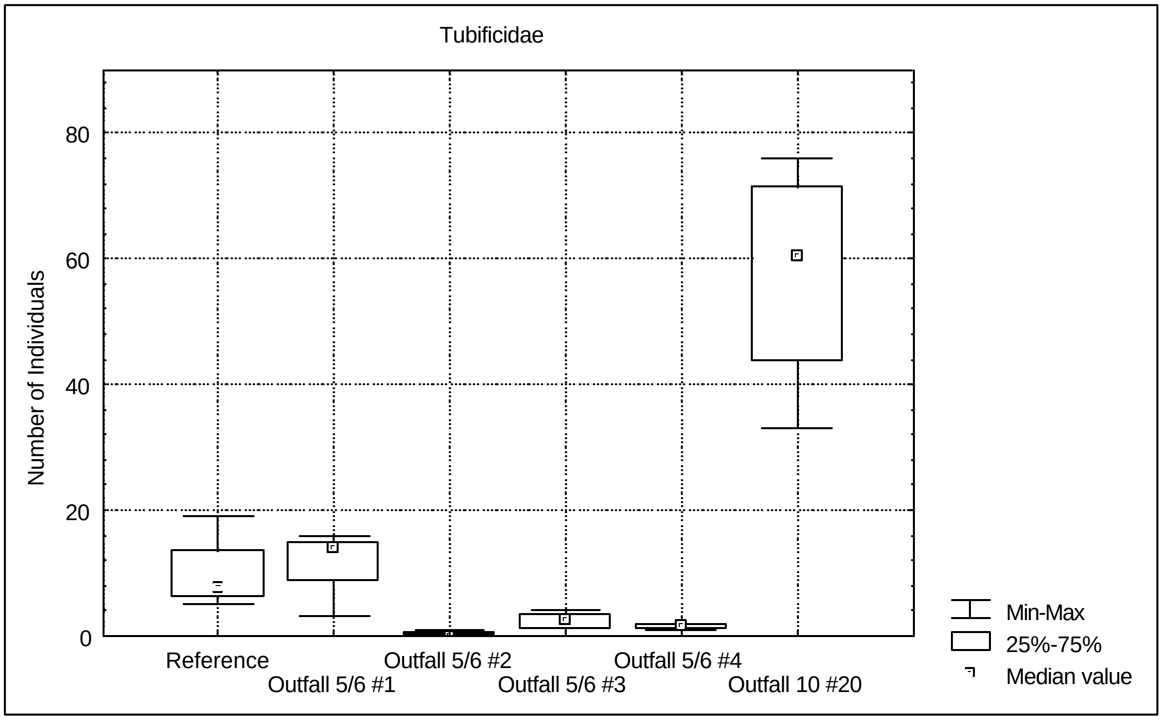


Figure 6-7: Abundance of *Gemma gemma* per sample at the Intertidal Stations

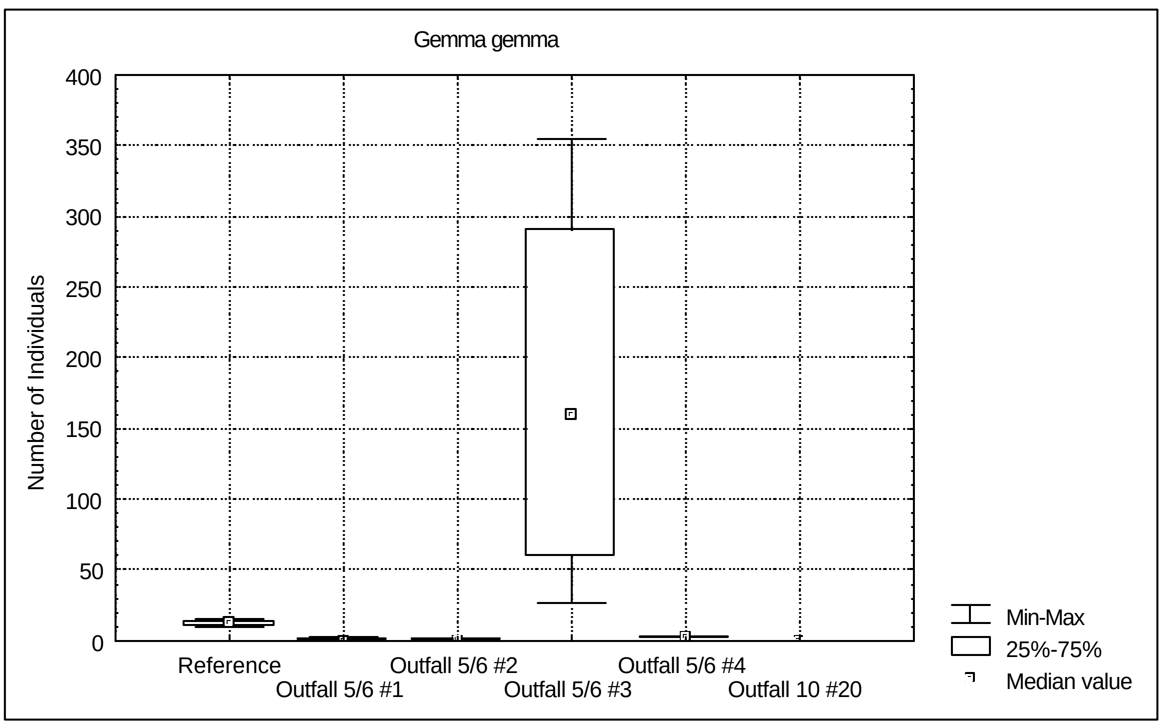


Figure 6-8: Abundance of *Streblospio benedicti* per sample at the Subtidal Stations

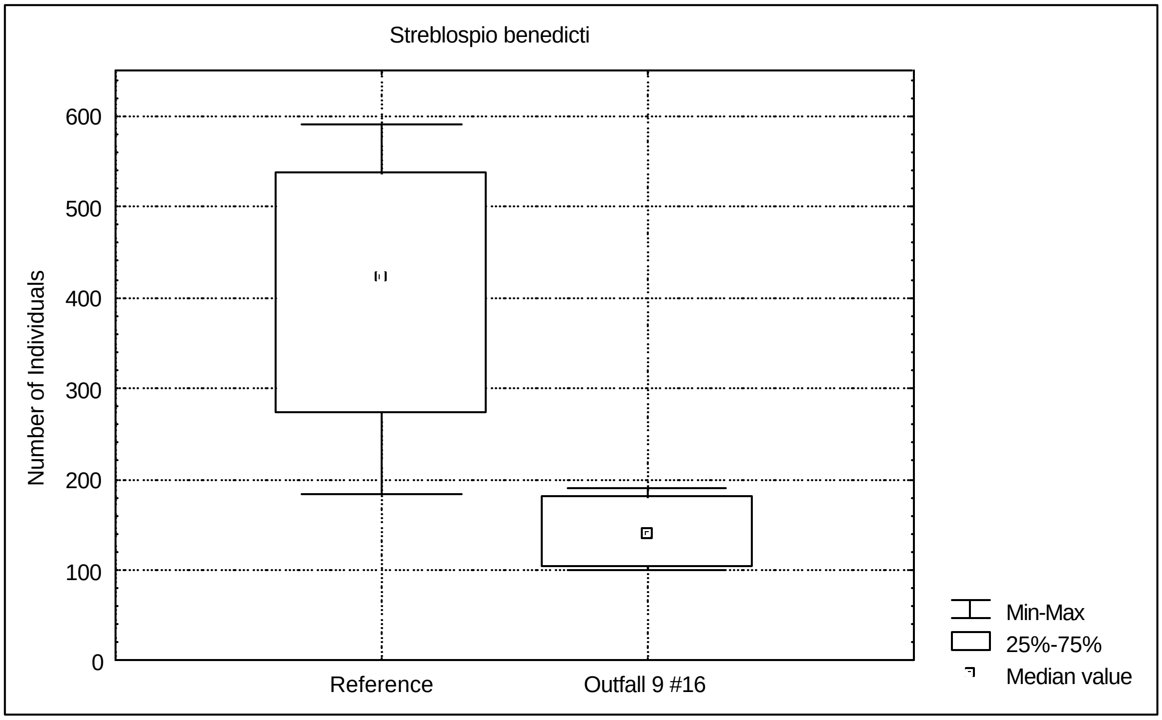


Figure 6-9: Abundance of *Neanthes virens* per sample at the Subtidal Stations

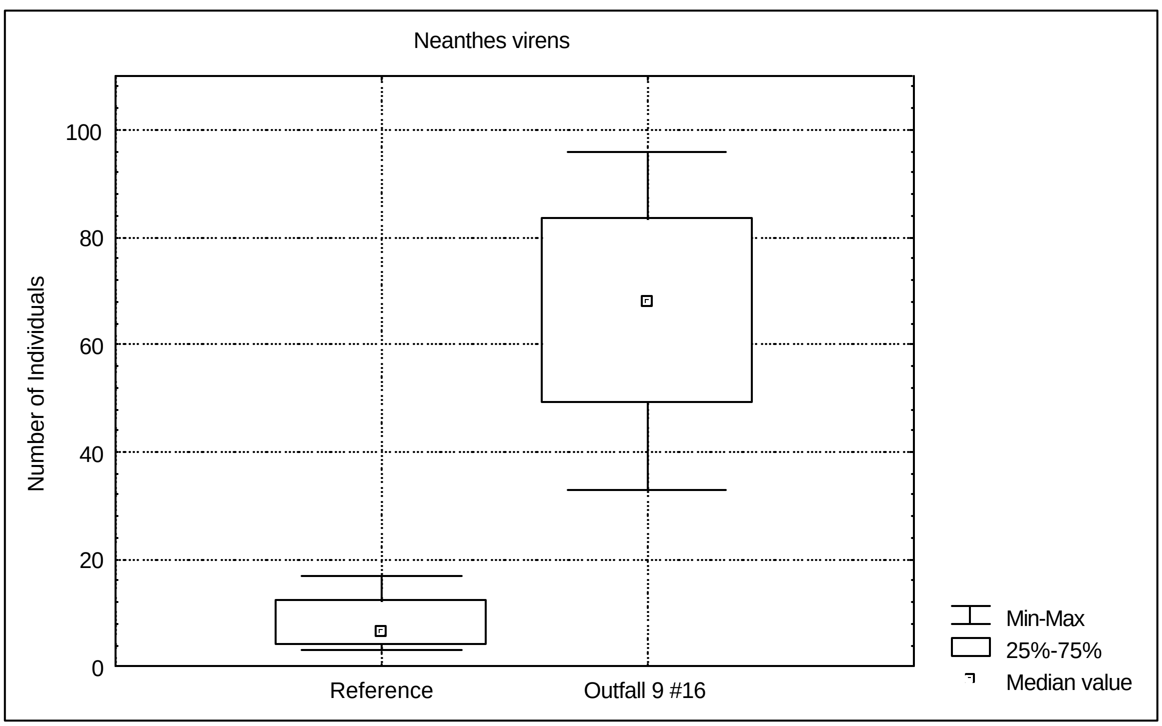


Figure 6-10: Abundance of *Heteromastus filiformis* per sample at the Subtidal Stations

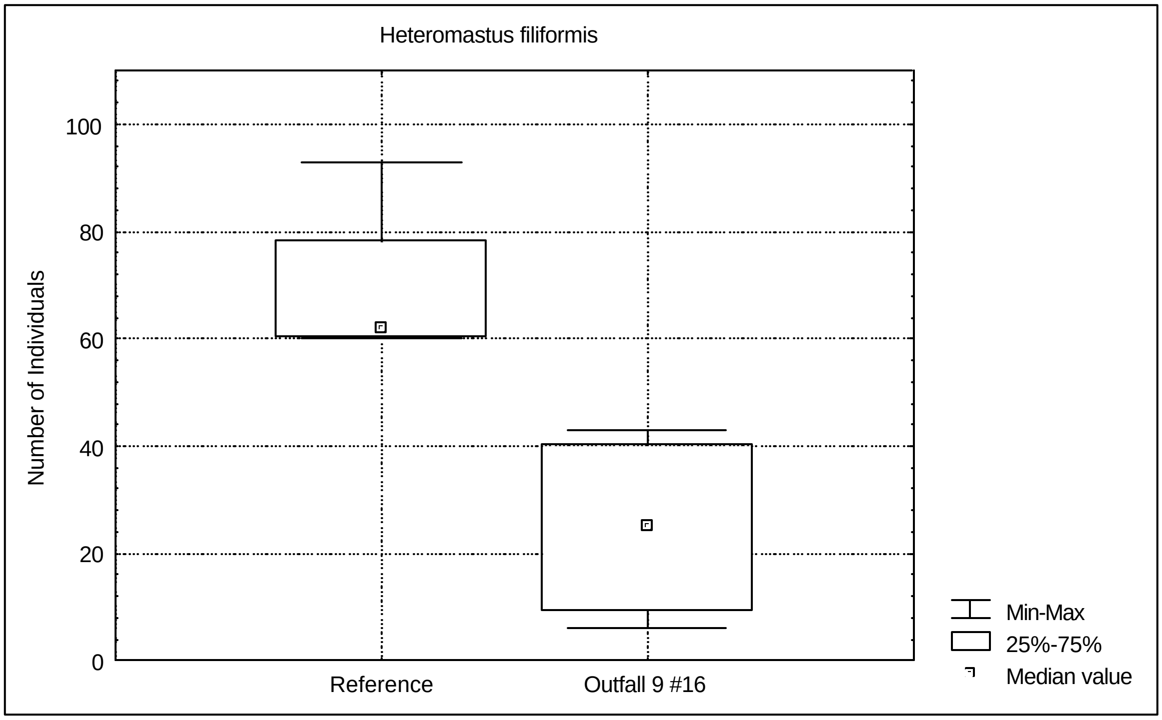


Figure 6-11: Abundance of *Tharyx acutus* per sample at the Subtidal Stations

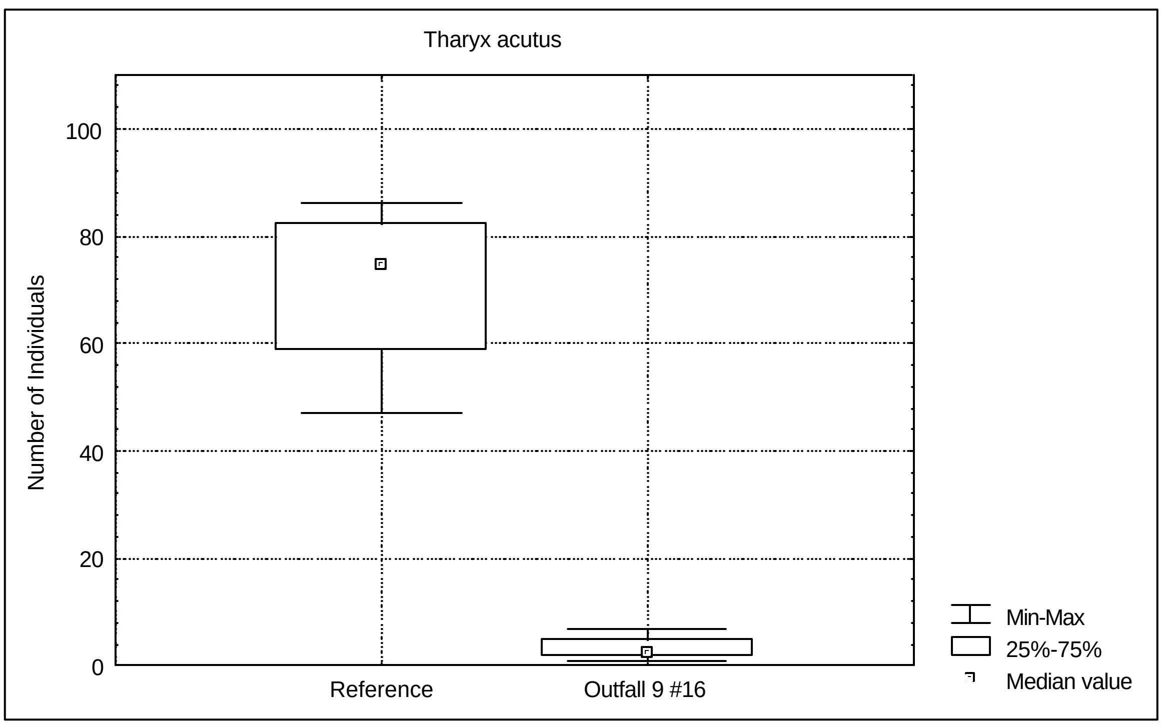


Figure 6-12: Abundance of Tubificidae per sample at the Subtidal Stations

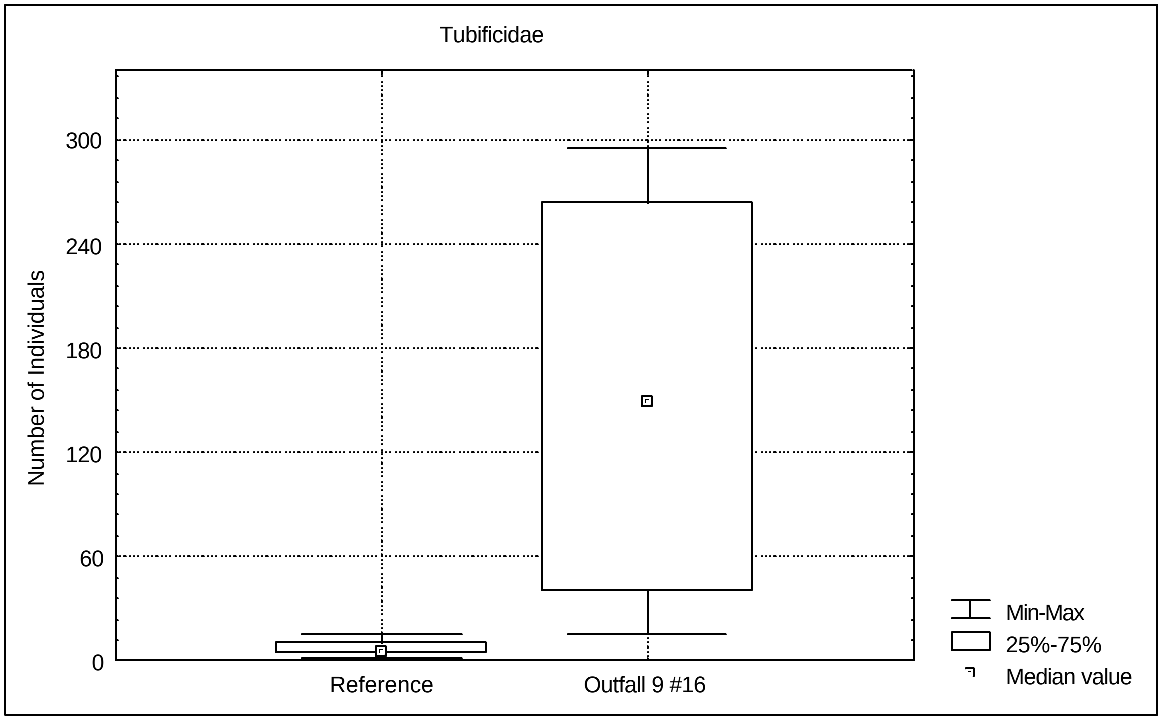
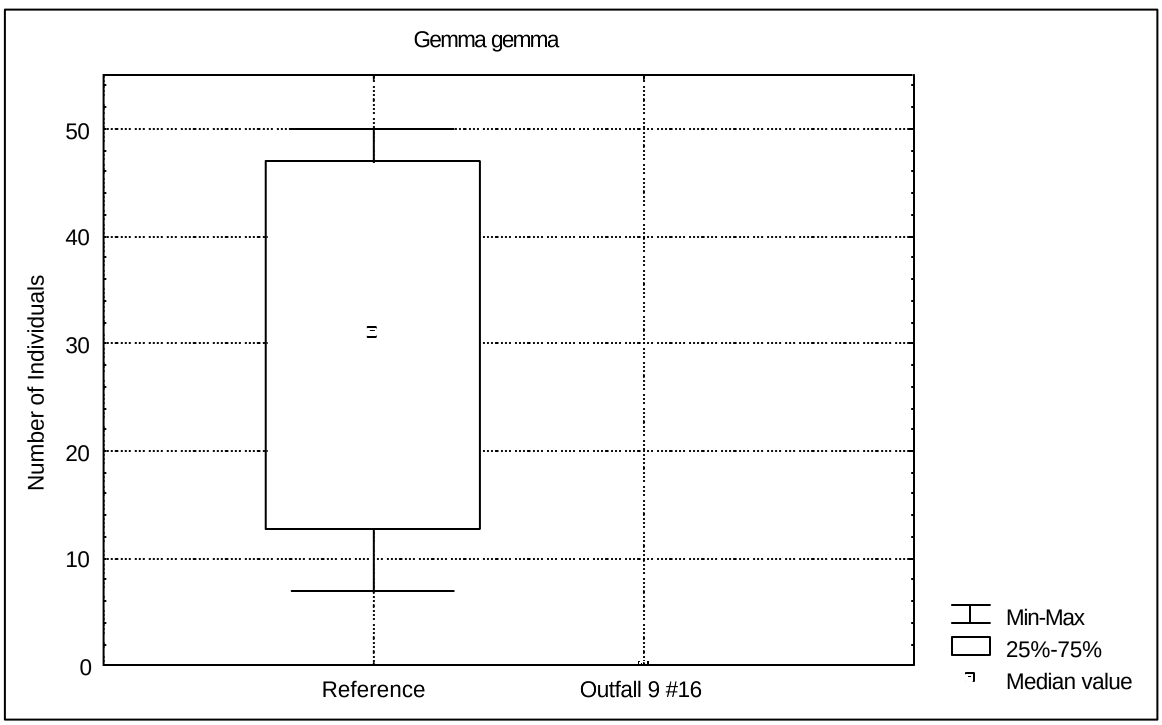


Figure 6-13: Abundance of *Gemma gemma* per sample at the Subtidal Stations



SECTION 7.0 - CONCLUSIONS

7.0 CONCLUSIONS

This RFI Report presents the field investigation within the 150 acre Bailey Point area of the Maine Yankee site, the portion of the site most impacted by construction and operation of the facility. The goals of this RFI were to complete the sampling program according to the PQOs identified in the QAPP. The PQOs include the generation of data to characterize contaminant sources, determine nature and extent of contamination, support fate and transport analysis, conduct risk assessments for human health and the environment, and support future remedial activities, if necessary, to minimize potential risk. A Backlands RFI Report, based on an investigation of the remaining unaffected 670 acres, was prepared separately to allow Maine Yankee the ability to expedite ownership transfer of the backlands portion of the site. In addition to investigating two study areas (Study Area 1 and 2), the Backlands RFI Report outlines the sampling program to establish soil and groundwater reference data.

As outlined in the QAPP, RFI activities included collection of soil, concrete, sediment, biota, surface water, and groundwater samples from specific areas of Bailey Point that had the greatest impact potential. The investigation was performed in four study areas (Study Areas 3 through 6), and included deep-water sediments collected in and around the submerged diffuser pipes, and reference sediment and tissue samples from locations sited away from impacted areas of the site. Remediation was performed in some areas (i.e., ISFSI) to support ongoing decommissioning activities and several activities were deferred as a result of demolition, sub-grade radiological remediation, and/or inability to access active areas (i.e., transformers and sumps). These sampling activities will be performed prior to final site closure as areas become available.

A number of contaminant migration pathways and receptors are present in the Bailey Point area of Maine Yankee. The Bailey Point area includes a near-shore environment that consists of populations of benthic organisms that are commercially and recreationally harvested and are a source of food for fish and wildlife. Future receptors include office workers, passive recreation seekers and construction workers.

The previous understanding of subsurface geology and hydrology in the Bailey Point area developed in the QAPP was confirmed and/or enhanced by the RFI. The additional information was integrated with existing geologic data and interpreted in a consistent manner to facilitate the prediction of contaminant fate and transport.

Three quality assurance assessments were performed for this RFI in the form of technical system audits, which were based on criteria outlined in the QAPP. The audits reviewed field sampling collection activities, laboratory analysis and data validation. The audits did not identify any deficiencies that impacted data quality.

7.1 Nature and Extent of Contamination

The Bailey Point RFI consisted of four study areas -- Study Areas 3 through 6 -- and an investigation of sediments in and around the submerged portion of the plant's diffuser pipes in the Back River. Potential contaminants of concern and migration pathways were identified, which focused primarily on releases to surface water discharge areas, soils from within the industrial area, and migration of contaminants from soils to site groundwater. Based on field and laboratory results for the Bailey Point RFI program, the following is a summary of the nature and extent of contamination.

7.1.1 Soil

A total of 263 soil samples were collected from 183 locations on Bailey Point from Study Areas 3 through 5. Sampling consisted of soil borings, surface/subslab samples, hand augering, test pitting, and Geoprobes. As a result of decommissioning activities, nine soil samples proposed in the QAPP remain to be collected from the plant area as confirmatory samples.

The following is a summary of the nature and extent of soil contamination within each of the study areas.

Study Area 3 – Foxbird Island

Surface soil samples collected from this 12-acre area to characterize the soil associated with historic construction of the diffuser pipeline detected no chemical constituents of concern. Based on these results, no further action is planned for this area.

Study Area 4 - ISFSI

Soil samples were collected from within this 9.5-acre area based on activity during construction and operation of the plant. Several areas of contamination were identified and remediated both prior to and during construction of the ISFSI. The following is a summary of the RFI and remedial actions performed in this area:

- The area was visually inspected prior to construction of the ISFSI and one small area of oil-contaminated soil was identified, which was characterized and removed. The characterization results, submitted to MDEP prior to ISFSI construction (MY, 2000d), noted EPH remaining in the soil.

- A release of kerosene to soil beneath a former spare generator storage building on the west side of this area was investigated and remediated to MDEP Baseline-2 standards (MDEP, 2000a) prior to the RFI. Approximately 1,700 tons of petroleum-contaminated soil was removed, and the remediation was completed in accordance with an MDEP-approved remediation plan and clean-up criteria (Stratex, 2000c).

- Two areas of subsurface historical petroleum contamination were discovered during construction of the ISFSI, which were subsequently remediated to MDEP Baseline-2 standards (MDEP, 2000a). The initial contamination discovery was during utility trenching along the west side of the ISFSI Operations Building. Approximately 300 cubic yards of petroleum-contaminated soil was removed, which was completed in accordance with an MDEP-approved remediation plan and clean-up criteria (S&W, 2000f). The second area was in the central portion of the ISFSI area and resulted in the removal of about 30 cubic yards of petroleum-impacted soil. A report summarizing that remediation of this second area was performed in accordance with the MDEP-approved plan and clean-up criteria was submitted to MDEP (JWC, 2000).

- One small area of "form oil" over-spray was reported during construction of the ISFSI that was remediated to MDEP Baseline-2 standards (MDEP, 2000a). About seven cubic yards of impacted surface soil was removed in a timely manner in accordance with MDEP clean-up criteria (JWC, 2001).

Based on data collected during the RFI, the additional samples that supported the ISFSI Site Location of Development permit and completion of aforementioned remedial activities, no further action is anticipated within Study Area 4.

Study Area 5 - Southern Plant Area

The southern portion of Study Area 5 is the area south of the ISFSI where the majority of plant operations occurred, and includes the diffuser forebay. Soil samples collected from this area were biased towards areas where plant operations had the greatest impact potential.

Three releases occurred in this area during operation of the plant and prior to the RFI: chromated water to a storm drain; water containing sodium chromate to subsurface soils; and release of low viscosity non-PCB-containing transformer oil to surface soils and the Back River. Several USTs were removed from this area: a gasoline tank northeast of the former Information Center; two diesel fuel tanks south of the former Turbine Hall; and a ferrous sulfate tank north of the former Circulating Water Pump House. These documented releases and closures were addressed in a timely manner, were remediated as necessary to the satisfaction of MDEP, and were sampled as part of the RFI.

The former Interim Hazardous Waste Storage Facility, the Lube Oil Storage Room, was closed during the RFI in accordance with an MDEP-approved closure plan (Stratex, 2001a). Because of DRO and PAH detections in subslab soils, these results were assessed as part of the RFI (MDEP, 2002c).

As a result of radiological impacts, several areas were or will be remediated, thus eliminating areas of potential concern identified in the RFI. These activities include removal of soil from the Radiological Restricted Area (MY, 2002k).

Samples collected from the forebay area prior to remedial activities indicated that operation of the forebay did not significantly impact either soils and sediments within the forebay, or seep water and sediment exterior to the forebay (MY, 2002p). As required by the MDEP-approved forebay remediation plan (MDEP, 2003a), confirmatory soil samples will be collected following completion of remedial activities.

During the RFI, several small surface spills and a historic subsurface petroleum-contaminated area were addressed, including:

- Two hydraulic oil leaks to surface soils in the Radiological Restricted Area that were cleaned-up to MDEP Baseline-2 standards (MDEP, 2000a). The two spills were timely addressed and a small volume of impacted surface soils was removed to MDEP clean-up standards (JWC, 2002).

- An area of subsurface historical petroleum soil contamination, discovered in the PAB Alleyway during decommissioning activities, was remediated to MDEP Baseline-2 standards (MDEP, 2000a). About eight cubic yards of soil was removed from this area. The soil was removed from about 10 feet below ground surface down to bedrock achieving MDEP clean-up standards (JWC, 2003).

Based on comparison to project action limits and reference soil, the RFI identified potential contaminants in soil in the southern portion of Study Area 5, including the following:

- Surface and subsurface soils in the Industrial and Radiological Restricted Areas contain elevated concentrations of PAHs and detected concentrations of PCBs and EPH. The distribution of these constituents is focused in surface soils beneath the Turbine Hall in the Industrial Area. These compounds are believed to be derived from the use of PCB-containing, petroleum-based compounds, and were typically detected in association with specific sources (i.e., oil reservoirs, sumps, and drains) and industrial activities.

- Surface soils behind the northwest side of Warehouse 2/3 contain elevated levels of PAHs, lead and PCBs. The PAHs, PCBs and elevated lead were only observed in surface soils and, following the collection of additional samples, the distribution of PAHs was bounded to a relatively small area.

- Subsurface soils behind the southwest side of Warehouse 2/3 contain elevated levels of VOCs (xylenes, ethylbenzene, and toluene) and PCBs associated with the disposal of paint and paint thinners. A focused test pit study has bounded the distribution of VOCs and PCBs in the subsurface soils.

- Surface soils associated with the Construction Transformer contain elevated concentrations of EPH and PCBs. The distribution of EPH and PCBs is focused in oil-stained surface soils adjacent to the transformer pad.

- Shallow soils in Parking Lot C contain elevated levels of EPH and PAHs.

- Shallow soils beneath the former Information Center contained an elevated concentration of lead.

Several areas identified in the QAPP remain to be investigated as a result of ongoing decommissioning activities. These areas, identified below, will be collected as confirmatory samples when the decommissioning schedule allows:

- Main and North Transformer pits – following de-energizing and removal of stone from these pits, confirmatory soil/concrete samples will be collected; and

- RA Buildings and an active sump in the Staff Building - subslab soil samples will be collected following removal of remaining building slabs and de-activating sumps.

<u>Study Area 5 – Northern Plant Area</u>

The northern portion of Study Area 5 is the area north of the ISFSI and 345 kV Switchyard and south of Old Ferry Road. The soils investigation within this area was in areas that had the greatest potential to be impacted by construction and operation of the plant.

Three notable features relating to construction of the plant were investigated as part of the RFI: a chemical cleaning basin; a garage used for the maintenance of concrete trucks; and a marine sediment/construction debris disposal area.

Based on comparison to project action limits and reference soils, the RFI identified potential contaminants in soil in the northern portion of Study Area 5, including the following:

- Subsurface soils in the 345 kV Transmission Line area contain elevated concentrations of EPH and PAHs, and some PCBs. These chemicals were likely associated with miscellaneous construction debris buried in this portion of the site.

- Subsurface soils in the Former Truck Maintenance Garage area contain elevated concentrations of petroleum hydrocarbons. Additional characterization will be required to improve understanding of the extent of petroleum hydrocarbon contamination.

- Subsurface soils in the Bailey Farm House area contain elevated levels of EPH and detected concentrations of PCBs. The EPH was detected in oil-stained soils from a residential fuel oil tank in the basement of the farmhouse and in shallow soils adjacent to and within a septic leachfield associated with the farmhouse. The petroleum-contaminated soils and the fuel oil tank in the Bailey Farm House were removed in July/August 2003. Low concentrations of PCBs were reported in shallow soils adjacent to and within the western leachfield soils.

7.1.2 Groundwater

An extensive sampling campaign was conducted within the Bailey Point area (Study Area 4 and 5) to characterize the nature and extent of contamination in groundwater. A total of 118 groundwater samples were collected for analysis from 65 locations, which consisted of 53 newly installed wells, 10 existing wells and two grab locations.

<u>Study Area 4 – ISFSI</u>

Groundwater samples were collected from existing and installed monitoring wells around the perimeter of Study Area 4. The groundwater sample results exhibited similar characteristics to that of the other wells installed and sampled across the northern portion of the site, namely, elevated petroleum hydrocarbons and metals. The groundwater results from this area are discussed within the context of the groundwater flow regime across the northern portion of Study Area 5.

<u>Study Area 5 - Southern Plant Area</u>

Sampling of groundwater monitoring wells in the southern portion of Bailey Point has revealed contaminants that were related to some aspect of plant construction and/or operation. Some contaminants may have been introduced to surface and/or subsurface soil through accidental spills or leaks, while other contaminants may not have been directly associated with plant activities, but were released from natural, geologic materials. The following is a summary of potential groundwater contaminants identified in the RFI for this portion of the site:

- Groundwater in the Industrial and Radiological Restricted Areas contains sodium concentrations that exceed MEGs, most likely as a result of saltwater intrusion, operational dosing of seawater, sodium chromate leaks, and winter salt application on site roadways;

- Groundwater in the Industrial and Radiological Restricted Areas contains DRO concentrations that exceed MEGs, most likely as a result of historical petroleum releases, former USTs and other non-point sources;

- Dieldrin was found in several bedrock wells in and near the RA in concentrations exceeding the MEGs, most likely from placement of fill during construction;

- Groundwater east and south of Warehouse 2/3 contains TCA and related chlorinated daughter products that exceed MEGs and MCLs, most likely as a result of solvent leakage from drum storage and management activities; and

- Groundwater west of Warehouse 2/3 contains BTEX compounds and metals that exceed MEGs, most likely from spilling paints and solvents to surface soils during operation.

Study Area 5 – Northern Plant Area

The following is a summary of potential groundwater contaminants identified in the RFI for this portion of the site:

- Groundwater beneath the dredge spoil disposal area north of the ISFSI and 345 kV Switchyard contains elevated metals, including boron, sodium, iron and manganese concentrations that exceed MEGs. These levels were most likely a result of the historic filling of the marsh area with marine sediments.

- Groundwater in most of the wells north of the Knoll contains DRO and EPH concentrations in excess of MEGs, most likely as a result of the kerosene and historical petroleum spills discovered within Study Area 4 (ISFSI), pre-operational features such as the Former Truck Maintenance Garage, and miscellaneous sources within the marine sediment/construction debris disposal area north of the 345 kV Switchyard.

- Across much of the northern and southern Bailey Point areas, the molybdenum concentration in groundwater exceeds the MEG. The source of molybdenum is unclear; possible sources are petroleum lubricant spills and natural rock minerals.

7.1.3 Sediment

Sediment was investigated within Study Area 5 (Bailey Point), Study Area 6 (Shoreline Areas) and the submerged diffuser system in Back River. A total of 103 samples were collected from 83 locations. For comparison purposes, seven reference marine sediment samples were collected away from the impact of the site in Brookings Bay, and two reference samples were collected from the Back River away from the impact of the diffuser system.

Study Area 5

Fifteen sediment samples collected from Study Area 5 consist of marine sediment from the forebay area and northern reaches of Bailey Cove and freshwater sediment from northern portions of Bailey Point. Elevated metal concentrations were detected in the marine sediment samples. Sediment within the forebay had, in addition to metals, elevated levels of PCBs, pesticides and PAHs. Most of the sediment will be removed as part of radiological remediation activities (MY, 2002g, 2002k and 2002p). Confirmatory soil samples will be collected following completion of remedial activities. Marine sediments from the reference location (Brookings Bay) had comparable metal concentrations.

Six freshwater sediment samples collected from Bailey Point were evaluated against reference soil data and/or ecological screening values. A bottom sediment sample from the Fire Pond, collected prior to draining, contained elevated metals compared to reference soil. This sediment, originally from Montsweag Brook water, was removed along with the Pond liner as part of decommissioning activities. Four sediment samples were collected from stormwater drainage areas north of the 345 kV Switchyard. Although several metals from each of the samples slightly exceeded ecological screening values, a significant ecological risk does not exist within these areas because of either lack of standing water and/or critical habitat. A freshwater sediment sample was collected from the small pond located in the northern portion of Bailey Point where a cleaning basin existed prior to operation. Two metals (arsenic and nickel) exceeded ecological screening values, but the concentrations are consistent with background levels.

Study Area 6 – Shoreline (Outfalls)

Study Area 6 consists of the intertidal and subtidal zones around the Bailey Point area where the majority of industrial area stormwater discharges occurred, and a small intertidal mudflat in the northern reach of Bailey Cove that received runoff from the silt spreading area. Seventy sediment, 47 biota (clams and blue mussel) samples from the outfall areas, three sediment samples from the mudflat north of the 345 kV Switchyard, and two sets of mummichog samples from intertidal water near Bailey Point were collected.

The sediment was evaluated in phases against ecological risk/toxicity benchmarks and reference concentrations. The results of the initial sediment screening, presented to MDEP in November 2001, concluded that only three of the outfall sampling locations required further investigation to assess ecological risk (CH2M Hill, 2001b). Therefore, additional testing for sediment toxicity and benthic community structure was performed at an intertidal location at Outfall 005/006 and Outfall 010, and a subtidal location at Outfall 009.

Following an investigation of sediment toxicity and the benthic community at these locations, the ecological risk to the benthic community near each outfall and potential risk posed by bioaccumulative chemicals in the sediments was assessed (CH2M Hill, 2002a, 2002b and 2002c). It was agreed with MDEP and federal regulators that PAH contamination identified at Outfall 009 should be remediated. The finding of PAHs at Outfall 009 is consistent with the petroleum releases documented during operation of the plant. The extent of PAH contamination was bounded as part of the RFI to an area of about 5,500 square feet and nearly 4 inches in depth. A remediation plan for this area has been developed and approved by MDEP for implementation summer 2003 (MDEP, 2003c).

