



August 3, 1993

Ms. Monica Rolluda
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop HW-114
Seattle, Washington 98101

Subject: Site Inspection, Prioritization - Level I
Hobart Landfill, Issaquah, Washington
EPA ID WAD 980639595
Work Assignment C1003929
Contract 068-W9-0009

Dear Ms. Rolluda:

PRC Environmental Management Inc. has completed a Level I site inspection prioritization (SIP) for the Hobart Landfill at 2341 Issaquah-Hobart Road in Issaquah, Washington. Information for the evaluation was gathered from files provided by the U.S. Environmental Protection Agency (EPA), by the Washington Department of Ecology (Ecology), and in King County Files. The majority of the information in this report was obtained from the *Site Inspection Report for King County Hobart Landfill Issaquah, Washington*, prepared for the EPA by Ecology and Environment, Inc. (E&E) in November 1988; the Ecology general correspondence file; the environmental monitoring data file; *The King County Solid Waste Division, Hobart Landfill Operations Plan*, prepared by King County (March 1991); the Ecology Leachate Handling Facility and Storm Water Facilities Operations file; and *Evaluation of Groundwater Quality Adjacent to Hobart Landfill*, prepared by Harding Lawson and Associates for King County (April 30, 1992).

Background

The Hobart Landfill is located between the towns of Hobart and Ravensdale, about 20 miles southeast of Seattle (Figure 1). The landfill is owned by King County and operated by the King County Solid Waste Division. The entire facility occupies approximately 72 acres. The King County Hobart Landfill is an active, unlined landfill covering 51 acres. King County also owns 21 acres used for leachate handling directly south of the landfill.

Before landfilling operations, the site was used for sand and gravel extraction. King County records show that the sand and gravel were removed until the shallow aquifer was exposed in certain areas of the site. Landfilling began in the 1950s, when refuse was placed in the former sand and gravel pit. Between 1950 and 1960, open burning of refuse was conducted at the landfill. Materials disposed of at the site include residential commercial and demolition wastes from eastern King County. From the early 1960s to 1990, refuse was disposed of in a controlled manner, including compaction and placement of daily cover.

Hydrogeologic investigations were initiated at the site in 1983 and included test pits, construction of perimeter monitoring wells, and initiation of periodic groundwater monitoring for general groundwater quality data.

Site characterization investigations were initiated at Hobart in August 1983. These geologic and hydrogeologic studies include the construction and sampling of four groundwater monitoring wells and the characterization of superficial soils using test pits.

An expanded site characterization investigation performed between August 1985 and March 1986 consisted of installing an additional 25 borings and monitoring wells. Three wells were installed in solid waste, and 22 were installed in native soils.

A slurry wall feasibility study performed in 1988 involved drilling 27 borings along the proposed wall alignment. Geotechnical investigations were also performed in 1988 to assess infiltration capacity of the shallow soils beneath the site.

A beneficial use survey was performed adjacent to the landfill to determine whether hydraulically downgradient residents were using the shallow aquifer for a water supply. Four potential users were located, and their water sources were replaced with deep aquifer water supply wells.

Water quality impacts to the shallow aquifer were detected, triggering remediation activities in the shallow aquifer. Site remediation occurred during 1988 and 1989, and included construction of a low-permeability soil and bentonite slurry cutoff wall around the landfill.

As of 1990, Hobart Landfill had final closure over half of the landfill. Closure activities included placement of a high-density polyethylene cap, drainage layer, and vegetative cover. The shallow aquifer within the perimeter slurry wall has been lowered beneath the refuse to an approximate elevation of 617 feet mean sea level using leachate extraction wells. The extracted groundwater is then routed to the leachate treatment system. Quarterly groundwater monitoring is currently performed for nine wells; six are screened in the shallow aquifer, and three are screened in the deep.

The landfill is located in a rural area with approximately one dwelling per 35,000 square feet. The population within a 1-mile radius is approximately 200 people. Two people work at the Hobart landfill and one worker and his family reside on site.

Immediately north of the site (0.5 mile) is the Walsh Lake Diversion ditch, which carries water from Walsh Lake to the Cedar River. Confluence of the ditch and the river is approximately 1 mile downgradient of the site. Wetlands are located 1/2 mile from the site.

The Hobart Landfill is located within the Puget Sound lowlands of western Washington (Figure 1). The Puget Sound lowlands are formed by a north-south trending structural trough bounded by the Cascade Range on the east and the Olympic Mountains to the west. During a series of glacial and interglacial periods, the trough was filled with a thick cover of glacial and fluvial deposits.

