

Former Truck Maintenance Garage Soil Remediation Report

Maine Yankee Decommissioning Project Corrective Measures Study

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Prepared for:

**Maine Yankee
321 Old Ferry Road, Bailey Point
Wiscasset, ME 04578**

Prepared by:

**Dickenson & Associates
45 Falmouth Road
Falmouth, ME 04105**

And

**CH2M Hill
25 New Chardon Street, Suite 500
Boston, MA 02114**

In association with:

**Jacques Whitford Co., Inc.
75 Pearl Street, Suite 410
Portland, ME 04101**

And

**Stratex, LLC
100 Middle Street
Portland, ME 04101**

Introduction

The former Truck maintenance Garage (FTMG) was located east of the former Plant Access Road adjacent to the ISFSI (**Figure 1**). The garage was used to conduct maintenance activities on concrete trucks and other vehicles during construction of the Maine Yankee facility. The location of the garage was confirmed by both aerial and project photographs taken during plant construction from 1968 to 1972. The garage was removed prior to operation of the Maine Yankee facility. Soil sampling conducted as part of the RCRA Facility Investigation (RFI) identified three areas of petroleum-contaminated soil, one directly adjacent to the former location of the garage, and two areas approximately 80 feet east of the garage location (**Figure 1**) (Reference 1).

To support the soil remediation for FTMG, Maine Yankee developed a remediation plan (Reference 2), which was approved by MDEP in June 2004. The plan described the soil removal approach, field screening, and confirmatory sampling activities.

Soil Removal Activities

Soil removal activities at the FTMG were initiated on July 14, 2004 and completed on August 9, 2004. Soil removal was conducted using a track-mounted John Deere 892 excavator with a 1.5-yard bucket. Soil was excavated from the three soil contamination areas using the excavator and placed in a large dump truck that was used to stockpile the excavated soil. A total of approximately 730 cubic yards of soil was removed from the three excavations.

Initial soil removal activities were conducted between July 14, 2004 and July 19, 2004 and approximately 660 cubic yards of petroleum-contaminated soil was removed from the three soil contamination areas. Based on preliminary confirmatory soil results an additional 50 cubic yards of soil was removed from Area 2 and 20 cubic yards was removed from both Area 1 and Area 3. The additional soil removal activities increased the total amount of excavated soil to 730 cubic yards in the three soil removal areas.

The soil profile in the excavations consisted of two to three feet of fill material over glaciomarine soils. The upper portion of the glaciomarine soils consisted of fine-grained, silty glaciomarine material. The fine-grained glaciomarine soils included thin sandy lenses. At depths in excess of eight feet silty fine to medium sand was present beneath the silty glaciomarine material. The fine-grained glaciomarine soils were olive to dark gray, clayey silt with a blocky structure. Vertical fracture planes were evident and manganese staining was observed on these vertical surfaces. The coarse-grained glaciomarine soils at the base of the excavation consisted of yellow brown to dark gray brown silty fine to medium sand.

Confirmatory Sample Results

Following excavation of contaminated soil, confirmatory soil samples were taken from the circumference and base of each excavation. A total of 37 sampling stations were established at

approximate ten –foot intervals around each excavation (MY05TP340 through MY05TP376) (**Figure 2**). At each sampling station soil samples were taken from the sidewall of the excavation from the ground surface to the base of the excavation at two-foot intervals. Additionally, two samples were taken from the base of each excavation (MY05TP380 through MY05TP385) (**Figure 2**). Each of the total 188 soil samples was screened with a PID using MDEP-approved headspace techniques. The PID soil screening results are summarized in **Table 1**, and PID values ranged from 1.0 ppm to 138.2 ppm. Two samples from each of the sidewalls and one sample from each end of the excavation with the highest PID values were collected for laboratory analysis. Two samples from the base of each excavation were also included for laboratory analysis. The 24 soil samples were analyzed for diesel range organics (DRO) using Maine DEP Method 4.1.25. Three duplicate samples and matrix spike and matrix spike duplicate samples were also taken to support data validation. The laboratory analysis and data validation activities were conducted consistent with the Maine Yankee Quality Assurance Project Plan (Reference 3).

