King County Department of Natural Resources and Parks

Solid Waste Division

Phase 1 – Enumclaw Landfill

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Post-Closure Maintenance and Evaluation Report in Preparation for Termination of Post-Closure

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King County
Department of
Natural Resources and Parks
Solid Waste Division

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POST-CLOSURE MAINTENANCE EVALUATION REPORT IN PREPARATION FOR TERMINATION OF POST-CLOSURE

Enumclaw Closed Landfill

Prepared for: King County Solid Waste Division

Project No. 090057-530.4.1 • September 15, 2017 Final

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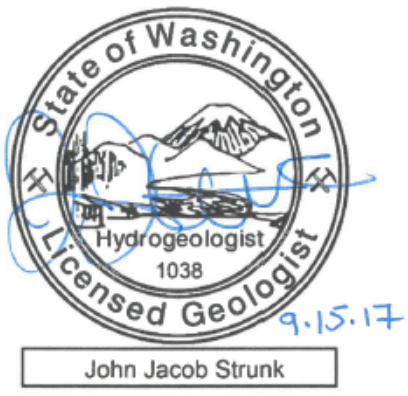

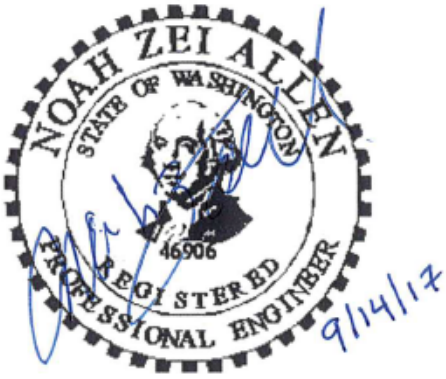

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Acronyms

ANOVA	analysis of variance
Aspect	Aspect Consulting, LLC
BTEX	benzene, toluene, ethylbenzene, xylene
BP	before present
COD	chemical oxygen demand
CDM	cumulative departure from the mean
DO	dissolved oxygen
DOH	Washington State Department of Health
Ecology	Washington State Department of Ecology
ELF	Enumclaw Landfill
ft/dy	feet per day
ft^2/dy	square feet per day
gpm	gallons per minute
KCEL	King County Environmental Laboratory
KCSWD	King County Solid Waste Division
LEL	lower explosive limit
LFG	landfill gas
MCL	maximum contaminant level
mg/L	milligrams per liter
µg/L	micrograms per liter
NMOC	nonmethane organic compound
ORP	oxygen reduction potential
RDL	reporting detection limit
scfm	standard cubic feet per minute
SMCL	secondary maximum contaminant level
TAP	toxic air pollutant
TCE	trichloroethene
TDS	total dissolved solids

TOC	total organic carbon
TSS	total suspended solids
VOC	volatile organic compound
WAC	Washington Administrative Code

1 Introduction

The Enumclaw Closed Landfill (ELF), located approximately 1.5 miles east of the City of Enumclaw, Washington (Figure 1), is in the post-closure phase of its permit issued under the Washington Administrative Code (WAC) Chapter 173-304 *Minimum Functional Standards for Solid Waste Handling*. The facility is nearing the end of the mandatory post-closure care period of 30 years and King County Solid Waste Division (KCSWD) is interested in reducing or possibly terminating post-closure care and monitoring requirements.

1.1 Post-Closure Evaluation Objectives & Purpose

The objective of this post-closure evaluation is to address potential issues that could preclude KCSWD from pursuing termination of post-closure care per the requirements of WAC 173-304-407.

These potential issues are related to post-closure monitoring termination and demonstration of landfill stability that are required to be addressed before modification or termination of post-closure monitoring will be evaluated by the Public Health-Seattle & King County (Public Health), the permitting authority and primary evaluator. The Washington State Department of Ecology (Ecology) provides Public Health with technical assistance. The primary issues that were evaluated at ELF included:

- Updating the existing hydrogeologic conceptual model.
- Evaluating groundwater quality data.
- Evaluating the existing groundwater monitoring network.
- Reviewing historical leachate pond and stormwater infiltration basin information.
- Evaluating the need for soil investigation in the area of the former Phase I leachate pond (built without a geomembrane lining system).
- Evaluating the extent of the landfill cover and potential cover system gaps in the southwest corner of the ELF.

The objective of the post-closure evaluation was to address these issues. The purpose of this report is to present the findings of the evaluation; provide justification to support the revisions to post-closure monitoring; and present recommendations for additional data collection, working towards the end goal of termination of post-closure monitoring at ELF.

1.2 Post-Closure Care Termination Requirements

Landfill post-closure is defined by WAC Section 173-304-100(59) as the requirements placed upon a landfill facility until the site becomes stabilized. Stability is demonstrated by little-or-no cover settlement, landfill gas (LFG) production, and leachate generation.

Post-closure termination has also been discussed in documents authored by the Interstate Technology & Regulatory Council (ITRC, 2006) and the Solid Waste Associate of North America (SWANA, 2011). For the purposes of this evaluation, the governing document used is Ecology's guidance document *Preparing for Termination of Post-Closure Activities at Landfills Closed Under WAC Chapter 173-304* (Publication No. 11-07-006), dated February 2011 and amended in January 2013. The criteria for little-or-no cover settlement, LFG production, and leachate generation defined in Ecology's guidance are as follows:

- Settlement criteria:
  - Uniform slope between 2 percent and 33 percent and maintains design slopes;
  - No evidence of differential settlement;
  - Settlement trend curve approaches zero slope; and
  - Uniform settlement is less than 0.5-inch over a 2-year period.
- LFG production criteria:
  - LFG concentrations at all monitoring points are below regulatory limits for the last eight consecutive sampling events;
  - Vent pipe gas concentrations during periods of steady or falling barometric pressure are below the 25-percent lower explosive limit (LEL) for methane for the last eight consecutive sampling events;
  - Statistically significant steady or declining trends in LFG concentrations; and
  - No ongoing air permit requirements.
- Leachate generation criteria:
  - Facilities with leachate lagoons—liquid volumes reduced over at least 2 years, or the accumulated liquids are primarily the result of precipitation;
  - Discharge permits are no longer required by the local discharge permit authority;
  - Lysimeters indicate no measurable liquid accumulation over last 2 years of regular monitoring; and
  - Groundwater monitoring indicates no recent or ongoing exceedances of WAC Chapter 173-200 criteria, and trend slopes for detected concentrations are zero, indicating groundwater does not show signs of potential negative landfill impacts.

Achieving a stabilized state means post-closure monitoring of groundwater, surface water, and LFG can safely be discontinued. The post-closure evaluation investigation for ELF was designed to compile and evaluate new and existing groundwater and leachate data necessary to appropriately develop post-closure care termination recommendations

for the ELF in general accordance with the Ecology guidance documents (Ecology, 2011 and 2013).

1.3 Report Organization

The Post-Closure Evaluation Report is presented in Sections 2.0 through 6.0:

- Section 2.0 Site History—This section presents the ELF history and background.
- Section 3.0 General Site Description—This section defines the general site description by discussing land use, geology, and hydrogeology.
- Section 4.0 Post-Closure Evaluation Findings—This section discusses the findings from the post-closure evaluation. The section is organized by Ecology's key Post-Closure Termination Care Requirements.
- Section 5.0 Conceptual Site Model—This section discusses the revised conceptual site model that updates the historical conceptual site model with recent data.
- Section 6.0 Recommendations—This section summarizes recommendations for modification of post-closure monitoring, summarizes site stabilization findings, and presents data gaps remaining to be addressed before termination of post-closure monitoring can be achieved.

2 Site History

This section describes the landfill history, closure, and post-closure activities.

2.1 Landfilling Activities

ELF covers approximately 39 acres and contains approximately 725,000 tons of refuse (Aspect, 2014). Landfill operations at the property began in the early 1950s under the informal supervision of the City of Enumclaw and King County Health Department (KCSWD, 2014). The landfill was constructed without a lining system, and has no leachate collection facilities. A former pond in the northwest corner of Phase I (the north half of the landfill) and two former ponds in Phase II (the south half of the landfill) were utilized during active refuse placement for leachate impoundment. All three former leachate ponds were decommissioned as part of the Phase I and Phase II closure activities. The landfill has received no waste since April 4, 1993.

2.2 Site Closure

The landfill was closed in two phases, with Phase I closed in 1989 and Phase II in 1993. ELF was closed in accordance with regulatory requirements specified by WAC 173-304, *Minimum Functional Standards for Solid Waste Handling* because of its final closure date of April 1993. The post-closure environmental control system components included: a cover system with a geomembrane and vegetated surface; a stormwater management system, including a stormwater infiltration basin constructed adjacent to the suspected location of the historical Phase I leachate pond; an active LFG collection system; and an enclosed flare system for thermal oxidation treatment of collected LFG. Final closure included placement of the final cover, completed during the summer and fall of 1993. The existing flare system is in the process of being replaced by a solar spark flare that is designed to function at lower LFG flow rates and methane levels (Aspect, 2014; Herrera, 2015). Figure 2 depicts the existing features at the landfill.

The performance of the environmental control system components is evaluated by an environmental monitoring network of subsurface gas probes and groundwater monitoring wells discussed in the next section.

2.3 Post-Closure Activities

Post-closure activities include routine groundwater monitoring, LFG monitoring, landfill cover surveys, and landfill infrastructure operations and maintenance. Post-closure activities have been conducted in general accordance with the 1996 operations and maintenance (O&M) manual (R.W. Beck, 1996). The existing LFG treatment system was installed in 1996, and includes an enclosed flare manufactured by John Zink, Inc. Figure 3 depicts the current post-closure monitoring locations, and Table 1 summarizes the monitoring schedule.

Post-closure groundwater monitoring includes measuring water levels and collecting groundwater quality samples from six on-site monitoring wells on a quarterly basis.

Groundwater sampling is conducted by KCSWD in accordance with procedures established in the Environmental Monitoring Quality Assurance Project Plan and Sampling and Analysis Plan (KCSWD, 2009, revised 2015). Routine monitoring includes measuring water elevations, monitoring water quality field parameters (dissolved oxygen, pH, temperature, turbidity, oxidation reduction potential, and specific conductance), and collecting groundwater quality samples for analysis at the King County Environmental Laboratory (KCEL). Water quality samples are routinely analyzed for the parameters prescribed by WAC 173-304-490 in addition to metals and volatile organic compounds (VOCs), as required by the Seattle-King County Department of Public Health. Annually, KCSWD prepares a data report that summarizes and evaluates the groundwater quality and hydrogeologic data for the preceding year (KCSWD, 2005–2014).