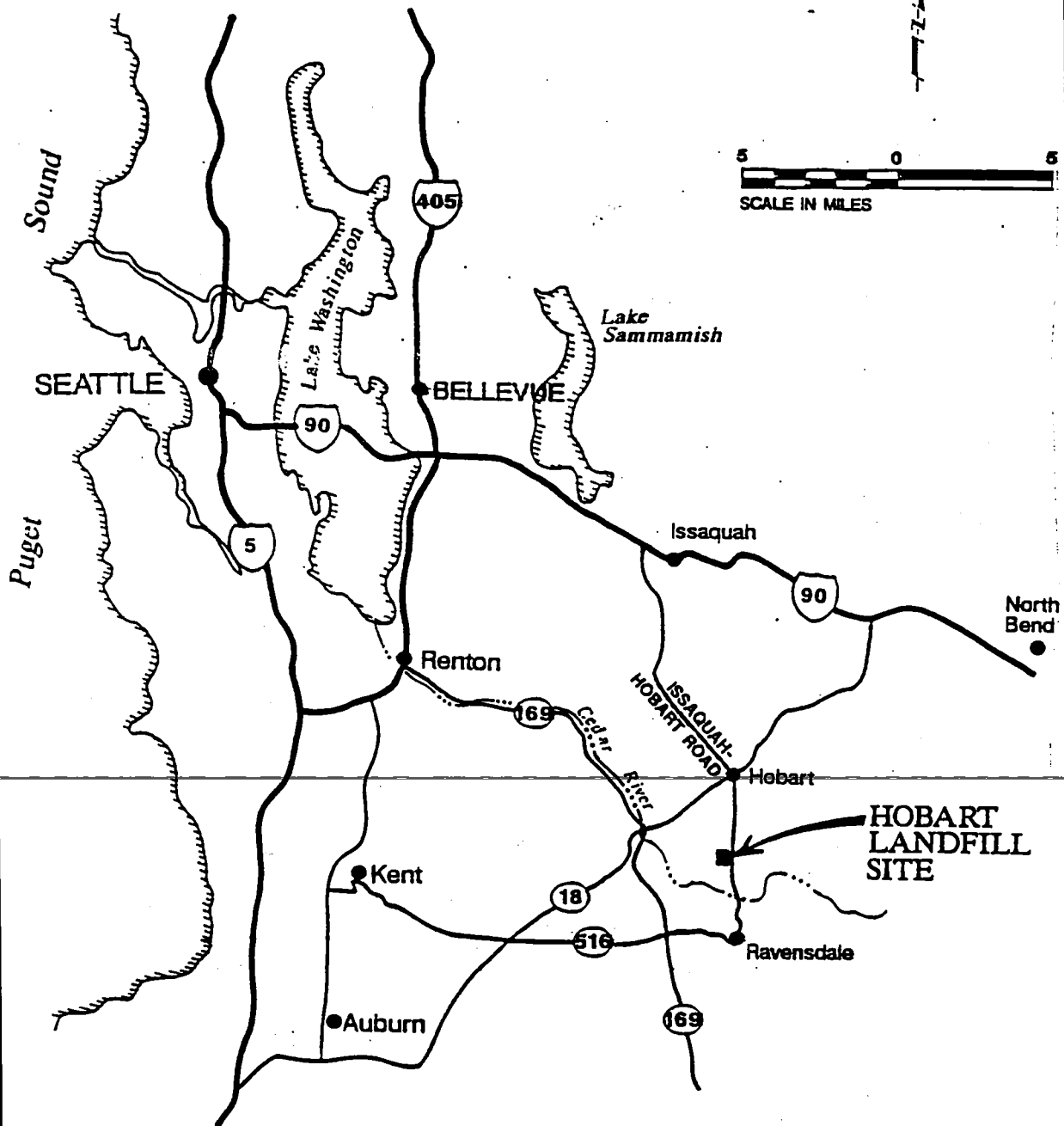