The potential human-health risk associated with commercial and recreational fisherman and other recreational users who may be exposed to residual sediment contamination while wading in the intertidal and subtidal zones was also evaluated and is summarized below in Section 7.3.

Diffuser

Although separate from the RFI, eight deep water sediment samples were collected from the Back River in and around the plant submerged diffuser system, including two reference samples upstream and downstream from the diffusers, to support an evaluation of decommissioning options and potential impact from operational releases (MDEP, 2002a). The chemical constituents detected in the six sediment samples collected from the interior and immediate exterior of the diffuser system were consistent with the results from the two reference sediment samples collected for the program. The diffuser pipes will remain in Back River and beneath Foxbird Island.

7.1.4 Tissue

Representative ecological receptors within Study Area 6 were selected and evaluated to assess potential risk from bioaccumulative chemicals. To this end, 38 samples of soft-shelled clams, blue mussel and mummichog were collected for chemical analysis. Seven reference tissue samples of clam, mussel and mummichog were collected from Brookings Bay for comparison purposes.

Analysis of clam and mussel tissue suggests that there are slightly elevated PAH concentrations at Outfalls 005/006 and 010, and substantially elevated PAH concentrations in blue mussels at Outfall 009, compared with the reference site. Mummichog tissue exhibited several elevated metals, PAHs, and four pesticides relative to reference conditions. However, all tissue residues were at or below critical tissue residue (screening) levels.

The results of this assessment phase were presented in a technical memorandum to the MDEP in July 2002 and was discussed with MDEP and federal regulators October 2002 (CH2M Hill, 2002b and 2002c). It was concluded that there is little to no elevated risk relative to reference conditions from the chemicals in the sediments and biota near the outfalls. Since potential risk from PAHs can be underestimated from tissue residues alone, the potential risk to fish from the PAHs in the sediments at Outfall 009 could not be ruled out. The weight of evidence and overall potential ecological risks associated with the identified chemical concentrations in both sediment and tissue were evaluated in the Ecological Risk Assessment and are summarized below in Section 7.4.

The human-health risk associated with ingestion of shellfish tissue, including mussels, clams and lobster, was also evaluated and is summarized below in Section 7.3.

7.1.5 Concrete

Subgrade concrete that will remain onsite was investigated in the industrial portion of Bailey Point (Study Area 5). Twenty samples of concrete were collected from 20 locations. The majority of the concrete surfaces were located within the RA area and were remediated (scabbled) prior to collection of RFI samples. Five areas identified in the QAPP remain to be sampled as confirmatory samples following completion of decommissioning activities.

Two small surface petroleum stains sampled in subgrade areas of the PAB and CWPH are not a significant source and are not expected to migrate from the concrete. A petroleum stain on the uncoated concrete slab of the Fire Pond Pump House was removed and confirmatory samples were collected as part of the RFI to confirm removal of contaminants.

Based on data collected during the RFI to characterize concrete that will remain onsite, no further action is warranted.

7.1.6 Surface Water

Five surface water locations were sampled from areas downgradient or within areas of suspected contamination within Study Area 5; seep locations on the Bailey Cove side of the forebay and 345 kV Transmission Line area, excess flow from Outfall 011 to Back River, and the small pond in the northern portion of Bailey Point where a cleaning basin existed prior to operation.

With the exception of three metals (aluminum, lead and zinc) and low EPH concentrations identified in seeps, all other compounds are below surface water PALs. Based on this understanding, no significant impacts to surface water were identified. Since these seep areas are small in size relative to receiving water bodies (Back River and Bailey Cove) and consist of low, intermittent flows, no further action is anticipated.

7.2 Contaminant Fate and Transport

The fate and transport of both organic and inorganic compounds in the environment is typically controlled by physical and chemical properties of the source and the media through which it travels. The RFI evaluated the fate and transport of identified contaminants, including the possible leaching from soil to groundwater, flow of groundwater and surface runoff to near shore areas and possible natural attenuation over time.

7.2.1 Fate and Transport in Soil

The concentration of detected metals in soil was typically below project action limits and reference concentrations, with the exception of iron, manganese and lead. These metals will typically remain stable in soil unless the stability of the metals changes. With the exception of an isolated detection of lead in shallow soil beneath the former Information Center, the areas of Bailey Point exhibiting the greatest concentrations of these metals are areas that were filled during construction, namely the RA, industrial, Warehouse 2/3, and 345 kV Transmission Line areas.

Surface and/or subsurface soils in several areas of the site (i.e., Industrial and Radiological Restricted Areas, Warehouse 2/3 area, Construction Transformer, Former Truck Maintenance Garage, 345 kV Transmission Line area, and the Bailey Farm House) contain elevated concentrations of PAHs, PCBs and/or EPH. These compounds have limited mobility in the environment, have biodegradation potential, and are expected to remain adsorbed to the shallow soils. The major portion of the detected EPH in the area of the Former Truck Maintenance Garage was comprised of C9-C18 aliphatic petroleum hydrocarbons, consistent with a diesel-like source material. This range of petroleum hydrocarbons has limited solubility, but will continue to degrade groundwater quality via infiltration and leaching processes. Biodegradation will also occur under aerobic conditions provided there is a source of oxygen or other electron acceptors. EPHs detected in most other portions of the site are heavier petroleum hydrocarbons including C19-C36 aliphatics and C11-C22 aromatics. These petroleum hydrocarbons are less soluble in water and will remain partitioned to soils.

Subsurface soils located behind Warehouse 2/3 contain elevated levels of VOCs (xylenes, ethylbenzene, and toluene) and PCBs associated with the disposal of paint thinners and paint. The VOCs have leached through the soil horizon via infiltration process and have degraded the adjacent groundwater. The PCBs associated with the paint wastes have gained enhanced mobility due to their inclusion in the waste material, and are present at decreasing concentrations with depth in the subsurface soils. The low water solubility of Aroclor 1254 has minimized the migration of PCBs into groundwater.

Low concentrations of pesticides were detected in surface and subsurface soils at several locations. Dieldrin was detected in several subsurface samples at depths up to 13 feet below ground surface. When detected in the subsurface soils, dieldrin was not observed in shallower soil samples at those locations. These dieldrin–containing soils were typically comprised of fill material. The limited mobility of dieldrin, the lack of dieldrin in shallow samples and the occurrence in fill material indicates that the source of the dieldrin is the original fill material.

7.2.2 Fate and Transport in Groundwater

There are several groundwater regimes on Bailey Point including the upper regime that encompasses the phreatic surface, and a deep bedrock regime. Flow generally moves perpendicular to ground surface topography in the soils and shallow bedrock. In the deeper bedrock, flow is generally down the axis of the peninsula from north to south. As bedrock flow approaches the edge of the shore, it turns toward it and flows upward to discharge in the near-shore area.

There are several remaining potential sources of contaminants on the site. Some sources, such as petroleum spills, are held in the unsaturated zone of soil or soil fill. Most of the identified spills have been remediated. Another contaminant source on the site is residual sodium that is moving from the solid phase to the liquid phase and diluting in the groundwater. This sodium has a number of sources on the site and occurs broadly over the site in concentrations exceeding the State of Maine MEG.

Iron, manganese, and, to a much lesser extent, arsenic are naturally occurring geologic materials that have dissolved into the groundwater. The metal solubility is a function of Eh-pH conditions related to burying former organic marsh deposits with marine dredge spoils, to petroleum spills and to other oxygen consuming contaminants. These metals are not likely to become lower in concentration with time. Molybdenum is more complicated and exceeds the State of Maine MEG over a large area of Bailey Point. The source of molybdenum in groundwater is not clear, but may be related to molybdenum-bearing petroleum lubricants and a natural occurrence from minerals in the granite and pegmatite bedrock.

TCA and its breakdown products 1,1-DCA, 1,1-DCE and VC, occur in a small groundwater plume originating east of Warehouse 2/3 and flowing south to discharge in the near-shore area of Outfalls 005 and 006. The presence of the TCA daughter compounds in groundwater downgradient of the source area indicates that TCA is naturally degrading and will attenuate over time. The low concentrations of TCA detected in soils within the historic release area do not represent an ongoing source to groundwater.

On the west side of Warehouse 2/3, there are BTEX compounds and metals in groundwater that are associated with a nearby source of contamination in soil. Ethylbenzene concentrations currently exceed the State of Maine MEG. The removal of the source should reduce the groundwater contamination in a fairly short period of time. Meanwhile, the groundwater from this area is flowing westward to discharge in the near-shore areas of Bailey Cove.

7.2.3 Fate and Transport in Sediment

Several metals detected in sediment - arsenic, chromium, lead, mercury, and selenium - will bioaccumulate to some degree; mercury (and in some cases selenium) is also known to biomagnify in aquatic food webs.

Most of the SVOCs detected in the sediment are PAHs. As the level of organic carbon in sediment increases, PAHs tend to become strongly adsorbed to the sediment and thus have limited bioavailability. Biodegradation and biotransformation by benthic organisms are the most important biological fate processes for PAHs in sediments. Most animals and microorganisms can metabolize and transform PAHs to breakdown products that may ultimately experience complete degradation. PAHs with high molecular weights are degraded slowly by microbes and readily by multicellular organisms.

7.3 Human Health Risk Assessment

The purpose of this baseline HHEA was to evaluate potential human health risks due to exposure to residual contamination in soils, sediment, shellfish tissue and groundwater at or surrounding the industrial portion of the Maine Yankee Facility. Based on the site history and results of the RFI, the site was divided into 10 discrete areas for purposes of site and risk characterization. The risks associated with exposure to soils in three of these areas (i.e., Foxbird Island, the Forebay, and the Former Truck Maintenance Area) were not evaluated as part of this risk assessment. RCRA constituents were found to be below PALs in soil samples from Foxbird Island and the Forebay has undergone significant radiological-driven soil remediation. Confirmatory samples following the Forebay remediation will be included in the RCRA Closure documentation. Only petroleum hydrocarbons were detected in soils at the Former Truck Maintenance Garage. Remediation of the petroleum hydrocarbons will be driven by the MDEP Decision Tree Guidance (MDEP, 2000a) and documented in the CMS.

The risks associated with exposure to soils at the 115 kV Switchyard, Personnel Buildings and Parking Lot Areas, and ISFSI (Study Area 4) were evaluated by comparing detected concentrations to the MDEP Remedial Action Guidelines concentrations. This approach was considered appropriate for these three areas as sampling and analytical results support the conclusion that these areas have not been adversely impacted by historical site activities. The risks associated with exposure at the Plant Areas, Warehouse 2/3, the 345 kV Transmission Line Area and the Bailey Farmhouse were evaluated in accordance with MDEP and USEPA methodology as presented in the Draft HHEA Work Plan.

A comparison of Remedial Action Guidelines to soil concentrations detected at the 115 kV Switchyard, ISFSI and Personnel Buildings and Parking Lot Areas indicates that these areas have not been adversely impacted by historical land use.

Exposure to soils within the Plant Area, Warehouse 2/3, 345 kV Transmission Line Area and Bailey Farmhouse was evaluated for a construction worker, on-site worker and resident. Exposure to sediment, fish tissue, groundwater and homegrown produce was evaluated for a hypothetical area resident. COPCs were selected for each study area based on USEPA screening criteria. EPCs were calculated for each COPC and used to estimate an exposure dose concentration for each exposure pathway. The exposure dose concentrations were combined with toxicity information to quantitatively estimate non-carcinogenic and carcinogenic risks. Estimated cancer risks were compared to the USEPA risk range of 10^{-4} to 10^{-6} and MDEP target risk level of 10^{-5}. Non-carcinogenic risks were compared to an HI of 1. The quantitative risk estimates were based on assumptions that render the final risk estimates as overly conservative.

7.3.1 Soils

Noncarcinogenic and carcinogenic risks associated with exposure to soil were evaluated for the on-site worker, construction worker and resident. A residential scenario was included at the request of MBOH. The application of institutional controls will restrict future land use to industrial/commercial activities. A summary of the Non Cancer and Cancer Risks is provided below.

Non-Cancer Risks

The noncarcinogenic risks for all exposure scenarios except the child residential exposure scenario were below an HI of 1.0. The HI, based on a 6-year childhood exposure to soils in the Warehouse 2/3 slightly exceeded 1.0. However, exposure to arsenic and iron accounts for the majority of the non-carcinogenic risks in this area. Arsenic and iron are naturally occurring elements and are not related to plant activities. Eliminating the risks associated with exposure to arsenic and iron results in a lowering of all noncarcinogenic risk estimates to below an HI of 1.0.

The noncarcinogenic risks from exposure to soils throughout Bailey Point are below levels considered to present a human health risk.

Cancer Risks

Carcinogenic risks associated with exposure to soil were evaluated for the construction worker, on-site worker and resident and are discussed below.

The carcinogenic risks associated with exposure to soil for the construction worker scenarios were all at or below the lower end of the USEPA target risk range and below MDEP target risk level of 10^{-5} . These risk estimates indicate that short-term intensive exposure to both surface and subsurface soils throughout Bailey Point does not present a significant health risk.

The carcinogenic risks associated with exposure to soil for the on-site worker were within or below the USEPA target risk range and at or below the MDEP target risk level. Only two constituents, arsenic and benzo(a)pyrene, are present in soil at concentrations associated with individual risk level greater than 10^{-6}.

For all exposure scenarios evaluated, exposure to arsenic presents the greatest risk. Arsenic is a naturally occurring element that is present at background levels and was not utilized or produced by any plant-related activities. Removing arsenic from the risk calculations results in carcinogenic risk estimates at or below the MDEP target risk level. Benzo(a)pyrene becomes the only constituent present in soils at concentrations associated with individual cancer risks greater than 10^{-6} , and no constituents are present at concentrations associated with individual cancer risks greater than 10^{-5}. These risk estimates indicate that long term exposure of an on-site worker to soil does not present a significant health risk.

The carcinogenic risks based on the residential CT exposure scenarios were all below the MDEP risk level and within the USEPA target risk range. The risks from exposure to soil under the residential Reasonable Maximum Exposure (RME) exposure scenario were greater than the MDEP target risk level of 10^{-5} for three of the four study areas. Exposure to arsenic presents the greatest risk to a hypothetical future resident. Removing arsenic from the carcinogenic risk calculations results in a lowering of the residential risk estimates to below the MDEP target level for all but two study areas. Only four constituents are present in soil at concentrations associated with a cancer risk of greater than 10^{-6} and include: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene; and dibenzo(a,h)anthracene. Benzo(a)pyrene is the only constituent present in soil at a concentration associated with an individual cancer risk greater than 10^{-5} .

Based on these risk estimates, no additional actions are considered necessary to reduce human health risks from exposure to surface soils at this site.

7.3.2 Subsurface Soils

A hypothetical construction worker scenario was developed consistent with USEPA guidance to evaluate potential risks from exposure to subsurface soil. The carcinogenic risks for this scenario were all less than the MDEP target risk level of 1×10^{-5}, and at or below the lower end of the USEPA target risk range. No individual cancer risks were above 1×10^{-6}. These risk estimates indicate that future exposure to subsurface soils at Bailey Point by construction workers does not present a significant health risk. No additional actions are considered necessary to reduce human health risks from exposure to subsurface soils at this site.

7.3.3 Sediments

Residual contamination was detected in sediments collected from the intertidal and subtidal portion of the Back River and Bailey Cove. Hypothetical Commercial Shell-fishing and residential exposure scenarios were evaluated to estimate potential risks from sediment exposure under future unrestricted access to the shoreline sediments. The carcinogenic risk estimates were within and below the USEPA target risk range and at or below the MDEP target risk level. The noncarcinogenic risks were all below a target HI of 1.0. These risk estimates indicate that future exposure to sediments within the Back River and Bailey Cove does not present a significant health risk. No additional actions are considered necessary to reduce human health risks from exposure to sediments at this site.

7.3.4 Shellfish Tissue

This risk assessment evaluated the ingestion of shellfish, including mussels, clams, lobsters, and lobster tomalley. The carcinogenic risk estimates for this route of exposure exceed both the MDEP target risk level and the USEPA target risk range for all species. Ingestion of shellfish containing arsenic presented the greatest risk based on the assumption that arsenic in shellfish is in the organic form. This assumption is overly conservative as 80 to 99 percent of arsenic in shellfish is typically in the nontoxic, organic form (ASTDR, 2000). The noncarcinogenic risks were greater than an HI of 1 for all species.

Carcinogenic and noncarcinogenic risks from ingestion of clams and mussels obtained from the reference locations were also greater than the MDEP target risk level and the USEPA target risk range and exceeded an HI of 1.0. Similar contaminants were detected in site and reference clam and mussel samples with the majority of contaminants at greater concentrations in the reference samples. The concentrations of individual PAH compounds, the primary contaminant in the outfall sediments, were actually greater in the reference samples. There does not appear to be a significant difference between the chemical composition of the site and reference samples. As such, the risks from ingestion of biota appear to be the result of background conditions.

7.3.5 Groundwater

Residual contamination was detected in the groundwater collected from Bailey Point. A residential groundwater scenario was evaluated to estimate potential risks from groundwater exposure under future unrestricted land use. The noncarcinogenic and carcinogenic risk estimates exceeded the USEPA target risk range and the MDEP target risk level and HI of 1.0. In addition, eighteen groundwater constituents were detected at concentrations greater than their respective MCL or MEG concentration.

These risk estimates indicate that exposure to groundwater from the Bailey Point may present health risks. As such, the Corrective Measures Study (CMS) should evaluate potential strategies to reduce human exposure to contaminant concentrations in groundwater.

7.3.6 Produce

This risk assessment evaluated the potential risks from contaminant uptake and ingestion of homegrown produce. Contaminant concentrations in produce were estimated using chemical specific bioconcentration factors and site-specific surface soil concentrations (USEPA, 1998f). The noncarcinogenic risks ranged from 0.2 to 1.3. The carcinogenic risks were all above the MDEP target risk level.

These risk estimates indicate that future exposure to homegrown produce may present a health risk.

7.4 Ecological Risk Assessment

The ERA was prepared to evaluate the potential risk to ecological receptors associated with the marine habitat surrounding the Maine Yankee site in order to make informed risk management decisions. This risk assessment was conducted consistent with the ERA Work Plan outlined in the QAPP, and in accordance with USEPA and MDEP guidance.

Based on the weight of evidence from the various studies and evaluations conducted for the ecological risk assessment, there are potentially moderate risks to fish and benthic invertebrates from site-related chemicals in the sediments at Outfall 009. Although some site-related chemicals were detected in the sediments at some of the other outfall locations, the weight of evidence suggests that the potential ecological risk at the other outfalls is minimal. The following is a summary of the ecological risk assessment.

7.4.1 Benthic Community

The results of the ERA indicated that there is no elevated benthic community risk, relative to the reference site, at Outfalls 008, 011, and 012. The risk characterization did indicate that there exists some potential risk to the benthic community at Outfalls 005/006 and 010; however, the risk does not appear great and a healthy benthic community is currently present at Outfall 005/006. Although pollution-tolerant species were found at Outfall 010, the species diversity and density were generally comparable to the reference station. The results of the ERA suggest that there is risk to the benthic community at Outfall 009, which will be addressed through the sediment removal action planned at this outfall.

7.4.2 Small Benthic Fish

The results of the ERA indicated that no elevated risk, relative to reference conditions, exists to small benthic fish from chemicals in the sediments at the outfall areas at Maine Yankee.

7.4.3 Carnivorous Fish

With one exception, the results of the ERA indicated that no elevated risk, relative to reference conditions, exists to carnivorous fishes from chemicals in the sediments at the outfall areas at Maine Yankee. The one exception was for arsenic on the west side of the facility (Bailey Cove), where it was identified as a COPC for carnivorous fish. However, there is uncertainty in this conclusion because of the conservative assumptions used in the food web calculations (e.g., the multiplier of ten used to estimate long-term exposure does not account for depuration of arsenic over time).

7.4.4 Carnivorous Wading Birds

The results of the ERA indicated that there is little to no potential risk to carnivorous wading birds that may forage near the outfall areas around Maine Yankee. In addition, relative to the reference area in Brookings Bay, there is no elevated risk from any of the chemicals detected, since the chemicals were present at higher concentrations in prey items from the reference area, and thus represent a pervasive presence throughout Montsweag Bay.

7.4.5 Piscivorous Birds

The potential risk to two groups of piscivorous birds was evaluated; birds that feed primarily on small estuarine fishes, such as the belted kingfisher, and birds that feed on larger predaceous fishes, such as the osprey. This evaluation revealed that for the kingfisher and similar birds, the dosages of only two chemicals, mercury and zinc, pose a potential risk. However, the concentrations of these metals in mummichog tissue were similar between the site and the reference area, indicating no elevated potential risk relative to reference conditions.

The evaluation for piscivorous birds that feed on larger predaceous fishes revealed that only one chemical (mercury) might pose a potential risk. However, the potential risk near Maine Yankee was similar to the potential risk at the reference site. Therefore, although a potential risk from mercury cannot be dismissed for piscivorous birds that feed on larger fishes, the potential risk appears to be pervasive throughout Montsweag Bay and unrelated to activities at the Maine Yankee facility.

7.4.6 Evaluation of Potential Effects from PAH Exposure to Fish

Since fish rapidly metabolize PAHs, additional evaluation was undertaken to assess potential risk to fish from these chemicals that might not be identified by tissue chemical residues. Sediment PAH concentrations linked to mutagenic and carcinogenic effects in fishes were compared with sediment PAH concentrations at the outfall areas. The results of this comparison indicated that there is no cancer risk to fish from PAH exposure at Outfall 005/006, a possibility of a risk to fish from PAHs at Outfall 010, but likely not significant, and a potential risk to fish from PAHs at Outfall 009.

7.5 Summary and Recommendations

RFI activities included the collection of soil, concrete, sediment, biota, surface water, and groundwater samples from areas of Bailey Point with known or suspected contamination. An evaluation of the affected site media was conducted to assess its nature and extent and fate and transport against project action limits, reference data and cited literature. Based on this evaluation, several areas of interest within Bailey Point were identified, which corresponded to the known or suspected areas of potential contamination. Several areas were remediated (i.e., soil removed) prior to or during the RFI to eliminate the potential sources of contamination.

The potential risk to human health and the environment was assessed within Bailey Point based on the relationship of identified source areas to potential pathways and receptors. The assessment of risk to human health concluded that exposure to groundwater from Bailey Point may present a health risk and no additional corrective actions are necessary to reduce risks from exposure to soil, sediment or shellfish. Based on the ecological risk assessment, there are potentially moderate risks to fish and benthic invertebrates in sediment at Outfall 009.

Several remaining areas will be addressed in the CMS, which will identify areas to be remediated, methods of remediation, and areas that will require ongoing monitoring. Remedial activities performed to date will be documented in the CMS.

Based on the fate and transport qualities and assessment of risk to human health and the environment, the following areas are recommended for consideration in the CMS:

- Subsurface soils containing VOCs on the southwest side of Warehouse 2/3 that affect groundwater quality;

- Surface and shallow soils containing petroleum hydrocarbons and PCBs near the Construction Transformer;

- Subsurface soils containing petroleum hydrocarbons in the area of the Former Truck Maintenance Garage;

- Subsurface soils adjacent to MW-401B in the RA as a result of petroleum hydrocarbons in groundwater;

- Groundwater associated with solvents and various metals downgradient of Warehouse 2/3; and

- Groundwater for DRO and various metals throughout Bailey Point.

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Appendix H-1

Human Health Exposure Assessment Work Plan and Correspondence

Date	HHEA Correspondence
January 15, 2003	HHEA Work Plan (Revision 1)
March 17, 2003	MDEP/MBOH/USEPA HHEA Comments
April 1, 2003	Response to 3/17/03 Regulatory Comments
April 11, 2003	MDEP Conditional Approval of HHEA and Additional Comments
May 7, 2003	Response to 4/11/03 Additional Regulatory Comments
June 2, 2003	Toxicity Values Provided by USEPA

Appendix H-2

Calculation of Exposure Point Concentrations

Appendix H-3

Focused Human Health Risk Evaluation (Fugitive Dust)

Calculation of Exposure Point Concentrations
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APPENDIX G
Geochemistry of the RA and Industrial Area

Introduction

As part of the RFI, Maine Yankee took groundwater samples in a period spanning late May 2002 to July 2002 from 16 locations within the RA and Industrial area of Bailey Point to characterize the geochemistry of the bedrock aquifer. These data were collected to examine the cation and anion geochemistry and evaluate the potential impact from several historic, overlapping sources of contamination in that area. The historic sources of contamination in the RA and Industrial Areas include: 1) seawater via intrusion and from both the storm water drain system and circulating cooling water pipes, 2) historic sodium chromate leaks associated with Secondary Component Cooling System, 3) leaching from subsurface concrete structures, and 4) historic release(s) of petroleum. **Table G-1** summarizes these data and compares them to earlier chemical analyses on the Knoll Well (the former plant drinking water supply), and later tests on the PAB Test Pit. There are a variety of ways to analyze and graphically portray the geochemistry of a groundwater. Maine Yankee utilized the Piper Diagram to evaluate the data, as this approach allows both cations and anions to be simultaneously evaluated. The Piper Diagram, **Figure G-1**, provides the most useful side-by-side comparison. **Table G-2** groups the various wells in standard categories that are defined by placement on the Piper Diagram.

Sodium was the dominant cation at seven of the monitoring well/sampling locations in the RA area (**Table G-2**). Even the Knoll Well, utilized for background comparison on Bailey Point, is dominated by sodium. The sources of sodium on the site are many, as discussed below. Despite the obvious effects of cement leaching in ground water near the massive underground concrete structures, only MW-401B, south of the “rad bunker,” had calcium as a dominant cation. The other eight locations tested had a mixture of sodium, calcium and magnesium (there is little potassium here), but no clear dominance (**Table G-2**).

Chloride is really only a dominant anion for three wells, two of which (B-201 and MW-401A) are clearly affected by saltwater intrusion, and the other (BK-1) most likely by winter deicing activities. The carbonate anion was dominant in MW-401B and the first PAB Test Pit sample, reflecting the influence of cement leaching. Carbonate is stabilized in groundwater relative to bicarbonate when pH is in excess of 9.0 (Hem, 1985). This is confirmed by the pH in MW-401B of 11.7 and in the PAB test pit of 9.8. Sulfate was only dominant in B-203B, although it occurred in relatively high concentrations in many other samples from the RA. The remaining locations (MW-306, MW-307, MW-403, B-202, and B-203B) were not dominated in the anion category by chloride, sulfate, carbonate or bicarbonate.

The PAB Test Pit was the only location sampled more than once for the full suite anions and cations. The first sampling, in July 2002, showed anomalously high concentrations of many constituents. This sample was taken during the early stages of PAB decontamination and there was a concern that those activities may have contaminated the Test Pit water. The second sampling in February 2003 shows a marked decrease of one to two orders of magnitude in most cases in constituent concentration, indicating that the first PAB sample was impacted by the nearby decontamination activities.

Evaluation of Sodium and Chloride Distribution

High concentrations of both sodium and chloride have been found in the ground water at the site since 1989. In December 1988, an underground leak of a Secondary Component Cooling system (SCC) pipe containing sodium chromate as a corrosion inhibitor, released a large quantity of water. A fate and transport study (RGGI, 1990) was conducted to evaluate the spill. As a result of this study, monitoring wells and groundwater sampling took place in the RA area for sodium, chromate, and other parameters. High sodium concentrations observed at that time could not be explained by the SCC leak alone, so studies of other possible sources of sodium and chloride were initiated.

A review of design documents and a consideration of the construction and operation of the plant revealed several sources of sodium other than the sodium chromate leaks. In the stormwater system serving the south side of the RA and Industrial Area, the pipe outlet invert in the seal pit of the forebay was actually below the seal pit water level during very high tides (the seal pit was filled with seawater from the circulating water cooling system). Since storm drains and catch basins were not constructed to be water tight, when seawater backed up in the storm drain, the seawater leaked out into the ground around the storm drain system, dosing the groundwater intermittently with pure seawater. Furthermore, the circulating cooling water pipes, which were buried deeply in the RA and Industrial Area yard continuously, released seawater to the groundwater system during plant operations.

Figure G-2 shows the correlation of conductivity as a function of chloride in the 2002 sampling. Only B-201, which is clearly affected by seawater intrusion, now shows a high conductivity (greater than 1500 S/cm) whereas in 1989, B-202, B-205, and B-206 had extremely high conductivity at times (Fig. 22 of RGGI, 1990). B-201 remains in a similar range as in 1989. **Figure G-3** shows the weekly concentrations of sodium and chloride in wells B-201, B-202, B-205 and B-206 in 1989. The statistics of these data are shown to the right of each graph and compared with the 2002 measured concentrations. With the exception of B-201, there have been very large reductions in sodium and chloride concentrations from 1989 to 2002. Notice on **Figure G-3** that sodium generally tracked with chloride concentrations, although at lower concentrations, and sodium did not increase or decrease so rapidly as chloride. Chloride is a very conservative tracer in groundwater. Sodium, on the other hand, is exchanged in complex ways with the geologic material (Hem, 1985). Therefore, the rate of change of the groundwater concentration of sodium is damped by the exchange process relative to chloride.

Since the plant ceased operation, the forebay level has dropped five feet, causing no further backup of seawater into the storm drain. Likewise, the continuous release of seawater from the circulating cooling water pipes has also ceased. The concentrations of both sodium and chloride have decreased dramatically, although not proportionately from levels detected in 1989. Sodium previously exchanged with geologic materials is now releasing from those materials back into groundwater and keeping the ratio of sodium to chloride as shown in **Table G-3,** well above the normal seawater ratio at most test locations.

The summer 2002 distribution of chloride in the RA area is shown on **Figure G-4.** As indicated, the chloride concentrations are much lower than that observed in the 1989 results which were associated with plant operations. The concentrations in the wells range from 30 to 151 mg/l, with the exception of B-201 (639 mg/l), which is placed well below sea level near the shoreline and shows seawater intrusion effects. With the exception of those points probably affected by current saltwater intrusion (B-201, CS-1, and MW-401A), the other elevated 2002 chloride concentrations are probably due to deicing salts used liberally in the paved areas around the RA and industrial area for safety reasons.

Figure G-5 shows the 2002 sodium concentrations in the RA area. On the north and upgradient side of the industrial area MW-308 only had a sodium concentration of 15.4 mg/l, but on the south and downgradient side of the industrial area concentrations ranged from 36 to 91 mg/l, except B-201 at 305 mg/l. The elevated sodium concentrations in these downgradient monitoring wells are most likely related to the historic impacts of seawater from either storm sewers or circulating cooling water pipes. The PAB Test Pit sample from July 2002 had 254 mg/l sodium, but had decreased to 55 mg/l in February 2003. The source of this high sodium concentration in the PAB in July 2002 is not known but may be related to the cleaning and decontamination activities associated with the PAB. The somewhat elevated sodium concentration in the CFS of 119 mg/l may be sourced from the PAB Test Pit area.

Several other ways of showing the change in sodium and chloride on the site since 1989 are illustrated in **Figures G-6, G-7**, and **G-8**. Although the ratios of sodium and chloride may fluctuate somewhat with time in a groundwater regime affected by seawater intrusion, the magnitude of the decrease in all the wells that previously had high concentrations is shown clearly on the graphs. The decrease of sodium and chloride in these monitoring wells from values observed in 1989 clearly demonstrates the historic impact of seawater on shallow groundwater as a function of plant operations and the decrease of seawater impacts in the years following plant closure.

The history of the Knoll Well sodium concentration is shown on **Figure G-6**, but is not related to the same processes that affected the RA and Industrial Area. The Knoll Well, which was located just off the southeast corner of the ISFSI and well upgradient of the RA and Industrial areas, was a bedrock well of several hundred feet in depth that produced several gallons per minute of potable water. The chloride concentration in the well never exceeded 10 mg/l from 1987 to 1996, so saltwater intrusion was not the source of sodium, nor was deicing salt application on the nearby road or parking lot a likely source. The most probable explanation is that the sodium is a residual effect of the filling of the area north of the ISFSI with marine sediments dredged from the circulating water intake channel. There is a suggestion from previous groundwater modeling (MY, 2001b, Fig. 5-23) that groundwater flowing through the Knoll Well area originates to the north under the area where dredge spoils were deposited. The chloride would have moved out fairly quickly through the soil groundwater flow system, but because of the exchange properties of the sodium, it would be released much more slowly with time. **Figure 4-11** shows that sodium concentrations in the area north of the Knoll Well are still elevated well above background. Sodium may have moved downward into the deep bedrock flow system.

In addition to the increasing sodium concentrations, arsenic in the knoll well is also observed to have increased with time (55 mg/l to 85 mg/l). The rising arsenic concentration in the Knoll Well may also be related to the filling of the marine sediments over the original marsh north of the ISFSI. The anaerobic conditions established at the base of the fill combined with the organic carbon source from the marsh may be responsible for release of arsenic from the natural, geologic materials and transport to the deep bedrock flow system (Ayotte, et. al., 2003).

Figure G-8 deals with the interesting geochemical history of the CFS. The sump at the bottom of the CFS goes to a maximum depth of 55 feet below MSL. The sump is emptied periodically by high- and low-level switches on a sump pump located in a deep manhole off to the west side of the containment. Therefore, the elevation of ground water under the containment fluctuated but was generally kept below about –45' MSL. It was clear from studies in 1988 and 1989 (RGGI, 1989a) that during plant operation the CFS contained a dilute 2% to 10% seawater mixture. When the plant was operating, the forebay was elevated 5 feet above normal sea level and this, combined with the depth and location of the CFS, permitted some upconing of seawater to the CFS. Since ceasing operation, the chloride concentration has significantly decreased. One can also see on **Figure G-8** that in 1989 the concentrations of sodium, nitrate, and potassium were very high and must have reflected various system leaks from tanks and buildings around the containment (the elevated sodium was probably due to the SCC leak). Hydrazine, a corrosion control agent used throughout the plant's history, would produce very high concentrations of nitrate in groundwater. Although the 2002 concentrations of calcium and magnesium were fairly low, the pH was fairly high (9.5) in the CFS, suggesting a cement leaching impact.

Carbonate, Bicarbonate and pH

To evaluate the effect of cement leaching, **Figure G-9** shows pH as a function of carbonate and bicarbonate. The concentration of bicarbonate and carbonate in groundwater represents a homogenous equilibrium that is a function of pH (Hem, 1985). For a fixed concentration of dissolved carbon, the carbonate/bicarbonate ration will increase with increasing pH at pH in excess of 9.0 (Hem, 1985). When carbonate and pH are high, the source is likely cement leaching. The PAB Test Pit samples, MW-401B, CS-1, MW-312, and to a minor extent MW-307 placement on the graph suggest a cement leaching impact, particularly since they all have a pH over 9.

Sulfate

Figure G-10 shows the distribution of sulfate within the RA and Industrial Area. Sulfate is a common anion. It is present at fairly high concentrations in seawater with 2700 mg/l being typical. Therefore, those wells identified as being affected by saltwater intrusion such as B-201 would be expected to be high in sulfate. Sulfate may also be left over from dosing of the area through circulating water pipe or stormwater pipe leaks of seawater. Sulfate may also be derived from the use of sulfuric acid in the plant for pH control. Leaks did occur from the waste neutralization tank and could have created elevated sulfate concentrations. Sulfate is also naturally derived because of the presence of sulfide minerals like iron pyrite in the soil and rock.

B-203B had the highest concentration of sulfate at 124 mg/l. Most other wells within the RA and Industrial Area had sulfate concentrations elevated above what would be expected to be normal background. Only MW-401A and B had values in the normal range. MW-308 on the north side of the Industrial Area even had a relatively high concentration. Most of these elevated values can be ascribed to residual effects of seawater dosing associated with the storm water and circulating cooling water pipes.

Chromium

Since sodium chromate was used as a pipe corrosion inhibitor until the early 1990s at the plant, since there are documented underground pipe breaks that released chromated water, and since chromium is a moderately retarded metal in groundwater flow, it is reasonable to assume that some residual chromium might still be detected. **Figure G-11** shows a graph of chromium concentration as a function of sodium. The only elevated chromium appeared in the PAB Test Pit. Monitoring wells CS-1 MW-312 (the PAB "alleyway") have chromium concentrations slightly above the range detected in reference wells in the backlands (MY, 2003). Although other B-series wells south of the containment were originally affected by the sodium chromate underground pipe leaks, apparently all residual chromium has been flushed out of those areas. The concentration of chromium decreased significantly between July 2002 and February 2003 in the PAB Test Pit to concentrations consistent with the reference wells.

Nitrate

Another potential indicator of a historical plant system release to groundwater is high nitrate in groundwater. Hydrazine was used as a corrosion inhibitor throughout the plant's operation. When it is released to the environment nitrate is formed if oxygen is present. Nitrate is a conservative contaminant in groundwater flow unless there is a source of organic carbon present that may assist in denitrification. Otherwise, nitrate is not absorbed or retarded and is only reduced by dilution in mixing with other ground water low in nitrate. **Figure G-12** shows the distribution of nitrate in the RA and Industrial Area. Background levels of nitrate at the site would not be likely to exceed 0.5 mg/l and nitrate in seawater is very low, too.

MW-308 is low in nitrate (0.2 mg/l) and near background. MW-401A, MW-401B, B-201, MW-307, and CS-1 are all in the background range. However, a number of other wells still showed the residual effects of receding Hydrazine plumes on the site. MW-203B has the highest concentration, as it does for several other constituents. This seems to imply that the groundwater flushing rate through the area of B-203B is very slow. In fact, much of the distribution of residual nitrate probably reflects the flushing and dilution capacity of those areas of rock still elevated in nitrate.

Boron

Boron is a natural constituent of seawater, but was also used in some of the primary plant operating systems as a neutron moderator. Therefore, elevated boron concentrations could be an indicator of either diluted seawater or of a past leak in a primary system. **Figure G-13** shows the summer 2002 distribution of boron in the RA and Industrial Area. With the exception of B-201, a well with saltwater intrusion, the focus of high boron concentrations is in the containment area, south to MW-402. Given that the current chloride concentration of B-201 is six times higher than CS-1, but that the boron concentrations are comparable, it appears that the boron in CS-1 and MW-402 is most likely from a plant system leak or leaks, possibly from the RWST which was borated and did leak. Background concentrations of boron would be expected to be less than 0.05 mg/l.