The subsurface LFG monitoring network includes 11 multilevel gas probe locations surrounding the perimeter of the ELF, with up to 3 probes completed at different depths at each location, for a total of 23 probes. Probe locations are shown on Figure 3. Post-closure LFG monitoring is currently conducted monthly by either the KCSWD LFG operations staff or the KCSWD engineering services section staff. Static pressure and concentrations of oxygen, carbon dioxide, and methane have been monitored using a gas sampling devise. Exceedances of the LEL are reported to the Seattle-King County Department of Public Health.

3 General Site Description

3.1 Land Use

The ELF property encompasses approximately 39 acres located in unincorporated King County, adjacent to and northeast of the City of Enumclaw city limits. The property is owned by the City of Enumclaw, and is leased by KCSWD as the landfill operator. The ELF property is zoned as a rural area developable by one dwelling unit per 10 acres (RA-10). Adjacent land to the west and north is also zoned RA-10. Land to the east of the landfill is zoned as forest land. Land adjacent to the south of the landfill is within the City of Enumclaw city limits and is zoned as public land (the transfer station) and residential.

3.2 Geology

The ELF sits on the Enumclaw Plateau, and underlying the site are unconsolidated mudflow and glacial sediments over crystalline volcanic bedrock. Major geologic units encountered at or near the ELF are described below. Cross sections for the ELF and the region graphically depict the major geologic units at the ELF. The ELF cross-section locations are depicted on Figure 4, and cross sections are presented on Figures 6 through 10. The regional cross section location is presented on Figure 5 and cross section is presented on Figure 11.

Fill and Refuse. Artificially placed material has been encountered in multiple borings across the ELF. These materials can be categorized as:

- Artificial Fill: Native sands, gravels, and cobbles with varying amounts of silts that have been reworked and artificially placed on-site. This artificial fill does not contain any landfill material.
- Landfill Refuse: Landfill refuse contains materials placed in the landfill when it was open, including materials such as glass, metal, Styrofoam, plastic, cloth, paper, and wood, in a gravelly, sandy matrix that is derived from underlying native materials, which were reworked and used as cover material during landfill operations.
- Inert Refuse Material: Inert refuse material contains similar materials as the landfill refuse, but also showed evidence of having been burnt. This evidence includes the presence of ash and charred materials, as well as a lack of organic material.

Osceola Mudflow Deposits (Qom). The Quaternary age Osceola Mudflow deposits are lahar flood deposits caused by the mixing of sediment, ash, and melted alpine glaciers during an eruption of Mount Rainier approximately 5,600 years before present (BP). The Osceola Mudflow deposits typically consist of poorly sorted clays, silts, sands, gravels, cobbles, and boulders. The fine-grained sediments comprise a matrix in the interstitial space between coarser sediments. Due to the fine-grained matrix, the Osceola Mudflow deposits tend to generally act as an aquitard and impede groundwater movement. The matrix material can be coarser grained locally, and these local coarse-grained zones are much less restrictive of groundwater flow. In the region, the Osceola Mudflow ranges

from 0 to 80 feet thick; and at the ELF, it is up to approximately 70 feet thick. The relatively low permeable Osceola Mudflow deposits appear to underlie all the landfill refuse mapped on the ELF.

Vashon Recessional Outwash (Qvr). The Quaternary age Vashon recessional outwash was deposited in proglacial outwash streams during the most recent glaciation in the Puget Sound as glaciers retreated at the end of the Vashon Stade of the Fraser Glaciation, approximately 14,000 years BP. These outwash deposits tend to be somewhat stratified sands and gravels, with minor amounts of silt also present. Due to the coarse-grained nature of the deposits, the Vashon recessional outwash has a relatively high permeability, and is the uppermost aquifer at the ELF. In the region and at the ELF, the Vashon recessional outwash can be over 80 feet thick.

Vashon Till (Qvt). The Quaternary age Vashon till was deposited during the Vashon Stade of the Fraser Glaciation, which reached its maximum terminus approximately 15,000 years BP. The Vashon till is an unstratified, poorly sorted assortment of sands, silts, and gravels, and serves as an aquitard due to its dense, glacially consolidated nature and the abundance of fine-grained sediments. Thickness can vary substantially, but near the ELF, the Vashon till is typically less than 80 feet thick.

Vashon Advance Outwash (Qva). The Quaternary age Vashon advance outwash is a stratified sand unit deposited in proglacial outwash channels as glaciation advanced southward in the Puget Sound during the Vashon Stade of the Fraser Glaciation. The Vashon advance outwash serves as a deeper aquifer at the ELF. The Vashon advance outwash can be up to 300 feet thick elsewhere in the Puget Sound, but in the Enumclaw region, it is generally thinner—ranging up to 100 feet thick.

Pre-Fraser Deposits, Undifferentiated (Qpfu). Underlying the Vashon advance outwash are glacial and nonglacial sediments that were deposited prior to the Vashon Stade of the Fraser Glaciation, and subsequently glacially overridden and consolidated. For this report, these deposits are not differentiated. At the ELF, the uppermost Pre-Fraser deposits have a comparatively low permeability, and act as an aquitard.

Tertiary Volcanics (Tv). Crystalline bedrock in the vicinity of the ELF is Tertiary age volcanic rocks, predominately andesite. Steep mountain slopes just to the east of the ELF are made up of these volcanics, as is a prominent bedrock knob just to the northeast of the ELF. The bedrock serves as a no-flow boundary and controls groundwater movement.

3.2.1 Geologic History of the Area

The ELF and the immediate vicinity is predominately covered by Osceola Mudflow deposits, except for areas where refuse material has been placed or the native materials have been reworked. The Osceola Mudflow ranges from a few feet thick to over 70 feet thick at the ELF, with the thinner areas occurring on the west side of the ELF. Below the Osceola Mudflow is the Vashon recessional outwash. Only one well (MW-7) drilled at the ELF penetrated through the Vashon recessional outwash and into the Vashon till. The Vashon recessional outwash encountered at MW-7 was 72 feet thick, as noted in the boring log (see Appendix A).

Tertiary volcanics outcrop to the east of the ELF along steep slopes, as well as in the knob to the northwest of the ELF. These topographic features likely represent paleotopography, which existed throughout recent geologic history. The undifferentiated

Pre-Fraser deposits were deposited in glacial, lacustrine, and fluvial environments in the low-lying areas around these paleotopographic highs. During the Fraser Glaciation, glaciers advanced into and retreated out of the Puget Sound multiple times. Most deposits in the Puget Sound are from the final glacial advance during the Fraser Glaciation, which is called the Vashon Stade of the Fraser Glaciation. Advance outwash deposits were laid down first, as part of streams and rivers fed by the leading edge of the glacial front. The advance outwash and the Pre-Fraser deposits were overridden and compacted as the glacier progressed southward in the region, and glacial till was deposited on top of the advance outwash. As the glaciers started retreating, recessional outwash was deposited in meltout streams and proglacial lakes. The Osceola Mudflow was deposited on top of the recessional outwash during an eruption of Mount Rainier. The eruption instantaneously melted alpine glaciers around the peak of Mount Rainier, creating lahar flood deposits consisting of a mixture of volcanic ash and native materials that inundated southern parts of the Puget Sound, including in the Enumclaw area.

3.3 Hydrogeology

The hydrogeologic conceptual model for the ELF was initially established in the report *Ground Water Geology/Quality Investigations for Rural Landfills in King County, Washington* (R.W. Beck and Associates, 1984), and further refined in *Geotechnical Report, Enumclaw Landfill, King County, Washington* (R.W. Beck and Associates, 1987). These reports established that the ELF is located within a recharge area for the intermediate groundwater flow system in the vicinity of the ELF. The recharge area for the regional flow system lies to the east of the ELF, and the regional flow system extends much further west of the ELF. The local groundwater flow system at the ELF is controlled by local recharge.

These reports defined the uppermost aquifer as the Vashon recessional outwash, though they did note that there was some seasonal perching of water in and on the Osceola Mudflow deposits, particularly along the northern perimeter of the ELF. The Vashon recessional aquifer was defined as largely unconfined and recharged by infiltration from the surface, and from underflow from the east.

Groundwater flow in the Vashon recessional aquifer was mapped as flowing west-southwest at the eastern edge of the ELF, and northwest at the western edge of the ELF. The water table gradient ranged from 0.02 to 0.006 foot/foot across the ELF. The water table in the Vashon recessional aquifer fluctuated seasonally, with the wells on the western side of the ELF (MW-2, MW-4, MW-5D, MW-8, MW-9, and MW-10) typically fluctuating up to 4 to 6 feet. The wells further east on the ELF (MW-1, MW-3, and MW-6A) had larger water level fluctuations, between 4 and 19 feet (Figure 14a). The fluctuations in water levels appear to be correlated with the amount of precipitation available. Figures 14a and 14b present hydrographs of water levels measured in wells at the ELF through August 2015. Figure 14b also presents the monthly precipitation cumulative departure from the mean (CDM) from the Buckley weather station. Closure dates are also noted on the figures. During periods of below average precipitation, the CDM shows a downward trend. During periods of average precipitation, the CDM is

relatively flat. And during periods of above average precipitation the CDM increases[1]. Seven hydrologic periods were identified based on trends in the CDM in Figure 14b:

- Average precipitation from 1987 to 1995;
- Above average precipitation from 1995 to 1998;
- Slightly below average precipitation from 1998 to 2002;
- Below average precipitation from 2002 to 2005;
- Average precipitation from 2005 to 2008;
- Below average precipitation from 2008 to 2009; and
- Above average precipitation from 2009 to 2015.

Water level fluctuations tend to be greater during periods of above average precipitation, such as the period between 1995 and 1998, when fluctuations in water levels were up to 19 feet in MW-3. During periods of below average precipitation, such as between 2002 and 2005, the water level fluctuations in the same well was 4 feet. This trend is seen in all the wells on the ELF.

These fluctuations do not cause confined conditions in most wells. The only potentially confined conditions were observed in the now-decommissioned MW-4 and MW-5 during wet seasons. These wells were decommissioned in 1999 (AESI, 2000), and confining conditions cannot currently be investigated in this area.

A short-duration pumping test and multiple slug tests were conducted to estimate hydraulic conductivity and calculate transmissivity of the Vashon recessional aquifer at the ELF. Estimates for hydraulic conductivity based on slug testing ranged from approximately 300 feet per day (ft/dy) to approximately 2,500 ft/dy. A pumping test in MW-4 with MW-5 as an observation well calculated the range in transmissivity between approximately 1,300 square feet per day (ft^2/dy) to approximately 11,000 ft^2/dy (R.W. Beck and Associates, 1987).