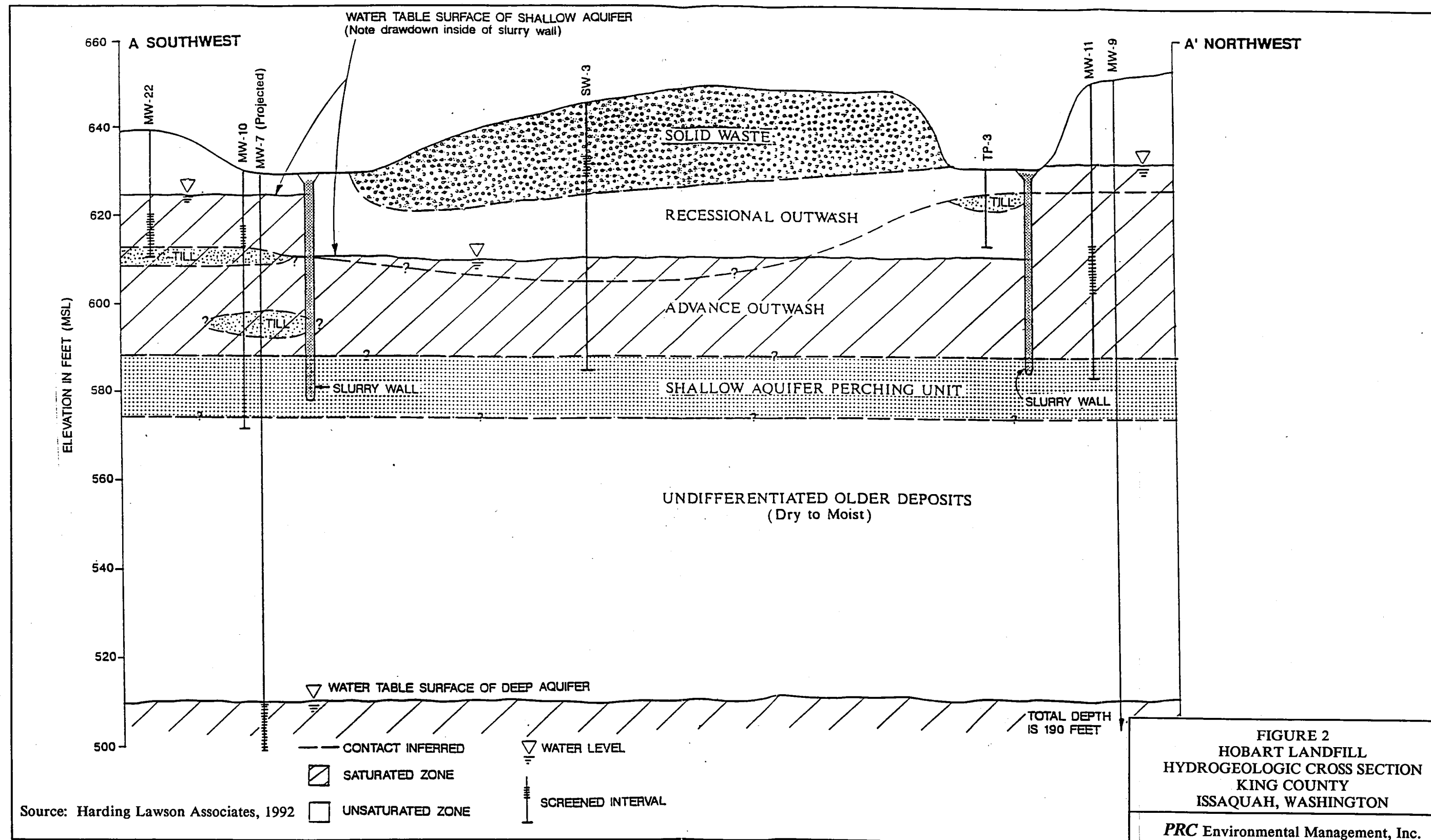