DRO

There are areas of the RA and Industrial Area that have residual Diesel Range Organics (DRO) from historical petroleum releases. **Figure 4-17** shows the DRO in groundwater in the summer of 2002. Prominent elevated DRO results were found in MW-401B, B-205, B-206A, MW-312, B-202, MW-403, MW-307, and MW-318. MW-318 lies in the general area east of the main transformers that would have been affected by the release of oil during the transformer fire of may 1991. MW-307 is next to the former underground storage tanks of the emergency diesel generators (some leakage of diesel fuel was removed during the removal of the tanks; RGGI, 1994g). MW-312 was just below a construction-era spill that occurred in the gravel backfill in the PAB alleyway that was identified and cleaned up in late 2002. MW-403 lies along a fractured bedrock zone inferred to be connected to MW-312, and is hydraulically downgradient of MW-312 and the historic release of petroleum in the PAB alleyway.

Several documented accidental releases from construction equipment have occurred in the yard area south of containment that could account for the observed DRO concentrations at B-205, B-202, and B-206A. There was apparently a surface spill in the immediate vicinity of MW-401B based on the high concentration in that area. In general, the distribution of DRO in the RA and Industrial Area is consistent with the petroleum sources discussed above and the groundwater flow behavior in that area (**Figures 4-16 and 3-10B**).

Summary of Operational Influences on Groundwater Geochemistry

Table G-4 summarizes the probable effects that various operations have had on groundwater geochemistry in the RA and Industrial Area. We have subjectively assigned one of two different designations to each monitoring point if we interpreted a result to indicate an elevated concentration according to the appropriate column heading. If a measured groundwater concentration is roughly one order of magnitude greater than background, or over an MCL or MEG, than the designation of "some indication" is given. If a result is roughly two orders of magnitude or more over background, or an order of magnitude or more over an MCL or MEG, than the designation of "significant indication" is given.

Most of the wells in the RA and Industrial Area have had either an influence from previous dosing by seawater and/or an elevated sodium and chloride due to deicing compound application. The B-200 series wells formerly very high in sodium and chloride have shown significant concentration declines since 1992.

Effects of cement leaching, causing pH elevation (except at B-203B), are indicated in some wells in the immediate vicinity of massive concrete extending below groundwater level, or down-gradient of those points. Alkalinity, bicarbonate, and carbonate hardness is variable, but pH exceeds 8.5 at five sampling points. As the natural buffering capacity of the natural soils and rocks is used up over time, pH can be expected to increase to a steady-state distribution downgradient of the deep concrete foundations left in place at the site.

Petroleum contamination as measured by DRO concentrations is spread throughout much of the RA and Industrial Area. Many small spills have occurred and been remediated, but some residual contamination has reached the bedrock. One major remaining suspected source area that must be investigated is soil near MW-401B.

Although not exceeding MCLs, nitrate concentrations are still elevated in some wells in the RA and Industrial area on the site, probably due to the historical use of Hydrazine as a pipe corrosion inhibitor.

Elevated concentrations of sulfate in most of the RA and Industrial Area are most likely due to past seawater dosing. Some sulfate concentrations may be related to past use of sulfuric acid for pH control, but that effect would probably only be present south of the former waste neutralization tank. Some wells may have elevated sulfate due to local naturally-occurring pyrites, a sulfide-bearing mineral.

Small residual concentrations of chromium (not over the MCL except in the original PAB Test Pit sample) were found at CS-1, MW-312, and the PAB Test Pit. Sodium at those test points may also be elevated from the original releases of sodium chromate in those areas.

Molybdenum is present in elevated concentrations in some locations because it is a constituent of petroleum-based lubricants (such as at MW-401B). However, molybdenum may also be a naturally-occurring mineral in the granites and pegmatites at the site.

Concentrations of arsenic, iron, manganese, and aluminum are above background at numerous points in the RA and Industrial Area. All of these metals are probably naturally derived from the geologic materials present and have been released into soluble form due to some geochemical process related primarily to either seawater dosing or some release of plant-derived contaminants. The few occurrences of above-background mercury, nickel, zinc, and vanadium are more difficult to relate to natural causes.

Note that the concentrations of contaminants in the PAB Test Pit declined significantly between July 2002 and February 2003. We suspect that the decontamination activities within the PAB Test Pit affected the July 2002 results (this correlates with anomalous radioactive results in the July tests, too). Since the PAB Test Pit water flows to the CFS, this may also have affected some of the CS-1 results from summer 2002.

For the few sampling points with historical data from 1989 and 1992, there is an indication of significant decline in concentrations from sodium, chloride and chromium related to plant operations. The CMS study will use these results to estimate the length of time necessary for contaminants in groundwater to decline below MCLs and MEGs.

Table G-3
June 2002 Chemical Ratios of Chloride in RA Groundwater

Well	Easting Coordinates	Northing Coordinates	Na:Cl	K:Cl	Mg:Cl	Ca:Cl
Sea Water	NA	NA	0.55	0.02	0.07	0.02
B-202	623834.1	407377.9	0.91	0.29	0.13	0.68
B-203B	623665.3	407475.9	0.90	0.13	0.79	1.32
B-205	623772.4	407390.6	0.81	0.12	0.18	0.22
B-206A	623823.8	407426.8	1.00	0.11	0.07	0.21
BK-1	623734.6	407697.2	0.29	0.08	0.08	0.39
CS-1	623809.0	407582.0	1.18	0.18	0.03	0.10
B-201	623860.0	407330.0	0.48	0.03	0.07	0.16
MW-306	624167.7	407349.9	0.44	0.10	0.21	0.71
MW-307	623984.0	407323.5	0.72	0.19	0.08	0.69
MW-308	623985.9	407784.9	0.45	0.14	0.35	1.23
MW-312	623899.2	407628.3	1.24	0.29	0.08	0.50
MW-401A	623639.4	407656.9	0.38	0.06	0.15	0.31
MW-401B	623639.4	407652.2	4.11	2.05	0.04	9.95
MW-402	623727.7	407418.4	1.41	0.12	0.12	0.27
MW-403	623917.1	407326.7	0.89	0.21	0.37	1.03
PAB Test Pit	623802.0	407657.0	5.79	3.26	0.01	4.15
PAB03fil[1]	623802.0	407657.0	2.12	0.73	0.04	0.37
PAB03unfil[2]	623802.0	407657.0	2.12	0.73	0.04	0.38
Knoll Well[3]	624440.0	408570.0	6.10	NA	NA	0.56

Notes:
"NA"= no test taken

1) PAB03fil is a sample taken from the PAB test pit on Feb 2003 and field-filtered to remove particulates
2) PAB03unfil is a sample taken from the PAB test pit on Feb 2003 without filtering
3) The Knoll well was the drinking water well that supplied the plant. Test results taken from the Maine Public Health Laboratory reports from the period 1988 to 1995.

Table G-1
June 2002 Geochemistry of RA Industrial Area Groundwater

Well:	B-202	B-203B	B-205	B-206A	BK-1	CS-1	B-201	MW-306	MW-307	MW-308	MW-312	MW-401A	MW-401B	MW-402	MW-403	PAB Test Pit	PAB03fil[1]	PAB03unfil[2]	Knoll Well[3]
Easting Coordinates	623834.1	623665.3	623772.4	623823.8	623734.6	623809.0	623860.0	624167.7	623984.0	623985.9	623899.2	623639.4	623639.4	623727.7	623917.1	623802.0	623802.0	623802.0	624440.0
Northing Coordinates	407377.9	407475.9	407390.6	407426.8	407697.2	407582.0	407330.0	407349.9	407323.5	407784.9	407628.3	407656.9	407652.2	407418.4	407326.7	407657.0	407657.0	407657.0	408570.0
Sodium	55.9	27.5	75.9	63.8	43.3	119	305	35.8	50.7	15.4	41.4	25.5	23.5	90.9	87.3	254	55	55	61
Potassium	17.9	3.92	10.8	6.93	12.6	17.8	17.2	8.12	13.5	5.01	9.88	4.26	11.7	7.75	20.4	143	19	19	NA
Calcium	41.8	40.2	20.3	13.3	58.8	9.69	100	57.2	48.8	42.6	16.6	20.5	56.9	17.2	101	182	9.7	9.9	5.6
Magnesium	8.2	23.9	16.7	4.59	11.9	3.34	44.5	16.8	5.57	12.1	2.63	9.72	0.256	7.7	36.6	0.365	1.1	1.1	NA
Chloride	61.1	30.4	93.3	64	151	101	639	80.9	70.8	34.6	33.5	66.8	5.72	64.3	97.7	43.9	26	26	10
Bicarbonate as CaCO3	87.4	67.2	80.1	48.5	48.2	34	63.9	73.7	112	88.1	55	38.2	10	98.1	50.1	4	69	70	NA
Carbonate as CaCO3	2	2	2	2	2	67.8	2	2	3.4	2	21	2	96	2	2	212	51	55	14
Sulfate	96.8	124	91.2	60.9	40.7	81.8	153	106	72.5	58.9	30.7	21.3	18.6	89.1	134	62.8	59	61	25
Hydroxide as CaCO3	2	2	2	2	2	2	2	2	2	2	2	2	107	2	2	792	0.5	0.5	NA
Alkalinity as CaCO3	87.4	67.2	80.1	49.1	48.2	102	63.9	73.7	115	88.1	76	38.2	203	98.1	50.1	1000	69	70	116
Bromide	0.1	0.1	0.1	0.1	0.1	0.1	1.84	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	NA
Iodine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.1	0.1	NA
Nitrate as N	1.7	3.02	0.867	0.686	1.02	0.1	0.1	1.21	0.101	0.215	0.459	0.1	0.1	1.44	2.82	0.402	1	1	0.23
Phosphate as P	0.1	0.1	0.1	0.1	0.1	0.137	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.08	0.08	NA
Sulfide	1	1	1	1	1	1	1	1	1	1	1	1	1.45	1	1	1	0.1	0.1	NA
Aluminum	0.22	0.887	0.112	0.446	0.025	0.0714	0.0869	0.0699	0.331	0.025	0.83	0.025	3.04	0.206	0.0643	0.999	0.1	0.099	NA
Antimony	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.007	0.007	NA
Arsenic	0.005	0.005	0.005	0.005	0.005	0.0171	0.005	0.005	0.005	0.005	0.0086	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01
Barium	0.048	0.0384	0.0191	0.0242	0.0737	0.0055	0.184	0.0369	0.0604	0.0367	0.0359	0.0383	0.0068	0.0497	0.0654	0.0746	0.009	0.009	0.025
Beryllium	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.002	0.0018	NA
Boron	0.047	0.0288	0.0937	0.0325	0.093	0.189	0.156	0.0705	0.0359	0.025	0.0688	0.117	0.025	0.161	0.0574	0.0903	0.19	0.18	NA
Cadmium	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00024	0.0002	0.0002	0.0002	0.0002	0.0002	0.00032	0.0002	0.0005	0.00032	0.002	0.002	0.00025
Chromium	0.002	0.0047	0.002	0.002	0.002	0.0222	0.002	0.002	0.002	0.002	0.0114	0.0028	0.002	0.002	0.002	0.0738	0.002	0.0049	0.001
Cobalt	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.0092	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006	NA
Copper	0.0074	0.005	0.005	0.005	0.005	0.0061	0.005	0.005	0.005	0.005	0.005	0.005	0.0208	0.005	0.005	0.0374	0.004	0.0041	0.045
Iron	0.418	1.4	0.16	0.338	0.05	0.05	0.288	0.139	0.0633	0.148	0.149	1.24	0.716	0.324	0.0603	0.291	0.012	0.025	0.16
Lead	0.00095	0.00085	0.0003	0.00079	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00045	0.0003	0.00086	0.0012	0.0003	0.0053	0.005	0.005	0.0015
Manganese	0.0126	0.045	0.0488	0.0097	0.001	0.0028	2.74	0.0806	0.88	0.783	0.0166	0.629	0.013	0.842	0.328	0.0096	0.004	0.004	0.03
Mercury	0.0002	0.0002	0.0002	0.0002	0.0002	0.00059	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0109	0.000007	0.000007	0.00025
Molybdenum	0.01	0.01	0.01	0.0167	0.01	0.0521	0.01	0.01	0.0127	0.054	0.01	0.01	0.0503	0.01	0.01	0.119	0.015	0.015	NA
Nickel	0.0071	0.005	0.005	0.005	0.005	0.005	0.0109	0.0053	0.0062	0.005	0.005	0.005	0.12	0.005	0.0422	0.005	0.011	0.011	NA
Selenium	0.001	0.001	0.001	0.001	0.001	0.0013	0.0046	0.001	0.001	0.001	0.001	0.001	0.0017	0.001	0.0032	0.001	0.01	0.01	0.0025
Silver	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.004	0.004	0.001
Thallium	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.013	0.013	NA
Vanadium	0.005	0.005	0.005	0.005	0.005	0.0208	0.005	0.005	0.005	0.005	0.0069	0.005	0.0187	0.005	0.005	0.013	0.006	0.006	NA
Zinc	0.0146	0.0414	0.131	0.0058	0.005	0.016	0.021	0.0347	0.006	0.005	0.005	0.005	0.0057	0.0174	0.0284	0.0132	0.025	0.025	0.05
pH	7.10	6.14	6.91	8.65	6.83	9.50	6.40	6.01	9.40	7.37	10.02	6.21	11.56	7.03	6.48	9.76	9.80	9.80	8.40
Ion balance, %	2.8	6.3	-0.5	-0.1	0.2	-7.8	0.1	1	-0.5	1.6	-1.8	-0.5	-38.4	2	30.5	-40.3	-16.5	-18.3	39.6
conductivity, S/cm	667	553	650	503	724	NA	2800	667	653	423	334	391	879	507	1498	473	NA	NA	NA
ORP, mV	154.7	265.6	182.6	182.3	193.9	NA	198.1	267.7	-103.3	-40.2	62.9	170.3	-57.2	178.7	165.2	NA	NA	NA	NA
DO, %	24.8	2.5	71	64.4	130.8	NA	11.3	63.5	9.7	7.9	4.6	153.1	134.9	127.3	73	NA	NA	NA	NA

Notes:
All results in mg/L, unless otherwise noted.
"NA"= no test taken
1) PAB03fil is a sample taken from the PAB test pit on Feb 2003 and field-filtered to remove particulates
2) PAB03unfil is a sample taken from the PAB test pit on Feb 2003 without filtering
3) The Knoll well was the drinking water well that supplied the plant. Test results taken from the Maine Public Health Laboratory reports from the period 1988 to 1995.

Table G-2
Summary of June 2002 RA Groundwater Geochemistry
Based on Piper Diagram Analysis

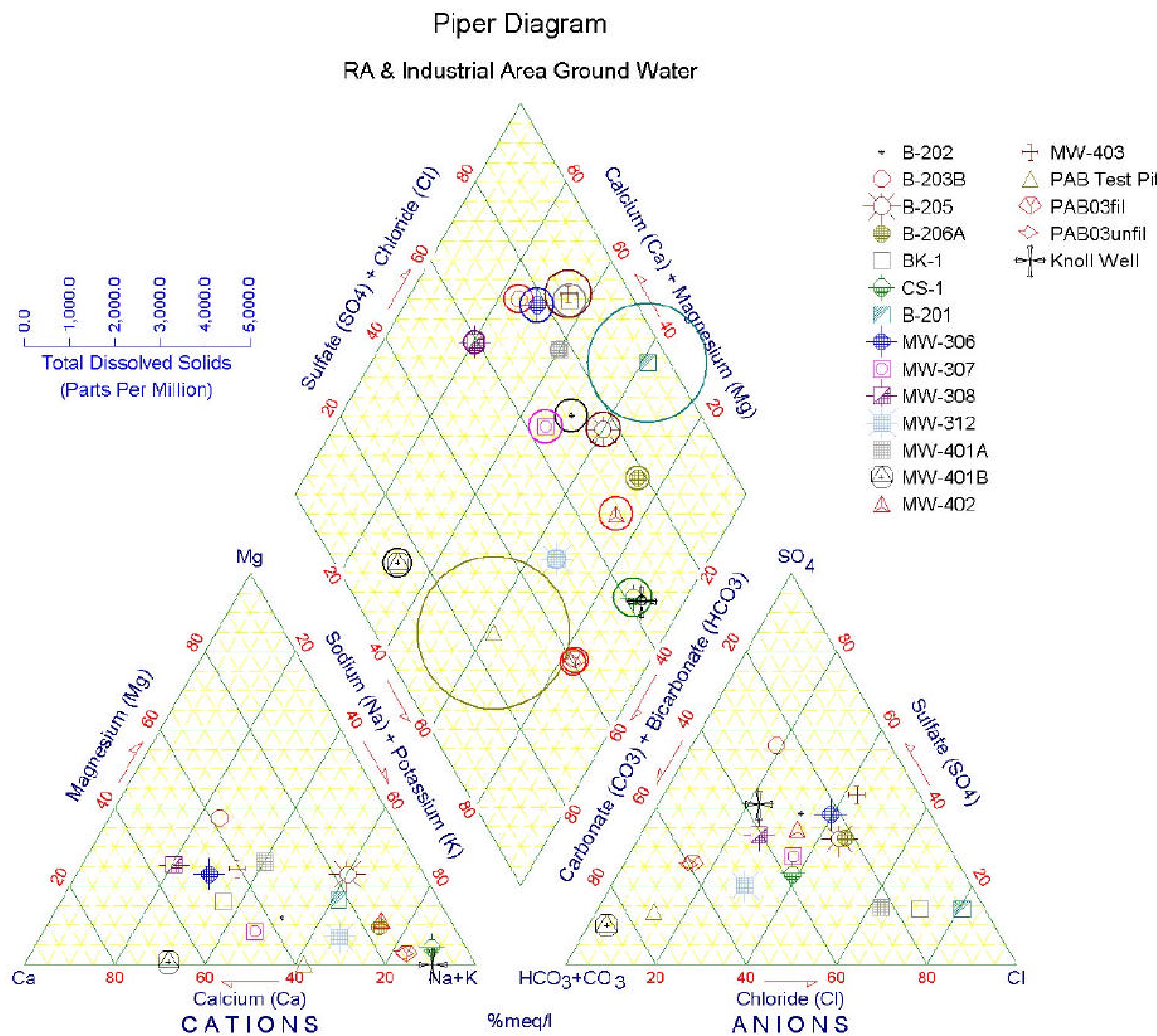
Cation Dominance	Well Locations	Anion Dominance	Well Locations	Alkaline Earths exceed Alkalies	Well Locations	Alkalies exceed Alkaline Earths	Well Locations
Calcium Type	MW-401B	**Bicarbonate Type**	MW401B	**Non-carbonate hardness >50% and strong acids > weak acids**	BK-1	**Non-carbonate Alkali >50% and strong acids > weak acids**	B-201
			PAB TP 7/02		B-203B		B-205
			PAB03 unfil		MW-306		B-206A
			PAB03 fil		MW-403		MW-402
							CS-1
							Knoll Well
				Carbonate hardness >50% and weak acids > strong acids	MW-401B	**No hardness dominance but weak acids > strong acids**	MW-312
							PAB TP 7/02
							PAB03 unfil
							PAB03 fil
Sodium Type	B-201	**Chloride Type**	BK-1	**No hardness dominance but strong acids > weak acids**	B-202		
	B-205		B-201		MW-307		
	B-206A		MW-401A		MW-308		
	MW-312						
	MW-402						
	CS-1						
	PAB TP 7/02						
	PAB03 unfil						
	PAB03fil						
	Knoll Well						
		Sulfate Type	B-203B				

Table G-4
Groundwater Geochemistry Inferences based on Anion/Cation Analysis and Field Parameters
Industrial Area

Well	Past or Current Seawater Influence	Effect from Current Deicing Compound Use	Effect from Cement leaching	Effect from Sodium Chromate	Effect from Petroleum Release	Elevated Sulfate[1]	Elevated Nitrate from Hydrazine	Elevated Arsenic[1]	Elevated Iron[1]	Elevated Manganese[1]	Elevated Mercury[2]	Elevated Molybdenum[1,3]	Elevated Nickel	Elevated Zinc	Elevated Vanadium	Elevated Aluminum[1]
B-201	X					X				X						
B-202	o	o			X	o	o		o							o
B-203B		o	o		o	X	o		X							o
B-205	o	o			X	o								o		o
B-206A	o	o			X	o			o							o
BK-1		X			o	o	o									
CS-1	X		X	o	?	o		o			o	o			o	
MW-306		o				X	o			o						
MW-307	o	o	o		X	o				o						o
MW-308					o	o				o		o				
MW-312		o	o	o	X	o										o
MW-401A	o								X	o						
MW-401B			X		X				o			o	X		o	X
MW-402	o	o				o	o		o	o						o
MW-403	o	o			X	X	o			o			o			
PAB TP			X	X	X	o					X	X			o	X

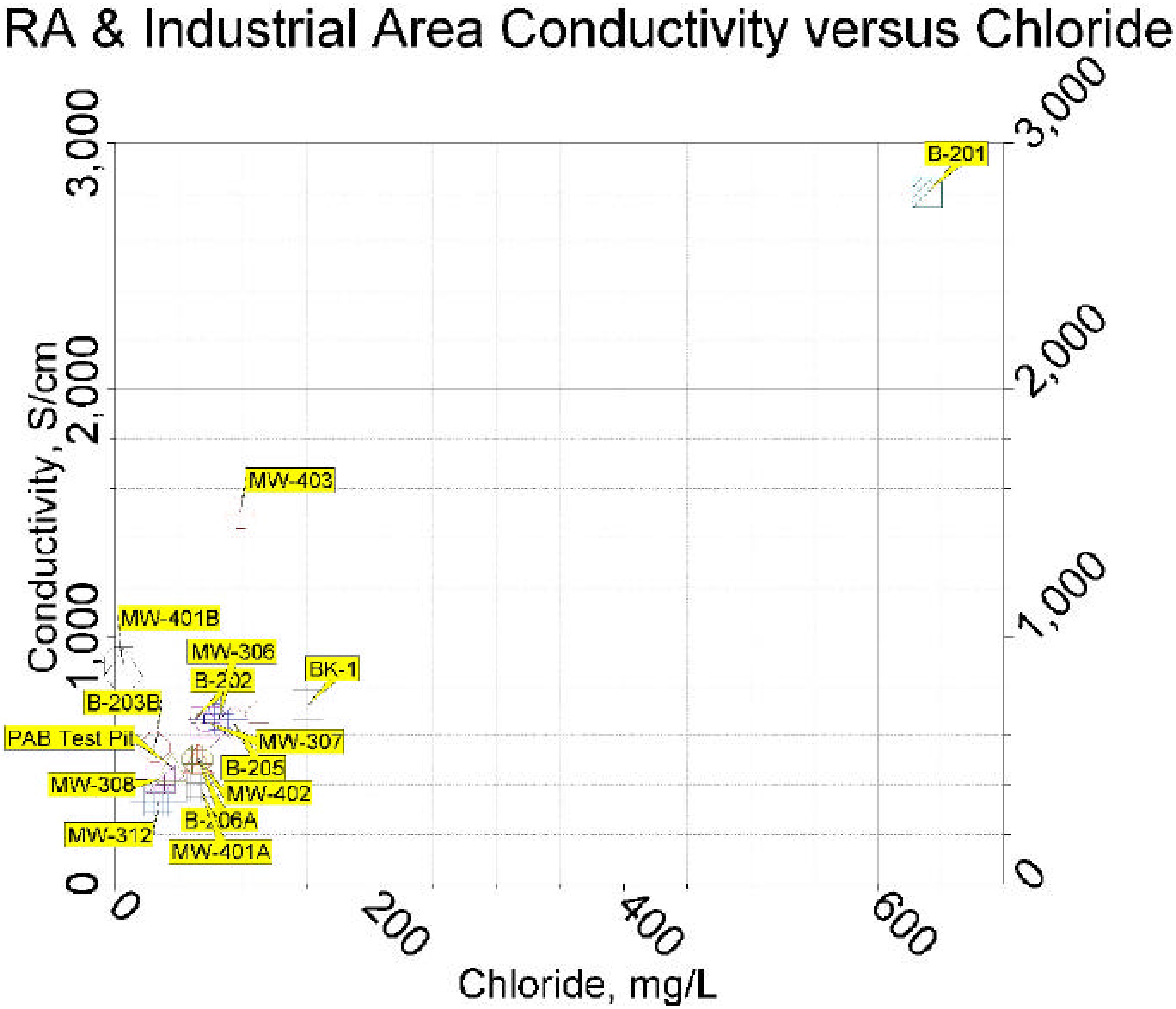
<u>Notes:</u>
"X" = significant Indication (subjective)
"o" = some indication (subjective)

1) possible origin is natural geologic materials; may have been released through reducing conditions or exchange with contaminants
2) probable source is paint chips entering PAB TP, then into CS-1
3) high molybdenum may be associated with high DRO concentrations



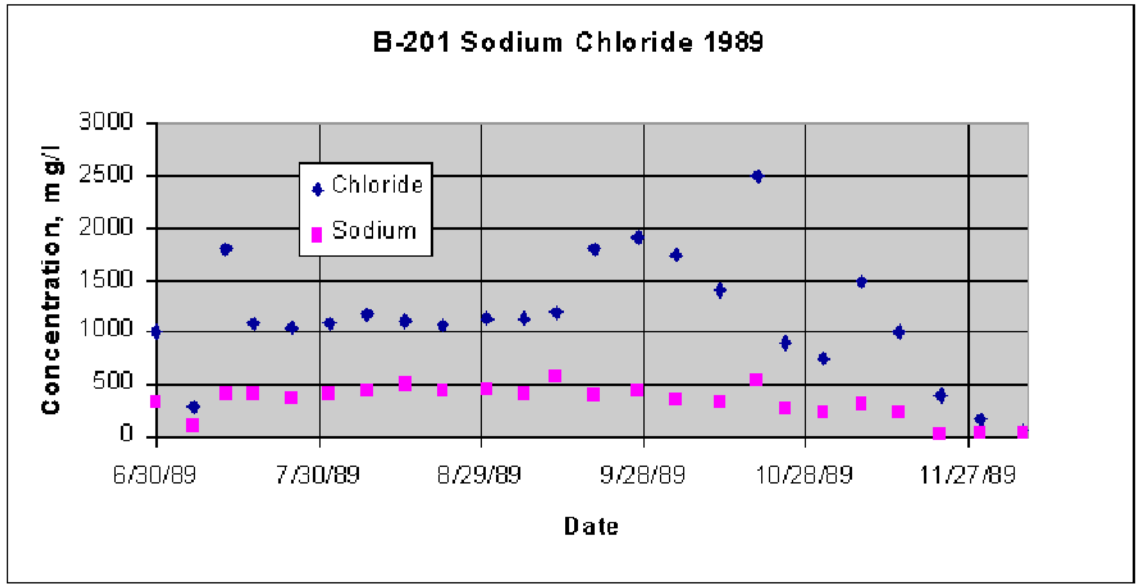
Note:
Based on Table G-1. Knoll Well chemistry was incomplete.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report				
CH2MHILL, STRATEX, JACQUES WHITFORD	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY				DRAWING TITLE: PIPER DIAGRAM
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME		PROJECT NUMBER/PHASE: MEP02167/8A	SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. G-1

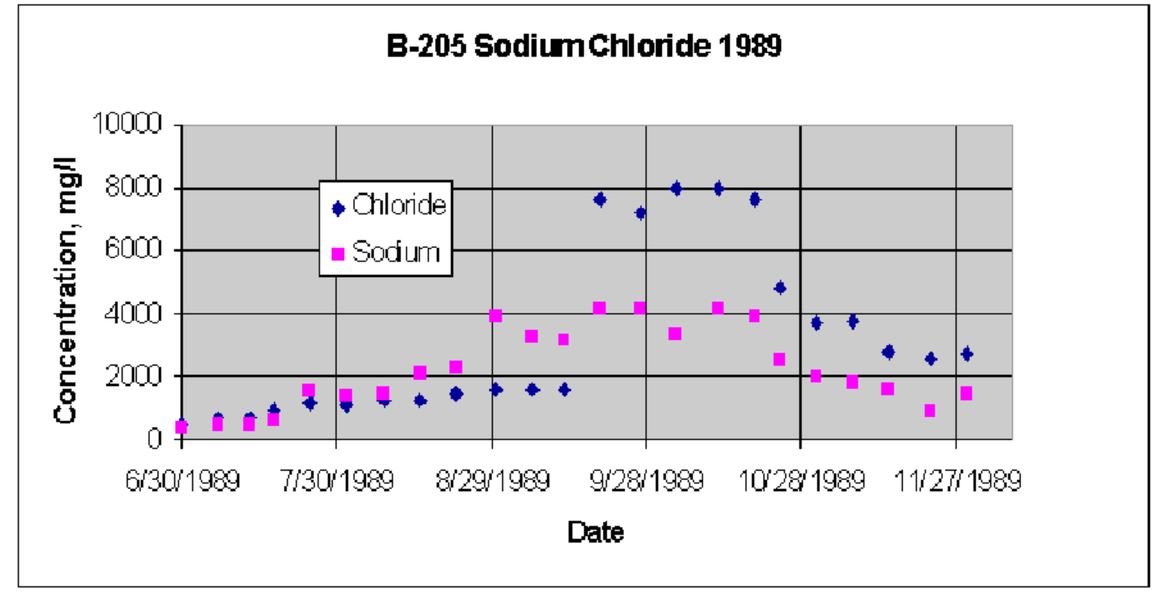


Note:
Based on Table G-1.

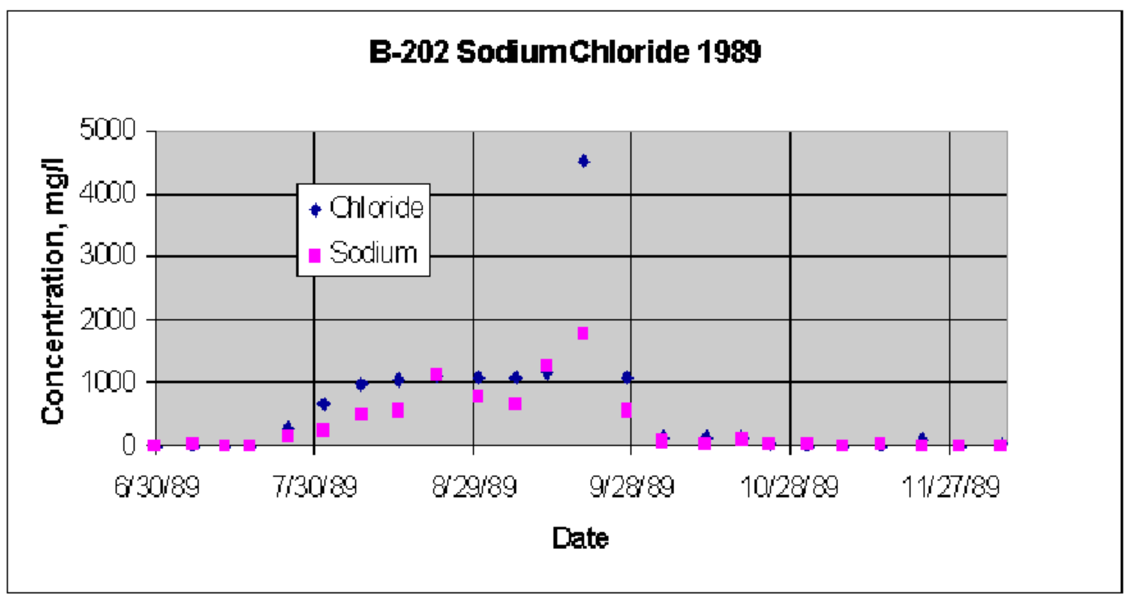
Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report				
CH2MHILL / STRATEX strategic consulting	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY				DRAWING TITLE: CONDUCTIVITY VERSUS CHLORIDE
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME	PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME; FIGURE NO. G-2



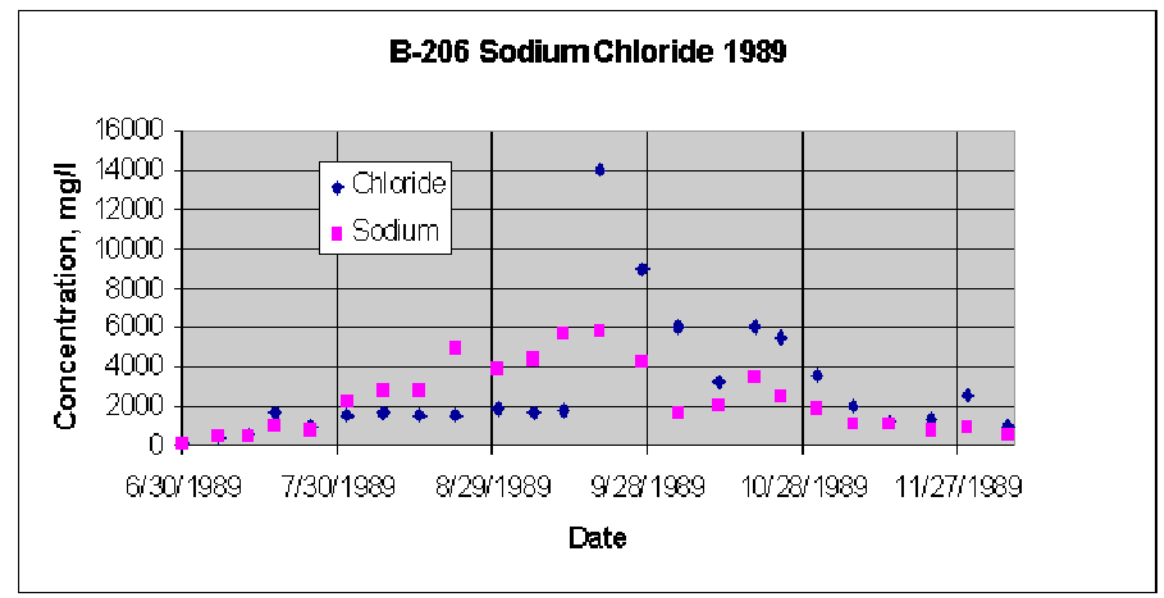
	1989	
	Chloride	Sodium
Max	2500.0	597.0
Min	70.0	22.0
Range	2430.0	575.0
STD	570.5	161.0
Mean	1137.8	339.2
2002	639.0	305.0



	1989	
	Chloride	Sodium
Max	8000.0	4150.0
Min	500.0	412.0
Range	7500.0	3738.0
STD	2661.7	1288.3
Mean	3165.9	2226.8
2002	93.3	75.9



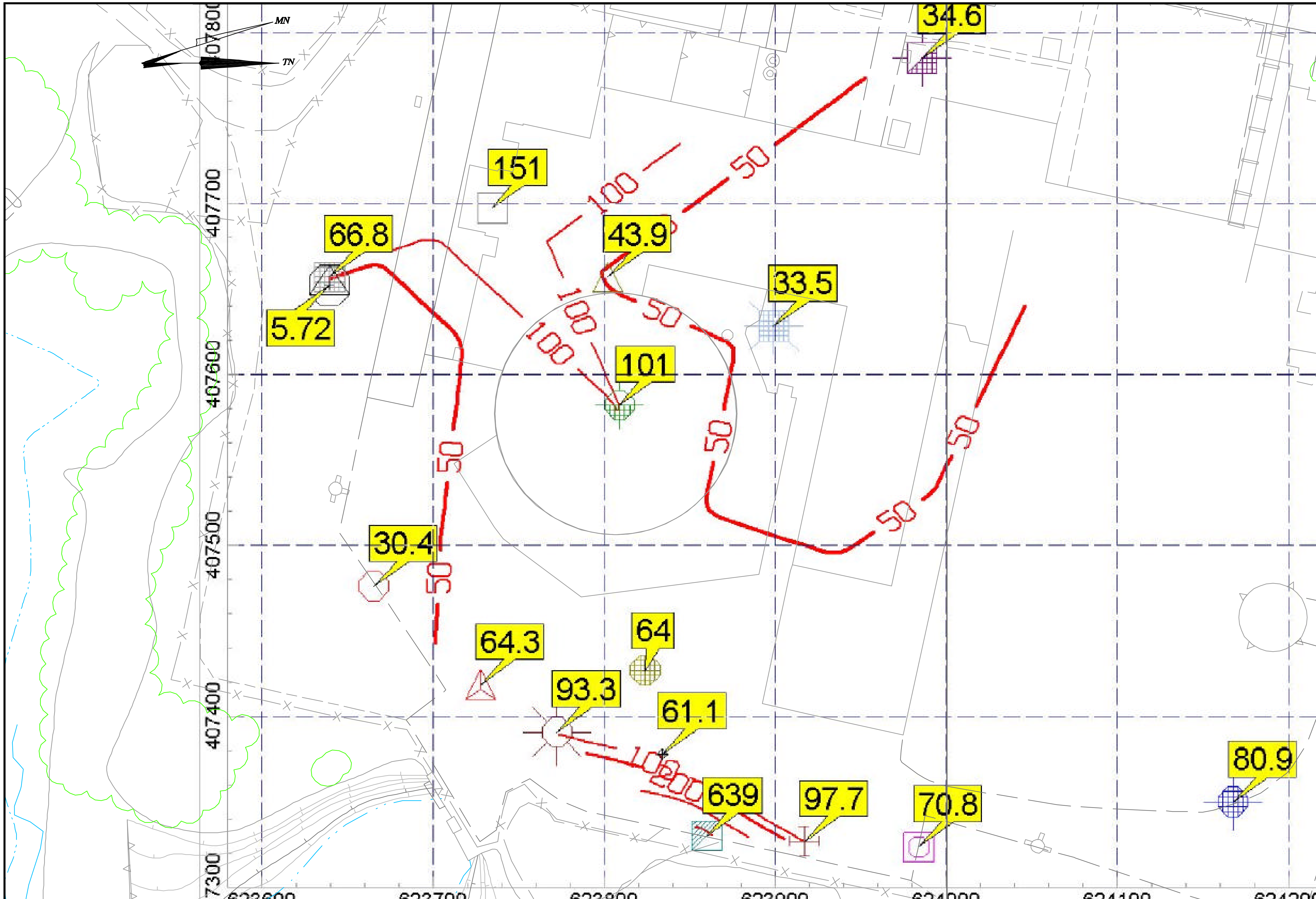
	1989	
	Chloride	Sodium
Max	4500.0	1769.0
Min	2.0	0.2
Range	4498.0	1768.8
STD	961.0	483.1
Mean	568.7	332.3
2002	61.1	55.9



	1989	
	Chloride	Sodium
Max	14000.0	5765.0
Min	130.0	161.0
Range	13870.0	5604.0
STD	3167.0	1745.1
Mean	2973.1	2316.4
2002	64.0	63.8

Note:
Based on RGGI, 1990, and Table G-1.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report				
	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY				DRAWING TITLE: WEEKLY SODIUM AND CHLORIDE CONCENTRATIONS, 1989
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME	PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. G-3



LEGEND:
- LINES OF EQUAL CHLORIDE CONCENTRATION
- 93.3 CHLORIDE CONCENTRATION Mg/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET: 30 0 60 120

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Note:

1 - Based on Table G-1. July 2002 PAB value used. Delauney contouring algorithm used. Where multi-level monitoring wells occur, the higher of the two concentrations is used in the contouring. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests.

