Remediation Plan for Contaminated Soils at Warehouse 2/3

Maine Yankee Decommissioning Project
RCRA Corrective Measures Study

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Introduction

Warehouse 2/3 is located in the northwest portion of the Industrial Area of the Maine Yankee site (**Figure 1**). The warehouse has historically been used to receive and store chemical and materials associated with the operation of the facility. Soil sampling conducted as part of the RCRA Facility Investigation (RFI) identified an area of soil contamination on the west side of the warehouse building (**Figure 2**). The area of soil contamination is located near the southern end of the west side of the warehouse and is associated with paint/paint thinner wastes and polychlorinated biphenyls (PCBs). These chemicals were observed in both shallow and deep soils at this location.

Characterization Results and Distribution of Soil Contamination

Three test pit explorations (MY05TP01 through MY05TP03) were initially targeted to assess the potential for waste sand blast grit historically placed on the west side of the building (**Figure 2**). The test pits were sampled at three depths and the soil samples were analyzed for volatile organic compounds (VOCs), Target Analyte List metals, semivolatile organic compounds (SVOCs), PCBs, pesticides, and extractable petroleum hydrocarbons (EPH). The initial soil sampling results indicated that detected concentrations of PCBs (Aroclor 1254) and elevated levels of non-chlorinated VOCs (ethylbenzene, toluene, and xylenes) occurred at one (MY05TP01) of the three test pits (**Table 1**).

Based on these initial results, an additional nine test pits (MY05TP09, MY05TP09, MY05TP10, MY05TP12, MY05TP139, MY05TP15, MY05TP16, MY05TP18, MY05TP19, and MY05TP21) were excavated to characterize the distribution of the paint waste material. The test pits were typically excavated to the top of bedrock (up to 12 feet below ground surface), and soil samples from the test pits were field-screened with a photoionization detector (PID) at two-foot intervals from the ground surface to the base of the test pit. Based on the screening results, soil samples from six (MY05TP10, MY05TP12, MY05TP13, MY05TP15, MY05TP16, and MY05TP19) of the nine additional test pits were analyzed for SVOCs and VOCs. To assess the potential impact of the waste paint-related chemicals on groundwater, two soil borings (MY05SB101 and MY05SB102) were drilled in the area downgradient of MY05TP01, and monitoring wells screened in the shallow bedrock aquifer (MW-404 and MW-405) were installed in the borings (**Figure 2**).

The results from the additional test pits and soil borings installed to determine the distribution of the paint wastes indicated that in addition to MY05TP01, three of the additional test pits (MY05TP10, MY05TP12, and MY05TP15) and one soil boring (MY05SB102) had detected concentrations of the non-chlorinated VOCs and elevated PID readings (**Tables 1 and 2**). The highest VOC concentrations (340 mg/kg) and PID values (1224 parts per million (ppm)) were observed in MY05TP01, and when detected, the highest VOC levels were typically observed in the deeper soil samples in the test pits and soil borings. Based on both laboratory and PID screening results, the southern limit of the VOC contaminated soil occurs near MY05TP10 where total VOCs were less than 0.05 mg/kg. The western limit of the VOC-contaminated soils

occurs between MY05TP12 (7 mg/kg total VOCs) and MY05TP13 (low to non-detect PID), and MY05TP15 (11.6 mg/kg total VOCs) and MY05SB101 (non-detect VOCs), while the northern end of the VOC-contaminated soils occurs south of MY05TP19 (non-detect VOCs) (**Table 1** and **Figure 2**).

While none of the VOCs detected in soil exceeded their respective project action limit (PAL), elevated concentrations of ethylbenzene (120 µg/l to 160 mg/l) and xylenes (450 µg/l to 510 µg/l) were observed in groundwater from MW-404 that was installed in MY05SB101 (**Table 3**). Low concentrations of the non-chlorinated VOCs (3 µg/l) and vinyl chloride (0.26 µg/l) were observed in MW-405 (**Figure 2 and Table 3**). The ethylbenzene concentrations observed in MW-404 and the vinyl chloride in MW-405 exceed the Maine Department of Environmental Protection (MDEP) maximum exposure guidelines (MEGs) of 70 µg/l and 0.2 µg/l, respectively.