FIGURE 1
 HOBART LANDFILL
 VICINITY MAP
 KING COUNTY
 ISSAQUAH, WASHINGTON

Source: Harding Lawson Associates, 1992

PRC Environmental Management, Inc.



The landfill is situated on a southwesterly sloping terrace at an average elevation of 630 feet above mean sea level. The terrace consists of Vashon and older glacial recessional outwash, lodgement till, advance outwash, and interglacial fluvial and lacustrine deposits. The thickness of these unconsolidated deposits beneath the terrace is not known, but wells in the area have encountered no bedrock up to depths of 200 feet.

Geologic studies at the Hobart Landfill have identified the following five lithologic units at the site:

- Recessional outwash deposits
- Glacial till
- Advance outwash deposits
- Lacustrine deposits
- Undifferentiated, older deposits

Figure 2 is a north-south cross section depicting the occurrence and variations in thickness of these units at the landfill.

Two groundwater systems have been identified beneath the site: a local or shallow aquifer in the recessional and advance outwash deposits, and a regional or deep aquifer in the undifferentiated older deposits. In the vicinity of the landfill groundwater from the deep aquifer is used.

The shallow aquifer has a saturated thickness of 40 to 50 feet with static water levels ranging from 3 to 30 feet below ground surface. Discharge from the shallow aquifer flows into the surface water of the Walsh Lake drainage ditch. The ditch's endpoint is Cedar River. The lithologic layer that inhibits downward migration of water from the shallow aquifer is found in the undifferentiated older deposits (UOD) and occurs for approximately 70 feet. This unit comprises a sequence of sand, gravel, silt, and older till units. The upper 20 feet of the UOD is highly oxidized and has a low hydraulic conductivity. The unit becomes increasingly less saturated with increasing depth. Below the perching layer, unsaturated conditions occur for greater than 60 feet before the deeper aquifer is encountered. There are 12 monitoring wells installed in the shallow aquifer; MW-4, MW-8, MW-18, MW-10, MW-1, and MW-11 upgradient are routinely monitored.

The deep aquifer occurs at depths between 130 feet and 150 feet bgs in older, undifferentiated sand and gravel materials. The aquifer is under partially confined conditions, and recharge occurs through percolation from the shallow aquifer. However, in the immediate site area, this effect is limited because of the continuous layer of the low-permeability unit in the undifferentiated older sediments. Recharge to the deep aquifer occurs outside the Hobart Landfill area. The aquifer discharges to the Cedar River. There are three monitoring wells installed in the deep aquifer: one upgradient (MW-9) and two downgradient (MW-3 and MW-7).

In 1988, a leachate handling system was installed at the site. The system includes a capped area, a slurry wall, extraction wells, and a stabilization/aeration basin. The slurry wall has been installed around the perimeter of the landfill to stop the flow of leachate into the perched aquifer and the Walsh Lake drainage ditch. The wall is 4,750 feet in length and a minimum of 4 feet wide. It extends from the surface to approximately 50 feet bgs, and extends 3 feet into the undifferentiated older sedimentary layer, which acts as a hydrologic barrier. Three extraction wells equipped with submersible pumps are used to drain the leachate from under the site where historically, the groundwater had saturated lower portions of the solid waste. Groundwater levels within the containment structure are drawn down to provide an inward gradient across the slurry wall. The inward gradient draws liquids from the outside of the slurry wall into the area beneath the landfill inhibiting leachate travel through the slurry wall into the shallow aquifer.

Discharge pipelines transport the leachate to the aeration basin. The basin provides pH equalization and aeration to the leachate. Treated effluent is sent to the Municipality of Metropolitan Seattle (METRO) Renton Waste Water Treatment Plant. The system must meet Metro's Industrial Waste Disclosure Permit granted to King County for disposal of leachate from Hobart Landfill.

Surface water is controlled by a system of lined and unlined ditches and sedimentation ponds. Runoff from the northern portion of the landfill is intercepted by ditches that funnel storm water into ponds. The southern slopes of the ponds have been lined with 60-mil HDPE. Any infiltration through unlined portions of the ponds will be collected by the leachate extraction wells. According to Kevin Keirnan, KCSWD representative, King County plans to close the site in 1994 when it has reached its maximum capacity.

Ecology performed a site visit to the facility in December 1991 and observed a "leachate weep" at the south end of the slurry wall/leachate containment system. The weep had a strong odor, was black in color. The weep was contained within the system. Ecology recommended that interceptor trenches be installed to carry the weep to the leachate treatment system.

In 1989, a citizen's complaint was filed with Ecology regarding liquid waste being deposited in Hobart Landfill. Reportedly, 3 to 4 55-gallon drums were deposited in the landfill and accidentally ruptured upon dumping. The drums were suspected to contain acetone but this was not substantiated.

The most recent groundwater sampling activity was in March of 1992. Very low levels of contaminants were detected. Detections were greater than 3 times background levels. Table 1 presents sampling results.

Sources of Contamination

Soil. Although no soil samples have been collected at the site, it is assumed that the soil is contaminated based on the analytical results of groundwater samples collected in 1988. Contaminants assumed to be associated with the landfill include benzene, chlorobenzene, dichloroethane, ethyl benzene, iron, manganese, tetrachloroethane, toluene, 1,1,1-trichloroethane, and 1,1,2-trichloroethane. These contaminants were detected from on site downgradient monitoring wells in 1988, before the extraction wells were operating.

Groundwater. Groundwater contamination is associated with the Hobart Landfill. The groundwater samples collected 1988 from downgradient monitoring wells screened in the perched aquifer contained benzene (up to 15 ppb), chlorobenzene (up to 5.4 ppb), dichloroethane (up to 10 ppb), ethyl benzene (up to 11 ppm), iron (up to 32.1 ppm), manganese (up to 29.2 ppm), tetrachloroethene (up to 10 ppb), toluene (up to 150 ppb), 1,1,1-trichloroethane (up to 10 ppb) and 1,1,2-trichloroethane (up to 10 ppb). No background monitoring data were collected.