2 - Refer to Figure G-1 for Monitoring Well designations.

Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY

DRAWING TITLE: **DISTRIBUTION OF CHLORIDE 2002**

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

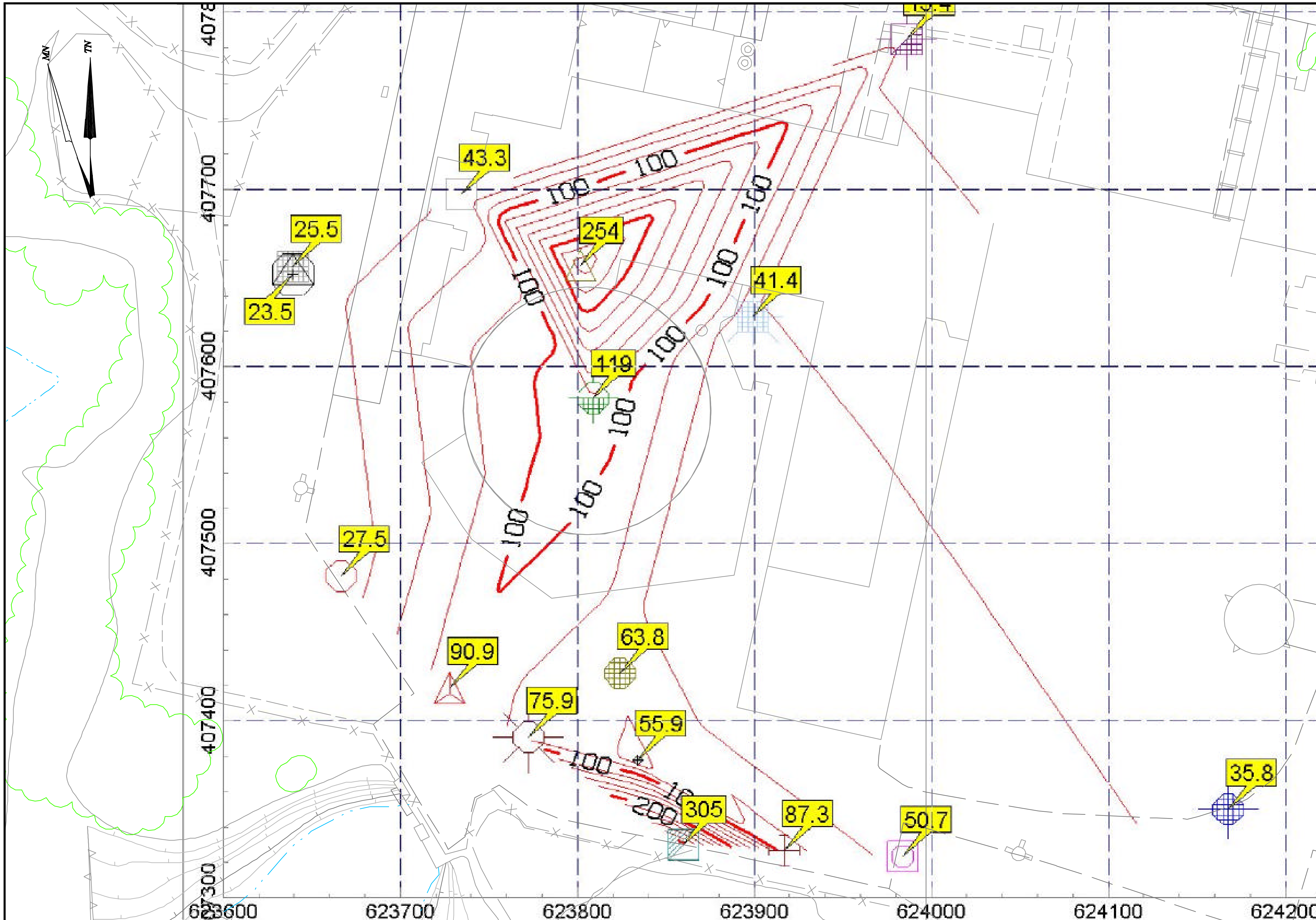
PROJECT NAME/FILE NAME: BAILEY/BPRCRA

PROJECT NUMBER/PHASE: MEP02167/8A

SCALE: 1"=60'

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. G-4



Note:
1 - Based on Table G-1. July 2002 PAB value used. Delauney contouring algorithm used. Where multi-level monitoring wells occur, the higher of the two concentrations is used in the contouring. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests.

2 - Refer to Figure G-1 for Monitoring Well designations.

LEGEND:

- LINES OF EQUAL SODIUM CONCENTRATION
- 35.8 SODIUM CONCENTRATION IN Mg/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET: 30 0 60 120

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

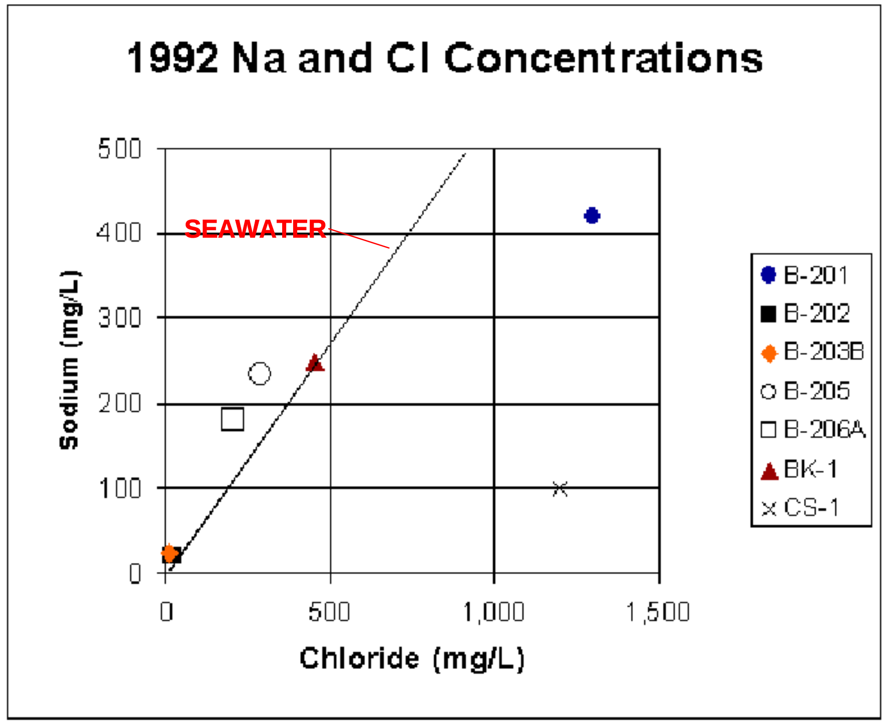
Maine Yankee

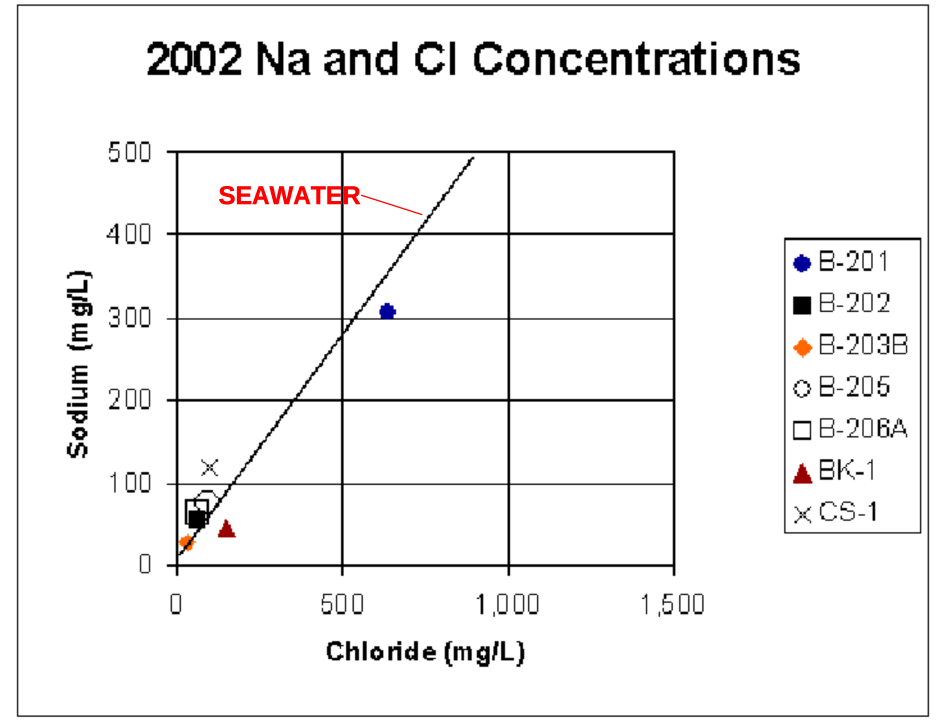
CH2MHILL

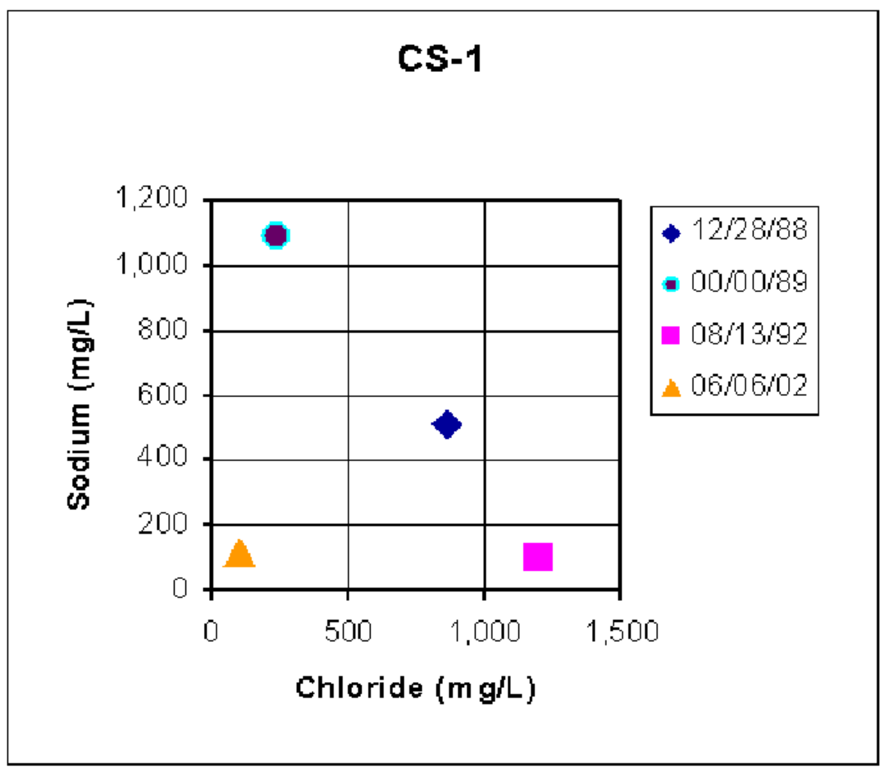
STRATEX

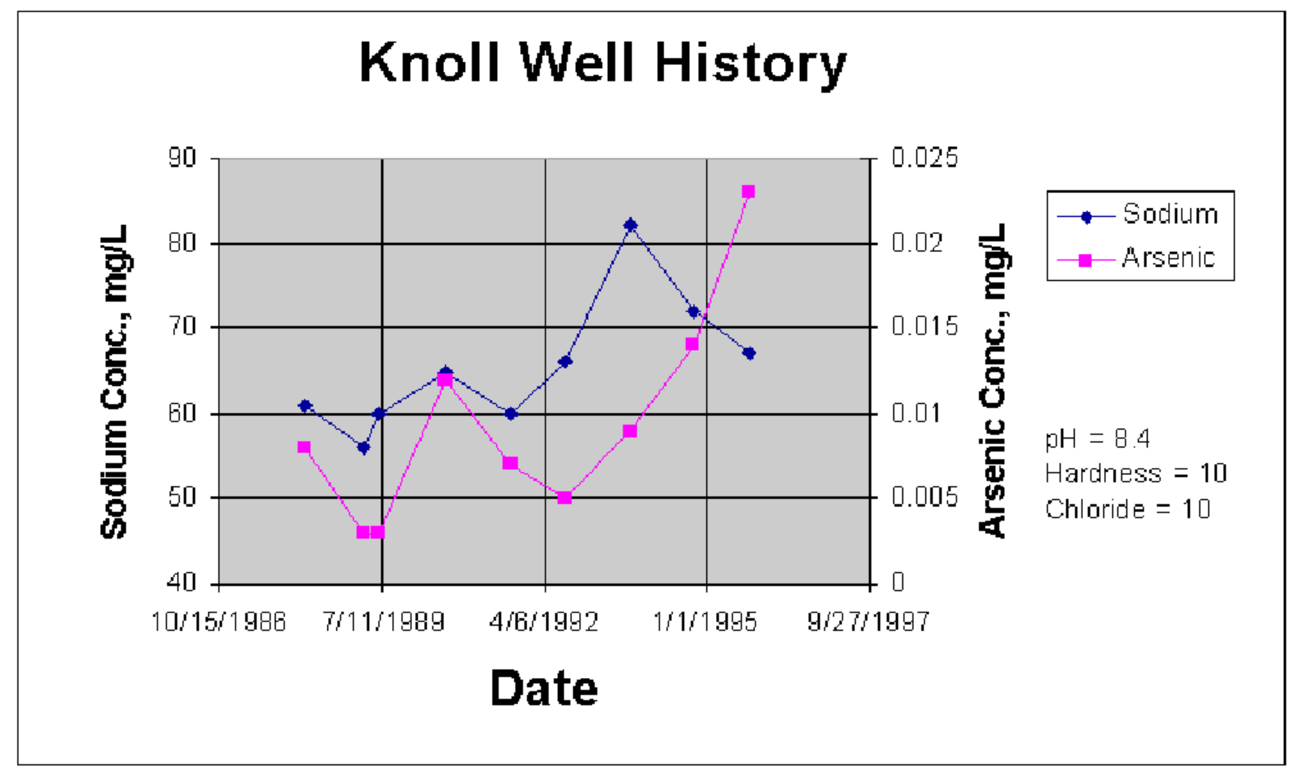
MAINE YANKEE RCRA CLOSURE - Baily Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DISTRIBUTION OF SODIUM 2002
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=60'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. G-5









Note:
1988 and 1989 CS-1 values based on RGGI, 1990. 1992 values for 200-series wells based on RGGI, 1992a. Knoll Well history based on Maine Public Health Laboratory test records. 2002 data based on Table G-1.

Maine Yankee

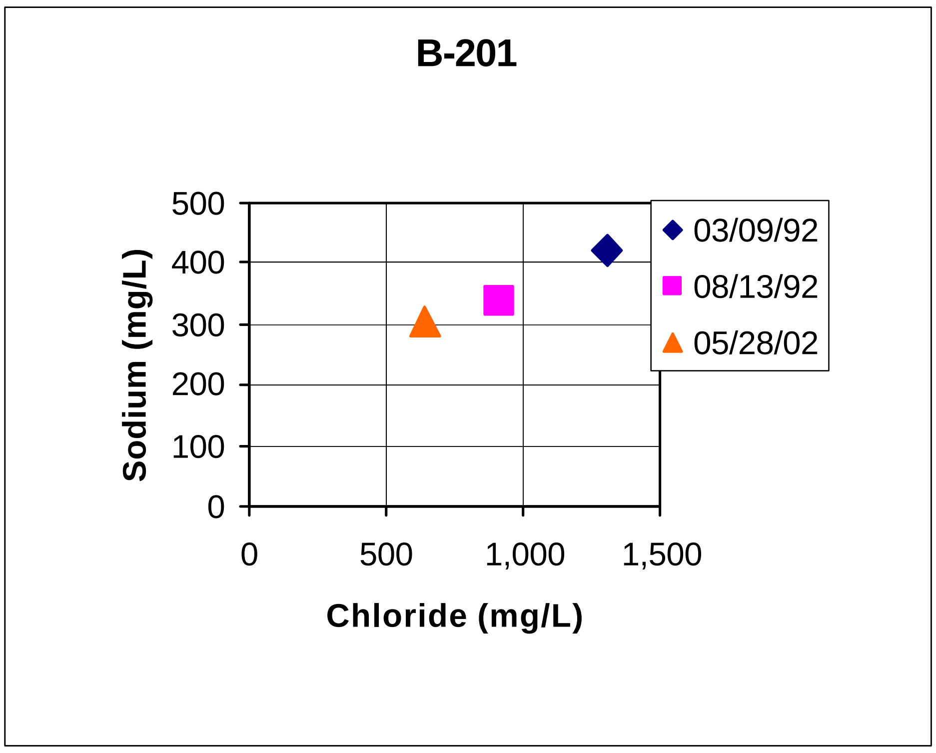
MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

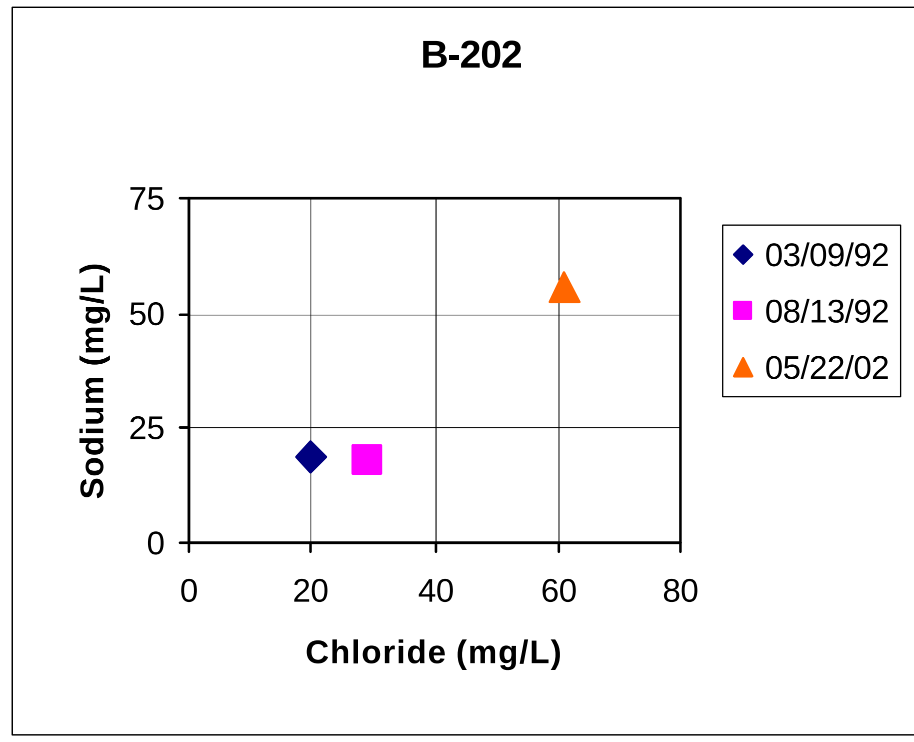
DRAWINGS PRODUCED BY:
CH2MHILL, STRATEX
JACQUES WHITFORD COMPANY

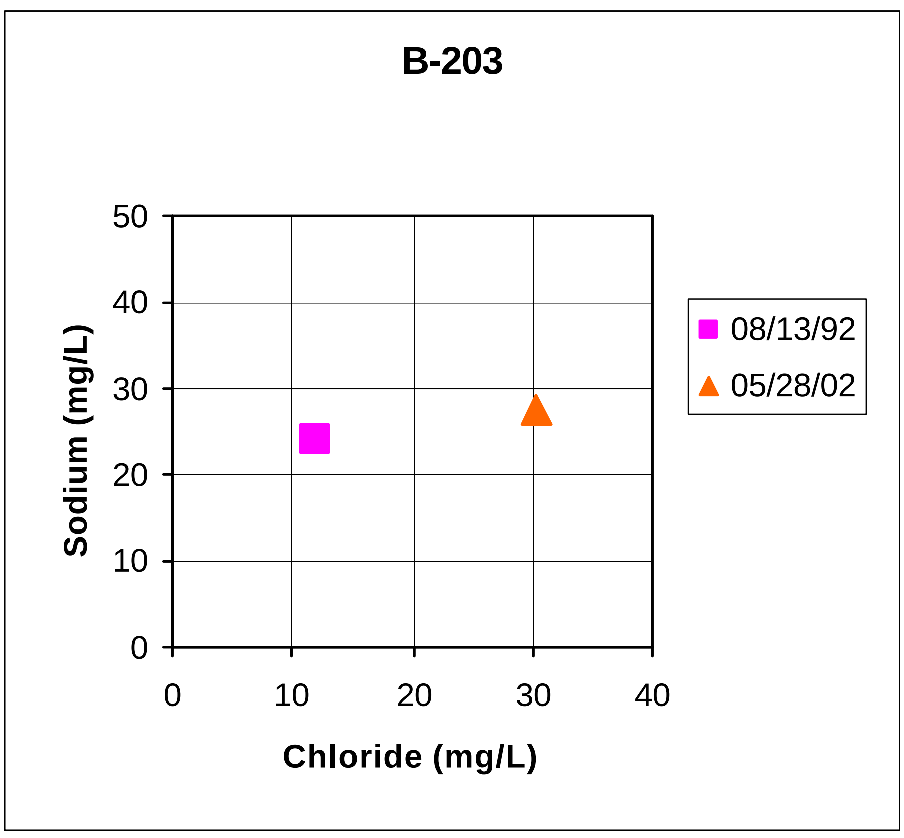
DRAWING TITLE:
SODIUM, CHLORIDE AND ARSENIC CONCENTRATIONS WITH TIME IN RA AREA AND AT KNOLL WELL

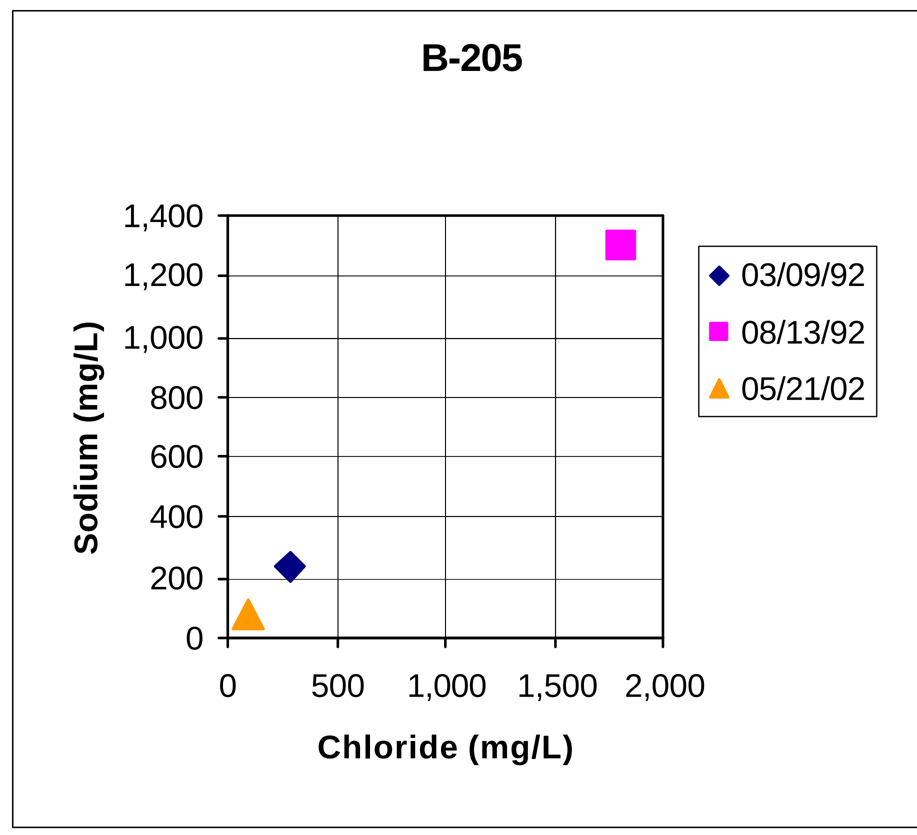
DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	RGG	BSB	NOS	RGG

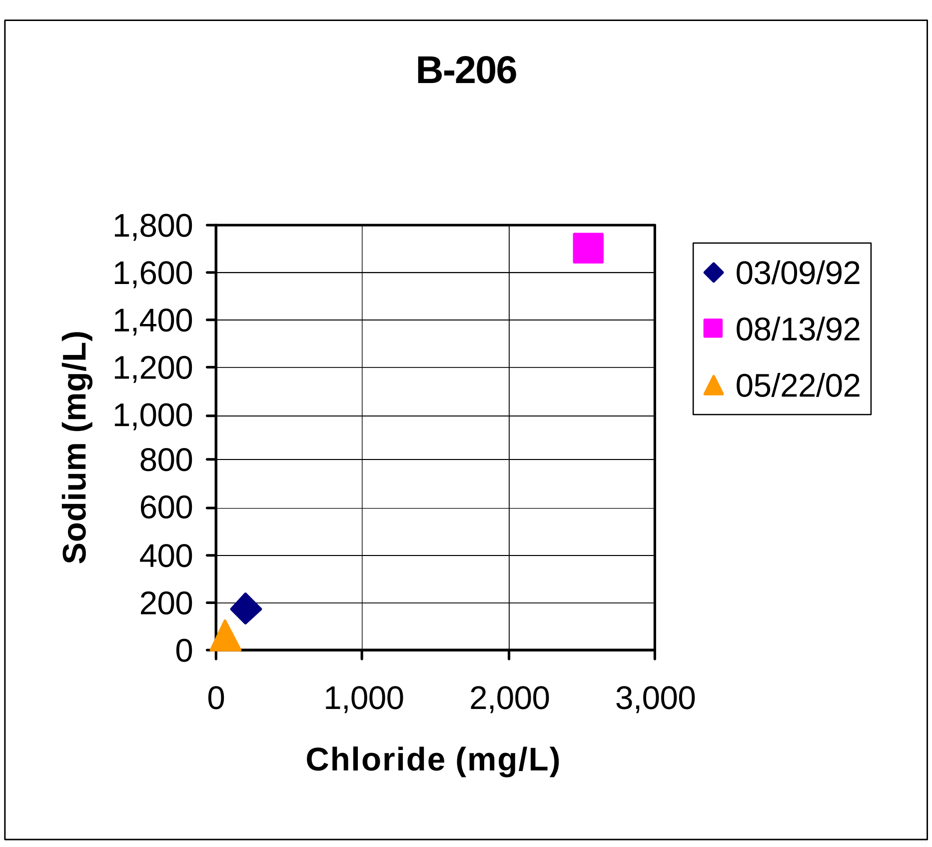
PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:	PREPARED FOR:	FIGURE NO.
BAILEY/XLSGRAPHME	MEP02167/8A	SHOWN	MAINE YANKEE ATOMIC POWER CO, Wiscasset ME	G-6

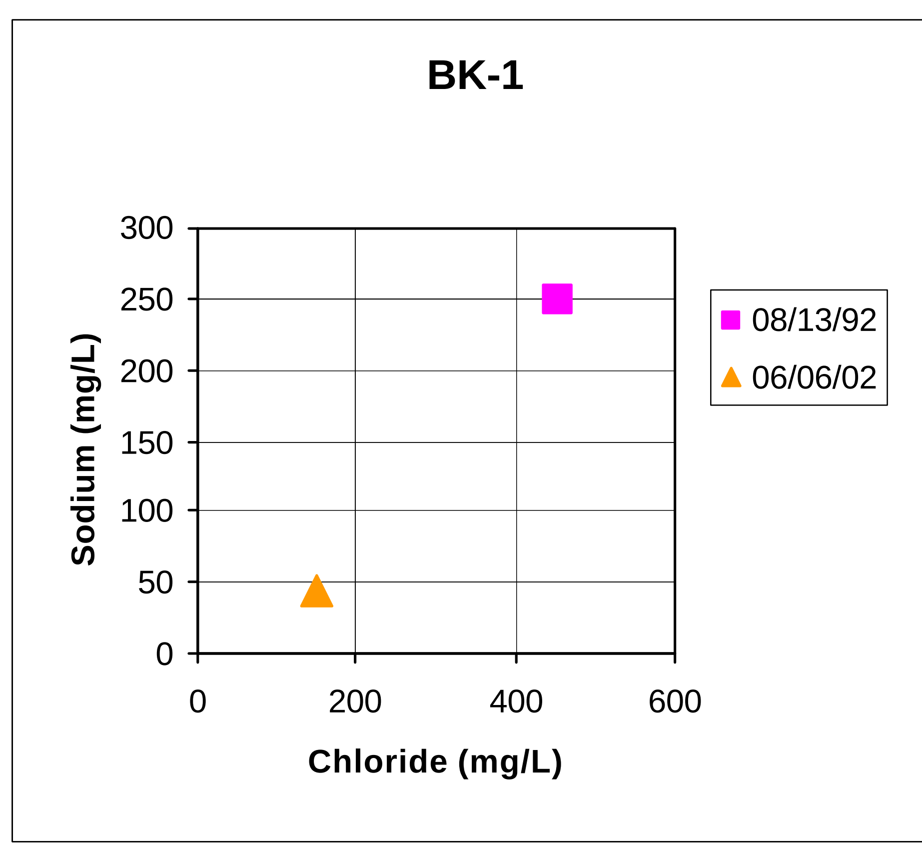












Note:
1992 values for 200-series wells based on RGGI, 1992a. 2002 data based on Table G-1.

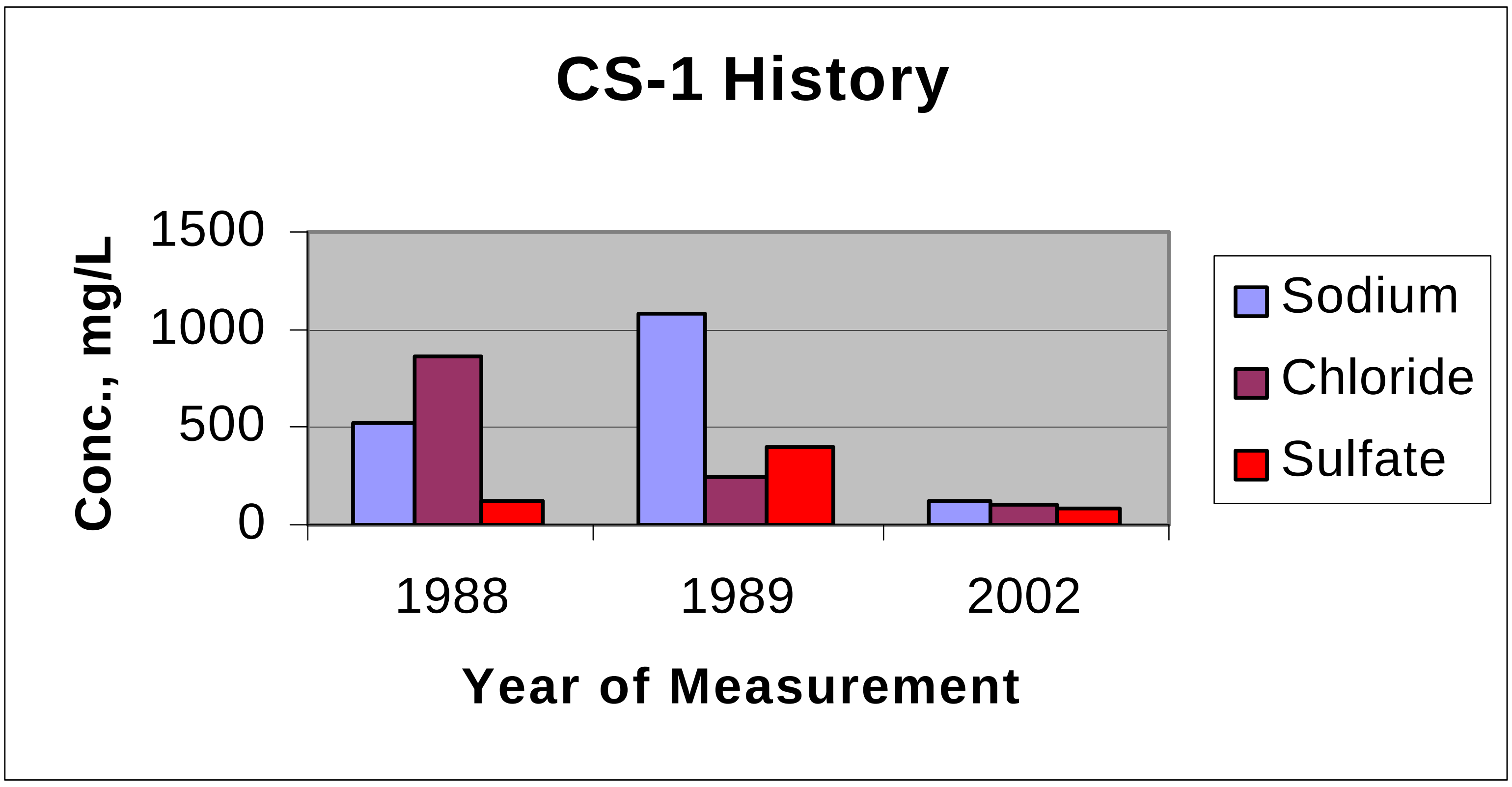
Maine Yankee

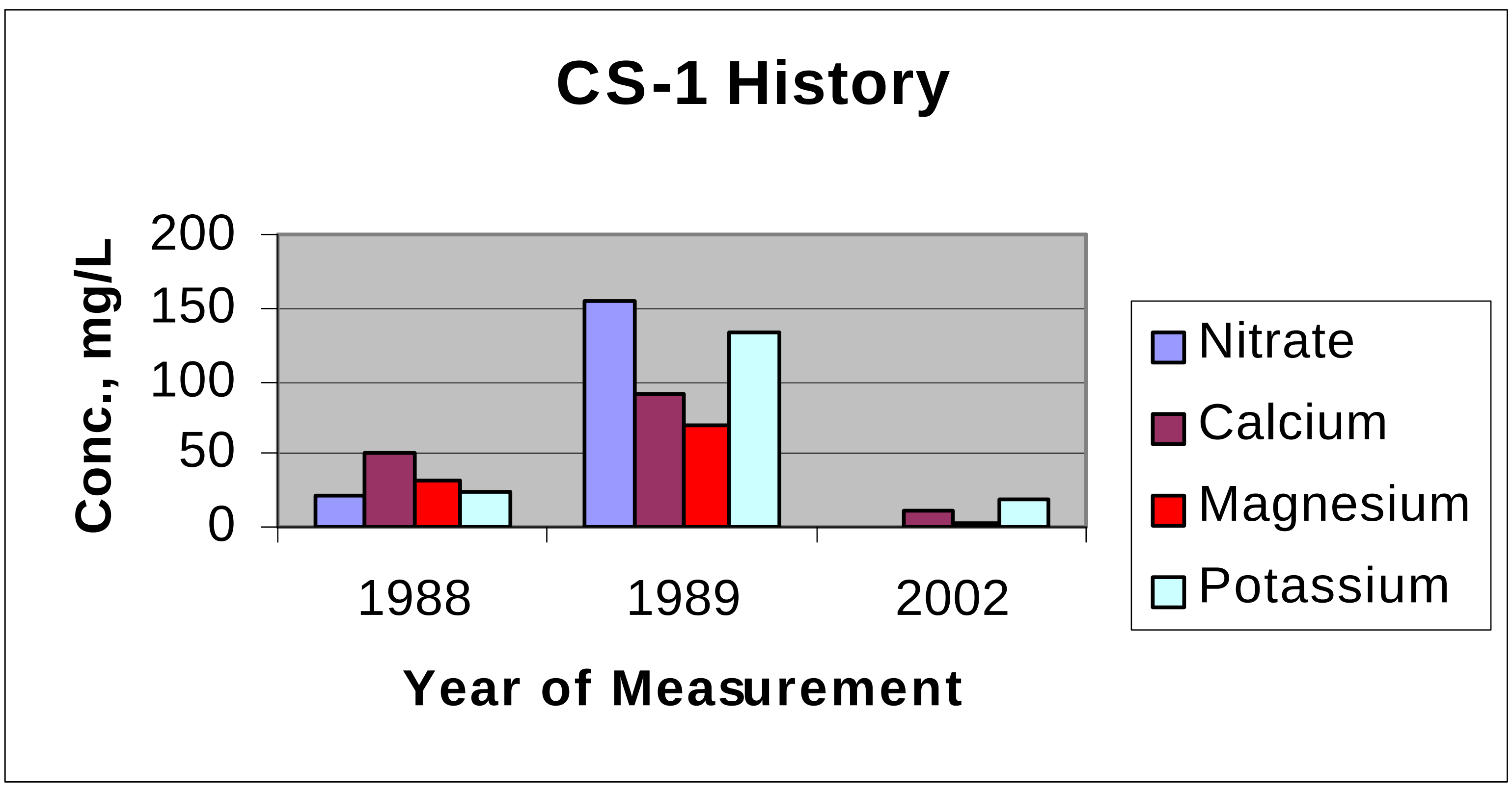
CH2MHILL

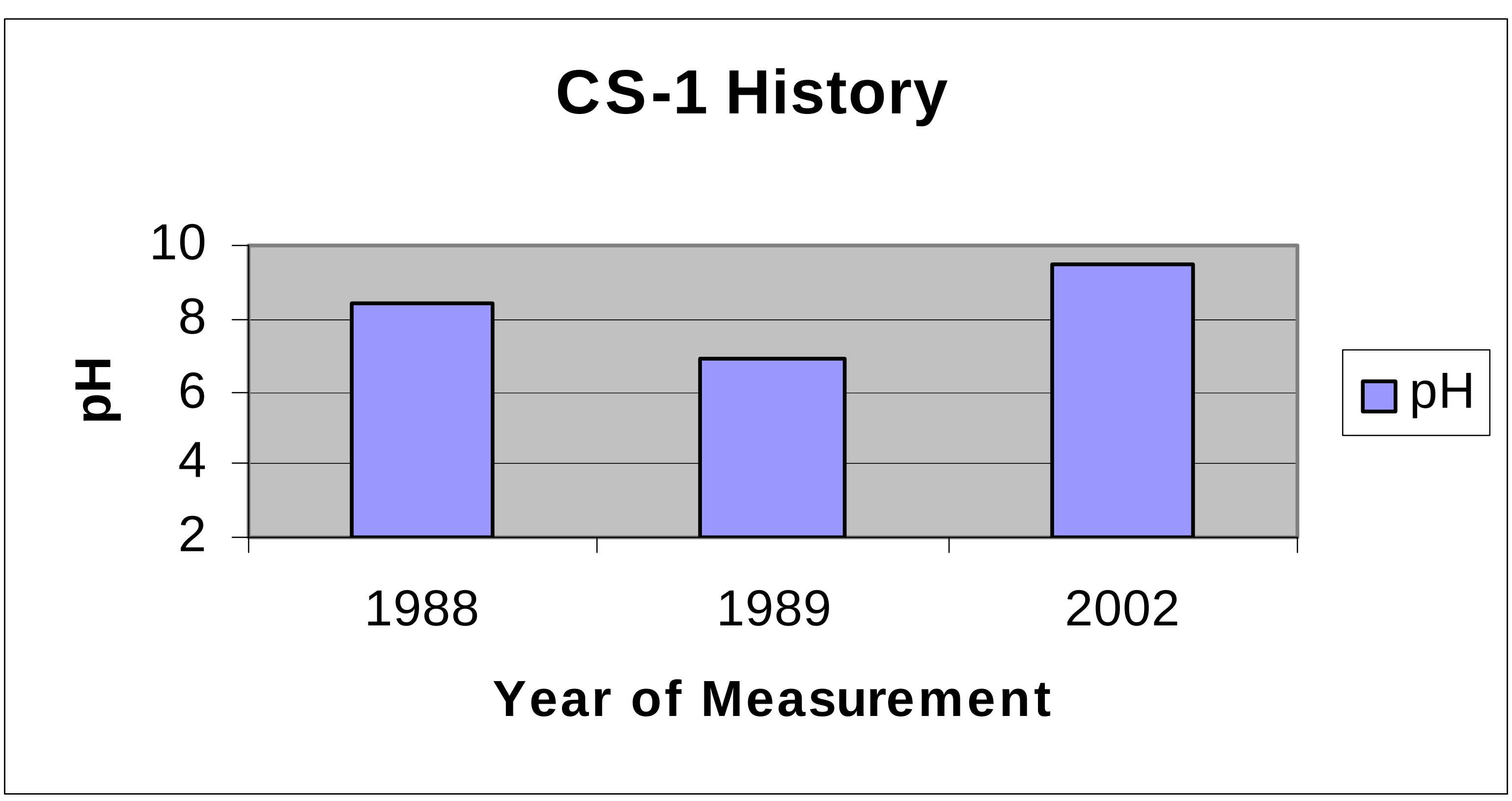
STRATEX strategic consulting

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: SODIUM VERSUS CHLORIDE, WELL BY WELL COMPARISON
DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO: G-7