Based on the soil and groundwater sampling results, a proposed area of soil removal for the VOC-contaminated soil is shown in **Figure 2**. This area includes approximately 2,000 square feet (40 feet by 50 feet) and will require soil removal to the top of bedrock, approximately 12 feet below ground surface. Some of the shallow soils in the western portion of soil removal area have low to non-detect VOC concentrations and PID values (**Tables 1 and 2**). These minimally impacted shallow soils will have to be excavated to provide access to the deeper, more contaminated soils below. It is estimated that approximately 500 cubic yards of contaminated soil will be excavated and disposed off-site.

Description of Remedial Action

Remedial work to support this Workplan consists of physically removing contaminated soil from the proposed Soil Removal Area (**Figure 2**). The area west of Warehouse 2/3 will initially be cleared of brush and small trees. Large trees would be spared as much as possible. Soil removal would then be performed using an excavator. Excavation of soil from the Soil Removal Area will begin from the western extent of the removal area and proceed to the east, towards the warehouse building. As indicated by the PID results and the laboratory analysis, the shallow soils in the western portion of the soil removal area have low to non-detect concentrations of VOCs, while the deeper soils have greater VOC concentrations. To manage the soil removal activities and determine whether excavated soils carry the VOC contamination, the soil will be removed in two-foot depth segments across the excavation. Each two-foot increment of soil will be screened in the field with a PID using MDEP-approved headspace techniques.

To evaluate the relationship between PID values and VOC concentration, the headspace PID results from the test pits and soil borings where VOC laboratory results were also taken have been evaluated to determine the site-specific relationship between PID headspace readings and total VOC concentration (**Figure 3**). As shown in **Figure 3**, there is a strong linear relationship between the PID values and the total VOC concentration (linear correlation coefficient of 0.9961) for all but the sample with the highest VOC concentration.

The results of the Draft RFI report for Bailey Point indicate that the Warehouse 2/3 soils do not create a risk to human health (Reference 1). Since there is no risk to human health, target

cleanup concentrations for the soil are based on the potential for the VOCs to migrate to the water table and degrade shallow groundwater. MDEP has developed Remedial Action Guidelines (RAGs) for compounds in soil that may impact groundwater (Reference 2). The RAGs groundwater guidelines for ethylbenzene, toluene, and xylene are 13 mg/kg, 12 mg/kg, and 190 mg/kg, respectively. Since the observed soil concentrations of ethylbenzene and xylene are typically much greater relative to toluene, the RAGs values for ethylbenzene and xylene are chosen to represent the target cleanup level for soil. Using the linear relationship between PID and total VOCs shown in **Figure 3**, a concentration of 12 mg/kg corresponds to a PID value of 124 ppm. Therefore, a conservative PID value of 50 ppm should correspond to total VOC concentrations less than 12 mg/kg and adequately screen the soil VOC concentrations in the field. Based on the site-specific relationship between PID values and total VOCs, soils with greater than 20 ppm PID readings will be segregated for off-site disposal, while those with PID values less than 20 ppm will be set aside for backfilling the excavation. To confirm the PID values for soil that is set aside for backfilling, one soil sample for each 100 cubic yards of soil stockpiled will be taken and analyzed for VOCs in accordance with protocols identified in the QAPP (Reference 3). It is estimated that up to 500 cubic yards of soil will be set aside for backfilling and that up to five samples will be analyzed for VOCs. If the laboratory VOC results for ethylbenzene, toluene, and xylene are less than the respective RAG values of 13 mg/kg, 12 mg/kg, and 190 mg/kg, the stockpiled soil will be considered appropriate for backfill. Stockpiled soils with ethylbenzene, toluene, and xylene concentrations in excess of the compound-specific RAG values will be appropriately disposed off-site.

The soil excavation activities will continue in two-foot increments until bedrock is encountered, or until all soil with PID values of 20 ppm or greater are removed from the excavation. Confirmatory soil samples (discussed below) will be taken from the walls and base of the excavation prior to backfilling activities.