Additional slug testing and pumping tests were conducted in 1999 and 2000. Slug tests in wells MW-2, MW-3, MW-9, and MW-10 estimated hydraulic conductivities in the Vashon recessional outwash to be between 30 ft/dy to 4,500 ft/dy. Pumping tests in MW-2, MW-9, and MW-10 calculated the range in transmissivities between approximately 2,100 ft^2/dy to approximately 187,200 ft^2/dy (AESI, 2000).

Using the estimates from the 1987 R.W. Beck and Associates report of hydraulic conductivity and an assumed effective porosity of 25 percent, a groundwater flow velocity was estimated to be between 10 to 40 ft/dy (R.W. Beck and Associates, 1987). Using estimates of hydraulic conductivity from the 2000 AESI report and an assumed

[1] The CDM plot presents the cumulative departure from the mean monthly precipitation. The Y-axis is a general indication of cumulative conditions from the start of the analysis period. Negative values indicate that a deficit in precipitation has occurred prior to the negative value date. Positive values indicate a surplus of precipitation prior to the positive value date. As discussed above, the slope of the CDM lines indicates periods of below average, average, or above average precipitation. For example, the 2005 to 2008 period of average precipitation plots as a relatively flat line at about -20 inches on the Y-axis because the preceding time period was dominated by a precipitation deficit from 1998 to 2005.

effective porosity of 36 percent, groundwater velocity was estimated to be between 0.74 ft/dy and 100 ft/dy (AESI, 2000). Subsequent groundwater velocities estimated in annual monitoring reports have fallen within this range.

Perched water has been observed within the Osceola Mudflow deposits, above the Vashon recessional aquifer, on the northern portion of the ELF. Water levels have been measured intermittently in multiple screened sections of gas probe GP-7. Saturated soil conditions and measurable water content were encountered during drilling at several well and gas probe boreholes along the northern boundary of the ELF, including GP-6, GP-7, GP-19, GP-15, and MW-1 (Figure 10).

A thorough review of the existing conceptual hydrogeologic site model and data collected after its establishment has been conducted, and the following updates have been made to the conceptual understanding of hydrogeology at the ELF:

- In the original description of the ELF's geology, Osceola Mudflow deposits were mapped as only covering part of the ELF, mostly on the eastern portions (R.W. Beck and Associates, 1984, 1987). A review of well logs drilled before and after that mapping suggests that the Osceola Mudflow deposits are much more laterally extensive across the ELF, and are present in every boring. The thinnest portions of Osceola Mudflow occur under the landfill refuse area where the Mudflow deposits have been reworked as part of landfill operations. The fine- grained matrix of the Osceola Mudflow deposits restrict groundwater flow and infiltration into the uppermost recessional outwash aquifer.
- While the Osceola Mudflow deposits are predominately restrictive of groundwater flow due to its fine-grained matrix, there are localized areas of coarser-grained material that provide limited flow pathways for groundwater infiltration and flow. The northern perimeter of the ELF is an area consisting of coarse-grained Osceola Mudflow, with perched groundwater observed in probes completed within the unit, and saturated or wet soil conditions encountered during drilling of probes and wells in the area (see cross-section E-E', Figure 10). Recharge along the northern area of the ELF is likely supplied by surface water runoff and mountain-front recharge from both the bedrock knob to the northwest and the Cascade mountain foothills to the east. This perched zone appears to be isolated to this one area at the north end of the ELF, and the perched water likely infiltrates vertically into the recessional outwash aquifer.
- Monitoring wells at the western edge of the ELF provide representative downgradient locations to assess groundwater quality along the main flow pathways in the upper aquifer. Well MW-10 is at the downgradient edge of a flow pathway that passes through the area underlying the Phase II closure and the inert refuse material. Well MW-2 is at the downgradient edge of a flow pathway that passes through the area underlying the Phase I closure and the inert refuse material. Well MW-9 is at the downgradient edge of a flow pathway that passes through the area underlying the perched water along the northern ELF boundary. These flow pathways are shown on potentiometric

maps during the highest water levels and lowest water levels (Figures 12 and 13). Groundwater gradients and groundwater flow velocities based on these potentiometric maps are consistent with gradients and velocities calculated in previous hydrogeologic investigations.

- Wells within a 1-mile radius of the ELF are shown on Figure 5. The City of Enumclaw's water supply wells, located within 1 mile of the ELF, are depicted on Figure 5 in relation to the ELF. These water supply wells are the PC Johnson, Watercress Springs and Boise Spring well fields. The PC Johnson well field, to the northwest of the ELF, is completed in the advanced outwash and recessional outwash aquifers, but is located crossgradient from the ELF, and is therefore unlikely to be impacted by landfill activities. The Watercress Springs Well is completed in the recessional outwash aquifer and downgradient from the ELF. The ELF downgradient wells (MW-2, MW-9, and MW-10) all lie between the landfill refuse and the Watercress Springs wells, and provide an adequate monitoring network to evaluate groundwater quality before it reaches the Watercress Springs wells. Boise Spring is located upgradient of the ELF.

4 Post-Closure Evaluation Findings

The following section presents the findings from the post-closure evaluation. This section is organized by Ecology's key Post-Closure Termination Care Requirements. A list of the historical documents that were reviewed for this evaluation is presented in Appendix F.

4.1 Leachate

4.1.1 Leachate Collection System History

The ELF was developed in the 1950s without a composite lining system or a leachate collection system. Closure of the ELF was completed in two phases, Phase I in 1989 and Phase II in 1993, both of which complied with the requirements of WAC 173-304. Leachate management facilities were subsequently added to control leachate seeps that developed in the side slopes of the active and operationally closed faces of both the Phase I and Phase II landfill areas. Therefore, leachate management systems at the ELF were limited to the collection, conveyance, storage, and intermittent disposal of these leachate seeps.

Leachate seeps at the ELF were collected by seep collectors that were installed in cross-slope berms, and at the toe of the fill slopes. Perforated pipes located within the berms were used to collect leachate that was then conveyed to one of three leachate holding ponds located on-site. Of these three ponds, one, located in the northern Phase I portion of the site (Figure 2), was partially lined with bentonite clay material. The two leachate ponds in the Phase II area were lined with a geomembrane material. Leachate from the ponds was periodically pumped and trucked to either a wastewater treatment facility or to Cedar Hills Regional Landfill, where it was combined with the leachate generated at that facility and discharged to the King County Metro wastewater system.

The Phase I and II closure areas consisted of installation of a composite cover system composed of the following (bottom to top):

- 1 foot of foundation material
- Geomembrane layer
- 1 foot of drain material
- Separation geotextile
- 1 foot of topsoil (seeded)

The cover system installed at the ELF is described in the Phase I and Phase II Final Design Reports (R.W. Beck, 1989 and 1992). The cover system was intended to serve as the primary leachate control element for the landfill because the primary contributing source for leachate flows was infiltration of precipitation. Installation of the cover system eliminated leachate seeps, and therefore the need for leachate collection and storage facilities. Therefore, upon termination of landfilling and closure of the ELF, the leachate collection system was decommissioned and the leachate ponds removed.

4.1.2 Basis of Leachate Evaluation for Post-Closure Care Termination

Due to the limited period of active leachate collection at ELF and the removal of all leachate collection, conveyance, and storage facilities during closure construction, the evaluation focused on historical information related to the former leachate system. Based on the history of leachate collection, conveyance, and storage at ELF, the leachate evaluation focused on the following items:

- Leachate flow/generation history;
- Documentation and/or anecdotal information regarding removal of the unlined leachate pond. (The Phase I leachate pond was the only leachate pond not constructed with a geomembrane lining system at ELF);
- Review of historical leachate data; and
- Review of groundwater monitoring data (Section 4.2).

The evaluation was primarily completed through review of historical documentation for the leachate system at ELF and supplemented by conducting interviews with pertinent KCSWD Staff that were present during landfilling operations at ELF.

4.1.2.1 Leachate Flow History

Documentation of leachate generation volumes from ELF have not been completed for the life of the landfill. The lack of a bottom lining system or leachate collection system precluded any measurement of actual leachate generation. However, during the design for the closure systems, leachate production for the active landfill site was estimated to be approximately 1 million gallons per acre per year (R.W. Beck, 1989). Post-closure leachate generation was estimated through HELP modelling based on the design of the cover system as part of the design report prepared by RW Beck. That effort estimated that leachate generation would be reduced to approximately 15,000 gallons per acre per year; an approximately 98 percent reduction in leachate generation. The design and integrity of the installed cover system is intended to maintain this significant reduction in leachate generation at ELF.

Site hydrogeological evaluations determined that groundwater elevations below the landfill varied seasonally, with a seasonal high water table located 25 feet below the base of waste (EMCON, 1992). Therefore, groundwater is not considered to be a potential contributing source for leachate generation. During the hydrogeological studies it was determined that the groundwater below the landfill is flowing at a relatively high rate (velocity varies between 0.74 to 100 ft/dy [AESI, 2000]), as described in the preceding hydrogeology section. The high transmissivity of the underlying aquifer results in a high rate of dilution and provides continual flushing.

Based on the leachate information available, it is not possible to quantify actual leachate generation. However, groundwater sampling data presented in Section 4.2 and contained in KCSWD's annual ELF Groundwater Reports indicate stable or decreasing trends for parameters attributed to landfill leachate.

4.1.2.2 Historical Review of Leachate Pond Removal

A review of historical documentation of leachate ponds at ELF indicated that three ponds were actively used during the operation of the landfill. Of these three leachate ponds, two

were lined with geomembrane and removed during the Phase II Closure. The third leachate pond was not lined with a geomembrane (Phase I leachate pond). The Phase I leachate pond was located in the northern portion of the ELF and was removed during construction of the Phase I Closure. In addition to reviewing historical documentation, pertinent KCSWD staff that participated in design and operations of the facility were interviewed.

All available documentation of the ELF facility was acquired from KCSWD and reviewed for relevant information regarding the Phase I leachate pond. Relevant information was considered to be any documentation relating to the design, operation, repair, removal, or water quality analysis. A brief summary of each document reviewed was compiled and is included as Appendix E.

An interview with pertinent KCSWD staff was completed on May 18, 2016. The focus of the interview was to attempt to verify information discovered during the review of historical documentation, and to provide an opportunity to the individuals to provide any anecdotal evidence related to the operation and removal of the leachate ponds at ELF. The list of interview questions is attached to this report as Appendix I.

Historical data provided clear evidence that the two geomembrane lined leachate ponds were fully removed during the Phase II closure. Therefore, only the Phase I leachate pond was further investigated. These further investigations considered whether completion of soil sampling within the footprint of the former Phase I leachate pond was necessary. The results of the review of historical documentation and interview with pertinent KCSWD staff regarding the Phase I leachate pond are presented in the following section.