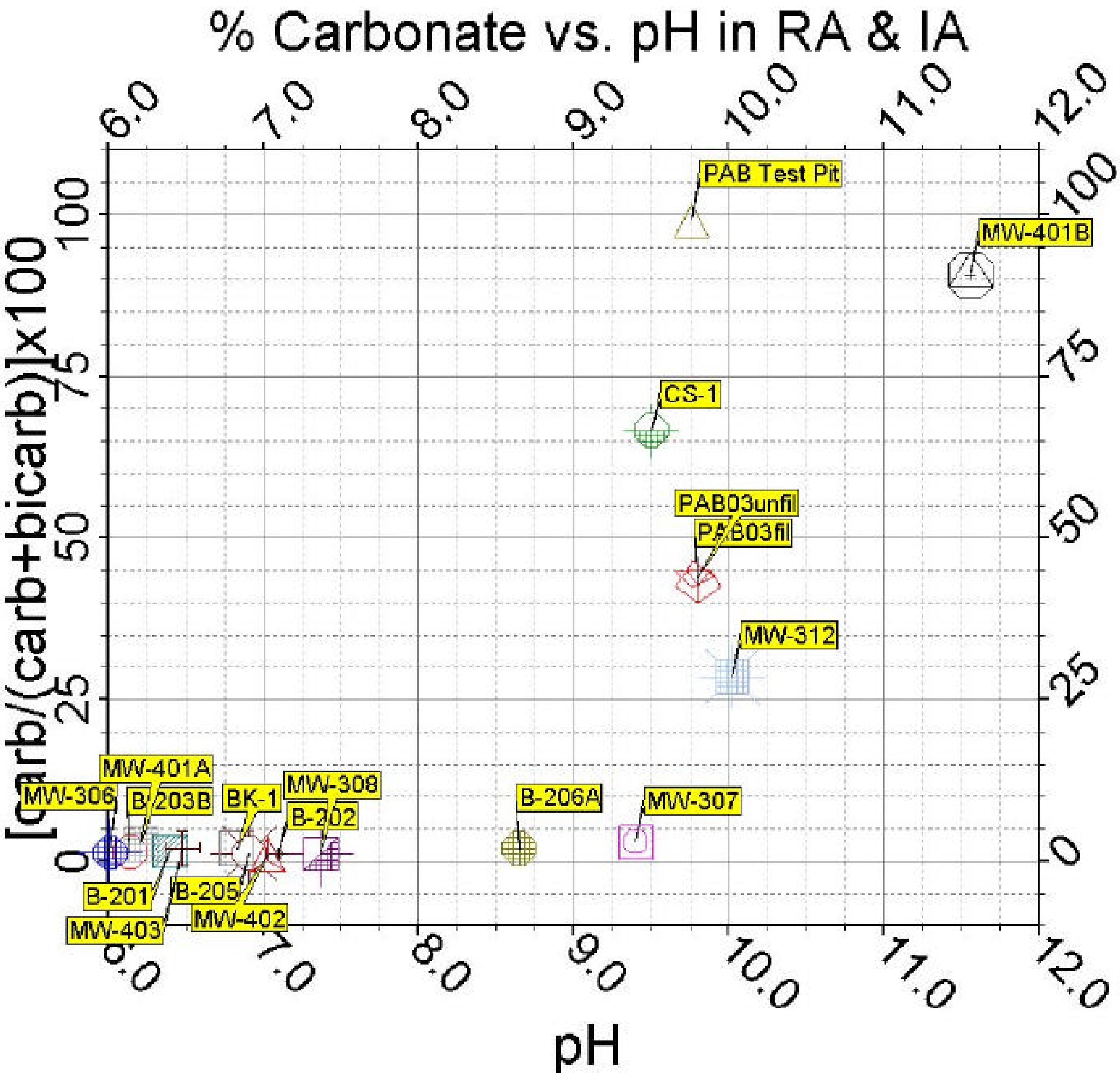






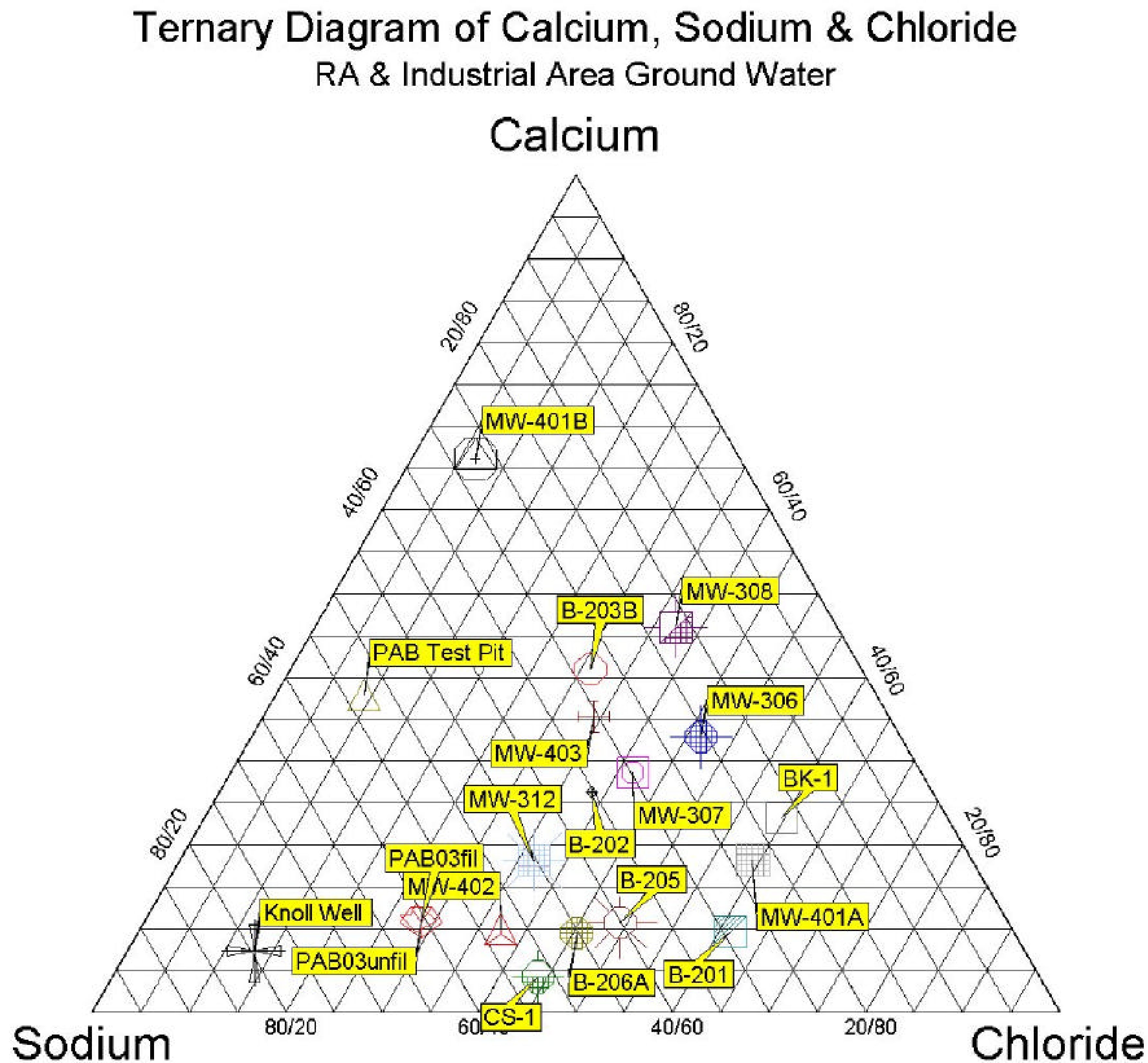
Note:
1988 and 1989 CS-1 values based on RGGI, 1990.
2002 data based on Table G-1.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report
DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY	DRAWING TITLE: CONTAINMENT FOUNDATION SUMP CHEMICAL HISTORY, 1988, 1989, 2002
DATE PREPARED: 09-02-03; DESIGNED BY: RGG; DRAWN BY: BSB; CHECKED BY: NOS; REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME; PROJECT NUMBER/PHASE: MEP02167/8A; SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME; FIGURE NO: G-8



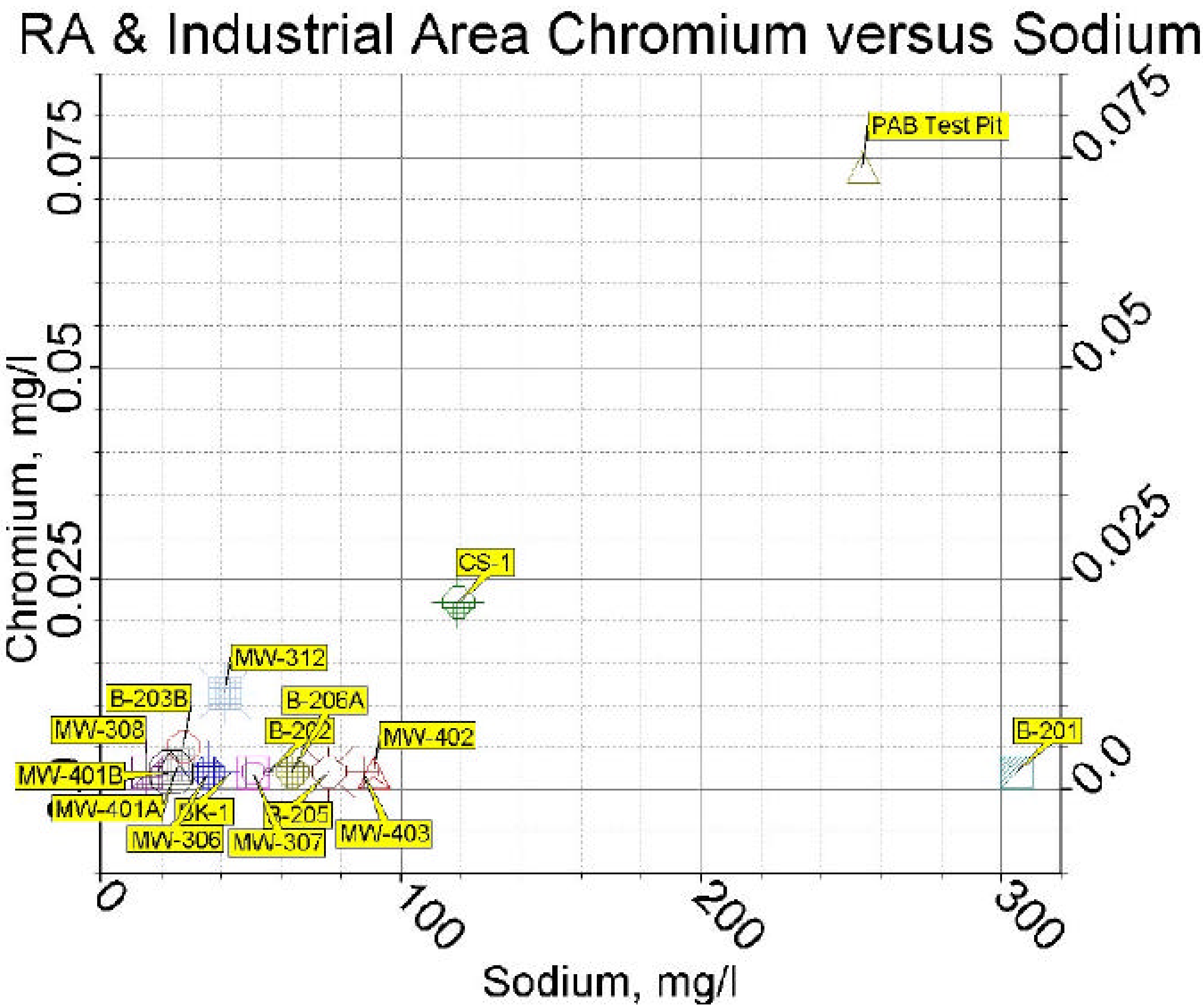
Note:
Based on Table G-1.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: pH VERSUS CARBONATE
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. G-9



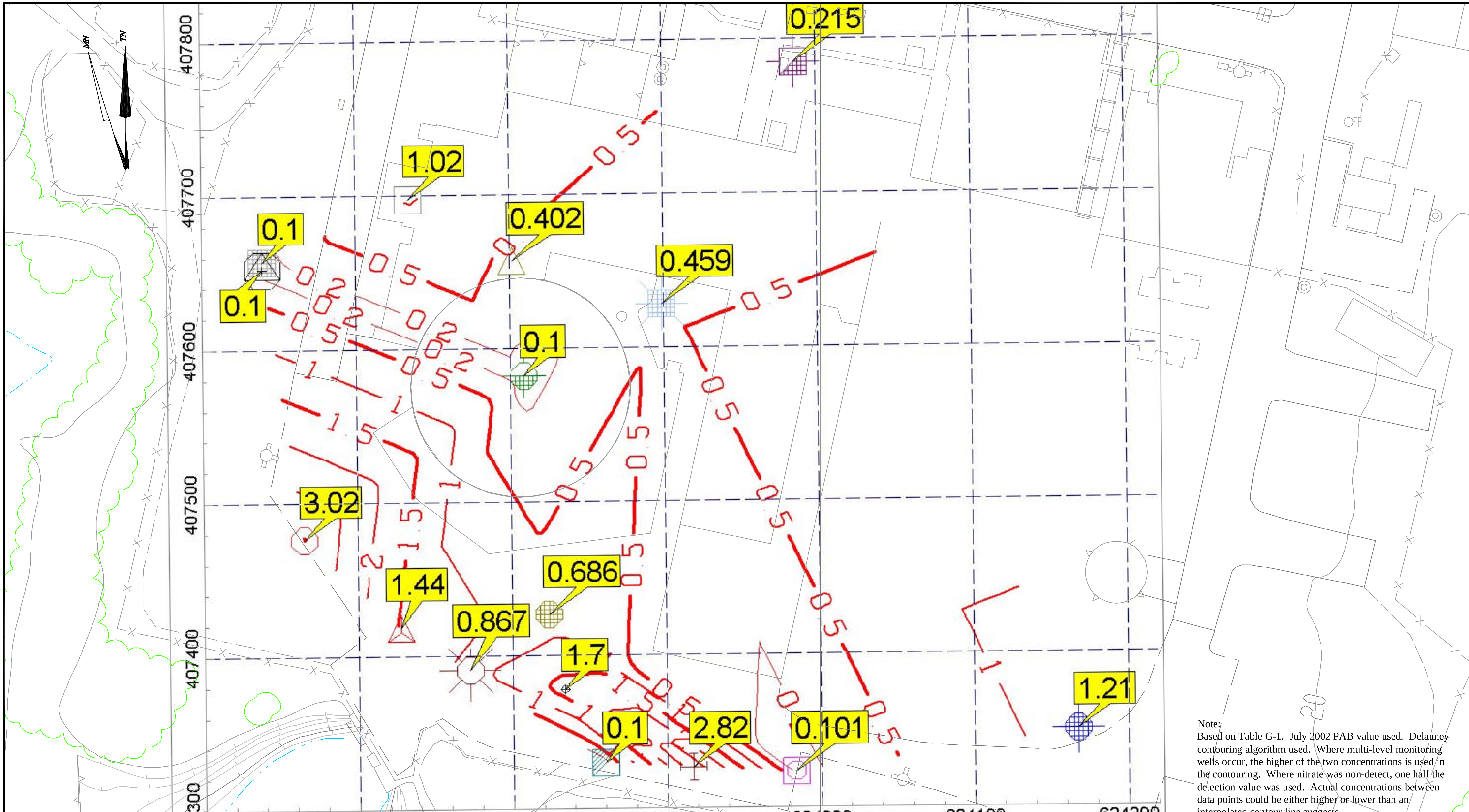
Note:
Based on Table G-1.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report				
	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY				DRAWING TITLE: TRILINEAR PLOT OF CALCIUM, SODIUM AND CHLORIDE
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME		PROJECT NUMBER/PHASE: MEP02167/8A	SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO: G-10



Note:
Based on Table G-1. Where chromium was non-detect, one-half the detection value was used.

Maine Yankee	MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report					
CH2MHILL / STRATEX strategic consulting	DRAWINGS PRODUCED BY: CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DRAWING TITLE: CHROMIUM VERSUS SODIUM
	DATE PREPARED: 09-02-03	DESIGNED BY: RGG	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
	PROJECT NAME/FILE NAME: BAILEY/XLSGRAPHME		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: SHOWN	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO, Wiscasset ME — FIGURE NO. G-11



LEGEND:

- LINES OF EQUAL NITRATE CONCENTRATION
- 0.0705 NITRATE CONCENTRATION, Mg/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET: 30 0 60 120

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Note:
Based on Table G-1. July 2002 PAB value used. Delauney contouring algorithm used. Where multi-level monitoring wells occur, the higher of the two concentrations is used in the contouring. Where nitrate was non-detect, one half the detection value was used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests.

Maine Yankee

CH2MHILL

STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY: CH2MHILL, STRATEX, JACQUES WHITFORD COMPANY

DATE PREPARED:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	REVIEWED BY:
09-02-03	NOS	BSB	NOS	RGG

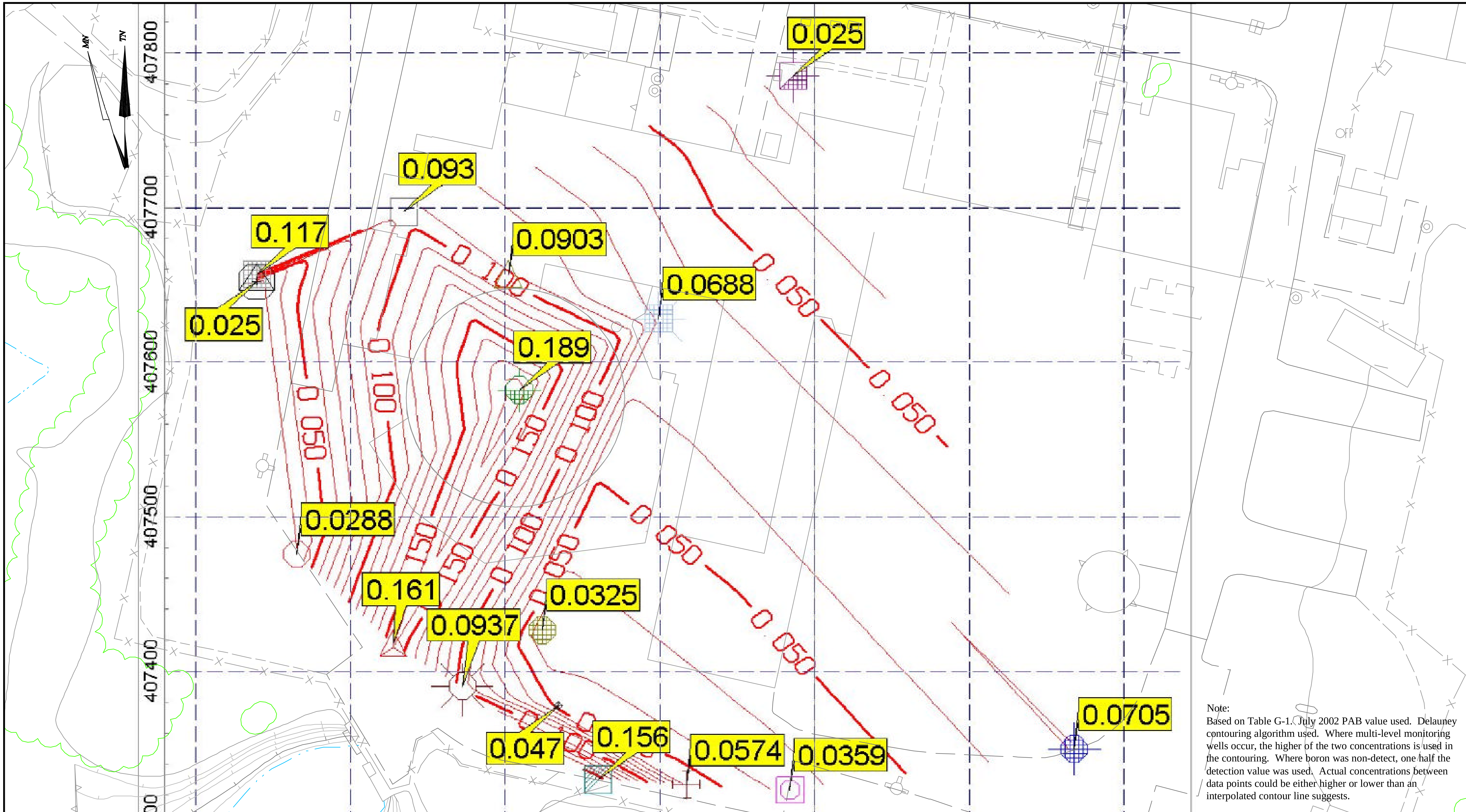
PROJECT NAME/FILE NAME:	PROJECT NUMBER/PHASE:	SCALE:
BAILEY/BPRCRA	MEP02167/8A	1"=60'

DRAWING TITLE:

DISTRIBUTION OF NITRATE 2002

PREPARED FOR: MAINE YANKEE ATOMIC POWER CO.

FIGURE NO. G-12



Note:
Based on Table G-1. July 2002 PAB value used. Delauney contouring algorithm used. Where multi-level monitoring wells occur, the higher of the two concentrations is used in the contouring. Where boron was non-detect, one half the detection value was used. Actual concentrations between data points could be either higher or lower than an interpolated contour line suggests.

LEGEND:

- LINES OF EQUAL BORON CONCENTRATION
- 0.047 BORON CONCENTRATION, Mg/L
- RAILROAD
- TOPOGRAPHIC CONTOURS (10-FT INTERVALS)
- UTILITY LINES (USGS QUAD)
- WATER WAY / STREAM / RIVER

SCALE IN FEET

30 0 60 120

ORIGINAL BASE MAP INFO OBTAINED FROM: JAMES SEWALL COMPANY

Maine Yankee

CH2MHILL STRATEX

MAINE YANKEE RCRA CLOSURE - Bailey Point RFI Report

DRAWINGS PRODUCED BY:					DRAWING TITLE:
CH2MHILL, STRATEX JACQUES WHITFORD COMPANY					DISTRIBUTION OF BORON 2002
DATE PREPARED: 09-02-03	DESIGNED BY: NOS	DRAWN BY: BSB	CHECKED BY: NOS	REVIEWED BY: RGG	
PROJECT NAME/FILE NAME: BAILEY/BPRCRA		PROJECT NUMBER/PHASE: MEP02167/8A		SCALE: 1"=60'	PREPARED FOR: MAINE YANKEE ATOMIC POWER CO. FIGURE NO. G-13

Appendix H-2
Focused Human Health Risk Evaluation

At the request of MBOH, a focused risk evaluation was conducted to evaluate the potential risk to human health from inhalation exposure to fugitive dust. Although no compounds were detected in soil at concentrations above their respective USEPA Region 9 Inhalation PRG, a quantitative risk assessment was performed consistent with USEPA guidance which states that inhalation of fugitive dusts should be evaluated for sites with proposed future commercial/industrial land use. This focused risk evaluation was based on analytical results from soil samples collected throughout Bailey Point during Fall 2001 and Spring 2002 and current USEPA and MDEP risk assessment guidance (MDEP, 1994; USEPA, 1991a, 1994 and 2001b).

<u>Exposure Assessment</u>

Inhalation exposure to fugitive dust can be a significant route of exposure during site remediation or construction as dust may be generated by wind erosion of exposed soils. Consistent with USEPA guidance, this exposure assessment evaluates exposure to construction workers present through out a construction project as well as exposures to nearby off-site residents (USEPA, 2001b). These receptors are potentially subject to higher contaminant exposures due to increased emissions during construction activities. However, to be consistent with the Baseline HHRA, an on-site worker exposure was also evaluated. The following exposure assumptions were used and are consistent with standard USEPA and MDEP guidance (MDEP, 1994, USEPA 1991a and 2001b):

Resident: A person resides at the site for 30 years (6-years as a child and 24 years as an adult) and is exposed to soils through inhalation of fugitive dust generated by wind erosion. An exposure frequency of 150 days per year for a 30-year exposure duration was assumed (USEPA, 1994). An inhalation rate of 20 m^3/day was assumed over a 24 hour exposure time (USEPA, 2001b). The USEPA default particulate emission factor (PEF) of 1.32×10^9 m^3/kg was used to relate the soil contaminant concentration to a dust particulate contaminant concentration (USEPA, 2001b).

On-Site Worker: An On-site worker is exposed to soils through the inhalation of fugitive dust. An inhalation rate of 20 m^3/day over an 8 hour exposure time was assumed for an exposure frequency of 150 days per year over a 25 year exposure duration (USEPA, 1994). The USEPA default PEF of 1.32×10^9 m^3/kg was used to relate the soil contaminant concentration to a dust particulate contaminant concentration (USEPA, 2001b).

Construction Worker: A construction worker is exposed to soils through the inhalation of fugitive dust generated as a result of construction related activities (i.e., excavation and vehicle traffic on unpaved roads). The construction worker is assumed to have a more intense exposure to soil contaminants resulting from the increased "dust" level in the breathing zone. The construction worker, however, is assumed to have a shorter exposure duration than the on-site worker as most construction projects are expected to last one-year. An inhalation rate of 20 m^3/day for an 8 hour exposure time was assumed to occur 150 days over a 1-year exposure duration (USEPA, 1994 and 2001b).

The USEPA default PEF could not be used for the construction worker scenario as it is likely to underestimate dust concentrations in air resulting from construction activities. Although emission factors are available for specific construction activities, their application requires more information on the types, locations and schedule of construction activities proposed for this site than is currently available. Therefore, dust emission for the construction worker was estimated using the construction emission factor for Total Suspended Particulate (TSP) emissions recommended by USEPA of 1.2 tons/acre/month or 1.04×10^{-4} g/m^2-sec (USEPA, 1993). Using this factor, the contaminant emissions from soil can be calculated as:

$$Q = E \times C \times 10^{-6}$$

Where:
Q = contaminant emissions flux (g/m^2-s)
E = heavy construction dust emissions factor (g/m^2-s)
C = contaminant concentration in soil (mg/kg)
10^{-6} = conversion factor

A box model was used to calculate the contaminant concentrations in the air over the source area. The box model assumed the air concentrations within a box is proportional to the emission rate and wind speed across the source area:

$$C_c = \frac{Q \times A \times 1{,}000 \text{mg/g}}{L \times V \times H}$$

Where:
C_c = concentration in air
Q = surface emission flux (g/m^2-s)
A = source area m^2
L = width of source area perpendicular to wind direction (m)
V = average wind speed (m/s)
H = box height (m)

A source area (A) of 2.5 acres square (10,120 m^2) corresponding to a width (L) of 100 m was assumed as a reasonable estimate of an area of the site undergoing remediation. This was based on the discrete areas of contamination that have been characterized and may require remediation. The USEPA default wind speed and box height values were used as model inputs.

The exposure parameters for these scenarios are presented in **Table H-1.**

To provide an overly conservative estimate of risk, no compounds were excluded from this risk evaluation. A total of 74 compounds were detected in at least one soil sample (all depths) and were selected as a Compounds of Potential Concern (COPCs) and retained for the focused risk evaluation. The Exposure Point Concentration (EPCs) for each COPC was set at the maximum detected concentration. As such, the exposure scenarios assume long-term concurrent exposure to the maximum detected contaminant concentration. This is an extremely conservative assumption as the location of the maximum detected concentrations varied across the site. Actual exposure and subsequent risk will be much less than estimated in this evaluation. The COPCs and EPCs are presented in **Table H-2**.

Toxicity Assessment

Quantitative estimates of inhalation toxicity (e.g., Reference Concentrations (RfCs) and Unit Risk Factors (URFs) were obtained from the USEPA Integrated Risk and Information System (IRIS) or National Center for Environmental Assessment (NCEA) for all COPCs. RfCs for carcinogenic compounds were identified and used to evaluate the noncarcinogenic risks from exposure to carcinogenic compounds. RfCs and URFs can be converted to inhalation Reference Dose (RfDs) and inhalation cancer slope factors (CSF) using the following equations:

Inhalation RfD (mg/kg-day) = RfC (mg/m^3) x 20 m^3/day x 1/70 kg

Inhalation CSF (mg/kg-day)$^{-1}$ = URF (ug/m^3)$^{-1}$ x day/20 m^3 x 70 kg x 10^3 ug/mg

Chronic URF and/or RfC were available for 19 of the 74 soil COPCs. Many of these compounds are not considered to be toxic through inhalation exposure. USPEA guidance states that inhalation of fugitive dust is typically not a concern for organic compounds and has developed Soil Screening Levels only for inorganic compounds (USEPA, 2001b).

Subchronic RfCs and URFs are available for only three of the 74 soil COPCs. USEPA guidance states that risks from subchronic inhalation exposure be evaluated using only subchronic toxicity information (USEPA, 2001b). As such, the non carcinogenic risks to the construction worker from inhalation exposure could not be evaluated.

A summary of the toxicity information for the soil COPCs is presented in **Table H-2**.

Risk Assessment

The non-carcinogenic risks from exposure to fugitive dust are expressed in terms of a Hazard Index (HI), which is calculated by dividing the estimated exposure dose by the inhalation RfD:

Hazard Index (HI) = Exposure Dose (mg/kg-day) / Inhalation RfD (mg/kg-day)

If the HI is less than 1.0, no adverse health effects are anticipated from the predicted exposure dose level. If the HI is greater than 1, the predicted exposure dose level could potentially cause adverse effects (USEPA, 1989).

The non-carcinogenic risks associated with exposure to fugitive dust from Bailey Point are presented in **Table H-3 and H-4** for the resident and on-site worker scenario. As stated, non carcinogenic risks to the construction worker could not be evaluated because of the lack of subchronic toxicity information. The non carcinogenic risks associated with a 6-year childhood exposure duration were also calculated and are presented in **Table H-5**. All non cancer risks were below an HI of 1.0 and include HI = 0.013 (residential), HI = 0.0038 (on-site worker) and HI = 0.029 (child).

The carcinogenic risk from exposure to soils is evaluated by multiplying the estimated exposure dose of each carcinogenic COPC by its respective inhalation CSF to obtain an estimate of incremental risk, as follows:

$$\text{Carcinogenic Risk} = \text{Exposure Dose (mg/kg-day)} \times \text{Inhalation CSF (mg/kg-day)}^{-1}$$

The CSF converts the estimated daily intake of a chemical averaged over a lifetime of exposure to an incremental risk of an individual developing cancer. The CSF used in these calculations is often the upper 95-percentile confidence limit of the probability of a response based on experimental data. As such, the carcinogenic risk estimates presented in this assessment are considered to be an upper-bound estimate of risk. The “true risk” to an individual is likely to be much less than predicted in this assessment (USEPA, 1989a).

USEPA guidelines state that the total incremental carcinogenic risk for an individual resulting from exposure at a RCRA Corrective Action site should not exceed a target risk range of $1\text{x}10^{-6}$ to $1\text{x}10^{-4}$ (USEPA, 1990). The MDEP has set $1\text{x}10^{-5}$ as the upper bound for an acceptable incremental lifetime cancer risk (MDEP, 1994).

The incremental carcinogenic risk associated with exposure to fugitive dust at Bailey Point are presented in **Table H-6, H-7 and H-8** for resident, on-site worker and construction worker scenarios, respectively. Cancer risks were estimated by multiplying the exposure dose of each COPC by its inhalation CSF. These risks were then summed to provide a total site incremental cancer risk. All cancer risks were below the MDEP target risk of 10^{-5} and the USEPA target risk range of 10^{-4} to 10^{-6} and include 2.6×10^{-8} (resident), 7.2×10^{-9} (on site worker) and 8.7×10^{-7} (construction worker).

Summary and Conclusions

The purpose of this focused risk evaluation was to evaluate potential human health risks from exposure to fugitive dust. The risk assessment was conducted in accordance with USEPA and MDEP guidance and is consistent with standard USEPA and MDEP methodology. The exposure scenario and assumptions used in this evaluation were overly conservative including long-term repetitive exposure to the maximum detected chemical concentration. However, even with these assumptions, the noncarcinogenic risk estimates are well below the target HI of 1.0 and the carcinogenic risk estimates are below the MDEP target risk level and the USEPA target risk range. These risk estimates support the conclusion that inhalation of fugitive dust is not a significant route of exposure at this site.

Table H-2C1
Screening Risk Calculations Using Maximum Concentrations
Calculation of Non Cancer Hazards
Exposure to Soil - Plant Area
Child - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Maximum Concentration (all depths)	Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient	Sum of Ingestion and Dermal Risks
Ingestion (1)	DIESEL RANGE ORGANICS	110.00	mg/kg	NA	6.03E-04	mg/kg-day				
	ALUMINUM	25400.00	mg/kg	NA	1.39E-01	mg/kg-day	1.00E+00	(mg/kg-d)	1.39E-01	1.39E-01
	ARSENIC	22.30	mg/kg	NA	1.22E-04	mg/kg-day	3.00E-04	(mg/kg-d)	4.07E-01	4.42E-01
	COPPER	757.00	mg/kg	NA	4.15E-03	mg/kg-day				
	IRON	46600.00	mg/kg	NA	2.55E-01	mg/kg-day	3.00E-01	(mg/kg-d)	8.51E-01	8.51E-01
	LEAD	42.50	mg/kg	NA	2.33E-04	mg/kg-day				
	MANGANESE	835.00	mg/kg	NA	4.58E-03	mg/kg-day	1.40E-01	(mg/kg-d)	3.27E-02	**3.27E-02**
	SODIUM	3700.00	mg/kg	NA	2.03E-02	mg/kg-day				
	THALLIUM	1.50	mg/kg	NA	8.22E-06	mg/kg-day				
	VANADIUM	59.10	mg/kg	NA	3.24E-04	mg/kg-day	1.00E-03	(mg/kg-d)	3.24E-01	3.24E-01
	Total PCBs	0.389	mg/kg	NA	2.13E-06	mg/kg-day	2.00E-05	(mg/kg-d)	1.07E-01	1.48E-01
	ENDRIN ALDEHYDE	0.002	mg/kg	NA	1.32E-08	mg/kg-day				
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	9.32E-06	mg/kg-day	9.00E-03	(mg/kg-d)	1.04E-03	**1.41E-03**
	BENZO(A)PYRENE equivalent	22.830	mg/kg	NA	1.25E-04	mg/kg-day				
	BENZO[G,H,I]PERYLENE	8.350	mg/kg	NA	4.58E-05	mg/kg-day				
	CARBAZOLE	8.100	mg/kg	NA	4.44E-05	mg/kg-day				
	PHENANTHRENE	34.500	mg/kg	NA	1.89E-04	mg/kg-day				
Dermal (2)	DIESEL RANGE ORGANICS	110.00	mg/kg						0.00E+00	
	ALUMINUM	25400.00	mg/kg				1.00E+00	(mg/kg-d)	0.00E+00	
	ARSENIC	22.30	mg/kg	0.03	1.03E-05	mg/kg-day	3.00E-04	(mg/kg-d)	3.42E-02	
	COPPER	757.00	mg/kg						0.00E+00	
	IRON	46600.00	mg/kg				3.00E-01	(mg/kg-d)	0.00E+00	
	LEAD	42.50	mg/kg						0.00E+00	
	MANGANESE	835.00	mg/kg				1.40E-01	(mg/kg-d)	0.00E+00	
	SODIUM	3700.00	mg/kg						0.00E+00	
	THALLIUM	1.50	mg/kg						0.00E+00	
	VANADIUM	59.10	mg/kg				1.00E-03	(mg/kg-d)	0.00E+00	
	Total PCBs	0.389	mg/kg	0.14	8.36E-07	mg/kg-day	2.00E-05	(mg/kg-d)	4.18E-02	
	ENDRIN ALDEHYDE	0.002	mg/kg						0.00E+00	
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	3.39E-06	mg/kg-day	9.00E-03	(mg/kg-d)	3.77E-04	
	BENZO(A)PYRENE equivalent	22.830	mg/kg	0.13	4.55E-05	mg/kg-day			0.00E+00	
	BENZO[G,H,I]PERYLENE	8.350	mg/kg	0.13	1.67E-05	mg/kg-day			0.00E+00	
	CARBAZOLE	8.100	mg/kg	0.13	1.62E-05	mg/kg-day			0.00E+00	
	PHENANTHRENE	34.500	mg/kg	0.13	6.88E-05	mg/kg-day			0.00E+00	
								Total Hazard Index Across All ExposurePathways	**1.9E+00**	

BOLD - indicates individual risks are less than HI = 0.1 or 1E-6.

