

4.1.2 Operable Unit 2

The ROD for Sullivan's Ledge OU2 was issued by EPA on September 27, 1991. The remedial action objectives listed in the ROD are:

- Reduce exposure of aquatic organisms to PCB-contaminated pore water and sediments either through direct contact or diet-related bioaccumulation;
- Reduce exposure of terrestrial and wetland species to PCB-contaminated sediment/soils through direct contact or diet-related bio-accumulation;
- Prevent or reduce releases of PCBs to the Unnamed Stream and the Apponagansett Swamp; and
- Mitigate the impacts of remediation on wetlands.

The selected remedy, as identified in the ROD, consisted of the following components:

- Site preparation;
- Excavation of contaminated sediments and soils from portions of Middle Marsh and the Adjacent Wetland;
- Dewatering and stabilization of the excavated sediment/soils;
- Disposal of the stabilized sediment/soils beneath the cap constructed over portions of the disposal area of the site;
- Wetlands restoration;
- Institutional controls to prevent future residential use and restrict commercial use; and
- Long-term environmental monitoring.

4.2 REMEDY IMPLEMENTATION

This section summarizes the implementation of the remedial actions specified in the RODs for OU1 and OU2.

4.2.1 Operable Unit 1

The settling defendants for OU1 formed the Sullivan's Ledge Site Group led by a project management committee (PMC) and hired a design engineering firm, O'Brien & Gere Engineers, Inc. (OBG), to implement the EPA OU1 Statement of Work. In June 1997, EPA approved the 100% design, initiating the time track for remedial action. The PMC contracted with Harding Lawson and Associates, Inc. (HLA) to implement the remedial actions. On-site construction activities for OU1 were initiated in March 1998 with Phase I mobilization.

Implementation of the remedial action for OU1 is discussed below, by component, as identified in the ROD. The information below is based primarily on the Remedial Construction Report (OBG, 2002d) for OU1.

Site Preparation

Site preparation work that was conducted included the installation of fencing and gates, clearing of vegetative material and debris and placement on the disposal area, placement of drums of soil and personal protective equipment and various construction debris on the disposal area, demolition of the former car wash located adjacent to the site and placement of the resulting debris on the disposal area, grading of the site to remove high points, abandonment of monitoring wells in the disposal area, proof rolling (or ensuring there are no unstable areas) of the site, and placement of a 12-inch ordinary borrow interim cover on the portion of the site not scheduled for capping until a later phase.

Soil Excavation

Soil excavation was conducted in several areas of the site. The approximate total volume of material removed from each area is provided as follows:

- **Unnamed Stream bed and southern tributary soil and sediments - 950 cubic yards plus 50 cubic yards of rock**
- East bank soils (south of car wash) - 140 cubic yards
- Soils east of stream channel - 910 cubic yards
- East bank soils (north of car wash) - 40 cubic yards

In each area, post-excavation confirmation samples were collected and compared to the clean-up criteria for soils of 10 ppm PCBs. When necessary, additional excavation was performed until confirmation sampling indicated that the clean-up criteria had been met. The excavated materials were placed in areas within the limits of the cap system in accordance with construction specifications.

Diversion and Lining of the Unnamed Stream

This component of the remedy involved lining the Unnamed Stream east of the disposal area with a 72-inch PCCP. The 72-inch PCCP was installed during Phase I of the remedial action.

Collection and Treatment of On-Site Groundwater

This component of the remedy involved the construction of the active groundwater collection system, the passive groundwater collection system, the slurry wall, and the groundwater treatment plant.

The active groundwater collection system was installed during Phase I of the remedial action and consisted of the installation of three bedrock recovery wells, conversion of three existing bedrock wells to recovery wells, installation of two high density polyethylene (HDPE) piping access vaults; installation of HDPE piping from each bedrock recovery well to a manifold in the groundwater treatment plant, and installation of pumps and controls in each of the six bedrock

recovery wells.

The passive groundwater collection system was installed during Phase I of the remedial action and consisted of approximately 660 feet of shallow collection trench (12-inch diameter HDPE perforated collection pipe surrounded by crushed stone backfill), HDPE manholes, a pump station, a valve vault, and associated double-walled piping.