Four off-site shallow drinking water wells were sampled in 1988. Toluene was detected in samples from three wells (up to 27 ppb), diethylphthalate in samples from two wells (data not available), and methylene chloride in samples from two wells (data not available). According to the November 1988 E&E site inspection report, no drinking water intakes are currently screened in the shallow aquifer, and all shallow screened wells have been replaced by deeper wells. No groundwater contamination has been documented in the deeper aquifer where all domestic and municipal intakes are screened. Less than 5,000 people have deep aquifer groundwater wells within a 4-mile radius.

During the last monitoring event (March 1992), groundwater samples collected from the shallow and deep aquifers beneath the site did not contain levels of contaminants greater than 3 times the background levels.

Other Media. Since the implementation of the leachate handling system no releases to surface water are assumed. Surface water run off is contained in ditches and the slurry wall inhibits leachate migration to nearby surface water bodies. No surface water samples have been collected. No air samples have been collected.

Recommendations

Extensive site remediation at the Hobart Landfill has occurred. The leachate handling system appears to be controlling the migration of leachate from the site to the shallow aquifer and therefore indirectly from the shallow aquifer into Walsh Lake drainage ditch and Cedar River. No drinking water wells are currently drawing water from the shallow aquifer; thus, human exposure to contaminants has been minimal. The deep aquifer is removed from possible contamination by a 70-foot thick lithologic barrier between aquifers, and the contamination source is located more than 100 feet above the deeper aquifer.

No further sampling under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program is recommended for the Hobart Landfill since sufficient data are available. Site contamination is being addressed, and groundwater monitoring is ongoing. In addition, no drinking water wells screened in the shallow aquifer are currently being used. Contaminant levels have decreased in the shallow aquifer since 1988 (when leachate handling was adopted), and no contamination has been detected in the deep aquifer. Continued monitoring of the shallow and deep aquifers is recommended. The leachate weeps observed during the 1991 inspection of the Hobart Landfill may warrant remediation to decrease the potential exposure of workers.

TABLE 1

MARCH 1992 GROUNDWATER DATA (mg/L)
HOBART LANDFILL

Monitoring Well	Chloride	Fluoride	Nitrate	Ammonia	Iron	Manganese	Arsenic	Acetone ^a	Methylene Chloride ^a
MW-1	--	--	--	--	7.1	2	0.01	19	3 B
MW-3	1.5	0.1	0.045	--	--	0.04	--	--	3 B
MW-4	--	0.03	1.2	--	--	--	--	46	6 B
MW-6	1.4	0.06	0.066	--	0.02	0.31	--	26	4 B
MW-7	14.0	--	0.016	--	0.02	--	--	--	3 B
MW-9 ^b	<1	0.07	0.3	0.05	0.02	0.01	0.001	46	4 B
MW-10	3.2	0.09	0.052	2.9	--	--	--	--	5 B
MW-11 ^c	8.96	<1	0.764	0.01	0.025	0.03	<.001	<4	--
MW-18	1.6	0.09	0.03	--	0.15	1	0.001	--	6 B

a Common laboratory contaminant

b Deep aquifer background

c Shallow aquifer background

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Information Sources

Information used for this SIP/PREscore evaluation was derived from the following sources:

King County, 1990-1992. Environmental Monitoring Data prepared for Hobart landfill.

Harding, Lawson Associates, 1992. Evaluation of Groundwater Quality Adjacent to Hobart Landfill, prepared for King County Solid Waste Division, (April).

King County, 1992. Leachate Handling Facilities and Storm Waster Facilities Operations and Maintenance Manual, Hobart Landfill, King County. Appendix F.

Harding, Lawson Associates, 1991. Operations Plan, Hobart Landfill, prepared for King County, (March).

EPA, 1985. Preliminary Assessment for Hobart Landfill, prepared by the EPA, (April).

Ecology and Environment, 1988. Site Inspection Report for King County Hobart Landfill, Issaquah, Washington, prepared for the EPA, (November).

Ecology and Environment, Inc., 1988. Preliminary HRS Score, King County Landfill, Issaquah, Washington, prepared for the EPA, (November).

A CERCLA/National Priorities List eligibility checklist and supporting documents used in the evaluation that did not come from the existing CERCLA file are attached to this letter.

Please contact me or Mary Bandrowski at 624-2692 if you have any questions regarding this SIP evaluation.

Sincerely,



Gretchen Herron
Site Manager

Attachments

cc: Mary Bandrowski