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.48E-06

(2) Intake Dermal = EPC * (SFS * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 1.53E-05

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration
RME = Reasonable Maximum Exposure

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	200
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6
SA cm2	Surface Area	2800
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

SFS = (SA x AF)/BW

Table H-2C2
Screening Risk Calculations Using Maximum Concentrations
Calculation of Cancer Risks
Exposure to Soils - Plant Area
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Maximum Concentration (all depths)	Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk	Sum of Ingestion and Dermal Risks
Ingestion (1)	DIESEL RANGE ORGANICS	110.00	mg/kg	NA	7.36E-05	mg/kg-day				
	ALUMINUM	25400.00	mg/kg	NA	1.70E-02	mg/kg-day				
	ARSENIC	22.30	mg/kg	NA	1.49E-05	mg/kg-day	1.5	1/(mg/kg-day)	2.24E-05	2.45E-05
	COPPER	757.00	mg/kg	NA	5.07E-04	mg/kg-day				
	IRON	46600.00	mg/kg	NA	3.12E-02	mg/kg-day				
	LEAD	42.50	mg/kg	NA	2.84E-05	mg/kg-day				
	MANGANESE	835.00	mg/kg	NA	5.59E-04	mg/kg-day				
	SODIUM	3700.00	mg/kg	NA	2.48E-03	mg/kg-day				
	THALLIUM	1.50	mg/kg	NA	1.00E-06	mg/kg-day				
	VANADIUM	59.10	mg/kg	NA	3.96E-05	mg/kg-day				
	Total PCBs	0.389	mg/kg	NA	2.60E-07	mg/kg-day	2	1/(mg/kg-day)	5.21E-07	2.53E-06
	ENDRIN ALDEHYDE	0.002	mg/kg	NA	1.61E-09	mg/kg-day				
	2-METHYLNAPHTHALENE	1.700	mg/kg	NA	1.14E-06	mg/kg-day				
	BENZO(A)PYRENE equivalent	22.830	mg/kg	NA	1.53E-05	mg/kg-day	7.3	1/(mg/kg-day)	1.12E-04	1.57E-04
	BENZO[G,H,I]PERYLENE	8.350	mg/kg	NA	5.59E-06	mg/kg-day				
	CARBAZOLE	8.100	mg/kg	NA	5.42E-06	mg/kg-day				
	PHENANTHRENE	34.500	mg/kg	NA	2.31E-05	mg/kg-day				
Dermal (2)	DIESEL RANGE ORGANICS	110.00	mg/kg							
	ALUMINUM	25400.00	mg/kg							
	ARSENIC	22.30	mg/kg	0.03	1.41E-06	mg/kg-day	1.5	1/(mg/kg-day)	2.12E-06	
	COPPER	757.00	mg/kg							
	IRON	46600.00	mg/kg							
	LEAD	42.50	mg/kg							
	MANGANESE	835.00	mg/kg							
	SODIUM	3700.00	mg/kg							
	THALLIUM	1.50	mg/kg							
	VANADIUM	59.10	mg/kg							
	Total PCBs	3.389	mg/kg	0.14	1.00E-06	mg/kg-day	2	1/(mg/kg-day)	2.01E-06	
	ENDRIN ALDEHYDE	0.002	mg/kg							
	2-METHYLNAPHTHALENE	1.700	mg/kg	0.13	4.67E-07	mg/kg-day				
	BENZO(A)PYRENE equivalent	22.830	mg/kg	0.13	6.27E-06	mg/kg-day	7.3	1/(mg/kg-day)	4.58E-05	
	BENZO[G,H,I]PERYLENE	8.350	mg/kg	0.13	2.29E-06	mg/kg-day				
	CARBAZOLE	8.100	mg/kg	0.13	2.23E-06	mg/kg-day				
	PHENANTHRENE	34.500	mg/kg	0.13	9.48E-06	mg/kg-day				
	Total Cancer Risk Across All Exposure Pathways								**1.8E-04**	

BOLD - indicates individual risks are less than HI = 0.1 or 1 x 10^{-6}.

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 6.69E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF * EV)/(AT * 365 day/yr)
= EPC * ABS * 2.11E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific
EV, event/day	Event Frequency	1

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table H-2C3
95 Percent Upper Confidence Level Calculations
Plant Area

Surface Soils			EPA 2002 Guidance - 95% UCL		
Analyte	**Mean**	**Std Dev**	**Normal**	**Lognormal**	**Non-Parametric**
Metals (mg/kg)					
ALUMINUM	9433.72	3921.11			12170.58
ARSENIC	7.66	3.12			9.84
COPPER	80.90	165.84			196.66
IRON	15656.25	7131.30		17373.24	
LEAD	11.19	7.88		13.01	
SODIUM	263.30	114.94	294.33		
THALLIUM	0.33	0.28		0.42	
VANADIUM	23.56	11.51			31.59
PCBs (ug/kg)					
PCB-1242	10.18	7.95			15.18
PCB-1248	37.71	51.47			70.09
PCB-1254	9.90	4.58			12.78
PCB 1260	10.51	6.38			14.53
TOTAL PCBs					112.58
Pesticides (ug/kg)					
ENDRIN ALDEHYDE	2.07	3.06			4.55
SVOCs (ug/kg)					
BENZO(K)FLOURANTHENE	1736.86	3310.54			3841.74
CHRYSENE	923.41	1577.51			1926.41
BENZO(A)ANTHRACENE	1745.78	3342.48			3848.71
BENZO(A)PYRENE	1602.01	2963.61			3466.57
BENZO(B)FLOURANTHENE	1991.41	3787.71			4374.46
DIBENZO(A,H)ANTHRACENE	408.02	587.09			777.39
INDENO(1,2,3-CD)PYRENE	1130.05	1963.10			2365.14
BENZO{A}PYRENE equivalent					**5343.13**
BENZO(G,H,I)PERYLENE	971.72	1663.62			2018.39
CARBAZOLE	671.16	1279.00			1403.2
PHENANTHRENE	3198.38	6221.49			7112.66

Benzo(a)pyrene equivalent is the sum of the individual PAH compounds modified by their respective TEF - see text.

Surface and Subsurface Soils			EPA 2002 Guidance - 95% UCL		
Analyte	**Mean**	**Std Dev**	**Normal**	**Lognormal**	**Non-Parametric**
Metals (mg/kg)					
ALUMINUM	10153.30	4370.19		11390.97	
ARSENIC	7.74	3.32			9.72
COPPER	65.40	144.28			151.78
IRON	16862.22	7898.13		18906.94	
LEAD	11.41	7.32		13.07	
SODIUM	314.68	487.72		353.76	
THALLIUM	0.34	0.25			0.49
VANADIUM	24.94	11.72		28.59	
Pesticides (ug/kg)					
ENDRIN ALDEHYDE	2.07	3.06			4.55
PCBs (ug/kg)					
PCB-1242	9.73	6.91			13.49
PCB-1248	30.58	46.19			55.75
PCB-1254	9.52	4.02			11.71
PCB 1260	9.98	5.60			13.03
TOTAL PCBS					93.98
SVOCs (ug/kg)					
BENZO(K)FLOURANTHENE	1408.07	2976.67			3069.35
CHRYSENE	768.05	1430.39			1566.35
BENZO(A)ANTHRACENE	1446.19	3033.20			3139.02
BENZO(A)PYRENE	1327.48	2692.97			2830.43
BENZO(B)FLOURANTHENE	1634.39	3435.30			3551.47
DIBENZO(A,H)ANTHRACENE	347.38	534.16			645.49
INDENO(1,2,3-CD)PYRENE	940.53	1787.02			1937.87
BENZO{A}PYRENE equivalent					**4371.02**
BENZO(G,H,I)PERYLENE	798.40	1512.18			1642.35
CARBAZOLE	671.16	1279.00			1403.2
PHENANTHRENE	2644.30	5653.95			5799.77

Benzo(a)pyrene equivalent is the sum of the individual PAH compounds modified by their respective TEF - see text.

Table H-2D1
Screening of Risk Calculations Using Maximum Concentrations
Calculation of Non Cancer Hazards
Exposure to Soil - Warehouse 2/3
Child - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Maximum Concentration (all depths)	Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient	Sum of Ingestion and Dermal Risks
Ingestion (1)	ALUMINUM	30700	mg/kg	NA	1.68E-01	mg/kg-day	1.00E+00	(mg/kg-d)	1.68E-01	1.68E-01
	ARSENIC	17	mg/kg	NA	9.10E-05	mg/kg-day	3.00E-04	(mg/kg-d)	3.03E-01	3.29E-01
	IRON	41800	mg/kg	NA	2.29E-01	mg/kg-day	3.00E-01	(mg/kg-d)	7.63E-01	7.63E-01
	LEAD	397	mg/kg	NA	2.18E-03	mg/kg-day				
	MANGANESE	910	mg/kg	NA	4.99E-03	mg/kg-day	1.40E-01	(mg/kg-d)	3.56E-02	**3.56E-02**
	SODIUM	352	mg/kg	NA	1.93E-03	mg/kg-day				
	Total PCBs	2.00	mg/kg	NA	1.10E-05	mg/kg-day	2.00E-05	(mg/kg-d)	5.48E-01	7.63E-01
	BENZO(A)PYRENE equivalent	5.03	mg/kg	NA	2.76E-05	mg/kg-day				
	BENZO[G,H,I]PERYLENE	1.80	mg/kg	NA	9.86E-06	mg/kg-day				
	CARBAZOLE	0.38	mg/kg	NA	2.08E-06	mg/kg-day				
	PHENANTHRENE	2.80	mg/kg	NA	1.53E-05	mg/kg-day				
	VANADIUM	61.8	mg/kg	NA	3.39E-04	mg/kg-day	1.00E-03		3.39E-01	3.39E-01
	2-METHYLNAPHTHALENE	2.8	mg/kg	NA	1.53E-05	mg/kg-day	9.00E-03		1.70E-03	**2.33E-03**
	ETHYLBENZENE	61	mg/kg	NA	3.34E-04	mg/kg-day	1.00E-01		3.34E-03	**3.34E-03**
	XYLENES	279	mg/kg	NA	1.53E-03	mg/kg-day	2.00E-01		7.64E-03	**9.78E-03**
Dermal (2)	ALUMINUM	30700	mg/kg				1.00E+00	(mg/kg-d)	0.00E+00	
	ARSENIC	17	mg/kg	0.03	7.64E-06	mg/kg-day	3.00E-04	(mg/kg-d)	2.55E-02	
	IRON	41800	mg/kg				3.00E-01	(mg/kg-d)	0.00E+00	
	LEAD	397	mg/kg						0.00E+00	
	MANGANESE	910	mg/kg				1.40E-01	(mg/kg-d)	0.00E+00	
	SODIUM	352	mg/kg						0.00E+00	
	Total PCBs	2.00	mg/kg	0.14	4.30E-06	mg/kg-day	2.00E-05	(mg/kg-d)	2.15E-01	
	BENZO(A)PYRENE equivalent	5.03	mg/kg	0.13	1.00E-05	mg/kg-day			0.00E+00	
	BENZO[G,H,I]PERYLENE	1.80	mg/kg	0.13	3.59E-06	mg/kg-day			0.00E+00	
	CARBAZOLE	0.38	mg/kg	0.13	7.58E-07	mg/kg-day			0.00E+00	
	PHENANTHRENE	2.80	mg/kg	0.13	5.58E-06	mg/kg-day			0.00E+00	
	VANADIUM	61.8	mg/kg				1.00E-03	(mg/kg-d)	0.00E+00	
	2-METHYLNAPHTHALENE	2.8	mg/kg	0.13	5.58E-06	mg/kg-day	9.00E-03	(mg/kg-d)	6.21E-04	
	ETHYLBENZENE	61	mg/kg				1.00E-01	(mg/kg-d)	0.00E+00	
	XYLENES	279	mg/kg	0.1	4.28E-04	mg/kg-day	2.00E-01	(mg/kg-d)	2.14E-03	
								Total Hazard Index Across All Exposure Pathways	**2.4E+00**	

BOLD - indicates individual risks are less than HI = 0.1 or 1 x 10^{-6}.

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.48E-06

(2) Intake Dermal = EPC * (SA* AF* CF * ABS * EF)/(AT * BW*365 day/yr)
= EPC * ABS * 1.53E-05

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, mg-day	Ingestion Rate	200
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6
SA cm2	Surface Area	2800
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram

EPC = Exposure Point Concentration

Table H-2D2
Screening Risk Calculations Using Maximum Concentration
Calculation of Cancer Risks
Exposure to Soils - Warehouse 2/3
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Maximum Concentration (all depths)	Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk	Sum of Ingestion and Dermal Risks
Ingestion (1)	ALUMINUM	30700	mg/kg	NA	2.05E-02	mg/kg-day				
	ARSENIC	17	mg/kg	NA	1.11E-05	mg/kg-day	1.50E+00	1/(mg/kg-day)	1.67E-05	1.82E-05
	IRON	41800	mg/kg	NA	2.80E-02	mg/kg-day				
	LEAD	397	mg/kg	NA	2.66E-04	mg/kg-day				
	MANGANESE	910	mg/kg	NA	6.09E-04	mg/kg-day				
	SODIUM	352	mg/kg	NA	2.36E-04	mg/kg-day				
	Total PCBs	2.00	mg/kg	NA	1.34E-06	mg/kg-day	2.00E+00	1/(mg/kg-day)	2.68E-06	3.86E-06
	BENZO(A)PYRENE equivalent	5.03	mg/kg	NA	3.37E-06	mg/kg-day	7.30E+00	1/(mg/kg-day)	2.46E-05	3.47E-05
	BENZO[G,H,I]PERYLENE	1.80	mg/kg	NA	1.20E-06	mg/kg-day				
	CARBAZOLE	0.38	mg/kg	NA	2.54E-07	mg/kg-day				
	PHENANTHRENE	2.80	mg/kg	NA	1.87E-06	mg/kg-day				
	VANADIUM	61.8	mg/kg	NA	4.14E-05	mg/kg-day				
	2-METHYLNAPHTHALENE	2.8	mg/kg	NA	1.87E-06	mg/kg-day				
	ETHYLBENZENE	61	mg/kg	NA	4.08E-05	mg/kg-day				
	XYLENES	279	mg/kg	NA	1.87E-04	mg/kg-day				
Dermal (2)	ALUMINUM	30700	mg/kg			mg/kg-day				
	ARSENIC	17	mg/kg	0.03	1.05E-06	mg/kg-day	1.50E+00	1/(mg/kg-day)	1.58E-06	
	IRON	41800	mg/kg			mg/kg-day				
	LEAD	397	mg/kg			mg/kg-day				
	MANGANESE	910	mg/kg			mg/kg-day				
	SODIUM	352	mg/kg			mg/kg-day				
	Total PCBs	2.00	mg/kg	0.14	5.92E-07	mg/kg-day	2.00E+00	1/(mg/kg-day)	1.18E-06	
	BENZO(A)PYRENE equivalent	5.03	mg/kg	0.13	1.38E-06	mg/kg-day	7.30E+00	1/(mg/kg-day)	1.01E-05	
	BENZO[G,H,I]PERYLENE	1.80	mg/kg	0.13	4.95E-07	mg/kg-day				
	CARBAZOLE	0.38	mg/kg	0.13	1.04E-07	mg/kg-day				
	PHENANTHRENE	2.80	mg/kg	0.13	7.69E-07	mg/kg-day				
	VANADIUM	61.8	mg/kg							
	2-METHYLNAPHTHALENE	2.8	mg/kg	0.13	7.69E-07	mg/kg-day				
	ETHYLBENZENE	61	mg/kg							
	XYLENES	279	mg/kg	0.1	5.90E-05	mg/kg-day				
	Total Cancer Risk Across All Exposure Pathways								**5.7E-05**	

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 6.69E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF)/(AT * 365 day/yr)
= EPC * ABS * 2.11E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table H-2D3
95 Percent Upper Confidence Level Calculations
Warehouse 2/3

Surface Soils			EPA 2002 Guidance - 95% UCL		
Analyte	**Mean**	**Std Dev**	**Normal**	**Lognormal**	**Non-Parametric**
Metals (mg/kg)					
ALUMINUM	14436.25	9929.96	21087.68		
ARSENIC	9.34	4.75	12.52		
IRON	20236.25	10802.03	27471.83		
LEAD	60.94	136.16		243.8	
SODIUM	138.94	42.07	167.12		
PCBs (ug/kg)					
PCB-1254	96.00	347.73			474.93
PCB-1260	81.75	177.06			274.69
SVOCs (ug/kg)					
BENZO(K)FLOURANTHENE	797.18	1346.58			2264.59
CHRYSENE	455.31	626.08			1137.57
BENZO(A)ANTHRACENE	937.08	1397.82			2695.96
BENZO(A)PYRENE	777.08	1106.41			2169.28
BENZO(B)FLOURANTHENE	1187.92	1834.20			3495.9
DIBENZO(A,H)ANTHRACENE	222.50	72.54			313.77
INDENO(1,2,3-CD)PYRENE	559.17	715.68			1459.71
BENO{A}PYRENE equivalent					**3271.99**
BENZO(G,H,I)PERYLENE	468.33	539.55			1147.25
CARBAZOLE	202.92	57.27			274.97
PHENANTHRENE	535.00	772.22			1506.69

Benzo(a)pyrene equivalent is the sum of the individual PAH compounds modified by their respective TEF - see text.

Surface and Subsurface Soils			EPA 2002 Guidance - 95% UCL		
Analyte	**Mean**	**Std Dev**	**Normal**	**Lognormal**	**Non-Parametric**
Metals (mg/kg)					
ALUMINUM	15300.53	9082.74		22019.65	
ARSENIC	8.72	4.02	10.32		
IRON	20652.11	10825.50			31477.6
LEAD	31.37	88.89			120.26
SODIUM	156.84	77.61	187.72		
VANADIUM	30.10	16.90		43.65	
PCBs (ug/kg)					
PCB-1254	67.73	243.41			247.07
PCB-1260	42.81	123.12			133.53
SVOCs (ug/kg)					
BENZO(K)FLOURANTHENE	441.92	897.79			1068.56
CHRYSENE	301.66	414.41			590.91
BENZO(A)ANTHRACENE	423.08	828.42			1001.29
BENZO(A)PYRENE	373.85	654.74			830.85
BENZO(B)FLOURANTHENE	500.26	1090.75			1261.58
DIBENZO(A,H)ANTHRACENE	203.21	43.06			233.26
INDENO(1,2,3-CD)PYRENE	306.79	421.28			600.84
BENZO{A}PYRENE equivalent					**1361.76**
BENZO(G,H,I)PERYLENE	278.85	317.50			500.46
CARBAZOLE	197.18	33.56			220.6
PHENANTHRENE	299.36	445.09			610.03

Benzo(a)pyrene equivalent is the sum of the individual PAH compounds modified by their respective TEF - see text.

Table H-2E1
Screening Risk Calculations Using Maximum Concentration
Calculation of Non Cancer Hazards
Exposure to Soil - 345 kV Transmission Lines

Child - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Surface Soils
Receptor Population:	Resident
Receptor Age:	Child

Exposure Route	Chemical of Potential Concern	Maximum Concentration (all depths)	Units	Dermal Absorption Factor	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Hazard Quotient	Sum of Ingestion and Dermal Risk
Ingestion (1)	ALUMINUM	29000	mg/kg	NA	1.59E-01	mg/kg-day	1	(mg/kg-d)	1.59E-01	1.59E-01
	ARSENIC	16	mg/kg	NA	8.77E-05	mg/kg-day	0.0003	(mg/kg-d)	2.92E-01	3.17E-01
	IRON	42600	mg/kg	NA	2.33E-01	mg/kg-day	0.3	(mg/kg-d)	7.78E-01	7.78E-01
	LEAD	396	mg/kg	NA	2.17E-03	mg/kg-day				
	MANGANESE	1300	mg/kg	NA	7.12E-03	mg/kg-day	0.14	(mg/kg-d)	5.09E-02	**5.09E-02**
	SODIUM	1480	mg/kg	NA	8.11E-03	mg/kg-day				
	THALLIUM	1.3	mg/kg	NA	7.12E-06	mg/kg-day				
	VANADIUM	63	mg/kg	NA	3.45E-04	mg/kg-day	0.001	(mg/kg-d)	3.45E-01	3.45E-01
	BENZO(A)PYRENE equivalent	1.56	mg/kg	NA	8.55E-06	mg/kg-day				
	BENZO[G,H,I]PERYLENE	0.49	mg/kg	NA	2.68E-06	mg/kg-day				
	CARBAZOLE	0.35	mg/kg	NA	1.92E-06	mg/kg-day				
	PHENANTHRENE	1.80	mg/kg	NA	9.86E-06	mg/kg-day				
	Total PCBs	0.30	mg/kg	NA	1.64E-06	mg/kg-day	3.00E-05	(mg/kg-d)	5.48E-02	**7.63E-02**
Dermal (2)	ALUMINUM	29000	mg/kg	NA			1	(mg/kg-d)	0.00E+00	
	ARSENIC	16	mg/kg	0.03	7.36E-06	mg/kg-day	0.0003	(mg/kg-d)	2.45E-02	
	IRON	42600	mg/kg	NA			0.3	(mg/kg-d)	0.00E+00	
	LEAD	396	mg/kg	NA						
	MANGANESE	1300	mg/kg	NA			0.14	(mg/kg-d)	0.00E+00	
	SODIUM	1480	mg/kg	NA					0.00E+00	
	THALLIUM	1.3	mg/kg	NA					0.00E+00	
	VANADIUM	63	mg/kg	NA			0.001	(mg/kg-d)	0.00E+00	
	BENZO(A)PYRENE equivalent	1.56	mg/kg	0.13	3.11E-06	mg/kg-day			0.00E+00	
	BENZO[G,H,I]PERYLENE	0.49	mg/kg	0.13	9.77E-07	mg/kg-day			0.00E+00	
	CARBAZOLE	0.35	mg/kg	0.13	6.98E-07	mg/kg-day			0.00E+00	
	PHENANTHRENE	1.80	mg/kg	0.13	3.59E-06	mg/kg-day			0.00E+00	
	Total PCBs	0.3	mg/kg	0.14	6.44E-07	mg/kg-day	3.0E-05	(mg/kg-d)	2.15E-02	
	Total Hazard Index Across All Exposure Pathways								**1.7E+00**	

BOLD - indicates individual risks are less than HI = 0.1 or 1 x 10^{-6}.

(1) Intake Ingestion = EPC * (IR * CF * RAF * EF*ED)/(BW*AT * 365 day/yr)
= EPC * 5.48E-06

(2) Intake Dermal = EPC * (SA * AF * CF * ABS * EF)/(AT * BW * 365 day/yr)
= EPC * ABS * 1.53E-05

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-day	Ingestion Rate	200
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	6
SA cm2	Surface Area	2800
AF, mg/cm2	Adherence Factor	0.2
ED, years	Exposure Duration	6
BWchild, kg	Body Weight	15

NA = Not Applicable
mg/kg - day = milligram/kilogram - day
mg/kg = milligram/kilogram
EPC = Exposure Point Concentration
RME - Reasonable Maximum Exposure

Table H-2E2
Screening Risk Calculations Using Maximum Concentration
Calculation of Cancer Risks
Exposure to Soils - 345 kV Transmission Line Area
Resident - RME

Scenario Timeframe:	Future
Medium:	Soils
Exposure Medium:	Soils
Receptor Population:	Resident
Receptor Age:	Child/Adult

Exposure Route	Chemical of Potential Concern	Maximum Concentration (all depths)	Units	Dermal Absorption Factor	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor 1/(mg/kg-day)	Cancer Slope Factor Units	Cancer Risk	Sum of Ingestion and Dermal Risks
Ingestion (1)	ALUMINUM	29000	mg/kg	NA	1.94E-02	mg/kg-day				
	ARSENIC	16	mg/kg	NA	1.08E-05	mg/kg-day	1.5	1/(mg/kg-day)	1.63E-05	1.78E-05
	IRON	42600	mg/kg	NA	2.85E-02	mg/kg-day				
	LEAD	396	mg/kg	NA	2.65E-04	mg/kg-day				
	MANGANESE	1300	mg/kg	NA	8.70E-04	mg/kg-day				
	SODIUM	1480	mg/kg	NA	9.91E-04	mg/kg-day				
	THALLIUM	1.3	mg/kg	NA	8.70E-07	mg/kg-day				
	VANADIUM	63	mg/kg	NA	4.22E-05	mg/kg-day				
	BENZO(A)PYRENE equivalent	1.56	mg/kg	NA	1.04E-06	mg/kg-day	7.3	1/(mg/kg-day)	7.62E-06	1.08E-05
	BENZO[G,H,I]PERYLENE	0.49	mg/kg	NA	3.28E-07	mg/kg-day				
	CARBAZOLE	0.35	mg/kg	NA	2.34E-07	mg/kg-day				
	PHENANTHRENE	1.80	mg/kg	NA	1.20E-06	mg/kg-day				
	Total PCBs	0.3	mg/kg	NA	2.01E-07	mg/kg-day	2.0	1/(mg/kg-day)	4.02E-07	**5.79E-07**
Dermal (2)	ALUMINUM	29000	mg/kg	NA						
	ARSENIC	16	mg/kg	0.03	1.01E-06	mg/kg-day	1.5	1/(mg/kg-day)	1.52E-06	
	IRON	42600	mg/kg	NA						
	LEAD	396	mg/kg	NA						
	MANGANESE	1300	mg/kg	NA						
	SODIUM	1480	mg/kg	NA						
	THALLIUM	1.3	mg/kg	NA						
	VANADIUM	63	mg/kg	NA						
	BENZO(A)PYRENE equivalent	1.56	mg/kg	0.13	4.29E-07	mg/kg-day	7.3	1/(mg/kg-day)	3.13E-06	
	BENZO[G,H,I]PERYLENE	0.49	mg/kg	0.13	1.35E-07	mg/kg-day				
	CARBAZOLE	0.35	mg/kg	0.13	9.62E-08	mg/kg-day				
	PHENANTHRENE	1.80	mg/kg	0.13	4.95E-07	mg/kg-day				
	Total PCBs	0.3	mg/kg	0.1	8.88E-08	mg/kg-day	2.0	1/(mg/kg-day)	1.78E-07	
Total Cancer Risk Across All Exposure Pathways									**2.9E-05**	

BOLD - indicates individual risks are less than HI = 0.1 or 1 x 10 $^{-6}$.

(1) Intake Ingestion = EPC * (IF * CF * RAF * EF)/(AT * 365 day/yr)
= EPC * 6.69E-07

(2) Intake Dermal = EPC * (SFSadj * CF * ABS * EF)/(AT * 365 day/yr)
= EPC * ABS * 2.11E-06

EPC, mg/kg	Exposure Point Concentration	chem-specific
IF, mg-yr/kg-day	Ingestion Rate, age weighted	114
CF, kg/mg	Conversion Factor	0.000001
RAF, unitless	Relative Absorption Factor	1
EF, day/yr	Exposure Frequency	150
AT, yr	Averaging Time	70
SFSadj, mg-yr/kg-event	Age-weighted Dermal Factor	360
ABS, unitless	Dermal Absorption Factor	chem-specific

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
NA = Not Applicable
EPC = Exposure Point Concentration
RME - Realistic Maximum Exposure

Table H-2E3
95 Percent Upper Confidence Level Calculations
345 kV Transmission Line Area

Surface Soils			EPA 2002 Guidance - 95% UCL		
Analyte	**Mean**	**Std Dev**	**Normal**	**Lognormal**	**Non-Parametric**
Metals (mg/kg)					
ALUMINUM	16424.04	3801.11	17697.37		
ARSENIC	10.41	2.55	11.27		
IRON	25440.00	6024.13	27458.05		
SODIUM	187.15	91.99	217.92		
THALLIUM	0.47	0.33		0.69	
VANADIUM	37.73	8.99	40.74		
SVOCs (ug/kg)					
BENZO(K)FLOURANTHENE	230.58	158.30			365.9
CHRYSENE	208.36	51.55			252.43
INDENO(1,2,3-CD)PYRENE	204.90	36.07			235.74
BENZO(A)PYRENE	255.38	131.11			337.46
BENZO(A)ANTHRACENE	234.04	177.82			299.3
BENZO(B)FLUORANTHENE	234.23	177.79			299.48
BENZO{A}PYRENE equivalent					**424.82**
BENZO(G,H,I)PERYLENE	205.29	37.70			237.51
CARBAZOLE	204.90	36.07			235.74
PHENANTHRENE	260.96	314.58			529.88

Benzo(a)pyrene equivalent is the sum of the individual PAH compounds modified by their respective TEF - see text.

Surface and Subsurface Soils			EPA 2002 Guidance - 95% UCL		
Analyte	**Mean**	**Std Dev**	**Normal**	**Lognormal**	**Non-Parametric**
Metals (mg/kg)					
ALUMINUM	18256.63	5343048.00		19688.66	
ARSENIC	11.01	2.81	11.68		
IRON	28876.33	7196.28	30600.58		
SODIUM	292.77	259.36		367.29	
THALLIUM	0.42	0.29		0.53	
VANADIUM	41.33	10.12	43.76		
PCBs (ug/kg)					
PCB-1242	12.45	18.21			23.79
PCB-1254	11.83	12.44			19.58
PCB 1260	219.64	68.59			262.35
TOTAL PCBS					305.72
SVOCs (ug/kg)					
BENZO(A)PYRENE	233.37	119.60			307.84
BENZO(K)FLOURANTHENE	220.92	116.93			293.73
CHRYSENE	205.76	35.09			227.62
DIBENZO(A,H)ANTHRACENE	220.87	71.79			265.57
BENZO(A)ANTHRACENE	240.61	155.13			280.16
BENZO(B)FLUORANTHENE	223.37	131.32			257.73
INDENO(1,2,3-CD)PYRENE	10.93	12.89			18.96
BENZO(A)PYRENE equivalent					**632.26**
BENZO(G,H,I)PERYLENE	215.56	54.82			249.7
CARBAZOLE	204.44	26.57			220.99
PHENANTHRENE	244.90	232.92			389.94

Benzo(a)pyrene equivalent is the sum of the individual PAH compounds modified by their respective TEF - see text.

Table H3-1
Values Used for Daily Intake/Absorbed Dose
Inhalation of Particulates

Scenario Timeframe:	Future
Medium:	Particulates
Exposure Point	Breathing Zone
Receptor Population:	See Below
Receptor Age:	Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Equation/ Model Name
On-Site Worker	CS	Chemical Concentration in soil	mg/kg			CS x IR x RAF x EF x ED x ET x (1/PEF)
	IR	Inhalation Rate	m3/hour	1.3	EPA, 1997	BW x AT x 365 days/yr
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	
	ET	Exposure Time	hours/day	8	EPA, 1991a	
	EF	Exposure Frequency	days/year	150	EPA, 1994	
	ED	Exposure Duration	years	25	EPA, 2001b	
	PEF	Particulate Emission Factor	m3/kg	1.36E+09	EPA, 2001b	
	BW	Body Weight	kg	70	EPA, 1991a	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	INTAKE DOSE
	AT-N	Averaging Time, non-cancer	years	25	EPA, 2001b	
Construction Worker	Cssoil	Chemical Concentration in soil	mg/kg			Q = CSsoil * E * CF
	Csair	Chemical Concentration in air	mg/m3			
	IR	Inhalation Rate	m3/hour	1.3	EPA, 1997	
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	
	ET	Exposure Time	hours/day	8	EPA, 1991a	CSair = CEF * A * 1000
	EF	Exposure Frequency	days/year	173	BPJ	L * V * H
	ED	Exposure Duration	years	1	EPA, 2001b	
	BW	Body Weight	kg	70	EPA, 1991a	CSair x IR x RAF x CF x EF x ED x ET
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	BW x AT x 365 days/yr
	AT-N	Averaging Time, non-cancer	years	1	EPA, 2001b	
	Q	Contaminantnant Emission Flux	g/m2-sec	chem specific		
	E	Construction Emission Factor	g/m2-sec	1.04E-04	EPA, 1993	
	A	Source Areas Surface Area	m2	10,120	BPJ	
	L	Width of Source Area	m	100	BPJ	
	V	Average Windspeed	m/sec	2.25	BPJ	
	H	Box Height	m	2	BPJ	INTAKE DOSE
	CF	Conversion Factor	kg/mg	10^{-6}		

Table H3-1
Values Used for Daily Intake/Absorbed Dose
Inhalation of Particulates

Scenario Timeframe:	Future
Medium:	Particulates
Exposure Point	Breathing Zone
Receptor Population:	See Below
Receptor Age:	Adult

Resident	CS	Chemical Concentration in soil	mg/kg			
	IR	Inhalation Rate	m3/day	13	EPA, 2001b	
	IRchild[1]	Inhalation Rate (child)	m3/day	8.1	EPA, 2001b	CS x IR x RAF x EF x ED x ET x (1/PEF)
	RAF	Relative Absorption Factor	unitless	1	EPA, 1991a	BW x AT x 365 days/yr
	ET	Exposure Time	24 hours/24- hour	1	EPA, 1991a	
	EF	Exposure Frequency	days/year	150	EPA, 1994	
	ED	Exposure Duration	years	30	EPA, 2001b	
	EDchild[1]	Exposure Duration (child)	years	6	EPA, 2001b	
	PEF	Particulate Emission Factor	m3/kg	1.36E+09	EPA, 2001b	
	BW	Body Weight	kg	70	EPA, 1991a	
	BWchild[1]	Body Weight (child)	kg	15	EPA, 2001b	
	AT-C	Averaging Time, cancer	years	70	EPA, 1991a	
	AT-N	Averaging Time, non-cancer	years	30	EPA, 2001b	INTAKE DOSE

(1) - These exposure factors are used to evaluate noncarcinogenic risks based on childhood exposure.
BPJ - Best Professional Judgement
Definitions: mg - milligram
kg - kilogram
RME - Reasonable Maximum Exposure
CEF - Surface emission flux parameter

Table H3-2
Exposure Point Concentrations and Toxicity Information for the Soil COPCs

Chemical of Potential Concern	Maximum Soil Concentration Bailey Point (mg/kg)	Residential Inhalation PRGs[1] (mg/kg)	Industrial Inhalation PRGs[1] (mg/kg)	Unit Risk Factor (ug/m3)-1	ref	Inhalation Slope Factor 1/(mg/kg-d)	ref	Chronic Reference Concentration (mg/m3)	ref	Chronic Inhalation RfD (mg/kg-day)	ref	Subchronic Reference Concentration (mg/m3)	ref
ALUMINUM	30700	3000000	9400000							1.00E-03	N		
ANTIMONY	2.2	31	410									4.00E-04	U
ARSENIC	22	590	1300	4.30E-03	I								
BARIUM	169	290000	960000					5.00E-04	H	1.40E-04	H		
BERYLLIUM	2.1	1100	2200	2.40E-03	I			2.00E-05	I	5.70E-06	I		
BORON	23	12000000	38000000									9.00E-02	H
CADMIUM	1.6	1400	3000	1.80E-03	I								
CHROMIUM	162												
COBALT	18	900	1900	2.80E-03	N			2.00E-05	N				
COPPER	757												
IRON	46600												
LEAD	969												
MAGNESIUM	14100												
MANGANESE	1300	29000	94000					5.00E-05	I				
MERCURY CHLORIDE	0.51							3.00E-04	I				
MOLYBDENUM	11.2												
NICKEL	153												
POTASSIUM	11100												
SELENIUM	1.3												
SILVER	7.4							1.00E-05	U			1.00E-04	U
SODIUM	3700												
THALLIUM	1.5												
VANADIUM	62.7												
ZINC	1060												
PCB-1242	0.098	4400	9400			2.00E+00	E						
PCB-1248	0.064	4400	9400			2.00E+00	E						
PCB-1254	1.400	4400	9400			2.00E+00	E						
PCB-1260	0.60	4400	9400			2.00E+00	E						
4,4'-DDT	0.007	26000	55000	9.70E-05	I								
ALDRIN	0.004	520	1100	4.90E-03	I								
DIELDRIN	0.013	550	1200	4.60E-03	I								
ENDRIN	0.0096	620000	2000000										
ENDRIN ALDEHYDE	0.0024												
GAMMA BHC	0.0040	6800	14000										
HEPTACHLOR EPOXIDE	0.00087	970	2100	2.60E-03	I								
METHOXYCHLOR	0.0098	10000000	34000000										
2-METHYLNAPHTHALENE	2.80												
4-METHYLPHENOL	0.47	10000000	34000000										
ACENAPHTHYLENE	3.40												
ANTHRACENE	9.00	330000	1100000										
BENZO(A)ANTHRACENE	19	12000	26000	8.80E-04	U								
BENZO(A)PYRENE	16	1200	2600	8.80E-04	U								
BENZO(B)FLUORANTHENE	21	12000	26000	8.80E-04	U								
BENZO(K)FLUORANTHENE	8.4	120000	260000	8.80E-04	U								