4.1.2.3 Phase I Leachate Pond Documentation Findings from Documentation Review

The Phase I leachate pond was located at the northern end of the site, and used to contain leachate collected by seep collectors installed in the Phase I refuse cell. No specific documentation exists regarding the construction of the Phase I leachate pond. However, various reports, including the ELF Evaluation of Groundwater Quality Data, June 1984 through June 1990 (EMCON 1992), document that the Phase I leachate pond was partially lined with a bentonite clay layer. This documentation was verified during the interview with pertinent KCSWD staff. As documented in the 1992 EMCON report, the clay lining system did not extend to the top of the leachate pond berm. Anecdotally, leachate fluid level elevations would occasionally crest the lined portion of the Phase I leachate pond.

The Phase I leachate lagoon was excavated and removed during the Phase I Closure construction (R.W. Beck, et al., 1988). Based on the approximate extents of the lagoon determined from the 1989 topographical survey (R.W. Beck 1989), a significant portion of the removed Phase I leachate pond was capped by the Phase I Closure cover system (Figure 2). Additional information related to the removal of the leachate pond, based on construction drawings (select drawings included in Appendix G) from the Phase I Closure, indicate the following:

- Based on the location of the infiltration pond shown on the Phase I Closure Construction drawing C-2 in Appendix G and Figure 2, the former leachate pond and the infiltration pond did not overlap.
- Sections on Drawing C-5 indicate the removal of soil from the location of the former Phase I leachate pond to construct the infiltration pond.

Soil testing data collected during the removal of the Phase I leachate pond was not identified during the review of the historical documentation. Due to the lack of soil sample data from this location, soil sampling in the location of the former leachate pond was considered.

4.1.2.4 Soil Sampling Decision Gate

The following documented conditions were considered during the determination of conducting soil sampling at the former Phase I leachate pond location:

- The high transmissivity of the aquifer in this area;
- No detections of VOCs since 2010, and stable or decreasing trends of leachate-indicating parameters in MW-9, which is located downgradient of the former leachate pond;
- That the former leachate pond is primarily located under the Phase I cover system; and
- The period of time (>26 years) since removal of the pond.

The historical documentation provides significant evidence that the Phase I leachate pond was excavated and removed. Based on this evidence coupled with the evidence that majority of the former leachate pond is capped by the Phase I closure, it was determined that soil sampling would not be necessary since the potential leachate pathway from the former pond area appears to be minimal.

4.1.3 Historical Leachate Data

Evidence of regular leachate sampling was not identified for the ELF over the history of the site, due to a lack of leachate collection facilities. KCSWD provided available historical leachate sampling results for the "North Pond" for samples collected between 1986 and 1989. Leachate analytical data collected from 1986 through 1989 is summarized in Table 4 and a copy of the analytical data reports is presented in Appendix E. The data summarized in Table 4 represents the only known available leachate quality data. It is presumed that these samples were collected from the former leachate pond that served Phase I (and not from northern of two ponds in Phase II), based on the period of the sample collection. An aerial photograph from 1986 (Appendix E) shows only a single pond at the ELF, corresponding with the location of the former Phase I leachate pond. From the data that was provided, it appears that leachate sampling was sporadic and not routine. In total, five (5) leachate samples were taken from the former Phase I Leachate pond between 1986 and 1989.

A summary of the results from the leachate sampling conducted between 1986 and 1989 is presented in Table 4. Leachate samples were analyzed for select general parameters, metals, VOCs, select pesticides, and select radionuclides. Results for each analyte were wide ranging. For example, known leachate indicator parameters chloride and barium,

ranged from 20 milligrams per liter (mg/L) to 436.2 mg/L and 0.06 mg/L to 0.122 mg/L, respectively. This may have to do with the quantity of stormwater in the leachate pond at the time of sample collection causing dilution, as a result of the leachate pond being fed by discharge from perforated pipes collecting leachate seeps from the landfill and, potentially, stormwater runoff. The leachate data identifies elevated chloride, total dissolved solids (TDS), conductance, total solids, chemical oxygen demand (COD), and hardness; detections of metals such as arsenic, barium, copper, iron, lead, manganese, mercury, nickel, and zinc; and detections of VOCs acetone, benzene, toluene, ethylbenzene, xylene (BTEX), 2-butanone, chloroethane, 1,1-dichloroethane, 1,2-dichloroethene, 2-hexanone, methylene chloride, 4-mehtyl-2-pentanone, trichloroethene (TCE), and vinyl chloride.

Groundwater samples have been collected at upgradient and downgradient monitoring wells from 1984 through the present. Samples are analyzed for leachate-indicating parameters, including general parameters, metals, and VOCs. Annual reports that include statistical and trend analyses are prepared based on the resulting data. A select few of the VOCs detected in leachate have historically been detected in groundwater. Of these VOCs detected in leachate, several were also historically detected in landfill groundwater samples, but only vinyl chloride has recently been detected in MW-1. MW-9, which is downgradient from the former Phase I leachate pond, has not had any detections of leachate VOCs since 2010. The results of the samplings have indicated that leachate-indicator parameters have exhibited stable or decreasing trends since the closure of the ELF in 1993 (KCSWD, 2002a; 2002b; 2005 – 2014). Additional evaluation of potential landfill impacts to groundwater are presented in Section 4.2.4 below.

4.2 Groundwater

This section provides a summary of the existing groundwater quality data collected at the ELF during routine post-closure monitoring from January 2010 through December 2015, with a focus on the last eight quarters of data, as requested by Ecology, and as specified by Ecology's post-closure guidance document (Ecology, 2013). Groundwater results are compared to Washington State groundwater standards. This section also summarizes existing regional groundwater quality data from January 2009 through December 2015, obtained from the Washington State Department of Health (DOH) and the City of Enumclaw for water supply wells within 1 mile of the ELF. Long-term ELF groundwater quality data for the period of this evaluation (2010–2015) is summarized in tables presented in Appendix B.

The end of this section presents the groundwater quality evaluation using statistical trends, population differences, and potential influence of landfill-related impacts on groundwater quality. These evaluations ultimately support recommended changes in reduction of the groundwater monitoring network, monitoring frequency, and analytes, and recommendations for moving the site toward termination of post-closure monitoring are presented in Section 6.

4.2.1 Groundwater Protection Standards

The applicable groundwater protection standards for the ELF are the Washington State primary and secondary maximum contaminant levels (MCLs/SMCLs) that are protective of human health (WAC 246-290-310) and the water quality standards for groundwater of

the State of Washington (WAC 173-200). The criteria presented in 173-200 WAC, Table 1, for carcinogens have not been updated since 1990. Since that time, EPA has published revised oral slope factors (identified as cancer potency factors in 173-200 WAC) for a number of carcinogens, but 173-200 WAC has not had corresponding updates. It is recommended that criteria for select carcinogens (arsenic and vinyl chloride) be recalculated using updated oral slope factors from EPA's Integrated Risk Information System for future evaluations.

All of the groundwater protection standards are presented in Appendix B. For the purpose of evaluating exceedances, a preliminary screening level was derived for each analyte with available groundwater protection standards. The preliminary screening level is the lowest value of the available groundwater protection standards and are presented in Table 2.

4.2.2 Site Groundwater Quality

The KCSWD database was queried for groundwater quality analytical data from 2010 through 2015 for all existing ELF wells, which includes MW-1, MW-2, MW-3, MW-6A, MW-9, and MW-10. Wells that are considered downgradient of the landfill, and thus are evaluated for potential landfill impacts, include MW-2, MW-9, and MW-10. Cross-gradient wells include MW-1 and MW-6A. The background well located on the landfill property is MW-3.

For this evaluation, the dataset was screened using applicable groundwater protection standards. Appendix B presents the long-term groundwater data from 2010 through 2015 and compares results to Washington State drinking water MCLs/SMCLs, water quality standards for groundwater (WAC 173-200 criteria), and calculated criteria for select carcinogens. The data presented in Appendix B is organized by well. Table 2 presents a summary of the detections and exceedances, summarized by analyte, for the short-term data collected during the last 8 quarters (Q1 2014 to Q4 2015). This table uses the lowest screening level for each analyte to evaluate the data for exceedances of regulatory standards. Table 2 presents the number of detections; the frequency of detections; the maximum, minimum, and average detected concentrations; the number of exceedances of the preliminary screening levels; the frequency of exceedances; and the date of last exceedance. Figure 16 depicts the extent of exceedances in groundwater.

4.2.2.1 Assessment of Analytes

4.2.2.1.1 *Conventional Parameters*

Conventional water quality parameters include those required by WAC 173-304-490 in addition to parameters that are indicators of landfill leachate and LFG impacts, and those appropriate for monitoring natural attenuation of contaminants. The conventional analytes routinely monitored at the ELF include: alkalinity, ammonia as nitrogen, chloride, nitrate as nitrogen, sulfate, TDS, total organic carbon (TOC), and total suspended solids (TSS). The only conventional parameters with regulatory standards are chloride, nitrate, sulfate, and TDS. The following discussion focuses on key landfill indicator parameters.

Chloride and alkalinity concentrations are important indicators for differentiating impacts due to leachate from those due to LFG. Whereas alkalinity concentrations serve as an indicator of both fugitive leachate and migrating LFG, chloride is an indicator of

leachate. Table 2 indicates 144 samples were analyzed for chloride and 145 for alkalinity. Chloride concentrations ranged from 0.118 mg/L to 20.5 mg/L (detected in MW-2), with the average detected concentration being 2.57 mg/L. Chloride was detected at 317 mg/L in MW-2, but this detection was identified as a statistically significant outlier, and was removed from the graphical representation of data in the figures. Chloride concentrations in MW-3 (the background well) ranged from 1.4 mg/L to 2.2 mg/L.

Box plots depicting the detections of select conventional water quality parameters key in evaluating landfill indicators are presented on Figure 17. The box plots depict the first quartile (25th percentile of the samples), median, and third quartile (75th percentile of the samples) of the detections within the box, and the whiskers extend upward to the maximum detection and downward to the minimum detection. Mean markers are noted on the figure with an X. The box plots for chloride indicate that little variation occurs in chloride detections in MW-1, MW-3, MW-6A, and MW-9. With the exception of the one detection of chloride in MW-2 that was identified as an outlier on the box plots, chloride concentrations in that well are generally less than 20 mg/L (Figure 18). The chloride concentrations do not indicate a fugitive leachate-to-groundwater pathway.