A slurry wall was constructed along the northern limits of the landfill cap. The slurry wall was installed to a depth of 20 to 25 feet and a width of 6 to 30 feet. Two recovery wells (called "Interim Wells") with pumps, controls, and associated piping were installed adjacent to the slurry wall.

The groundwater treatment plant was constructed during Phase I of the remedial action. The start-up period and initial operations occurred from December 10, 1999 through October 19, 2000.

Construction of an Impermeable Cap

This component of the remedy involved the following activities:

- installation of the geogrids along the former quarry limits;
- construction of the gas venting system including placement of granular material, installation of gas vent risers and horizontal gas collection pipe, and installation of 22 gas monitoring wells around the perimeter of the landfill cap system;
- installation of the geosynthetic clay liner;
- installation of the flexible membrane (LLDPE) cover;
- installation of the synthetic drainage layer;
- placement of the barrier protection material;
- placement of topsoil;
- excavation and construction of the sedimentation basin;
- augmentation of the Hathaway Road culvert;
- construction of run-on/run-off controls including berms, lined swales, and culverts;
- construction of access roads; and
- installation of site security measures including fencing and gates.

Wetlands Restoration/Enhancement

The restoration of affected wetlands in OU1 was conducted concurrently with OU2 wetlands restoration. HLA subcontracted certain wetland restoration tasks (vegetation plantings, invasive control, monitoring, reporting) for both OUs to New England Environmental (NEE) of Amherst, Massachusetts.

Sediment Treatment

Sediment excavation was performed within a tributary of the Unnamed Stream (Tributary #2), and two golf course hazards (Ponds A and B). Post-excavation confirmation samples were

collected and compared to the clean-up criteria of 20 µg PCBs/gram carbon. A total of approximately 7,590 cubic yards of sediment was excavated from these areas. Excavated sediments were transferred to the treatment pad, stabilization agents (lime kiln dust and sand) were added and mixed using an excavator, and then the material was spread out and moisture conditioned (treated with admixtures to dry the sediment and improve usability as fill). A total of approximately 9,340 cubic yards of stabilized sediment was placed within the limits of the cap system.

The Sullivan's Ledge Superfund Site, Operable Unit 1, Remedial Construction Report was completed in March 2002 by OBG (OBG, 2002d). This report included a Certification of Completion of Construction, signed on March 8, 2002. This report was approved by EPA on January 23, 2003, which triggered the start of the O&M period.

Institutional Controls

To date, the institutional controls identified in the OU1 ROD have not been implemented. These include:

- ordinances and zoning restrictions to prevent the use of groundwater for drinking water; and
- deed restrictions regulating land use at the site

EPA, the Commonwealth of Massachusetts, and the PRPs have drafted and agreed upon a Grant of Environmental Restrictions (GER) for the institutional controls for the site. The current draft document will have language to address a potential solar project on the site. The draft document is in its final review and expected to be issued during 2013. The remedy is protective in the short-term without the GER in place because exposures to hazardous constituents remain under control due to completion of construction at the Site and continued operation and maintenance activities.

Active Landfill Gas Extraction System

Active methane gas removal was not part of the remedy specified in the ROD for OU1. However, landfill gas monitoring conducted in 2001 and 2002, in accordance with the Post-Construction Environmental Monitoring Plan (OBG, 1996b), indicated that several gas monitoring wells had methane concentrations that exceeded 25% of the lower explosive limit (LEL) for methane. On-site landfill gas vents were also monitored and methane was found to be present. Methane was not detected in explosive gas screenings of subsurface structures and buildings, on and adjacent to the site. Soil gas surveys were performed in spring and summer 2002, indicating that methane was present at greater than 25% LEL both east and west of the landfill but was not detected in any adjacent buildings or structures screened.

A Corrective Action Alternative Analysis was performed to mitigate the migration of explosive gases from the landfill which exceeded the concentrations specified in 310 CMR 19.132(4)(g) and (h). The corrective action chosen was active gas control concurrent with data collection to evaluate the effectiveness in removing landfill gas and reducing off-site migration of landfill gases above 25% LEL. On November 15, 2002 a revised Corrective Action Design was submitted for approval on behalf of the Settling Parties by OBG. The PMC proposed to install a pilot gas extraction system consisting of a trailer mounted 8 horsepower blower with knockout

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BRISTOL COUNTY, MASSACHUSETTS**



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Date