Following removal of the contaminated soil, the soil with PID values less than 20 ppm that was set aside and characterized for VOC concentration will be used for backfill along with clean fill to bring the excavation to grade. The fill material will be placed in the excavation in two-foot lifts to allow for proper compaction. Following the completion of the filling activities the area will be stabilized and mulched.

Project Management

The project team identified in Section 4 of the QAPP was involved in the design and will manage the implementation of the remedial work identified in this Workplan (Reference 3). Identified in the QAPP are the levels of authority and responsibility, lines of communication and a description of the qualifications of key personnel involved with this remedial effort.

Project Schedule

The soil remedial work is scheduled for implementation following approval of this Workplan by MDEP. Following remediation, a report evaluating the confirmatory sample results will be included as an appendix to the Corrective Measures Study Report.

Site Safety and Controls

The area to be remediated is within property controlled by Maine Yankee. Erosion and sediment controls will be placed as necessary downgradient of the contaminated area in accordance with the Maine Yankee Erosion and Sediment Control Plan (Reference 4).

During remedial activity, work zones will be established to limit access to the site and to support decontamination of personnel and equipment (**Figure 2**). An exclusion zone will be established around the proposed remediation areas, with an approximate 50 foot corridor extending to the south for access and decontamination purposes. The adjacent area to the south would be utilized to support remedial activities. All equipment involved with remedial work will be inspected and documented clean prior to performing remedial work.

All on-site personnel performing this remedial work will be 40-hour health and safety trained pursuant to 29 CFR 1910.120. The work will be supervised by the Project Health and Safety Officer and performed under the Health and Safety Plan (HASP) presented in Appendix D of the QAPP (Reference 3). Site-specific information to supplement the HASP will be developed, as necessary, prior to conducting remedial work.

Waste Management Practices

Waste characterization data will be collected and supplied to the disposal contractor to profile the waste, as appropriate, for transport and disposal. An estimated 500 cubic yards of soil will be disposed from the remediation area and managed in accordance with Maine Yankee's Waste Management Plan (Reference 5). Any soil determined to constitute a hazardous waste will be disposed at a hazardous waste facility as identified in the waste management procedures.

Confirmatory Sampling and Analysis Plan

Ten confirmatory soil samples will be collected from the excavation on the west side of Warehouse 2/3 to confirm that the residual soils are below RAG values established for groundwater protection (Reference 2). Two samples will be collected from each of the four walls of the excavation and the base of the removal area. Prior to collecting the confirmatory samples, soil samples will be collected from multiple locations along each wall and the base of the excavation, and headspace screening will be conducted on those samples with the PID. The headspace samples will be taken at ten-foot intervals across the wall (laterally), and at two-foot intervals with depth (vertically). The laboratory confirmation samples will be taken from the area with the highest PID headspace values and/or the most contaminated area. The laboratory confirmation samples will be taken from the area with the highest PID headspace values and/or the most contaminated area on each wall and base of the excavation. If soils are removed to the bedrock surface exposing the bedrock, no samples will be taken from the base of the excavation. The samples will be collected and analyzed for VOCs and PCBs in accordance with protocols identified in the QAPP (Reference 3). The confirmatory sample locations from the removal area will be surveyed as required by the QAPP (Reference 1). In addition, QA/QC samples (i.e., duplicate sample, MS/MSD sample and equipment blanks) will be collected in accordance with

methods and frequencies identified in the QAPP. Following analysis, the sample results will be validated and evaluated as outlined in the QAPP.

References

1. Draft RCRA Facility Investigation Report (September 2003)

2. Implementation of Remedial Action Guidelines (MDEP) (May 1997)

3. Maine Yankee Quality Assurance Project Plan – Revision 1 (June 2001)

4. Maine Department of Environmental Protection (MDEP), 2002, *Site Location of Development Modification/Natural Resources Protection Act Coastal Wetland Alteration/Water Quality Certification Findings of Fact and Order (L-17973-26-AC-M/L-17973-4E-AA-N) for Final Decommissioning Activities* (February 6, 2002)
5. Maine Yankee Waste Management Plan (Procedure No. 9.0)

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1. Site Location Map
2. Warehouse 2/3 Remediation Plan
3. PID vs. total VOCs Paint Waste Area

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