Table H3-2

Exposure Point Concentrations and Toxicity Information for the Soil COPCs

Chemical of Potential Concern	Maximum Soil Concentration Bailey Point (mg/kg)	Residential Inhalation PRGs[1] (mg/kg)	Industrial Inhalation PRGs[1] (mg/kg)	Unit Risk Factor (ug/m3)-1	ref	Inhalation Slope Factor 1/(mg/kg-d)	ref	Chronic Reference Concentration (mg/m3)	ref	Chronic Inhalation RfD (mg/kg-day)	ref	Subchronic Reference Concentration (mg/m3)	ref
BENZO[G,H,I]PERYLENE	8.4												
BIS(2-ETHYLHEXYL) PHTHALATE	2.3	630000	1300000			1.40E-02	N					1.00E-02	U
BUTYL BENZYL PHTHALATE	2.6	410000000	1300000000										
CARBAZOLE	8.1												
CHRYSENE	20	1200000	2600000	8.80E-04	U								
DI-N-BUTYL PHTHALATE	0.51	210000000	670000000										
DIBENZO(A,H)ANTHRACENE	1.75	1200	2600	8.80E-04	U								
DIBENZOFURAN	2.45	4100	13000										
FLUORANTHENE	49	82000000	270000000										
FLUORENE	4.60	23000	74000										
INDENO(1,2,3-CD)PYRENE	9.7	12000	26000	8.80E-04	U								
NAPHTHALENE	1.25	58	190					3.00E-03	I				
PHENANTHRENE	36												
PYRENE	40	180000	580000										
1,1,1-TRICHLOROETHANE	0.006	2700	7100										
2-BUTANONE (MEK)	0.16												
2-HEXANONE	0.041	900	2900					5.00E-03	U			5.00E-02	U
4-METHYL-2-PENTANONE (MIBK)	2.90	8700	28000					3.00E+00	I			8.00E-01	H
ACETONE	0.63	2000	6400									1.30E+01	M
BENZENE	0.016	1	1	7.80E-06	I			3.00E-02	I			4.00E-03	M
CARBON DISULFIDE	0.004	370	1200					7.00E-01	I			7.00E-01	H
CHLOROFORM	0.003	4	12	2.30E-05	I			5.00E-02	U	8.60E-04	N	5.00E-02	U
ETHYLBENZENE	61							1.00E+00	I			1.00E+00	M
M-,P-XYLENE	200	280	900					1.00E-01	I			7.00E-01	M
METHYLENE CHLORIDE	0.09	10	22	4.70E-07	I							3.00E-01	M
O-XYLENE	79	280	900					1.00E-01	I			7.00E-01	M
TOLUENE	0.49	680	2200					4.00E-01	I				
TRICHLOROETHENE	0.06	0.055	0.12			4.00E-01	N	4.00E-02	N			1.00E-01	M
VINYL CHLORIDE	0.03	0.11	0.93	4.40E-06	I	3.10E-02	I	1.00E-01	I			3.00E-02	M

ref - I - IRIS; N - NCEA; H - HEAST as referenced in USEPA Region 9 PRG Tables (October, 2002); E - EPA Region I Risk Update #2 and
USEPA Guidance on PCBs (EPA/600/P-96/001F); U - USEPA in letter dated June 2, 2003 (USEPA, 2003); CA - California Office of Health Hazard Assessment (2003)
M - ATSDR Minimal Risk Levels (ATSDR, 2003); U* - modified subchronic RfC based on chronic study provided by USEPA (USEPA, 2003)

1 - USEPA Region 9, October, 2002

IRIS - Integrated Risk Information System

mg/kg-day = milligram/kilogram - day

NCEA - National Center for Environmental Assessment

HEAST - Health Effects Assessment Summary Table

The Reference Concentration (RfC) can be converted to an inhalation RfD as follows: RfC (mg/m3) * 20 m3/day * 1/70 kg = inhalation RfD (mg/kg-day)

The Unit Risk Factor (URF) can be converted to an Inhalation Cancer Slope Factor as follows: URF 1/(ug/m3) * 1/20 m3/day * 70 * 10E-3 ug/1 mg = Inhalation CSF (mg/kg-day)-1

Table H3-3
Non Carcinogenic Risks - Inhalation Exposure - Residential Scenario

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium	Airborne Particulates
Exposure Point:	Breathing Zone
Receptor Population:	Resident

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Inhalation PRG (Residential) (mg/kg)	Chronic Reference Concentration (mg/m3)	Inhalation Intake(1) mg/kg-day	Inhalation Reference Dose (mg/kg-day)	Non Cancer Hazard Index
Inhalation	Aluminum	30700	2900000	4.00E-03	1.72E-06	1.0E-03	1.72E-03
	Barium	169	290000	5.00E-04	9.48E-09	1.4E-04	6.64E-05
	Beryllium	2.1	1100	2.00E-05	1.18E-10	5.7E-06	2.06E-05
	Cobalt	18.35	900	2.00E-05	1.03E-09	5.7E-06	1.80E-04
	Mangansese	1300	29000	5.00E-05	7.30E-08	1.4E-05	5.11E-03
	Mercury	0.51		3.00E-04	2.86E-11	8.6E-05	3.34E-07
	Silver	7.4		1.00E-05	4.15E-10	2.9E-06	1.45E-04
	Naphthalene	1.25	58	3.00E-03	7.01E-11	8.6E-04	8.18E-08
	2-Hexanone	0.041	8700	5.00E-03	2.30E-12	1.4E-03	1.61E-09
	4-Methyl-2-Pentanone	2.9	900	3.00E+00	1.63E-10	8.6E-01	1.90E-10
	Benzene	0.016	0.60	3.00E-02	8.98E-13	8.6E-03	1.05E-10
	Carbon Disulfide	0.004	370	7.00E-01	2.24E-13	2.0E-01	1.12E-12
	Chloroform	0.003	3.60	5.00E-02	1.68E-13	1.4E-02	1.18E-11
	Ethylbenzene	61	2400	1.00E+00	3.42E-09	2.9E-01	1.20E-08
	M-P-Xylene	200	280	1.00E-01	1.12E-08	2.9E-02	3.93E-07
	O-Xylene	79	280	1.00E-01	4.43E-09	2.9E-02	1.55E-07
	Toluene	0.49	680	4.00E-01	2.75E-11	1.1E-01	2.41E-10
	Trichloroethene	0.058	0.06	4.00E-02	3.25E-12	1.1E-02	2.85E-10
	Vinyl Chloride	0.029	0.11	1.00E-01	1.63E-12	2.9E-02	5.70E-11
						Total Non Cancer Risk Across All Exposure Routes/Pathways	7.2E-03

(1) Intake Inhalation = EPC * (IR*ED*EF*(1/PEF))/(AT*BW)
= EPC* 5.61E-11

	EPC, mg/kg	Exposure Point Concentration	chem-specific
PRG - Preliminary Remediation Goal	IR m3/day	Inhalation Rate	13
mg/kg = milligram/kilogram	EF, day/yr	Exposure Frequency	150
mg/kg - day = milligram/kilogram - day	AT, days	Averaging Time	10950
NA = Not Applicable	PEF, m3/kg	Particulate Emission Factor	1.36E+09
EPC = Exposure Point Concentration	ED, years	Exposure duration	30
	BW, kg	Body Weight	70

Table H3-4
Non Carcinogenic Risks - Inhalation Exposure - On-Site Worker Scenario

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium:	Airborne Particluates
Exposure Point:	Breathing Zone
Receptor Population:	On-Site Worker

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Inhalation PRG (Residential) (mg/kg)	Chronic Reference Concentration (mg/m3)	Inhalation Intake (1) mg/kg-day	Inhalation Reference Dose (mg/kg-day)	Non Cancer Hazard Index
Inhalation	Aluminum	30700	9400000	4.00E-03	1.38E-06	1.1E-03	1.21E-03
	Barium	169	960000	5.00E-04	7.59E-09	1.4E-04	5.31E-05
	Beryllium	2.1	2200	2.00E-05	9.43E-11	5.7E-06	1.65E-05
	Cobalt	18.35	1900	2.00E-05	8.24E-10	5.7E-06	1.44E-04
	Mangansese	1300	94000	5.00E-05	5.84E-08	1.4E-05	4.09E-03
	Mercury	0.51		3.00E-04	2.29E-11	8.6E-05	2.67E-07
	Silver	7.4		1.00E-05	3.32E-10	2.9E-06	1.16E-04
	Naphthalene	1.25	190.000	3.00E-03	5.61E-11	8.6E-04	6.55E-08
	2-Hexanone	0.041	28000	5.00E-03	1.84E-12	1.4E-03	1.29E-09
	4-Methyl-2-Pentanone	2.9	2900	3.00E+00	1.30E-10	8.6E-01	1.52E-10
	Benzene	0.016	1.3	3.00E-02	7.18E-13	8.6E-03	8.38E-11
	Carbon Disulfide	0.004	1200	7.00E-01	1.80E-13	2.0E-01	8.98E-13
	Chloroform	0.003	12.000	5.00E-02	1.35E-13	1.4E-02	9.43E-12
	Ethylbenzene	61	8000	1.00E+00	2.74E-09	2.9E-01	9.59E-09
	M-P-Xylene	200	900	1.00E-01	8.98E-09	2.9E-02	3.14E-07
	O-Xylene	79	900	1.00E-01	3.55E-09	2.9E-02	1.24E-07
	Toluene	0.49	2200	4.00E-01	2.20E-11	1.1E-01	1.92E-10
	Trichloroethene	0.058	0.12	4.00E-02	2.60E-12	1.1E-02	2.28E-10
	Vinyl Chloride	0.029	0.93	1.00E-01	1.30E-12	2.9E-02	4.56E-11
					Total Non Cancer Risk Across All Exposure Routes/Pathways		5.6E-03

(1) Intake Inhalation = EPC * (IR*ED*ET*EF*(1/PEF))/(AT*BW)

= EPC* 4.49E-11

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR m3/hour	Inhalation Rate	1.3
EF, day/yr	Exposure Frequency	150
AT, days	Averaging Time	9125
PEF, m3/kg	Particulate Emission Factor	1.36E+09
ED, years	Exposure duration	25
BW, kg	Body Weight	70
ET, hours/day	Exposure Time	8.0

mg/kg = milligram/kilogram

mg/kg - day = milligram/kilogram - day

EPC = Exposure Point Concentration

PRG - Preliminary Remediation Goal

Table H3-5
Non Carcinogenic Risks - Inhalation Exposure - Child

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium:	Airborne Particluates
Exposure Point:	Breathing Zone
Receptor Population:	Child Resident

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Inhalation PRG (Residential) (mg/kg)	Chronic Reference Concentration (mg/m3)	Inhalation Intake (1) mg/kg-day	Inhalation Reference Dose (mg/kg-day)	Non Cancer Hazard Index
Inhalation	Aluminum	30700	2900000	4.00E-03	5.01E-06	1.1E-03	4.38E-03
	Barium	169	290000	5.00E-04	2.76E-08	1.4E-04	1.93E-04
	Beryllium	2.1	1100	2.00E-05	3.43E-10	5.7E-06	6.00E-05
	Cobalt	18.35	900	2.00E-05	2.99E-09	5.7E-06	5.24E-04
	Mangansese	1300	29000	5.00E-05	2.12E-07	1.4E-05	1.48E-02
	Mercury	0.51		3.00E-04	8.32E-11	8.6E-05	9.71E-07
	Silver	7.4		1.00E-05	1.21E-09	2.9E-06	4.23E-04
	Naphthalene	1.25	58	3.00E-03	2.04E-10	8.6E-04	2.38E-07
	2-Hexanone	0.041	8700	5.00E-03	6.69E-12	1.4E-03	4.68E-09
	4-Methyl-2-Pentanone	2.9	900	3.00E+00	4.73E-10	8.6E-01	5.52E-10
	Benzene	0.016	0.60	3.00E-02	2.61E-12	8.6E-03	3.05E-10
	Carbon Disulfide	0.004	370	7.00E-01	6.53E-13	2.0E-01	3.26E-12
	Chloroform	0.003	3.60	5.00E-02	4.90E-13	1.4E-02	3.43E-11
	Ethylbenzene	61	2400	1.00E+00	9.95E-09	2.9E-01	3.48E-08
	M-P-Xylene	200	280	1.00E-01	3.26E-08	2.9E-02	1.14E-06
	O-Xylene	79	280	1.00E-01	1.29E-08	2.9E-02	4.51E-07
	Toluene	0.49	680	4.00E-01	8.00E-11	1.1E-01	7.00E-10
	Trichloroethene	0.058	0.06	4.00E-02	9.46E-12	1.1E-02	8.28E-10
	Vinyl Chloride	0.029	0.11	1.00E-01	4.73E-12	2.9E-02	1.66E-10
					Total Non Cancer Risk Across All Exposure Routes/Pathways		2.0E-02

* = obtained from USEPA, 2001, specific to fugitive dust

(1) Intake Inhalation = EPC * (IR*ED*EF*(1/PEF))/(AT*BW)

= EPC* 1.63E-10

	EPC, mg/kg	Exposure Point Concentration	chem-specific
	IR m3/day	Inhalation Rate	8.1
mg/kg = milligram/kilogram	EF, day/yr	Exposure Frequency	150
mg/kg - day = milligram/kilogram - day	AT, days (ED*365)	Averaging Time	2190
PRG - Preliminary Remediation Goal	PEF, m3/kg	Particulate Emission Factor	1.36E+09
EPC = Exposure Point Concentration	ED, years	Exposure duration	6
	BW, kg	Body Weight	15

Table H3-6
Non Carcinogenic Risks - Inhalation Exposure - Construction Worker

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium:	Airborne Particulates
Exposure Point:	Breathing Zone
Receptor Population:	Construction Worker

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Inhalation PRG[1] (Industrial) (mg/kg)	Contaminant Emission Flux[3] (g/m2-s)	EPC in Air[4] (mg/m3)	Chemical Intake (mg/kg-day)	Subchronic Reference Concentration (mg/m3)	Subchronic Reference Dose[5] (mg/kg-day)	Hazard Index
Inhalation									
	Antimony	2.2	NA	2.29E-10	5.15E-06	3.62E-07	4.00E-04	1.14E-04	3.17E-03
	Boron	23	NA	2.39E-09	5.38E-05	3.79E-06	9.00E-02	2.57E-02	1.47E-04
	Bis(2-ethylhexyl)phthalate	2.3	NA	2.39E-10	5.38E-06	3.79E-07	1.00E-02	2.86E-03	1.33E-04
	Acetone	0.63	NA	6.55E-11	1.47E-06	1.04E-07	1.30E+01	3.71E+00	2.79E-08
	Methylene Chloride	0.09	NA	9.36E-12	2.10E-07	1.48E-08	3.00E-01	8.57E-02	1.73E-07
	Silver	7.4	NA	7.70E-10	1.73E-05	1.22E-06	1.00E-04	2.86E-05	4.27E-02
	2-Hexanone	0.041	NA	4.26E-12	9.59E-08	6.75E-09	5.00E-02	1.43E-02	4.73E-07
	4-Methyl-2-Pentanone	2.9	NA	3.02E-10	6.78E-06	4.78E-07	8.00E-01	2.29E-01	2.09E-06
	Benzene	0.016	NA	1.66E-12	3.74E-08	2.64E-09	4.00E-03	1.14E-03	2.31E-06
	Carbon Disulfide	0.004	NA	4.16E-13	9.36E-09	6.59E-10	7.00E-01	2.00E-01	3.29E-09
	Chloroform	0.003	NA	3.12E-13	7.02E-09	4.94E-10	5.00E-02	1.43E-02	3.46E-08
	Ethylbenzene	61	NA	6.34E-09	1.43E-04	1.00E-05	1.00E+00	2.86E-01	3.52E-05
	M-P-Xylene	200	NA	2.08E-08	4.68E-04	3.29E-05	7.00E-01	2.00E-01	1.65E-04
	O-Xylene	79	NA	8.22E-09	1.85E-04	1.30E-05	7.00E-01	2.00E-01	6.51E-05
	Trichloroethene	0.058	NA	6.03E-12	1.36E-07	9.55E-09	1.00E-01	2.86E-02	3.34E-07
	Vinyl Chloride	0.029	NA	3.02E-12	6.78E-08	4.78E-09	3.00E-02	8.57E-03	5.57E-07
								Total Non Cancer Risk Across All Exposure Routes/Pathways	4.6E-02

(1) -USEPA Region 9 PRGs not applicable to this scenario

Intake Inhalation = EPCair * (IR * ET* EF* ED)/(AT*BW)

= EPCair * 7.04E-02

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
EPC = Exposure Point Concentration
PRG - Preliminary Remediation Goal
NA - Not Applicable

Csair, mg/m3	Exposure Point Concentration -air	chem-specific	
CSsoil, mg/kg	Exposure Point Concentration soil	chem-specific	
IR, m3/hour	Inhalation Rate	1.3	
ET, hours/day	Exposure Time	8.00	
EF, day/yr	Exposure Frequency	173	
AT, days	Averaging Time	365	
ED, years	Exposure duration	1	
BW, kg	Body Weight	70	
A, m2	source area surface area	10,120	2.5-acre
L, m	width of source area	100	square area
V, m/s	average windspeed	2.25	USEPA default
H, m	Box Height	2	USEPA default
E , g/m2-sec	Heavy Construction Emission Factor	1.04E-04	
CF kg/mg	Conversion Factor	1.00E-06	

(3)- Contaminant Emission Flux (Q) = CSsoil * E (1E-4) * CF (1E-6)
(4) - Concentration in air = (Q * A * 1000mg/g)/(L * V * H)
(5) - Subchronic RfD = Subchronic RfC(mg/m3) * 20m3/day/70 kg

Table H3-7
Carcinogenic Risks - Inhalation Exposure - Residential Scenario

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium:	Airborne Particluates
Exposure Point:	Breathing Zone
Receptor Population:	Resident

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Inhalation PRG[1] (Residential) (mg/kg)	Unit Risk Factor[2] (ug/m3)-1	Chemical Intake mg/kg-day	Cancer Slope Factor 1/(mg/kg-day)	Cancer Risks
Inhalation							
	4,4-DDT	0.007	26000	9.70E-05	1.73E-13	3.4E-01	5.88E-14
	Aldrin	0.004	520	4.90E-03	9.86E-14	1.7E+01	1.69E-12
	Arsenic	22.3	770*	4.30E-03	5.36E-10	1.5E+01	8.07E-09
	Benzene	0.016	0.630	7.80E-06	3.85E-13	2.7E-02	1.05E-14
	Beryllium	2.100	1400*	2.40E-03	5.05E-11	8.4E+00	4.24E-10
	DEHP	2.300	630000		5.53E-11	1.4E-02	7.74E-13
	Dieldrin	0.013	550	4.60E-03	3.13E-13	1.6E+01	5.03E-12
	Gamma BHC	0.004	6800		9.38E-14		
	Heptachlor Epoxide	0.00087	970	2.60E-03	2.09E-14	9.1E+00	1.90E-13
	Methylene Chloride	0.090	10	4.70E-07	2.16E-12	1.6E-03	3.56E-15
	Trichloroethene	0.058	NA		1.39E-12	4.0E-01	5.58E-13
	Vinyl chloride	0.029	0.110	4.40E-06	6.97E-13	1.5E-02	1.07E-14
	Chloroform	0.003	3.600	2.30E-05	7.22E-14	8.1E-02	5.81E-15
	Cadmium	1.600	1400	1.80E-03	3.85E-11	6.3E+00	2.42E-10
	Cobalt	18.350	900	2.80E-03	4.41E-10	9.8E+00	4.33E-09
	PCB-1242	0.098	4400		2.36E-12	2.0E+00	4.71E-12
	PCB-1248	0.064	4400		1.54E-12	2.0E+00	3.08E-12
	PCB-1254	1.400	4400		3.37E-11	2.0E+00	6.73E-11
	PCB-1260	0.600	4400		1.44E-11	2.00E+00	2.89E-11
	Benzo(a)pyrene	16	1200	8.80E-04	3.85E-10	3.1E+00	1.19E-09
	Benzo(a)anthracene	19	12000	8.80E-04	4.57E-10	3.1E+00	1.41E-09
	Benzo(b)fluoranthene	21	12000	8.80E-04	5.05E-10	3.1E+00	1.56E-09
	Benzo(k)fluoranthene	8.4	120000	8.80E-04	2.02E-10	3.1E+00	6.22E-10
	Chrysene	19	1200000	8.80E-04	4.57E-10	3.1E+00	1.41E-09
	Indeno(1,2,3-cd)pyrene	9.7	12000	8.80E-04	2.33E-10	3.1E+00	7.19E-10
	Dibenz(a,h)anthracene	1.77	1200	8.80E-04	4.26E-11	3.1E+00	1.31E-10
						Total Cancer Risk Across All Exposure Routes/Pathways	2.0E-08

(1) - USEPA Region 9 PRGs specific to the inhalation route of exposure

(2) - Unit risk factors are converted to Cancer Slope Factor as follows: (URF(ug/m3)-1 * 70kg * 1000ug/mg)/20day/m3

Intake Inhalation = EPC * (IR*ED*EF*(1/PEF))/(AT*BW)

= EPC * 2.41E-11

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
PRG - Preliminary Remediation Goal
EPC = Exposure Point Concentration

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR (m3/day)	Inhalation Rate	13
EF, day/yr	Exposure Frequency	150
AT, days	Averaging Time	25550
PEF, m3/kg	Particulate Emission Factor	1.36E+09
ED, years	Exposure duration	30
BW, kg	Body Weight	70

Table H3-8
Carcinogenic Risks - Inhalation Exposure - On-Site Worker

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium:	Airborne Particluates
Exposure Point:	Breathing Zone
Receptor Population:	On-Site Worker

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Inhalation PRG[1] (Industrial) (mg/kg)	Unit Risk Factor[2] (ug/m3)-1	Chemical Intake (mg/kg-day)	Cancer Slope Factor 1/(mg/kg-day)	Cancer Risks
Inhalation							
	4,4-DDT	0.007	55000	9.70E-05	1.15E-13	3.4E-01	3.93E-14
	Aldrin	0.004	1100	4.90E-03	6.41E-14	1.7E+01	1.09E-12
	Arsenic	23.1	1400	4.30E-03	3.70E-10	1.5E+01	5.56E-09
	Benzene	0.016	1.3	7.80E-06	2.57E-13	2.7E-02	6.93E-15
	Beryllium	2.100	2600	2.40E-03	3.37E-11	8.4E+00	2.83E-10
	DEHP	2.300	1300000		3.69E-11	1.4E-02	5.16E-13
	Dieldrin	0.013	1200	4.60E-03	2.08E-13	1.6E+01	3.34E-12
	Gamma BHC	0.004	14000		6.25E-14		
	Heptachlor Epoxide	0.00087	2100	2.60E-03	1.40E-14	9.1E+00	1.28E-13
	Methylene Chloride	0.090	22	4.70E-07	1.44E-12	1.6E-03	2.31E-15
	Trichloroethene	0.058	0.12		9.30E-13	4.0E-01	3.72E-13
	Vinyl chloride	0.029	0.93	4.40E-06	4.65E-13	1.5E-02	6.97E-15
	Chloroform	0.003	12	2.30E-05	4.81E-14	8.1E-02	3.87E-15
	Cadmium	1.600	900	1.80E-03	2.57E-11	6.3E+00	1.62E-10
	Cobalt	18.350	1900	2.80E-03	2.94E-10	9.8E+00	2.88E-09
	PCB-1242	0.098	9400		1.57E-12	2.0E+00	3.14E-12
	PCB-1248	0.064	9400		1.03E-12	2.0E+00	2.05E-12
	PCB-1254	1.400	9400		2.24E-11	2.0E+00	4.49E-11
	PCB-1260	0.600	9400		9.62E-12	2.0E+00	1.92E-11
	Benzo(a)pyrene	16	2600	8.80E-04	2.57E-10	3.1E+00	7.90E-10
	Benzo(a)anthracene	19	26000	8.80E-04	3.05E-10	3.1E+00	9.38E-10
	Benzo(b)fluoranthene	21	26000	8.80E-04	3.37E-10	3.1E+00	1.04E-09
	Benzo(k)fluoranthene	8.4	260000	8.80E-04	1.35E-10	3.1E+00	4.15E-10
	Chrysene	19	2600000	8.80E-04	3.05E-10	3.1E+00	9.38E-10
	Indeno(1,2,3-cd)pyrene	9.7	26000	8.80E-04	1.56E-10	3.1E+00	4.79E-10
	Dibenz(a,h)anthracene	1.7	2600	8.80E-04	2.73E-11	3.1E+00	8.40E-11
						Total Cancer Risk Across All Exposure Routes/Pathways	1.4E-08

(1) - USEPA Region 9 PRGs specific to the inhalation route of exposure

(2) - Unit risk factors are converted to Cancer Slope Factor as follows: (URF(ug/m3)-1 * 70kg * 1000ug/mg)/20day/m3

Intake Inhalation = EPC*(IR*ET*EF*ED*(1/PEF))/(AT*BW)

= EPC * 1.60E-11

mg/kg = milligram/kilogram
mg/kg - day = milligram/kilogram - day
EPC = Exposure Point Concentration
PRG - Preliminary Remediation Goal

EPC, mg/kg	Exposure Point Concentration	chem-specific
IR, m3/hour	Inhalation Rate	1.3
ET, hours/day	Exposure Time	8
EF, day/yr	Exposure Frequency	150
AT, day	Averaging Time	25550
ED, years	Exposure duration	25
BW, kg	Body Weight	70
PEF, m3/kg	Particulate Emission Factor	1.36E+09

Table H3-9
Carcinogenic Risks - Inhalation Exposure - Construction Worker

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium:	Airborne Particluates
Exposure Point:	Breathing Zone
Receptor Population:	Construction Worker

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Inhalation PRG[1] (Industrial) (mg/kg)	Unit Risk Factor[2] (ug/m3)-1	Contaminant Emission Flux[3] (g/m2-s)	EPC in Air[4] (mg/m3)	Chemical Intake (mg/kg-day)	Cancer Slope Factor 1/(mg/kg-day)	Cancer Risks
Inhalation									
	4,4-DDT	0.007	NA	9.70E-05	7.49E-13	1.68E-08	1.69E-11	3.40E-01	5.75E-12
	Aldrin	0.004	NA	4.90E-03	4.16E-13	9.36E-09	9.41E-12	1.72E+01	1.61E-10
	Arsenic	22.3	NA	4.30E-03	2.32E-09	5.22E-05	5.25E-08	1.51E+01	7.90E-07
	Benzene	0.016	NA	7.80E-06	1.66E-12	3.74E-08	3.76E-11	2.73E-02	1.03E-12
	Beryllium	2.100	NA	2.40E-03	2.18E-10	4.91E-06	4.94E-09	8.40E+00	4.15E-08
	DEHP	2.300	NA		2.39E-10	5.38E-06	5.41E-09	1.40E-02	7.58E-11
	Dieldrin	0.013	NA	4.60E-03	1.35E-12	3.04E-08	3.06E-11	1.61E+01	4.92E-10
	Gamma BHC	0.004	NA		4.06E-13	9.12E-09	9.18E-12		
	Heptachlor Epoxide	0.00087	NA	2.60E-03	9.09E-14	2.04E-09	2.06E-12	9.10E+00	1.87E-11
	Methylene Chloride	0.090	NA	4.70E-07	9.36E-12	2.10E-07	2.12E-10	1.65E-03	3.48E-13
	Trichloroethene	0.058	NA		6.03E-12	1.36E-07	1.36E-10	4.00E-01	5.46E-11
	Vinyl chloride	0.029	NA	4.40E-06	3.02E-12	6.78E-08	6.82E-11	1.54E-02	1.05E-12
	Chloroform	0.003	NA	2.30E-05	3.12E-13	7.02E-09	7.06E-12	8.05E-02	5.68E-13
	Cadmium	1.600	NA	1.80E-03	1.66E-10	3.74E-06	3.76E-09	6.30E+00	2.37E-08
	Cobalt	18.350	NA	2.80E-03	1.91E-09	4.29E-05	4.32E-08	9.80E+00	4.23E-07
	PCB-1242	0.098	NA		1.02E-11	2.29E-07	2.31E-10	2.00E+00	4.61E-10
	PCB-1248	0.064	NA		6.66E-12	1.50E-07	1.51E-10	2.00E+00	3.01E-10
	PCB-1254	1.400	NA		1.46E-10	3.27E-06	3.29E-09	2.00E+00	6.59E-09
	PCB-1260	0.600	NA		6.24E-11	1.40E-06	1.41E-09	2.00E+00	2.82E-09
	Benzo(a)pyrene	16	NA	8.80E-04	1.66E-09	3.74E-05	3.76E-08	3.08E+00	1.16E-07
	Benzo(a)anthracene	19	NA	8.80E-04	1.98E-09	4.44E-05	4.47E-08	3.08E+00	1.38E-07
	Benzo(b)fluoranthene	21	NA	8.80E-04	2.18E-09	4.91E-05	4.94E-08	3.08E+00	1.52E-07
	Benzo(k)fluoranthene	8.4	NA	8.80E-04	8.74E-10	1.96E-05	1.98E-08	3.08E+00	6.09E-08
	Chrysene	19	NA	8.80E-04	1.98E-09	4.44E-05	4.47E-08	3.08E+00	1.38E-07
	Indeno(1,2,3-cd)pyrene	9.7	NA	8.80E-04	1.01E-09	2.27E-05	2.28E-08	3.08E+00	7.03E-08
	Dibenz(a,h)anthracene	1.75	NA	8.80E-04	1.82E-10	4.09E-06	4.12E-09	3.08E+00	1.27E-08
								Total Cancer Risk Across All Exposure Routes/Pathways	2.0E-06

(1) -USEPA Region 9 PRGs specific to inhalation route of exposure - Not applicable to this scenario

(2) - Unit risk factors are converted to Cancer Slope Factor as follows: (URF(ug/m3)-1 * 70kg * 1000ug/mg)/20day/m3

Intake Inhalation = EPCair * (IR * ET* EF* ED)/(AT*BW)

= EPCair * 1.01E-03

Csair, mg/m3	Exposure Point Concentration -air	chem-specific	
CSsoil, mg/kg	Exposure Point Concentration soil	chem-specific	
IR, m3/day	Inhalation Rate	1.3	
ET, hours/hours	Exposure Time	8.00	
EF, day/yr	Exposure Frequency	173	
AT, days	Averaging Time	25550	
ED, years	Exposure duration	1	
BW, kg	Body Weight	70	
A, m2	source area surface area	10,120	2.5-acre
L, m	width of source area	100	square area
V, m/s	average windspeed	2.25	USEPA default
H, m	Box Height	2	USEPA default
E , g/m2-sec	Heavy Construction Emission Factor	1.04E-04	
CF kg/mg	Conversion Factor	1.00E-06	

mg/kg = milligram/kilogram

mg/kg - day = milligram/kilogram - day

EPC = Exposure Point Concentration

PRG - Preliminary Remediation Goal

NA - Not Applicable

(3)- Contaminant Emission Flux (Q) = CSsoil * E (1E-4) * CF (1E-6)

(4) - Concentration in air = (Q * A * 1000mg/g)/(L * V * H)

Table H3-10

Non Carcinogenic Risks - Predicted Fugitive Dust Concentrations

Scenario Timeframe:	Future
Medium:	Particulates
Exposure Point:	Breathing Zone
Exposure Medium:	Airborne Particluates
Receptor Population:	Resident

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Airborne Dust Concentration [EPC/PEF (mg/m3)]	Chronic Reference Concentration (mg/m3)	Hazard Index
Inhalation	Aluminum	30700	2.26E-05	4.00E-03	5.64E-03
	Barium	169	1.24E-07	5.00E-04	2.49E-04
	Beryllium	2.1	1.54E-09	2.00E-05	7.72E-05
	Cobalt	18.35	1.35E-08	2.00E-05	6.75E-04
	Mangansese	1300	9.56E-07	5.00E-05	1.91E-02
	Mercury	0.51	3.75E-10	3.00E-04	1.25E-06
	Silver	7.4	5.44E-09	1.00E-05	5.44E-04
	Naphthalene	1.25	9.19E-10	3.00E-03	3.06E-07
	2-Hexanone	0.041	3.01E-11	5.00E-03	6.03E-09
	4-Methyl-2-Pentanone	2.9	2.13E-09	3.00E+00	7.11E-10
	Benzene	0.016	1.18E-11	3.00E-02	3.92E-10
	Carbon Disulfide	0.004	2.94E-12	7.00E-01	4.20E-12
	Chloroform	0.003	2.21E-12	5.00E-02	4.41E-11
	Ethylbenzene	61	4.49E-08	1.00E+00	4.49E-08
	M-P-Xylene	200	1.47E-07	1.00E-01	1.47E-06
	O-Xylene	79	5.81E-08	1.00E-01	5.81E-07
	Toluene	0.49	3.60E-10	4.00E-01	9.01E-10
	Trichloroethene	0.058	4.26E-11	4.00E-02	1.07E-09
	Vinyl Chloride	0.029	2.13E-11	1.00E-01	2.13E-10
					2.6E-02

mg/kg = milligram/kilogram

mg/kg - day = milligram/kilogram - day

EPC = Exposure Point Concentration

PEF - Particulate Emission Factor

Table H3-11
Carcinogenic Risks - Predicted Fugitive Dust Concentrations

Scenario Timeframe:	Future
Medium:	All Soils
Exposure Medium:	Airborne Particluates
Exposure Point:	Breathing Zone
Receptor Population:	Resident

Exposure Route	Chemical of Potential Concern	EPC (mg/kg)	Airborne Dust Concentration [EPC/PEF (ug/m3)]	Unit Risk Factor[2] (ug/m3)-1	Cancer Risk
Inhalation					
	4,4-DDT	0.007	5.29E-09	9.70E-05	5.14E-13
	Aldrin	0.004	3.01E-09	4.90E-03	1.48E-11
	Arsenic	22.3	1.64E-05	4.30E-03	7.05E-08
	Benzene	0.016	1.18E-08	7.80E-06	9.18E-14
	Beryllium	2.100	1.54E-06	2.40E-03	3.71E-09
	DEHP	2.300	1.69E-06		
	Dieldrin	0.013	9.56E-09	4.60E-03	4.40E-11
	Gamma BHC	0.004	2.87E-09		
	Heptachlor Epoxide	0.00087	6.40E-10	2.60E-03	1.66E-12
	Methylene Chloride	0.090	6.62E-08	4.70E-07	3.11E-14
	Trichloroethene	0.058	4.26E-08		
	Vinyl chloride	0.029	2.13E-08	4.40E-06	9.38E-14
	Chloroform	0.003	2.21E-09	2.30E-05	5.07E-14
	Cadmium	1.600	1.18E-06	1.80E-03	2.12E-09
	Cobalt	18.350	1.35E-05	2.80E-03	3.78E-08
	PCB-1242	0.098	7.21E-08		
	PCB-1248	0.064	4.71E-08		
	PCB-1254	1.400	1.03E-06		
	PCB-1260	0.600	4.41E-07		
	Benzo(a)pyrene	16	1.18E-05	8.80E-04	1.04E-08
	Benzo(a)anthracene	19	1.40E-05	8.80E-04	1.23E-08
	Benzo(b)fluoranthene	21	1.54E-05	8.80E-04	1.36E-08
	Benzo(k)fluoranthene	8.4	6.18E-06	8.80E-04	5.44E-09
	Chrysene	19	1.40E-05	8.80E-04	1.23E-08
	Indeno(1,2,3-cd)pyrene	9.7	7.13E-06	8.80E-04	6.28E-09
	Dibenz(a,h)anthracene	1.77	1.30E-06	8.80E-04	1.15E-09
					1.8E-07

mg/kg = milligram/kilogram

mg/kg - day = milligram/kilogram - day

EPC = Exposure Point Concentration

PEF - Particulate Emission Factor

FOCUSED HUMAN HEALTH RISK EVALUATION

At the request of MBOH, two focused risk evaluations were conducted to evaluate the potential risk to human health from inhalation exposure to fugitive dust. Although no compounds were detected in soil at concentrations above their respective USEPA Region 9 Inhalation Preliminary Remediation Goal (PRG), these quantitative risk assessments were performed consistent with USEPA guidance which states that inhalation of fugitive dusts should be evaluated for sites with proposed future commercial/industrial land use. The focused risk evaluations were based on analytical results from soil samples collected throughout Bailey Point during Fall 2001 and Spring 2002 and current USEPA and MDEP risk assessment guidance (MDEP, 1994 and 2004; USEPA, 1991a, USEPA, 1994, USEPA, 2001b and USEPA, 2002b).

Exposure Assessment

Inhalation exposure to fugitive dust can be a significant route of exposure during site remediation or construction as dust may be generated by wind erosion of exposed soils. Consistent with USEPA guidance, this exposure assessment evaluates exposure to construction workers present throughout a construction project as well as exposures to nearby off-site residents (USEPA, 2001b). These receptors are potentially subject to higher contaminant exposures due to increased emissions during construction activities. However, to be consistent with the Baseline HHRA, an on-site worker exposure was also evaluated.

Exposure Scenarios: The following exposure assumptions were used and are consistent with standard USEPA and MDEP guidance (MDEP, 1994, USEPA 1991a, 1997b and 2001b):

Resident: A person resides at or near the site for 30 years (6-years as a child and 24 years as an adult) and is exposed to soils through inhalation of fugitive dust generated by wind erosion. An exposure frequency of 150 days per year for a 30-year exposure duration was assumed (USEPA, 1994). An inhalation rate of 13 m^3/day for an adult and 8.1 m^3/day for a child was assumed over a 24 hour exposure duration (USEPA, 1997b). The USEPA default particulate emission factor (PEF) of 1.36×10^9 m^3/kg was used to relate the soil contaminant concentration to a dust particulate contaminant concentration (USEPA, 2001b).

On-Site Worker: An On-site worker is exposed to soils through the inhalation of fugitive dust. An inhalation rate of 1.3 m^3/hour over an 8 hour/day exposure time was assumed for an exposure frequency of 150 days per year over a 25 year exposure duration (USEPA, 1994 and 1997b). The USEPA default PEF of 1.36×10^9 m^3/kg was used to relate the soil contaminant concentration to a dust particulate contaminant concentration (USEPA, 2001b).