The validated results of the laboratory analysis are presented in **Table 2**. Most of the confirmatory DRO results were below 100 mg/kg and the concentrations ranged from non-detect to 5,000 mg/kg. Each of the three soil remediation areas had confirmatory sample locations with elevated DRO values. The southeast corner of Area 1 (MY05TP366(6-8)) and the southern bottom sample (MY05TP384(8)) in Area 1 had 700 mg/kg and 1,500 mg/kg DRO, respectively. The sidewalls in the central portion of Area 2 (MY05TP349(6-8), MY05TP350(6-8), and MY05TP357(8-10)) had DRO values ranging from 520J mg/kg to 3,300 mg/kg, and the southern bottom sample in Area 2 (MY05TP382(9)) had 5,000 mg/kg. The western sidewall and northern end of Area 3 (MY05TP345(4-6), MY05TP341(4-6), and MY05TP340 (2-4)) also had elevated DRO values ranging from 210 mg/kg to 790 mg/kg.

To address these focused areas of remaining petroleum contamination, approximately 70 additional cubic yards of soil was removed from the three excavations. Approximately 50 cubic yards of additional soil was removed from the sidewalls and southern bottom of Area 2, and approximately 20 cubic yards of soil was removed from the focused areas of elevated DRO in Areas 1 and 3. A total of eight confirmatory soil samples were taken following the additional soil excavation. The samples were analyzed for DRO and the results are included in **Table 2**. One duplicate sample and a matrix spike and matrix spike duplicate sample were also taken to support data validation. The laboratory analysis and data validation activities were conducted consistent with the Maine Yankee Quality Assurance Project Plan (Reference 3).

The DRO concentrations of the follow-up confirmatory samples ranged from non detect to 120 mg/kg. Using a combination of the original confirmatory samples from the locations where no additional soil removal was conducted and the follow-up confirmatory samples from the areas where additional soil was removed, an average DRO value for each excavation was calculated. The average DRO values ranged from 12.9 mg/kg in Area 3 to 57.2 mg/kg in Area 2 (**Table 2**).

Following completion of the soil excavation and review of the confirmatory soil samples, a total of approximately 1400 pounds of oxygen release compound (ORC) was spread across the base of the excavations. The amount of ORC utilized was based on proprietary worksheets developed by the vendor (RETEC). The worksheets evaluated the size of the excavations, thickness of saturated treatment zone, soil porosity, and dissolved phase hydrocarbon concentration. The layer of ORC was worked into the soil across the base of each excavation based on specifications developed from the vendor (RETEC).

The three excavations were backfilled following review of the confirmatory soil samples and application of the ORC. The clean fill material was dumped into each excavation and spread across the excavations by the track-mounted excavator in two-foot lifts to bring the excavations to grade. After completing the back fill activities, the area was graded and seeded.

Conclusions

Approximately 730 cubic yards of soil was excavated from the three petroleum-contaminated areas associated with the FTMG. The soil in the three areas was excavated from the ground surface to depths ranging from six to nine feet below ground surface, consistent with the MDEP-approved Soil Remediation Plan. The contaminated soil was shipped to Commercial Recycling Systems in Scarborough, Maine

A total of 182 soil samples were collected from the sidewalls of the excavations at 10-foot intervals around each excavation, and vertically at two-foot intervals to the base of each excavation. Two samples were also collected from the base of each excavation. The soil samples were screened using a PID and two samples from each of the sidewalls and one sample from each end of the excavations with the highest PID values were collected for laboratory analysis. Two soil samples from the base of each excavation were also included for laboratory analysis. The soil samples were analyzed for DRO using MDEP Method 4.1.25. Several focused areas of elevated DRO were identified based on the initial confirmatory samples. Follow-up soil excavation was conducted to remove the focused areas of petroleum-contaminated soil associated with each excavation. Additional confirmatory soil samples were taken from the areas of follow-up soil removal and analyzed for DRO. Average values of DRO were calculated for each of the three excavations, and all average DRO values were less than 58 mg/kg, consistent with the MDEP Decision Tree guidance of 50 to 100 mg/kg DRO (Reference 4).

References

1. Bailey Point RCRA RFI Report (August, 2004)
2. Remediation Plan for Contaminated Soils at Warehouse 2/3 (June 2004)
3. Maine Yankee Quality Assurance Project Plan – Revision 1 (June 2001)
4. Procedural Guidelines for Establishing Action Levels and Remediation Goals for the Remediation of Oil Contaminated Soil and Groundwater in Maine (March, 2000)

Figures

1. Former Truck Maintenance Garage Areas of Petroleum Contamination
2. Former Truck Maintenance Garage Remediation Area

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