Alkalinity concentrations ranged from 21.8 mg/L to 127 mg/L, with an average concentration of 43 mg/L. The highest alkalinity concentrations were detected in MW-1. Alkalinity concentrations in background well MW-3 ranged from 28 mg/L to 35.5 mg/L. Alkalinity concentrations in MW-2, MW-6A, and MW-9 were generally consistent with the range of concentrations detected in MW-3. MW-10 and MW-1 generally had higher concentrations of alkalinity than MW-3. The box plots for alkalinity indicate a wider range of variability of concentrations in MW-1, MW-9, and MW-10, with several outliers. MW-1 had the highest mean concentration. The low concentration of chloride in MW-1, coupled with the elevated alkalinity concentrations, indicate there may be a LFG-to-groundwater pathway at this well.

Nitrate concentrations ranged from 0.027 mg/L to 8.19 mg/L, with an average concentration of 1.14 mg/L. The highest nitrate concentrations were detected in MW-9. The 8.19 mg/L was an outlier identified on the box plots in Figure 17. Although the highest detection of nitrate was not identified in MW-10, this well did have a wider range of detected concentrations that appeared higher than background. Nitrate in MW-3 ranged from 0.906 mg/L to 1.49 mg/L. The concentrations of nitrate detected in MW-1 and MW-2 was lower than background in MW-3, while MW-6A and MW-9 concentrations (aside from the outlier) were generally consistent with the range of concentrations detected in MW-3. Nitrate concentrations in regional groundwater are a primary concern to the City of Enumclaw's water system, and are closely monitored due to the prevalence of septic systems and agricultural land within the City and surrounding areas (Robinson Noble Saltbush, Inc., 2009).

Sulfate concentrations ranged from 1.2 mg/L to 35.7 mg/L, with an average of 5.95 mg/L for the last eight sampling events. The highest sulfate concentration was detected in MW-10. The box plots for sulfate clearly indicate that the majority of detections and the mean concentration of sulfate in MW-10 was greater than that detected in MW-3. MW-1, MW-2, and MW-9 also had a range of detections and means greater than MW-3. MW-6A experienced detections similar to background.

TDS concentrations ranged from 51.7 mg/L to 193 mg/L, with an average concentration of 86.1 mg/L. The highest TDS concentration was detected in MW-9, but more typically the concentrations in MW-9 ranged from 67.7 mg/L to 92.7 mg/L. MW-10 actually experiences a higher range of concentrations than MW-9. The background well, MW-3 had typical TDS concentrations ranging from 51.7 mg/L to 72.5 mg/L. MW-2 and MW-6A experienced TDS concentrations similar to the background well.

4.2.2.1.2 *Field Parameters*

Field parameters routinely monitored during groundwater sampling at the ELF include pH, specific conductance, and temperature (all requirements of WAC 173-304-490). Figure 15 presents maximum concentration of field parameters and selected metals detected between 2014-2015. During the last two events of 2015, dissolved oxygen (DO), oxygen reduction potential (ORP), and turbidity were also measured. DO and ORP are helpful for evaluating monitored natural attenuation at a site, and turbidity helps evaluate the quality of groundwater samples. The minimum pH measurement was 5.75, the maximum was 7.48, and the average pH measurement was 6.4. The low pH in the up-gradient well, MW-3, indicates the low pH results are a natural background condition and are not attributed to landfill impacts. The peak pH and specific conductance detections in MW-1 during the last 8 quarters of data correspond with the peak alkalinity detection discussed above.

Box plots depicting pH and specific conductance in each well are presented on Figure 17. The box plots for pH indicate slightly acidic and slightly variable pH concentrations in all wells except MW-9, but also shows neutral conditions. Figure 18 graphically depicts the pH data for each well. MW-1 has one statistical outlier. The box plots for specific conductance show limited variability in concentrations for MW-2, MW-3, MW-6A, and MW-9. Specific conductance concentrations in MW-1 and MW-10 have much wider variability in concentrations. Figure 18 graphically depicts the specific conductance data.

4.2.2.1.3 *Metals*

Metals that are routinely analyzed in groundwater at the ELF include antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. Only dissolved metals have been analyzed since 2010. Metals that have been detected include arsenic, barium, calcium, copper, iron, magnesium, manganese, potassium, and sodium.

Arsenic concentrations in MW-1 ranged from 1.11 micrograms per liter (ug/L) to 9.51 ug/L. MW-2 had a single detection of arsenic during the first quarter of 2014 at 1.05 ug/L, whereas in all the proceeding sampling events arsenic was not detected above the laboratory's reporting detection limit (RDL). Arsenic was not detected in any of the other wells during the last 8 quarters. The notable box plot for arsenic on Figure 17 is that of MW-1, which depicts a wide range of detections with one outlier. The graphical depiction of arsenic data on Figure 18 also depicts the variability in MW-1 arsenic detections with a peak detection during the last sample event of 2015. This peak concentration corresponds with the peak alkalinity, pH, and specific conductance detections in MW-1.

Iron was detected in MW-2 at concentrations that varied widely (from 17 ug/L up to 887 ug/L), as depicted on the Figure 17 iron box plots. Iron was also detected at MW-1, but at

more consistent concentrations within a narrower range than MW-2. Iron was not detected in any of the other wells during the last eight quarters. Figure 18 graphically depicts the iron detections in MW-1 and MW-2.

MW-1 had concentrations ranging from 814 ug/L to 1,360 ug/L, while MW-2 had concentrations ranging from 155 ug/L to 685 ug/L. Manganese was also detected in groundwater samples from MW-9. MW-3, MW-6A, and MW-10 did not have any detections of manganese above laboratory RDLs during the last 8 quarters. The box plots on Figure 17 depict the range of detections of manganese in MW-1 and MW-2.

4.2.2.1.4 *Volatile Organic Compounds*

Groundwater samples are routinely analyzed for a standard list of VOCs. The only detected VOCs during the last 8 quarters have been acetone (three detections, MW-10 and MW-2), chloromethane (one detection, MW-2) and vinyl chloride (one detection, MW-1). No other VOCs have been detected during the last 8 quarters. For comparison purposes, the dataset since 2010 had a number of additional acetone, chloromethane, dichlorodifluoromethane, and vinyl chloride detections. Laboratory quality control blanks during the last 8 quarters have had single detections of acetone and chloromethane, and repeated detections of methylene chloride. Acetone and methylene chloride are common laboratory contaminants while chloromethane is a suspected laboratory contaminant.

The detection of vinyl chloride in December 2015 corresponds with the peak detection of alkalinity, pH, specific conductance, ammonia, and arsenic in MW-1. A similar peak in alkalinity and vinyl chloride were also observed in 2010. The occurrence of these two peaks indicates a potential for a LFG-to-groundwater pathway at MW-1.

4.2.2.2 Assessment of Exceedances

4.2.2.2.1 *Conventional Parameters*

The conventional water quality parameters with screening levels are chloride, nitrate, specific conductance, sulfate, and total dissolved solids. Chloride was the only conventional water quality parameter with any detections exceeding the 250 mg/L screening level. Chloride was detected at a concentration of 317 mg/L during the December 2014 sample event in MW-2. However, this detection of chloride was identified as a statically significant outlier and was removed from the graphs and box plots presented in Figures 17 and 18, respectively. No other detections in MW-2 or other wells at the site had detections of chloride that exceeded the preliminary screening levels.

4.2.2.2.2 *Field Parameters*

pH and specific conductance are the only two field parameters with screening levels. None of the groundwater samples exceeded the screening level for specific conductivity. The screening level for pH is a range from 6.5 to 8.5 pH units. Every well had at least two measurements of pH that were outside of the low-end of this range, including upgradient well MW-3. As noted in Section 4.2.1.1, the low pH in MW-3, outside of the screening level range, indicates that low pH results identified in other wells at the site are the result of natural background conditions and are not attributed to landfill impacts.

4.2.2.2.3 *Metals*

Of the metals that were detected in groundwater, only arsenic, barium, copper, iron, manganese, and sodium have screening levels for comparison to detected concentrations.

Arsenic, iron, and manganese were detected at concentrations exceeding their respective preliminary screening levels. Preliminary screening levels used in the evaluation are listed in the WAC 173-200 as total metals concentrations. Since total metals have not been analyzed, the metals evaluation compared the screening levels to results from dissolved samples that are field filtered. Iron and manganese are considered secondary contaminants, and their screening levels are set for aesthetic considerations. Figure 15 depicts select field parameters and iron, arsenic, and manganese concentrations. Figure 16 depicts all groundwater exceedances.

Arsenic concentrations exceeded screening levels (0.05 ug/L) during seven of the last eight sampling events at MW-1. MW-2 was the only other well where arsenic was detected at a concentration exceeding the preliminary screening level. The arsenic detected in both wells is less than the Washington State primary drinking water standard of 10 ug/L, but exceeds the WAC 173-200 groundwater quality criteria. Arsenic occurs naturally throughout King County. A study of arsenic identified arsenic exceeding the drinking water standard in 11 of 68 ambient monitoring sites (Ferguson and Johnson, 2006). An additional geochemical investigation would be required to determine if arsenic in MW-1 and MW-2 are related to landfill impacts or the result of naturally occurring, regional variability.

Iron, a secondary contaminant, was detected at concentrations exceeding the preliminary screening level of 300 ug/L during five of the last eight sampling events at MW-2, with concentrations that ranged from 31 ug/L to 887 ug/L. Iron was also detected at MW-1, but only at concentrations below the preliminary screening level.

Manganese, a secondary contaminant, was detected at concentrations exceeding the preliminary screening level of 50 ug/L during all eight sampling events at MW-1 and MW-2. Manganese was also detected in groundwater samples from MW-9, but at concentrations below the preliminary screening level.

4.2.2.2.4 *Volatile Organic Compounds*

Vinyl chloride was the only VOC that was detected at a concentration exceeding the preliminary screening level (0.02 ug/L). MW-1 had a detection of vinyl chloride during the last sampling event in 2015 at a concentration of 0.0399 ug/L. Figure 16 depicts the exceedance of vinyl chloride in MW-1.

4.2.2.3 Statistical Evaluation

A statistical evaluation of the WAC 173-304-490 parameters, plus arsenic and vinyl chloride (compounds exceeding screening levels), was conducted using ProUCL 5.0 (ProUCL; EPA, 2013) and WQStat Plus™ (WQStat; Sanitas Technologies, 2010) statistical software programs. ProUCL was used for outlier detection (Rosner's and Dixon), verifying data distributions (normal/lognormal/nonparametric), and calculating statistical trends and associated significance (Mann-Kendall and Theil-Sen). WQ Stat was also used for calculating statistical trends and analyzing for population differences using analysis of variance (ANOVA). The statistical evaluation focused on exceedances of parameters related to landfill impacts, and not on parameters that could be the result of naturally occurring or background groundwater quality conditions. Appendix C contains the data outputs and graphics produced by ProUCL.

