

4 Containment Actions

The soil cleanup action included several actions in addition to the removal of contaminated soils as defined in the RI/FS and in the CAP. The additional actions included containment technologies and institutional controls.

Containment technologies were applied at Parcel 2 to address residual contaminated soils present above applicable MTCA cleanup levels as developed under Method A and Method B residential cleanup levels and the interim TPH policy. This section describes the completion of these additional actions. Photographs taken during implementation of these additional actions are contained in Appendix A. Specific additional actions implemented by Sun included the following:

- installation of a subsurface containment wall along the Fidalgo Bay shoreline,
- placement of an indicator layer and clean soil cap over the entire Parcel 2 property,
- construction and activation of a methane control system within the completed buildings at the property,
- implementation of infiltration controls,
- use of appropriate construction controls during Parcel 2 development, and
- implementation of institutional controls at the property.

4.1 Shoreline Containment Wall

Containment Wall Installation

A sheet pile containment wall was installed along a portion of the Fidalgo Bay shoreline as shown in Figures 3-1 and 3-2. Previous testing had identified the presence of petroleum, PCB and heavy metals in soils shoreward of this area (see Figure 2-1).

The center portions of the containment wall (STA P 0+40 to STA 1+70) were moved approximately 10 feet to closer to Fidalgo Bay than had been specified in the CAP and project specifications. This relocation was performed in order to expand the area of containment in this area. A test pit investigation conducted during installation of the sheet-pile wall verified that this relocation was feasible. Logs from these test pits (TPB-1 and TPB-2) are included in Appendix I.

To facilitate installation of the wall, a 2-foot deep trench was excavated along the proposed wall alignment. Steel sheet-pile sections, twenty-five feet in length, were installed using a P&H 670 Crawler crane with an 80 to 100 foot boom and a APE150 model vibratory pile driving hammer. The sheet piles consisted of hot-rolled, "Z"-section, 3/8-inch thick Bethlehem Section PZ22 steel. A total of 155 pilings were placed in a stair-step fashion, with several pairs driven in 4 to 6 feet at a time. This process insured that all the sheet piles were installed vertically. The bottom of the 25-foot piles were driven to 26 feet below ground surface (bgs). The containment wall installation was completed in four sections. The total length of the containment wall is 199.2 feet.

Cathodic Protection System

A cathodic protection system was designed and installed by Norton Corrosion Engineers to ensure the long-term integrity of the containment wall. The design package for the cathodic protection system and operation and maintenance specifications are included in Appendix K of this report.

The active current system is powered by a current rectifier located in the Sun building. The rectifier is connected by a lead wire to the containment wall and a series of system anodes. The 60-inch anodes are located between 10 and 20 feet behind the wall. Test boxes are provided for each anode station, as well as for the two system test stations.

Final installation and testing of the system was completed in late April of 2000. The system is operating within specifications. Appendix M includes the monitoring checklist for the system. This monitoring is to be performed by Sun on a monthly basis, with an annual inspection of the system by a cathodic protection engineer.

4.2 Protective Soil Cap

Placement of Soil Cap and Indicator Layer

A protective soil cap was installed between July of 1999 and April of 2000, as shown in Figure 4-1. The cap includes both an indicator layer of geotextile fabric and a layer of clean capping soils. The indicator layer was installed to facilitate the long-term maintenance of the cap as described in the RI/FS and CAP. The preload sand which had been subject to extensive chemical testing, was used for the capping material, consistent with the RI/FS and CAP. A cap thickness of 2 feet (measured from the top of the indicator layer) was achieved throughout the Parcel 2 property, except for the two specific areas described below.

In two areas of Parcel 2, (fire access lane and shoreline promenade area) this thickness was reduced slightly as required to achieve grade transitions between Parcel 2 and the adjacent South Harbor Park. In both areas of reduced cap thickness, additional protective barriers were installed to enhance the integrity of the capping material. Along the fire access lane, a synthetic mat ("grass-crete") was installed over the capping soil to provide a durable surface that would resist erosion in this area. Along the shoreline promenade, armor stone was placed along either side of the concrete-paved walkway. The armor-stone prevents erosion of the capping material, and provides a stable transition between the concrete-paved promenade and the higher grade of the capped area.

Cap Maintenance

Cap maintenance is required to ensure long-term integrity of the containment system. This maintenance includes monthly inspections of the cap, and correction of any detected cap erosion. A monitoring checklist is included in Appendix M of this report.