Construction Worker: A construction worker is exposed to soils through the inhalation of fugitive dust generated as a result of construction related activities (i.e., excavation and vehicle traffic on unpaved roads). The construction worker is assumed to have a more intense exposure to soil contaminants resulting from the increased "dust" level in the breathing zone. The construction worker, however, is assumed to have a shorter exposure duration than the on-site worker as most construction projects are expected to last one-year. An inhalation rate of 1.3 m^3/hour over an 8 hour/day exposure time was assumed to occur 173 days over a 1-year exposure duration (USEPA, 1994, 1997b and 2001b).

The USEPA default PEF could not be used for the construction worker scenario as it is likely to underestimate dust concentrations in air resulting from construction activities. Although emission factors are available for specific construction activities, their application requires more information on the types, locations and schedule of construction activities proposed for this site than is currently available. Therefore, dust emission for the construction worker was estimated using the construction emission factor for Total Suspended Particulate (TSP) emissions recommended by USEPA of 1.2 tons/acre/month or 1.04×10^{-4} g/m^2-sec (USEPA, 1993d). Using this factor, the contaminant emissions from soil can calculated as:

$$\mathbf{Q = E \times C \times 10^{-6}}$$

Where:

Q = contaminant emissions flux (g/m^2-s)
E = heavy construction dust emissions factor (g/m^2-s)
C = contaminant concentration in soil (mg/kg)
10^{-6} = conversion factor

A box model was used to calculate the contaminant concentrations in the air over the source area. The box model assumed the air concentrations within a box is proportional to the emission rate and wind speed across the source area:

$$\mathbf{C_c = \frac{Q \times A \times 1{,}000 mg/g}{L \times V \times H}}$$

Where:

C_c = concentration in air
Q = surface emission flux (g/m^2-s)
A = source area m^2
L = width of source area perpendicular to wind direction (m)
V = average wind speed (m/s)
H = box height (m)

A source area (A) of 2.5 acres square (10,120 m^2) corresponding to a width (L) of 100 m was assumed as a reasonable estimate of an area of the site undergoing remediation. This was based on the discrete areas of contamination that have been characterized and may require remediation. The USEPA default wind speed and box height values were used as model inputs.

The exposure parameters for these scenarios are presented in **Table H3-1.**

Compounds of Potential Concern (COPCs) and Exposure Point Concentrations (EPCs): All compounds detected in soil throughout Bailey Point were retained as COPCs. This was done to provide an overly conservative estimate of risk. A total of 73 compounds were detected in at least one soil sample (all depths) and were retained for the focused risk evaluation. The Exposure Point Concentration (EPCs) for each COPC was set at the maximum detected concentration. As such, the exposure scenarios assume long-term concurrent exposure to the maximum detected contaminant concentration. This is an extremely conservative assumption as the location of the maximum detected concentrations varied across the site. Actual exposure and subsequent risk will be much less than estimated in this evaluation. The COPCs and EPCs are presented in **Table H3-2**.

Toxicity Assessment

Quantitative estimates of inhalation toxicity (e.g., Chronic and Subchronic Reference Concentrations (RfCs) and Unit Risk Factors (URFs)) were obtained from the USEPA Integrated Risk and Information System (IRIS) or National Center for Environmental Assessment (NCEA) for the COPCs. RfCs for carcinogenic compounds were identified and used to evaluate the noncarcinogenic risks from exposure to carcinogenic compounds. RfCs and URFs can be converted to inhalation Reference Dose (RfDs) and inhalation cancer slope factors (CSF) using the following equations:

Inhalation RfD (mg/kg-day) = RfC (mg/m^3) x 20 m^3/day x 1/70 kg

Inhalation CSF $(mg/kg\text{-}day)^{-1}$ = URF $(ug/m^3)^{-1}$ x day/20 m^3 x 70 kg x 10^3 ug/mg

Chronic URF and/or RfC were available for 19 of the 73 soil COPCs as many of these compounds are not considered to be toxic through inhalation exposure (USEPA, 2001b). Subchronic RfC were available for 16 of the 73 soil COPCs. A summary of the toxicity information for the soil COPCs is presented in **Table H3-2**.

Risk Assessment

Two quantitative risk evaluations were conducted and are presented in this section. The first evaluation is based on less than lifetime exposure and provides estimates of noncancer hazards and carcinogenic risk using the standard USPEPA risk assessment methodology and converted RfC and URFs (USEPA, 1989). The second evaluation is based on a continuous exposure to a predicted air concentration and was conducted at the request of MDEP to address the limitations in applying converted RfC and URFs to less than lifetime (i.e., acute and sub chronic) exposures (USEPA, 2002b). This evaluation includes a comparison of predicted air concentrations to RfC for noncarcinogenic COPCs and multiplying the predicted air concentrations by the URF for carcinogenic COPCs.

Less Than Lifetime Exposure Risks: Based on standard USEPA methodology, the non-carcinogenic risks from exposure to fugitive dust are expressed in terms of a Hazard Index (HI), which is calculated by dividing the estimated exposure dose by the inhalation RfD (USEPA, 2001b):

Hazard Index (HI) = Exposure Dose (mg/kg-day) / Inhalation RfD (mg/kg-day)

If the HI is less than 1.0, no adverse health effects are anticipated from the predicted exposure dose level. If the HI is greater than 1, the predicted exposure dose level could potentially cause adverse effects (USEPA, 1989c).

The non-carcinogenic risks associated with exposure to fugitive dust from Bailey Point are presented in **Table H3-3 through H3-6** for the resident, on-site worker, 6-year childhood exposure and construction worker scenarios. All non cancer risks were below an HI of 1.0 and include HI = 0.007 (resident), HI = 0.006 (on-site worker), HI = 0.02 (child) and HI = 0.05 (construction worker).

The carcinogenic risk from exposure to soils is evaluated by multiplying the estimated exposure dose of each carcinogenic COPC by its respective inhalation CSF to obtain an estimate of incremental risk, as follows:

Carcinogenic Risk = Exposure Dose (mg/kg-day) x Inhalation CSF $(mg/kg\text{-}day)^{-1}$

The CSF converts the estimated daily intake of a chemical averaged over a lifetime of exposure to an incremental risk of an individual developing cancer. The CSF used in these calculations is often the upper 95-percentile confidence limit of the probability of a response based on experimental data. As such, the carcinogenic risk estimates presented in this assessment are considered to be an upper-bound estimate of risk. The "true risk" to an individual is likely to be much less than predicted in this assessment (USEPA, 1989c).

USEPA guidelines state that the total incremental carcinogenic risk for an individual resulting from exposure at a RCRA Corrective Action site should not exceed a target risk range of $1x10^{-6}$ to $1x10^{-4}$ (USEPA, 1990). The MDEP has set $1x10^{-5}$ as the upper bound for an acceptable incremental lifetime cancer risk (MDEP, 1994).

The incremental carcinogenic risk associated with exposure to fugitive dust at Bailey Point are presented in **Table H3-7, H3-8 and H3-9** for resident, on-site worker and construction worker scenarios, respectively. Cancer risks were estimated by multiplying the exposure dose of each COPC by its inhalation CSF. These risks were then summed to provide a total site incremental cancer risk. All cancer risks were below the MDEP target risk of 10^{-5} and the USEPA target risk range of 10^{-4} to 10^{-6} and include 2.0 x 10^{-8} (resident), 1.4 x 10^{-8} (on site worker) and 2.0 x 10^{-6} (construction worker). Inhalation of naturally occurring arsenic in soils contributed significantly to the cancer risks for the construction worker. Arsenic is present throughout Bailey Point at concentrations associated with background conditions (see Section 4.7.1 of the Bailey Point RFI). Eliminating arsenic from the risk calculation results in a cancer risk of 1.2×10^{-6}.

Continuous Lifetime Exposure: To address the limitations of applying converted RfCs and URFs to less than lifetime exposure, the predicted long-term air concentrations were compared directly to RfCs for noncarcinogenic compounds and multiplied by URFs for carcinogenic compounds (USEPA, 2002b). This evaluation assumes that exposure occurs continuously over a lifetime. The predicted airborne dust air concentrations (mg/m^3) for each soil COPC was calculated by dividing the maximum detected soil concentration (mg/kg) by the USEPA PEF of 1.36×10^9 (m^3/kg). The noncancer and cancer risks associated with exposure to airborne dust are presented in **Table H3-10 and H3-11**, respectively. Both risk evaluations are below their respective target risk level. The noncarcinogenic risks associated with exposure to airborne dust is 0.03, below the target HI of 1.0 and the carcinogenic risks associated with exposure to airborne dust is 1.8×10^{-7}, below the target risk level of 10^{-5}.

Summary and Conclusions

The purpose of these two focused risk evaluations was to evaluate potential human health risks from exposure to fugitive dust. These risk assessments were conducted in accordance with USEPA and MDEP guidance and is consistent with standard USEPA and MDEP methodology. The exposure scenarios and assumptions used in these evaluations were overly conservative including long-term repetitive exposure to the maximum detected chemical concentration. However, even with these assumptions, the noncarcinogenic risk estimates are well below the target HI of 1.0 and the carcinogenic risk estimates are below the MDEP target risk level and the USEPA target risk range. These risk estimates support the conclusion that inhalation of fugitive dust is not a significant route of exposure at this site.

Table H4-C1
Summary of Contaminant Concentrations in Produce
Plant Area

Chemical	Concentration in Soil - Cs (mg/kg)	Concentration in Aboveground Produce (mg/kg DW)	Concentration in Belowground Produce (mg/kg DW)	Total Produce Concentration (dry-weight basis) (mg/kg)	Concentration in Aboveground Produce (mg/kg wet weight)	Concentration in Belowground Produce (mg/kg wet weight)	Total Produce Concentration (wet-weight basis) (mg/kg)
ALUMINUM	1.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	9.8E+00	6.2E-02	7.9E-02	6.5E-02	7.8E-03	1.7E-02	9.2E-03
BENZO(A)ANTHRACENE	3.8E+00	7.8E-02	8.1E-02	7.8E-02	9.8E-03	1.8E-02	1.1E-02
BENZO(A)PYRENE	3.5E+00	3.8E-02	4.3E-02	3.9E-02	4.8E-03	9.7E-03	5.5E-03
BENZO(B)FLUORANTHENE	4.4E+00	4.4E-02	7.3E-02	4.8E-02	5.5E-03	1.6E-02	7.0E-03
BENZO(K)FLUORANTHENE	3.8E+00	3.9E-02	6.4E-02	4.3E-02	4.9E-03	1.4E-02	6.2E-03
BENZO[G,H,I]PERYLENE	2.0E+00	2.0E-02	3.3E-02	2.2E-02	2.5E-03	7.4E-03	3.2E-03
CARBAZOLE	1.4E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CHRYSENE	1.9E+00	3.5E-02	3.9E-02	3.6E-02	4.5E-03	8.6E-03	5.1E-03
COPPER	2.0E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIBENZO(A,H)ANTHRACENE	7.8E-01	4.9E-03	1.1E-02	5.8E-03	6.2E-04	2.5E-03	8.8E-04
ENDRIN ALDEHYDE	4.5E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
INDENO(1,2,3-CD)PYRENE	2.4E+00	9.2E-03	2.8E-02	1.2E-02	1.2E-03	6.2E-03	1.9E-03
IRON	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
LEAD	1.3E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MANGANESE	8.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
total PCBs	1.1E-01	1.1E-03	1.6E-02	3.2E-03	1.4E-04	3.5E-03	6.2E-04
2-METHYLNAPTHALENE	1.7E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PHENANTHRENE	7.1E+00	6.4E-01	1.1E-01	5.6E-01	8.1E-02	2.4E-02	7.3E-02
SODIUM	2.9E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
THALLIUM	4.2E-01	3.6E-04	1.7E-04	3.3E-04	4.5E-05	3.7E-05	4.4E-05
VANADIUM	3.2E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Fraction of crop intake as aboveground produce	8.6E-01
Fraction of crop intake as root crops (belowground	1.4E-01

Wet-to-dry weight conversion factor - aboveground produce (grams dry/grams wet)	1.3E-01
Wet-to-dry weight conversion factor - belowground produce (grams dry/grams wet)	2.2E-01

Table H4-C2
Contaminant Concentration in Above Ground Produce
Plant Area

$$\Pr_{ag} = Cs \times Br_{ag}$$

Symbol	Value	Description	Units
Cs	measured	Average soil concentration over exposure duration	mg/kg
Prag	chemical-specific	Concentration in aboveground produce due to root uptake	mg/kg DW
Br_{ag}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce	unitless
Br_{forage}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce - livestock foage and silage	unitless

Chemical	Cs (mg/kg)	Br_{ag}	Pr_{ag} - (mg/kg DW)
2-METHYLNAPHTHALENE	1.70E+00	0.00E+00	0.00E+00
ALUMINUM	1.22E+04	0.00E+00	0.00E+00
ARSENIC	9.84E+00	6.33E-03	6.23E-02
BENZO(A)ANTHRACENE	3.84E+00	2.02E-02	7.76E-02
BENZO(A)PYRENE	3.45E+00	1.11E-02	3.83E-02
BENZO(B)FLUORANTHENE	4.37E+00	1.00E-02	4.37E-02
BENZO(K)FLUORANTHENE	3.84E+00	1.02E-02	3.92E-02
BENZO[G,H,I]PERYLENE	2.00E+00	1.00E-02	2.00E-02
CARBAZOLE	1.40E+00	0.00E+00	0.00E+00
CHRYSENE	1.90E+00	1.87E-02	3.55E-02
COPPER	1.96E+02	0.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	7.77E-01	6.36E-03	4.94E-03
INDENO(1,2,3-CD)PYRENE	2.36E+00	3.90E-03	9.20E-03
IRON	1.74E+04	0.00E+00	0.00E+00
LEAD	1.30E+01	0.00E+00	0.00E+00
MANGANESE	8.35E+02	0.00E+00	0.00E+00
PCB-1016	0.00E+00	2.91E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	0.00E+00
PCB-1242	1.50E-02	0.00E+00	0.00E+00
PCB-1248	7.00E-02	0.00E+00	0.00E+00
total PCBs	1.12E-01	1.00E-02	1.12E-03
PCB-1260	1.40E-02	0.00E+00	0.00E+00
PHENANTHRENE	7.10E+00	9.00E-02	6.39E-01
SODIUM	2.94E+02	0.00E+00	0.00E+00
THALLIUM	4.20E-01	8.58E-04	3.60E-04
VANADIUM	3.16E+01	0.00E+00	0.00E+00

Table H4-C3
Contaminant Concentration in Below Ground Produce
Plant Area

$$\Pr_{bg} = Cs \times Br_{rootveg} \times VG_{rootveg}$$

Symbol	Value	Description	Units
Prbg	calculated	Concentration of COPC in belowground produce due to root uptake	mg COPC/kg DW
Cs	measured	Average soil concentration over exposure duration	mg/kg
$Br_{rootveg}$	chemical-specific	Plant-soil bioconcentration factor for belowground produce	unitless
$VG_{rootveg}$	chemical-specific	Empirical correction factor for belowground produce	unitless

Chemical	**Cs (mg/kg in soil)**	**$Br_{rootveg}$**	**$VG_{rootveg}$**	**Pr_{bg} - (mg/kg)**
2-METHYLNAPHTHALENE	1.70E+00	0.00E+00	1.00E+00	0.00E+00
ALUMINUM	1.22E+04	0.00E+00	1.00E+00	0.00E+00
ARSENIC	9.84E+00	8.00E-03	1.00E+00	7.87E-02
BENZO(A)ANTHRACENE	3.84E+00	2.11E+00	1.00E-02	8.10E-02
BENZO(A)PYRENE	3.45E+00	1.26E+00	1.00E-02	4.35E-02
BENZO(B)FLUORANTHENE	4.37E+00	1.66E+00	1.00E-02	7.25E-02
BENZO(K)FLUORANTHENE	3.84E+00	1.66E+00	1.00E-02	6.37E-02
BENZO[G,H,I]PERYLENE	2.00E+00	1.66E+00	1.00E-02	3.32E-02
CARBAZOLE	1.40E+00	0.00E+00	1.00E+00	0.00E+00
CHRYSENE	1.90E+00	2.05E+00	1.00E-02	3.90E-02
COPPER	1.96E+02	0.00E+00	1.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	7.77E-01	1.43E+00	1.00E-02	1.11E-02
INDENO(1,2,3-CD)PYRENE	2.36E+00	1.19E+00	1.00E-02	2.81E-02
IRON	1.74E+04	0.00E+00	1.00E+00	0.00E+00
LEAD	1.30E+01	0.00E+00	1.00E+00	0.00E+00
MANGANESE	8.35E+02	0.00E+00	1.00E+00	0.00E+00
PCB-1016	0.00E+00	1.45E+01	1.00E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1242	1.50E-02	0.00E+00	1.00E+00	0.00E+00
PCB-1248	7.00E-02	0.00E+00	1.00E+00	0.00E+00
total PCBs	1.12E-01	1.42E+01	1.00E-02	1.59E-02
PCB-1260	1.40E-02	0.00E+00	1.00E+00	0.00E+00
PHENANTHRENE	7.10E+00	1.49E+00	1.00E-02	1.06E-01
SODIUM	2.94E+02	0.00E+00	1.00E-02	0.00E+00
THALLIUM	4.20E-01	4.00E-04	1.00E+00	1.68E-04
VANADIUM	3.16E+01	0.00E+00	1.00E+00	0.00E+00

Table H4-D1
Summary of Contaminant Concentrations in Produce
Warehouse 2/3

Chemical	Concentration in Soil - Cs (mg/kg)	Concentration in Aboveground Produce (mg/kg DW)	Concentration in Belowground Produce (mg/kg DW)	Total Produce Concentration (dry-weight basis) (mg/kg)	Concentration in Aboveground Produce (mg/kg wet weight)	Concentration in Belowground Produce (mg/kg wet weight)	Total Produce Concentration (wet-weight basis) (mg/kg)
ALUMINUM	2.1E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	1.3E+01	7.9E-02	1.0E-01	8.2E-02	1.0E-02	2.2E-02	1.2E-02
BENZO(A)ANTHRACENE	2.7E+00	5.4E-02	5.7E-02	5.5E-02	6.8E-03	1.3E-02	7.7E-03
BENZO(A)PYRENE	2.2E+00	2.4E-02	2.7E-02	2.4E-02	3.0E-03	6.0E-03	3.4E-03
BENZO(B)FLUORANTHENE	3.5E+00	3.5E-02	5.8E-02	3.8E-02	4.4E-03	1.3E-02	5.6E-03
BENZO(K)FLUORANTHENE	2.3E+00	2.3E-02	3.8E-02	2.5E-02	2.9E-03	8.3E-03	3.7E-03
BENZO[G,H,I]PERYLENE	1.1E+00	1.1E-02	1.9E-02	1.2E-02	1.4E-03	4.2E-03	1.8E-03
CARBAZOLE	2.7E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CHRYSENE	1.1E+00	2.1E-02	2.3E-02	2.1E-02	2.7E-03	5.1E-03	3.0E-03
DIBENZO(A,H)ANTHRACENE	3.1E-01	2.0E-03	4.5E-03	2.3E-03	2.5E-04	9.9E-04	3.5E-04
INDENO(1,2,3-CD)PYRENE	1.5E+00	5.7E-03	1.7E-02	7.3E-03	7.1E-04	3.8E-03	1.1E-03
IRON	2.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
LEAD	2.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total PCBs	7.5E-01	7.5E-03	1.1E-01	2.1E-02	9.4E-04	2.4E-02	4.1E-03
MANGANESE	7.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PHENANTHRENE	1.5E+00	1.4E-01	2.2E-02	1.2E-01	1.7E-02	4.9E-03	1.5E-02
SODIUM	1.7E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Fraction of crop intake as aboveground produce	8.6E-01
Fraction of crop intake as root crops (belowground	1.4E-01

Wet-to-dry weight conversion factor - aboveground produce (grams dry/grams wet)	1.3E-01
Wet-to-dry weight conversion factor - belowground produce (grams dry/grams wet)	2.2E-01

Table H4-D2
Contaminant Concentration in Above Ground Produce
Warehouse 2/3

$$\Pr_{ag} = Cs \times Br_{ag}$$

Symbol	Value	Description	Units
Cs	measured	Average soil concentration over exposure duration	mg/kg
Prag	chemical-specific	Concentration in aboveground produce due to root uptake	mg/kg DW
Br_{ag}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce	unitless
Br_{forage}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce - livestock foage and silage	unitless

Chemical	Cs (mg/kg)	Br_{ag}	Pr_{ag} - (mg/kg DW)
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	0.00E+00
ALUMINUM	2.11E+04	0.00E+00	0.00E+00
ARSENIC	1.25E+01	6.33E-03	7.93E-02
BENZO(A)ANTHRACENE	2.69E+00	2.02E-02	5.43E-02
BENZO(A)PYRENE	2.16E+00	1.11E-02	2.40E-02
BENZO(B)FLUORANTHENE	3.49E+00	1.00E-02	3.49E-02
BENZO(K)FLUORANTHENE	2.26E+00	1.02E-02	2.31E-02
BENZO[G,H,I]PERYLENE	1.14E+00	1.00E-02	1.14E-02
CARBAZOLE	2.74E-01	0.00E+00	0.00E+00
CHRYSENE	1.13E+00	1.87E-02	2.11E-02
COPPER	0.00E+00	0.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	3.13E-01	6.36E-03	1.99E-03
INDENO(1,2,3-CD)PYRENE	1.45E+00	3.90E-03	5.66E-03
IRON	2.75E+04	0.00E+00	0.00E+00
LEAD	2.43E+02	0.00E+00	0.00E+00
MANGANESE	7.44E+02	0.00E+00	0.00E+00
PCB-1016	0.00E+00	2.91E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	0.00E+00
PCB-1242	0.00E+00	0.00E+00	0.00E+00
PCB-1248	0.00E+00	0.00E+00	0.00E+00
PCB-total	7.48E-01	1.00E-02	7.48E-03
PCB-1260	2.74E-01	0.00E+00	0.00E+00
PHENANTHRENE	1.50E+00	9.00E-02	1.35E-01
SODIUM	1.67E+02	0.00E+00	0.00E+00
THALLIUM	0.00E+00	8.58E-04	0.00E+00
VANADIUM	0.00E+00	0.00E+00	0.00E+00

Table H4-D3
Contaminant Concentration in Below Ground Produce
Warehouse 2/3

$$\Pr_{bg} = Cs \times Br_{rootveg} \times VG_{rootveg}$$

Symbol	Value	Description	Units
Prbg	calculated	Concentration of COPC in belowground produce due to root uptake	mg COPC/kg DW
Cs	measured	Average soil concentration over exposure duration	mg/kg
$Br_{rootveg}$	chemical-specific	Plant-soil bioconcentration factor for belowground produce	unitless
$VG_{rootveg}$	chemical-specific	Empirical correction factor for belowground produce	unitless

Chemical	Cs (mg/kg in soil)	$Br_{rootveg}$	$VG_{rootveg}$	Pr_{bg} - (mg/kg)
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	1.00E+00	0.00E+00
ALUMINUM	2.11E+04	0.00E+00	1.00E+00	0.00E+00
ARSENIC	1.25E+01	8.00E-03	1.00E+00	1.00E-01
BENZO(A)ANTHRACENE	2.69E+00	2.11E+00	1.00E-02	5.68E-02
BENZO(A)PYRENE	2.16E+00	1.26E+00	1.00E-02	2.72E-02
BENZO(B)FLUORANTHENE	3.49E+00	1.66E+00	1.00E-02	5.79E-02
BENZO(K)FLUORANTHENE	2.26E+00	1.66E+00	1.00E-02	3.75E-02
BENZO[G,H,I]PERYLENE	1.14E+00	1.66E+00	1.00E-02	1.89E-02
CARBAZOLE	2.74E-01	0.00E+00	1.00E+00	0.00E+00
CHRYSENE	1.13E+00	2.05E+00	1.00E-02	2.32E-02
COPPER	0.00E+00	0.00E+00	1.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	3.13E-01	1.43E+00	1.00E-02	4.48E-03
INDENO(1,2,3-CD)PYRENE	1.45E+00	1.19E+00	1.00E-02	1.73E-02
IRON	2.75E+04	0.00E+00	1.00E+00	0.00E+00
LEAD	2.43E+02	0.00E+00	1.00E+00	0.00E+00
MANGANESE	7.44E+02	0.00E+00	1.00E+00	0.00E+00
PCB-1016	0.00E+00	1.45E+01	1.00E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1242	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1248	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-total	7.48E-01	1.42E+01	1.00E-02	1.06E-01
PCB-1260	2.74E-01	0.00E+00	1.00E+00	0.00E+00
PHENANTHRENE	1.50E+00	1.49E+00	1.00E-02	2.24E-02
SODIUM	1.67E+02	0.00E+00	1.00E-02	0.00E+00
THALLIUM	0.00E+00	4.00E-04	1.00E+00	0.00E+00
VANADIUM	0.00E+00	0.00E+00	1.00E+00	0.00E+00

Table H4-E1
Summary of Contaminant Concentrations in Produce
345 kV Transmision Lines

Chemical	Concentration in Soil - Cs (mg/kg)	Concentration in Aboveground Produce (mg/kg DW)	Concentration in Belowground Produce (mg/kg DW)	Total Produce Concentration (dry-weight basis) (mg/kg)	Concentration in Aboveground Produce (mg/kg wet weight)	Concentration in Belowground Produce (mg/kg wet weight)	Total Produce Concentration (wet-weight basis) (mg/kg)
ALUMINUM	1.8E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	1.1E+01	7.1E-02	9.0E-02	7.4E-02	9.0E-03	2.0E-02	1.1E-02
BENZO(A)PYRENE	3.4E-01	3.7E-03	4.2E-03	3.8E-03	4.7E-04	9.4E-04	5.4E-04
BENZO(K)FLUORANTHENE	3.7E-01	3.7E-03	6.1E-03	4.1E-03	4.7E-04	1.3E-03	5.9E-04
BENZO[G,H,I]PERYLENE	2.4E-01	2.4E-03	3.9E-03	2.6E-03	3.0E-04	8.7E-04	3.8E-04
BENZO(A)ANTHRACENE	3.0E-01	6.0E-03	6.3E-03	6.1E-03	7.6E-04	1.4E-03	8.5E-04
BENZO(B)FLOURANTHENE	3.0E-01	3.0E-03	5.0E-03	3.3E-03	3.8E-04	1.1E-03	4.8E-04
CARBAZOLE	2.4E-01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CHRYSENE	2.5E-01	4.7E-03	5.2E-03	4.8E-03	5.9E-04	1.1E-03	6.7E-04
INDENO(1,2,3-CD)PYRENE	2.4E-01	9.2E-04	2.8E-03	1.2E-03	1.2E-04	6.2E-04	1.9E-04
IRON	2.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MANGANESE	1.3E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PHENANTHRENE	5.3E-01	4.8E-02	7.9E-03	4.2E-02	6.0E-03	1.8E-03	5.4E-03
SODIUM	2.2E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
THALLIUM	6.9E-01	5.9E-04	2.8E-04	5.5E-04	7.5E-05	6.1E-05	7.3E-05
VANADIUM	4.1E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Fraction of crop intake as aboveground produce	8.6E-01
Fraction of crop intake as root crops (belowground	1.4E-01

Wet-to-dry weight conversion factor - aboveground produce (grams dry/grams wet)	1.3E-01
Wet-to-dry weight conversion factor - belowground produce (grams dry/grams wet)	2.2E-01

Table H4-E2
Contaminant Concentration in Above Ground Produce
345 kV Transmission Lines

$$\Pr_{ag} = Cs \times Br_{ag}$$

Symbol	Value	Description	Units
Cs	measured	Average soil concentration over exposure duration	mg/kg
Prag	chemical-specific	Concentration in aboveground produce due to root uptake	mg/kg DW
Br_{ag}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce	unitless
Br_{forage}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce - livestock foage and silage	unitless

Chemical	Cs (mg/kg)	Br_{ag}	Pr_{ag} - (mg/kg DW)
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	0.00E+00
ALUMINUM	1.77E+04	0.00E+00	0.00E+00
ARSENIC	1.13E+01	6.33E-03	7.13E-02
BENZO(A)ANTHRACENE	2.99E-01	2.02E-02	6.04E-03
BENZO(A)PYRENE	3.37E-01	1.11E-02	3.74E-03
BENZO(B)FLUORANTHENE	2.99E-01	1.00E-02	2.99E-03
BENZO(K)FLUORANTHENE	3.65E-01	1.02E-02	3.72E-03
BENZO[G,H,I]PERYLENE	2.37E-01	1.00E-02	2.37E-03
CARBAZOLE	2.35E-01	0.00E+00	0.00E+00
CHRYSENE	2.52E-01	1.87E-02	4.70E-03
COPPER	0.00E+00	0.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	0.00E+00	6.36E-03	0.00E+00
INDENO(1,2,3-CD)PYRENE	2.35E-01	3.90E-03	9.17E-04
IRON	2.75E+04	0.00E+00	0.00E+00
LEAD	0.00E+00	0.00E+00	0.00E+00
MANGANESE	1.30E+03	0.00E+00	0.00E+00
PCB-1016	0.00E+00	2.91E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	0.00E+00
PCB-1242	0.00E+00	0.00E+00	0.00E+00
PCB-1248	0.00E+00	0.00E+00	0.00E+00
PCB-1254	0.00E+00	1.00E-02	0.00E+00
PCB-1260	0.00E+00	0.00E+00	0.00E+00
PHENANTHRENE	5.29E-01	9.00E-02	4.76E-02
SODIUM	2.17E+02	0.00E+00	0.00E+00
THALLIUM	6.90E-01	8.58E-04	5.92E-04
VANADIUM	4.04E+01	0.00E+00	0.00E+00

Table H4-E3
Contaminant Concentration in Below Ground Produce
345 kV Transmission Lines

$$\Pr_{bg} = Cs \times Br_{rootveg} \times VG_{rootveg}$$

Symbol	Value	Description	Units
Prbg	calculated	Concentration of COPC in belowground produce due to root uptake	mg COPC/kg DW
Cs	measured	Average soil concentration over exposure duration	mg/kg
$Br_{rootveg}$	chemical-specific	Plant-soil bioconcentration factor for belowground produce	unitless
$VG_{rootveg}$	chemical-specific	Empirical correction factor for belowground produce	unitless

Chemical	**Cs (mg/kg in soil)**	**$Br_{rootveg}$**	**$VG_{rootveg}$**	**Pr_{bg} - (mg/kg)**
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	1.00E+00	0.00E+00
ALUMINUM	1.77E+04	0.00E+00	1.00E+00	0.00E+00
ARSENIC	1.13E+01	8.00E-03	1.00E+00	9.02E-02
BENZO(A)ANTHRACENE	2.99E-01	2.11E+00	1.00E-02	6.31E-03
BENZO(A)PYRENE	3.37E-01	1.26E+00	1.00E-02	4.25E-03
BENZO(B)FLUORANTHENE	2.99E-01	1.66E+00	1.00E-02	4.96E-03
BENZO(K)FLUORANTHENE	3.65E-01	1.66E+00	1.00E-02	6.06E-03
BENZO[G,H,I]PERYLENE	2.37E-01	1.66E+00	1.00E-02	3.93E-03
CARBAZOLE	2.35E-01	0.00E+00	1.00E+00	0.00E+00
CHRYSENE	2.52E-01	2.05E+00	1.00E-02	5.17E-03
COPPER	0.00E+00	0.00E+00	1.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	0.00E+00	1.43E+00	1.00E-02	0.00E+00
INDENO(1,2,3-CD)PYRENE	2.35E-01	1.19E+00	1.00E-02	2.80E-03
IRON	2.75E+04	0.00E+00	1.00E+00	0.00E+00
LEAD	0.00E+00	0.00E+00	1.00E+00	0.00E+00
MANGANESE	1.30E+03	0.00E+00	1.00E+00	0.00E+00
PCB-1016	0.00E+00	1.45E+01	1.00E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1242	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1248	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1254	0.00E+00	1.42E+01	1.00E-02	0.00E+00
PCB-1260	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PHENANTHRENE	5.29E-01	1.49E+00	1.00E-02	7.88E-03
SODIUM	2.17E+02	0.00E+00	1.00E-02	0.00E+00
THALLIUM	6.90E-01	4.00E-04	1.00E+00	2.76E-04
VANADIUM	4.04E+01	0.00E+00	1.00E+00	0.00E+00

Table H4-F1
Summary of Contaminant Concentrations in Produce
Bailey Farmhouse

Chemical	Concentration in Soil - Cs (mg/kg)	Concentration in Aboveground Produce (mg/kg DW)	Concentration in Belowground Produce (mg/kg DW)	Total Produce Concentration (dry-weight basis) (mg/kg)	Concentration in Aboveground Produce (mg/kg wet weight)	Concentration in Belowground Produce (mg/kg wet weight)	Total Produce Concentration (wet-weight basis) (mg/kg)
ALUMINUM	2.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	7.2E+00	4.6E-02	5.8E-02	4.7E-02	5.7E-03	1.3E-02	6.7E-03
IRON	2.4E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
LEAD	6.2E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MANGANESE	5.2E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SODIUM	1.4E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Fraction of crop intake as aboveground produce	8.6E-01
Fraction of crop intake as root crops (belowground	1.4E-01

Wet-to-dry weight conversion factor - aboveground produce (grams dry/grams wet)	1.3E-01
Wet-to-dry weight conversion factor - belowground produce (grams dry/grams wet)	2.2E-01

Table H4-F2
Contaminant Concentrations in Above Ground Produce
Bailey Farmhouse

$$\Pr_{ag} = Cs \times Br_{ag}$$

Symbol	Value	Description	Units
Cs	measured	Average soil concentration over exposure duration	mg/kg
Prag	chemical-specific	Concentration in aboveground produce due to root uptake	mg/kg DW
Br_{ag}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce	unitless
Br_{forage}	chemical-specific	Plant-soil bioconcentration factor for aboveground produce - livestock foage and silage	unitless

Chemical	Cs (mg/kg)	Br_{ag}	Pr_{ag} - (mg/kg DW)
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	0.00E+00
ALUMINUM	2.32E+04	0.00E+00	0.00E+00
ARSENIC	7.20E+00	6.33E-03	4.56E-02
BENZO(A)ANTHRACENE	0.00E+00	2.02E-02	0.00E+00
BENZO(A)PYRENE	0.00E+00	1.11E-02	0.00E+00
BENZO(B)FLUORANTHENE	0.00E+00	1.00E-02	0.00E+00
BENZO(K)FLUORANTHENE	0.00E+00	1.02E-02	0.00E+00
BENZO[G,H,I]PERYLENE	0.00E+00	1.00E-02	0.00E+00
CARBAZOLE	0.00E+00	0.00E+00	0.00E+00
CHRYSENE	0.00E+00	1.87E-02	0.00E+00
COPPER	0.00E+00	0.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	0.00E+00	6.36E-03	0.00E+00
INDENO(1,2,3-CD)PYRENE	0.00E+00	3.90E-03	0.00E+00
IRON	2.43E+04	0.00E+00	0.00E+00
LEAD	6.22E+01	0.00E+00	0.00E+00
MANGANESE	5.22E+02	0.00E+00	0.00E+00
PCB-1016	0.00E+00	2.91E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	0.00E+00
PCB-1242	0.00E+00	0.00E+00	0.00E+00
PCB-1248	0.00E+00	0.00E+00	0.00E+00
PCB-1254	0.00E+00	1.00E-02	0.00E+00
PCB-1260	0.00E+00	0.00E+00	0.00E+00
PHENANTHRENE	0.00E+00	9.00E-02	0.00E+00
SODIUM	1.41E+02	0.00E+00	0.00E+00
THALLIUM	0.00E+00	8.58E-04	0.00E+00
VANADIUM	0.00E+00	0.00E+00	0.00E+00

Table H4-F3
Contaminant Concentration in Below Ground Produce
Bailey Farmhouse

$$\Pr_{bg} = Cs \times Br_{rootveg} \times VG_{rootveg}$$

Symbol	Value	Description	Units
Prbg	calculated	Concentration of COPC in belowground produce due to root uptake	mg COPC/kg DW
Cs	measured	Average soil concentration over exposure duration	mg/kg
$Br_{rootveg}$	chemical-specific	Plant-soil bioconcentration factor for belowground produce	unitless
$VG_{rootveg}$	chemical-specific	Empirical correction factor for belowground produce	unitless

Chemical	**Cs (mg/kg in soil)**	**$Br_{rootveg}$**	**$VG_{rootveg}$**	**Pr_{bg} - (mg/kg)**
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	1.00E+00	0.00E+00
ALUMINUM	2.32E+04	0.00E+00	1.00E+00	0.00E+00
ARSENIC	7.20E+00	8.00E-03	1.00E+00	5.76E-02
BENZO(A)ANTHRACENE	0.00E+00	2.11E+00	1.00E-02	0.00E+00
BENZO(A)PYRENE	0.00E+00	1.26E+00	1.00E-02	0.00E+00
BENZO(B)FLUORANTHENE	0.00E+00	1.66E+00	1.00E-02	0.00E+00
BENZO(K)FLUORANTHENE	0.00E+00	1.66E+00	1.00E-02	0.00E+00
BENZO[G,H,I]PERYLENE	0.00E+00	1.66E+00	1.00E-02	0.00E+00
CARBAZOLE	0.00E+00	0.00E+00	1.00E+00	0.00E+00
CHRYSENE	0.00E+00	2.05E+00	1.00E-02	0.00E+00
COPPER	0.00E+00	0.00E+00	1.00E+00	0.00E+00
DIBENZO(A,H)ANTHRACENE	0.00E+00	1.43E+00	1.00E-02	0.00E+00
INDENO(1,2,3-CD)PYRENE	0.00E+00	1.19E+00	1.00E-02	0.00E+00
IRON	2.43E+04	0.00E+00	1.00E+00	0.00E+00
LEAD	6.22E+01	0.00E+00	1.00E+00	0.00E+00
MANGANESE	5.22E+02	0.00E+00	1.00E+00	0.00E+00
PCB-1016	0.00E+00	1.45E+01	1.00E-02	0.00E+00
PCB-1221	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1232	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1242	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1248	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PCB-1254	0.00E+00	1.42E+01	1.00E-02	0.00E+00
PCB-1260	0.00E+00	0.00E+00	1.00E+00	0.00E+00
PHENANTHRENE	0.00E+00	1.49E+00	1.00E-02	0.00E+00
SODIUM	1.41E+02	0.00E+00	1.00E-02	0.00E+00
THALLIUM	0.00E+00	4.00E-04	1.00E+00	0.00E+00
VANADIUM	0.00E+00	0.00E+00	1.00E+00	0.00E+00