Prediction limits were reviewed for applicability to the ELF groundwater quality analysis. Ecology's 2012 guidance recommends the use of prediction limits at sites that are

currently in ongoing Detection Monitoring to predict when releases may be occurring. Due to the historic groundwater quality relative to background at the ELF, it is not expected that prediction limits are suitable for identifying potential releases or impacts to downgradient groundwater quality. Ecology also recommends that trend tests may be an alternative methodology for sites, such as the ELF, in ongoing Compliance Monitoring for evaluating the trend of existing detections. As such, statistical trend tests have been implemented to identify the current progress towards groundwater quality returning to background conditions (Ecology, 2012).

Evaluation of statistically increasing trends is required under WAC 173-304-490(2i). Statistical trend summaries for long-term (2010–2015 data) and short-term (last 8 quarters from Q1 2014 to Q4 2015) sampling events are presented in Table 5. This table presents the trend evaluation using Mann-Kendall, and trend slopes evaluated using a Theil-Sen test. Statistically significant trends indicate that a change in concentration has occurred for the period tested (EPA, 2009).

Long-term statistical analysis indicates decreasing trends for a number of parameters in MW-1, MW-2, MW-3, MW-6A, and MW-10. The only statistically significant increasing trends identified during the long-term statistical analysis were nitrate in MW-1 and ammonia in MW-3. The rest of the data had trends identified as not statistically significant. Nitrate is considered a poor indicator of leachate impacts, due to low concentrations of nitrogen compounds in leachate; therefore, the long-term increasing nitrate trend in MW-1 is not attributed to landfill impacts. MW-3 is the background well for the landfill, so an increasing ammonia trend in this well is likely the result of an upgradient source unrelated to the landfill.

From the short-term statistical analysis for the most recent eight sampling events, decreasing statistically significant trends were identified for ammonia in MW-2 and manganese in MW-9. The only statistically significant increasing trend was identified for sulfate in MW-1. Sulfate is a major ion and indicator of geochemical processes. The rest of the data had trends that were not statistically significant.

4.2.2.3.1 *MW-1*

The long-term statistical analysis indicates decreasing trends in MW-1 for ammonia, arsenic, chloride, iron, manganese, and TOC. This is significant because although MW-1 has had detections of arsenic and manganese exceeding preliminary screening levels; overall, this well is experiencing decreasing trends for arsenic and manganese.

In the most recent 8 sample quarters, sulfate was the only parameter with a statistically significant increasing trend, which was identified in MW-1. Sulfate has a preliminary screening level, but the concentrations detected at the ELF are one to two orders of magnitude below preliminary screening levels, so at this time, the increasing trend is not a concern for exceeding groundwater standards. However, this is a trend that should be closely evaluated during future monitoring events. None of the other parameters, including vinyl chloride, in MW-1 had statistically significant trends.

4.2.2.3.2 *MW-2*

Long-term statistical analysis indicates statistically significant decreasing trends for ammonia, arsenic, iron, manganese, specific conductance, and sulfate in MW-2. There were no increasing statistically significant trends for MW-2 in the long-term data.

In the most recent 8 sample quarters, ammonia was the only parameter with a statistically significant decreasing trend. There were no increasing statistically significant trends for MW-2 in the most recent data.

4.2.2.3.3 *MW-3*

Long-term statistical analysis indicates a statistically significant increasing trend for ammonia, and a decreasing trend for sulfate in MW-3. As mentioned earlier, MW-3 is the background well for the landfill, and thus changes in groundwater quality at this location indicate influence unrelated to the landfill. For the short-term statistical analysis, the result indicated no statistically significant trends for MW-3.

4.2.2.3.4 *MW-6A*

The only statistically significant increasing trend identified during the long-term statistical analysis in MW-6A was pH. The increasing trend for MW-6A is not a concern at this point, as the water is near neutral pH and currently is below the target regulatory range for pH in Washington State. MW-6A also experienced a statistically significant decreasing trend for sulfate in the long-term dataset. The result of the MW-6A results were either nondetect or there was not a statistically significant trend identified.

In the most recent 8 sampling quarter, there were no statistically significant trends identified for MW-6A. This is in part due to nearly half of the parameters in MW-6A reported as nondetects.

4.2.2.3.5 *MW-9*

Long-term statistical analysis indicates a statistically significant decreasing trend for manganese in MW-9. There were no statistically significant increasing trends identified for MW-9. The remaining parameters had trends that were not statistically significant.

In the most recent 8 sample quarters, statistical trend analysis indicates a statistically significant decreasing trend for manganese in MW-9.

This monitoring well is downgradient of the former leachate pond, and thus groundwater conditions in MW-9 are an important indicator of groundwater contacting leachate-impacted soil, if present.

4.2.2.3.6 *MW-10*

Long-term statistical analysis indicates a statistically significant decreasing trend for TOC in MW-10. TOC is a fundamental parameter for monitoring geochemical processes in groundwater. This decreasing trend indicates that the level of carbon-atom-containing compounds present in the groundwater (either from natural or anthropogenic sources) is reducing. There were no statistically significant increasing trends identified for MW-10. The remaining parameters had trends that were not statistically significant, and a third of the parameters were not detected above laboratory RDLs.

In the most recent 8 sample quarters, there were no statistically significant trends identified in MW-10. Nearly half of the parameters were not detected above laboratory RDLs.

4.2.2.4 Comparison of Upgradient and Downgradient Conditions

A comparison of upgradient and downgradient groundwater quality data is required under WAC 173-304, and is recommended submittal information under termination of post-closure monitoring requirements. The comparison was used to further evaluate landfill impacts on groundwater quality at the ELF. The groundwater results from each site monitoring well was statistically compared to site background, as represented by MW-3, using a one-sided, nonparametric ANOVA test. Table 6 presents a summary of the population differences, and overlays the previously discussed trends presented in Table 5.

Because variation in the concentration of many of the analytes occurs naturally, and the analytes may have been present prior to the ELF, false positives can occur when comparing downgradient to upgradient conditions. To reduce the chances of obtaining a false positive, statistical comparison of upgradient and downgradient monitoring wells was restricted to WAC 173-304-required parameters that are identified in Section 4.2.4, where the concentrations measured in leachate were at least 10 times greater than that measured in background, and those where exceedances of preliminary screening levels were detected in groundwater. Results are further discussed below.

For the long-term ANOVA test, the statistically significant parameters above background results were ammonia, arsenic, chloride, iron, manganese, and sulfate in MW-1 and MW-2. Specific conductance was also above background in MW-1. MW-9 had manganese and TOC above background. MW-10 had chloride, specific conductance, sulfate, and TOC statistically significantly above background. The ANOVA analysis indicates that the greatest impact remains at wells MW-1 and MW-2. Lesser impacts are noted at MW-10. However, many of these constituents are experiencing statistically significant long-term decreasing trends consistent with degrading impacts.

In the last 8 quarters, there were far fewer parameters statistically above background. Ammonia, arsenic, iron, manganese, specific conductance, and sulfate were statistically above background in MW-1, while only iron, manganese, and sulfate were statistically above background in MW-2. MW-9 was statistically above background for TOC, and MW-10 was only statistically above background for chloride, specific conductance, and sulfate. None of the parameters statistically above background showed statistically significant declines in the last 8 quarters. Ammonia and manganese (in MW-2 and MW-9 respectively) were the only constituents with statistically significant declines, but these parameters were not statistically elevated above background. The parameter that was detected statistically above background that is also experiencing an increasing trend in the last 8 quarters is sulfate in MW-1. Continued monitoring and analysis of sulfate in MW-1 should be performed.

The results of the trend and the ANOVA population difference statistical evaluations indicate that over time, the water quality appears to be improving. This is evidenced by the reduction in the number of analytes statistically above background and a reduction in the number of increasing trends between the long- and short-term datasets.

4.2.3 Regional Groundwater Quality

An assessment of regional groundwater quality was conducted using publicly available data obtained from the DOH for the Boise Spring, Watercress Spring #1, and Watercress Spring #2 water supplies. Each of these water supplies obtain groundwater from the

recessional outwash aquifer, which is the same aquifer that is monitored by wells completed at the ELF. The Boise Spring represents the nearest and most representative groundwater supply well for evaluation of regional groundwater quality upgradient of the landfill. However, the quality of Boise Spring may be compromised by the comingling of groundwater and surface water upgradient of Boise Spring. The City of Enumclaw's *Wellhead Protection Plan Update* (Robinson Noble Saltbush, Inc., 2009) identified that a reach of Boise Creek is recharging the aquifer. Furthermore, Robinson Noble Saltbush, Inc., also noted that the losing nature of Boise Creek in the vicinity of Boise Springs is supported by the fact that the spring facility is insufficient to provide the actual volume of discharge that is observed at the spring. Nevertheless, Boise Spring was used for this comparison, as there are no other viable alternatives for comparing upgradient regional groundwater quality.

The Watercress Springs wells represent the nearest and most representative groundwater supply wells to evaluate regional groundwater quality downgradient of the landfill. Groundwater analytical data for 2009 through 2015, obtained from the DOH, for these three water supply wells are presented in Appendix D. The regional well dataset was extended to include data collected in 2009 because they represent the most recent events where raw, pretreated water was tested. The remaining results from 2010–2015 were of post-treatment water.

The water supply wells are sampled routinely, but the list of analytes changes frequently. Therefore, for comparison purposes, the regional water quality dataset is not very robust and makes for a difficult evaluation. Furthermore, the majority of the regional groundwater results are flagged as "less than" or "nondetect" values[2]; therefore, Table 3 presents a summary of only the detections (flagged as "equal" in the DOH dataset).

Background regional groundwater quality data for Boise Spring is very limited with only four sample events with any detections. None of the detected concentrations exceeded preliminary screening levels. Downgradient regional groundwater quality data for Watercress Springs had six sample events with detections. Similar to the background regional water quality, no exceedances of preliminary screening levels were observed at Watercress Springs, with the exception of a single detection of sodium.

Concentrations of the detected conventional parameters such as nitrate, sulfate, sodium chloride, and turbidity at the landfill were within the background levels as measured at Boise Spring. However, there is a very limited dataset from Boise Spring and the majority of the samples with results are post-treatment samples, so the actual condition of raw groundwater is difficult to evaluate.

Concentrations of the detected conventional parameters in the downgradient Watercress Springs were also within the range of concentrations detected at the landfill, with the exception of a single sodium detection in 2012 that exceeded preliminary screening levels at Watercress Spring #2. There is no evidence that this result is from landfill impacts.

Constituents exceeding preliminary screening levels in landfill wells (arsenic, iron, manganese, and vinyl chloride) were less than or nondetect in regional water supply well raw water samples collected downgradient of the landfill. The ELF is located within the

[2] The difference between "less than" and "nondetect" is unclear from the data provided by DOH. Less than flagged results were treated for this evaluation as nondetects.

1-year travel-time zone for Watercress Springs wells, and no indication of drinking water parameter exceedances in raw Watercress Springs well water samples have been observed.

4.2.4 Evaluation of Analytes as Indicators of Landfill Impacts

4.2.4.1 Leachate

The effectiveness of the detected analytes as indicators of landfill leachate was examined by comparing concentrations from samples collected from MW-9, located downgradient of the former Phase I leachate pond, to concentrations in the background monitoring well (MW-3). Focusing on analytes that are present in leachate at sufficient concentrations to be detected in groundwater is consistent with the EPA's Unified Guidance (2009) overall philosophy of reducing the false-positive rate. The overall goal is to identify the most reliable constituents for groundwater monitoring. Spatial variability in parameters may occur in the pre-landfill condition and elevated downgradient concentrations can be falsely assigned to landfill impacts (EPA, 2009). For example, barium, arsenic, and selenium may vary considerably under natural conditions (EPA, 2009).

Analytes with low concentrations in upgradient groundwater and high concentrations in leachate are good indicators of leachate impacts. Table 7 presents the ratio of the maximum background concentration to the maximum leachate concentration. Ratios of leachate-to-background concentration were then computed for analytes that were detected in leachate. Leachate concentrations were obtained from the only available leachate analytical dataset (1986–1989 Enumclaw Leachate [North Pond]) and monitoring well conditions were obtained using the maximum value of the most recent 8 quarters for the upgradient well MW-3 (background).

Fugitive leachate entrained in groundwater will mix and dilute from advective groundwater flow. Analytes that are good leachate indicators should be of sufficient concentration that their presence can be detected after dilution. The EPA-recommended default dilution factor of 10 for sites larger than 0.5 acres (EPA, 1996) was used to identify analytes in leachate of sufficient concentration that, when detected in groundwater, are likely to be indicative of landfill impacts rather than false positives resulting from natural background variability.

Using the screening ratio of 10, ammonia, barium, chloride, iron, manganese, specific conductance, sulfate, TDS, TOC, TSS, and vinyl chloride may be considered effective leachate indicators at the ELF based on leachate-to-background ratios. A release of leachate to groundwater would be expected to result in elevated concentrations of these analytes at a compliance point downgradient of the landfill after accounting for dilution. However, because of spatial variability, barium is not considered a good leachate indicator parameter.

Wells MW-9 and MW-10 were further evaluated for impacts by leachate because of their proximity to the former Phase I leachate pond and downgradient location from the inert refuse area, respectively. Very slight landfill impacts to groundwater were observed in these wells, as indicated by slightly elevated leachate indicator parameters over background conditions (e.g., TOC for MW-9 and chloride, specific conductance, and

sulfate for MW-10). However, neither of these wells have encountered concentrations of indicator parameters above preliminary screening levels, and no VOCs have been detected in these downgradient wells. All statistically significant trends identified during the last 8 quarters of monitoring in MW-9 and MW-10 are decreasing.

4.2.4.2 Landfill Gas

As mentioned earlier, chloride and alkalinity concentrations are important indicators for differentiating impacts due to leachate from those due to LFG. Whereas alkalinity concentrations serve as an indicator of both fugitive leachate and migrating LFG, chloride is an indicator of leachate. The periodic vinyl chloride detections in MW-1 (once in 2010 and again in December 2015) appear to be the result of ongoing LFG effects. This is evidenced by the elevated presence of alkalinity while chloride concentrations were low, and the correspondence of a peak in alkalinity concentration in December 2015 when vinyl chloride was detected. Furthermore, methane has periodically been detected in gas probes along the northern perimeter of the landfill, near MW-1. The hourly LFG monitoring using the GasClam instrumentation, that has been conducted since February 2016, has measured low levels methane up to 0.849 percent by volume in GP-7S. This is consistent with the historical methane observations from January 2008 through September 2013 depicted on Figure 21. Likewise, GP-7I, GP-7D, and GP-6S, all located on the northern border of the ELF, have also experienced historical methane detections. LFG does not appear to be impacting groundwater anywhere else at the landfill. Modifications to LFG extraction duration at lower flow rates on the north side of the landfill should improve groundwater quality conditions at MW-1 to below preliminary screening levels. The LFG system is further evaluated in the next section.

4.3 Landfill Gas

4.3.1 Evaluation of LFG System

The LFG treatment system, depicted on Figure 19, has been increasingly difficult to operate as methane concentrations have decreased and equipment has aged. Alternative LFG treatment systems to the existing enclosed flare were identified and ranked by CH2M Hill (2006a and 2006b). The LFG collection and treatment system was evaluated and recommendations for reducing the level of active LFG collection and alternative LFG treatment options were presented in Aspect's 2014 Findings Report, a summary of which is presented here.

The LFG collection well field has been optimized to collect LFG only from extraction wells that demonstrate sustained methane concentrations. The LFG collection flow rates have been approximately 300 standard cubic feet per minute (scfm), with a long-term average of approximately 39 scfm in May 2013.

Figure 20 presents the summary statistics for carbon dioxide, oxygen, methane, and static pressure at each of the gas probes from manual measurements collected by King County from January 2008 through September 2013. In summary, the probes along the north boundary have elevated carbon dioxide and depressed oxygen, consistent with aerobic microbial activity. The graphs on Figure 21 are explained below (starting with the top graph)

- A plot of **static pressures** shows several probes (G-6S, G-7S, G-7I, G-7D, G-10D, G-16S, G-18, and G-19S) have exhibited a larger range of pressures than others. Typical gas probe pressures would not be expected to generate pressures beyond the range of daily barometric pressure (approximately 10 inches water column), if the probe is open and clear. This pressure range may indicate temporary blockage (water or biofouling) in the screen and/or tygon tubing. Static pressures were recorded starting in July 2010.
- A plot of **oxygen concentrations** shows average oxygen concentrations were less than 15 percent by volume at six probes (G-7S, G-7I, G-7D, G-9S, G-10D, and G-15D).
- A plot of **carbon dioxide** concentrations shows maximum carbon dioxide concentrations were greater than 5 percent by volume at seven probes (G-7S, G-7I, G-7D, G-9S, G-10S, G-10D, and G-15D).
- A plot of **methane concentrations** shows methane was detected at concentrations of up to 0.7 percent by volume at four probes (G-6S, G-7S, G-7I, and G-7D).
- Figure 21 shows stacked-area graphs of LFG concentrations over time at probes located along the northern edge of the ELF. These graphs have been oriented horizontally from east to west, and vertically to roughly approximate similar sampling elevations.

There has been little to no evidence of subsurface LFG migration laterally (based on measurements at perimeter LFG probes) or vertically (based on groundwater samples collected from monitoring wells) in the past several years. Since 2002, methane concentrations have been in compliance with the limits for explosive gases (less than 5 percent methane by volume) required by WAC 173-304-460(2)(b).

Methane has been detected at the edge of waste along the north property boundary line at concentrations less than compliance limits. These detections of methane coincide with the presence of shallow, perched groundwater and recent detections of vinyl chloride in MW-1. The limited LFG generation and limited potential for migration is further supported by the observation of no significant vacuum while the LFG collection system is active, and, likewise, no significant pressure buildup while the LFG collection system was inactive (Aspect, 2015).

The enclosed flare has been used to treat actively collected LFG (specifically odors, nonmethane organic compounds [NMOCs], and toxic air pollutants [TAPs]) at the ELF since the landfill was closed. Based on a reevaluation of source testing and recent LFG sampling, LFG treatment may no longer be required. Recent and historical LFG sampling results are presented in Table 8.

The 2014 Findings Report concluded that the long-term average LFG collection rate has been substantially less than the estimated LFG generation rate, indicating that the LandGEM model assumptions may overpredict LFG generation rates due to an unknown volume of burned waste in the refuse or other site-specific conditions. LandGEM model predictions aside, during the first half of 2013, when the extraction system was minimally operated, methane increases in extraction wells indicated ongoing LFG generation. The

uncollected methane does not appear to have migrated through the subsurface to the monitoring probe network during that period.

Aspect's 2014 Findings Report presented a number of recommendations pertaining to LFG collection, treatment, migration monitoring, and regulatory coordination. Post-2013 LFG evaluations are not included in this report.

4.3.2 LFG System Modifications

Design, construction, and installation of a low-flow utility flare was selected as a remedy for the intermittent and inefficient operation of the existing flare. The low-flow utility flare will be able to function under a wide range of operational conditions (i.e., 140 to 5 scfm at 25 percent methane), but will not operate when methane concentrations drop below approximately 25 percent. Once conditions are suitable, the low-flow utility flare system can easily be converted to an active vent, and eventually to a passive vent, with minor modifications.

Design plans indicate the header of the existing flare will be connected to the new low-flow flare. The old flare will be left in place and used, as needed, for one year until the new low-flow flare system is fully operational and baseline operating conditions are established. At the time of this report, the low-flow utility flare is being manufactured and installation is anticipated to begin in the late third or early fourth quarter of 2016.

4.3.3 GasClam Monitoring

Aspect installed LFG monitoring instrumentation (GasClams) at the flare inlet and G-7S in February 2016 to continuously monitor LFG. Continuous hourly monitoring provides sensitive and definitive data during extreme barometric changes, when potential LFG migration may be dominated by temporary pressure gradients. The GasClams collect data (methane, oxygen, pressure, and temperature) on an hourly basis. Data from the GasClams is downloaded and evaluated on a monthly basis and time-series graphs are presented on Figure 22. The GasClams were installed prior to installation of the low-flow utility flare in order to collect baseline conditions.

The general observations at G-7S, as indicated on Figure 22, are that there was little to no LFG observed at G-7S. Methane concentrations were very low (0.01 to 0.849 percent by volume), if detected. Manual carbon dioxide concentrations were relatively steady at 6 to 7 percent by volume. Manual oxygen concentrations decreased from approximately 6 percent to 0 percent by volume, and were generally less than GasClam measurements. Greater barometric pressure swings due to storm events were observed prior to June 2016, and temperatures generally increased during the monitoring period. Starting in June 2016, the influence of barometric pressure on G-7S was lower relative to the probe pressure, and may reflect smaller barometric pressure swings (due to fewer and smaller storms events) and lower soil moisture (due to less rainfall and increased evapotranspiration).

The general observations at the flare inlet are that LFG concentrations were influenced by barometric pressure changes when the flare was not in operation. During the short periods of flare operation, the methane concentration steadily decreased to the flammability limit at the flare. Methane concentrations ranged from over 45 percent to less than 5 percent by volume. Carbon dioxide concentrations ranged from almost 30 percent to less than 5 percent by volume. Oxygen concentrations ranged from approximately 10 percent to 0

percent by volume. The GasClam oxygen sensor did not calibrate successfully starting in June 2016, and appeared to have failed. The low probe pressure, relative to barometric pressure, identified the short periods of flare operation.

The GasClams will remain in place for at least 6 months after the low-flow flare is started up in order to monitor any changes that may occur with the implementation of this new system.

4.4 Landfill Cover Settlement & Integrity

The cover system at the ELF was constructed in two closure phases (Phase I in 1989 and Phase II in 1993). Both closure phases utilized similar cover systems that consisted of the following components (bottom to top):

- Foundation material
- Geomembrane layer
- Drain material
- Separation geotextile
- Topsoil/vegetative layer (seeded)

Regular maintenance of the cover system has been performed by KCSWD as prescribed by their Post-Closure Care Plan for the ELF. However, to determine whether the facility is suitable to end post-closure care, additional documentation related to the cover system is required. The primary concern is whether the cover system meets the requirements of WAC 173-304. The requirements for termination of post-closure care for landfill cover systems are related to settlement observed over a minimum 2-year period as listed below.

- Uniform slopes between 2 percent and 33 percent and maintains design slopes;
- No evidence of differential settlement;
- Settlement trend curve approaches zero slope; and
- Uniform settlement is less than 0.5 inch over a 2-year period.

To provide a baseline and regular data points for determining if the ELF cover system meets the requirements to terminate post-closure care, KCSWD is conducting biannual settlement surveys at the ELF.

4.4.1 Settlement

Preliminary settlement trends for the ELF are the result of analysis of biannual settlement surveys that were initiated in November 2015. The first 6-month interval was completed in May 2016. The complete results of the settlement survey are included in Appendix H. Evaluation of the baseline and first 6-month survey resulted in a range of 0.00 to 0.36 inches of settlement at 59 individual locations at the ELF. Figure 23 graphically displays the preliminary settlement data from the 6-month survey. However, this is just a preliminary evaluation of the data as the post-closure requirements indicate 2 years of

monitoring is required before a determination can be made that settlement at the landfill is negligible.

4.4.2 Cover Extent

During the review of historical documentation for the site, it was noted in the boring log for MW-10 that inert refuse material was encountered in this boring located outside of the areas included in the Phase I and Phase II closures. These initial findings resulted in further investigation of the extents of the material outside the cover system, the characteristics of this material, and why this material was excluded from the Phase I or Phase II closure areas. The additional investigations included review of closure design reports and interviews with KCSWD personnel familiar with operations at ELF.

Based on historical documentation, any waste in the area outside of the Phase I or Phase II closure areas (Figure 2) was in place prior to any available documentation and was placed by the previous owner of the property. Anecdotal evidence provided during interviews with pertinent KCSWD staff indicate that the material located within the area around MW-10, and approximately identified on Figure 2, consists of inert waste material. In addition to the anecdotal evidence, boring logs from the installation of MW-10 and MW-2 were reviewed based on the location of these wells within the approximated extents of the inert waste material. The boring log for MW-2 did not indicate the presence of any waste materials. However, the boring log for the installation of MW-10 indicated debris between the ground surface to a depth of approximately 30 feet. The debris consisted of glass, metal, Styrofoam, plastic, cloth, wood, and paper. Additionally, burned material (wood and paper) was found during the installation of refuse probes located within the approximate extents of the inert waste material (R.W. Beck, 1992).

During the design phase on the Phase II Closure, it was determined that the inert refuse area did not require a final cover system. This was based on the results of investigations that are detailed in the closure design report (R.W. Beck, 1992) that include the following rational:

1. A LFG monitoring study conducted on RP-3 between 1987 and 1988 resulted in no detection of methane.
2. The refuse encountered had been burned with little organic material remaining, or was non-organic (inert) construction debris.
3. No evidence of stress in vegetation.
4. To preserve the existing stand of trees established over the older landfill area, due to the trees' ability to provide an effective visual buffer between the landfill and the surrounding properties that would not be replaceable should a geomembrane cover be installed. This vegetation has been undisturbed since prior to 1980 based on aerial photography observed during the review of historical documentation.

The inert refuse material is primarily located to the east of downgradient monitoring wells MW-2 and MW-10, but both of these wells are located within a portion of the approximate extents of this inert material. Exceedances for the parameters arsenic, iron, and manganese have been continually observed and reported at MW-2, and are attributed to landfill impacts from the upgradient municipal waste. MW-10, which was completed

in the inert refuse area, has not exhibited any exceedances of WAC Chapter 173-200 water quality standards, other than pH. And that measurement was not statistically elevated above background conditions. Neither MW-10 nor MW-2 exhibit increasing trends.

5 Conceptual Site Model

The hydrogeologic conceptual model for the ELF was initially established in the report *Ground Water Geology/Quality Investigations for Rural Landfills in King County, Washington* (R.W. Beck, 1984), and further refined in *Geotechnical Report, Enumclaw Landfill, King County, Washington* (R.W. Beck, 1987). The conceptual site model presented here refines the existing conceptual site model with updated information. The conceptual model for affected environmental media at the ELF addresses the following items:

- Source medium
- Transport mechanism
- Exposure medium
- Exposure location

The updated conceptual site model is described below, followed by more detailed descriptions of contaminant sources and pathways.

5.1 Summary of Conceptual Site Model

A conceptual site model was developed from the existing data and data gathered during this post-closure evaluation. The conceptual site model includes the following components:

- The ELF is underlain by mudflow deposits and glacial sediments over crystalline volcanic bedrock. The mudflow deposits generally appear to underlie all of the landfill refuse mapped on the ELF, and act as an aquitard and impede groundwater movement. The glacial sediments at the ELF primarily include recessional outwash and till. The recessional outwash represents the uppermost aquifer at the ELF and has a high permeability. The low-permeability glacial till units largely impede groundwater recharge and serve as an aquitard. The crystalline volcanic bedrock located adjacent and northeast of the ELF serves as a no-flow boundary and controls groundwater movement both regionally and along the northern portion of the ELF.
- Recharge to the uppermost aquifer is controlled by underflow from the east, and local infiltration from the stormwater collection system controls and runoff from the Phase I and Phase II landfill covers. Also noted is some seasonal perching of water in and on the Osceola Mudflow along the northern perimeter of the ELF. Recharge along the northern area of the ELF is likely supplied by surface water runoff and mountain-front recharge from both the bedrock knob to the northwest and the Cascade mountain foothills to the east. This perched zone appears to be isolated to this one area at the north end of the ELF, and the perched water likely infiltrates vertically into the Recessional Outwash aquifer.
- Groundwater flow in the upper aquifer beneath the ELF is predominantly westerly, flowing west-southwest at the eastern edge of the ELF and northwest at the western edge of the ELF. The groundwater velocities at the

ELF are high, estimated to range between 0.74 ft/dy and 100 ft/dy (AESI, 2000).

- Groundwater migrates predominantly horizontally through the upper aquifer. The high groundwater flow velocity provides for attenuation and dispersion of contaminants, and reduces potential impacts on groundwater quality in the regional aquifer. Likewise, water quality impacts would be expected to migrate quickly in a horizontal direction through the upper aquifer. Downward migration of contaminants to the regional aquifer is precluded by the glacial till aquitard. Downgradient regional wells do not indicate landfill impacts to groundwater quality.
- LFG migration is largely controlled within the ELF, as evidenced by routine monitoring of gas probes along the landfill perimeter. Monitoring results indicate little to no horizontal migration of LFG to the perimeter probes, with the exception of GP-7 and GP-6 located on the northern boundary of the landfill. LFG probe GP-7 has exhibited annual cycles in LFG concentrations, while GP-6 has had isolated occurrences of LFG (Aspect 2014). LFG concentrations tend to be higher during periods of falling, low barometric pressure events. It is suspected that by optimizing the existing LFG system and construction of the low-flow utility flare, LFG migration will be eliminated and collection within the landfill will be more efficient (Aspect 2014; Herrera 2015).
- LFG migrates from the refuse mass through native soils, predominantly the mudflow deposits in the shallow unsaturated zone overlying the upper aquifer.
- VOC concentrations and loading factors in the LFG (measured at the flare inlet) show significant decreasing or stable concentrations over time for many compounds (Aspect 2014). The LFG contains VOCs that may dissolve into groundwater, as evidenced by vinyl chloride in MW-1. Redox processes related to LFG may also cause naturally occurring metals in soils to dissolve into groundwater, as evidenced by arsenic concentrations in MW-1, and iron and manganese in MW-1 and MW-2. LFG may contact groundwater and seasonally perched water via preferential pathways, such as dry wells and other landfill infrastructure or through zones of higher permeability within the soils.
- Leachate generated within the closed ELF migrates vertically to groundwater, typically located approximately 25 feet below the base of refuse. The relatively thick unsaturated soils provide a buffering zone before leachate can directly mix with groundwater. Wells located downgradient of the landfill (MW-2, MW-9, and MW-10) are situated such that potential leachate parameters that could impact the underlying groundwater will be intercepted by the well configuration and detected, if present, during groundwater sampling. In particular, MW-9, situated in a downgradient position from the former Phase I leachate pond, has provided data since 2000 to assess water quality along a flow path from the former leachate pond.

6 Recommendations

This section of the report presents recommendations in the context of meeting requirements of WAC 173-304 and termination of post-closure care. To terminate post-closure care, stability must be demonstrated. Stability is demonstrated by little-or-no cover settlement, LFG production, and leachate generation. The criteria for little-or-no cover settlement, LFG production, and leachate generation are defined in Ecology's guidance document *Preparing for Termination of Post-Closure Activities at Landfills Closed Under Chapter 173-304 WAC* (Publication No. 11-07-006) dated February 2011, and amended in January 2013.

6.1 Site Stabilization Demonstration

6.1.1 Groundwater Monitoring

For groundwater monitoring to be terminated, groundwater results must indicate no recent or ongoing (within the last eight consecutive monitoring events) exceedances of WAC Chapter 173-200 criteria, and trend slopes for detected concentrations must be zero or less, indicating groundwater does not show signs of potential negative landfill impacts. Generally, Ecology will not support ending post-closure care for any landfill with existing groundwater impacts.

The groundwater analyte evaluation for the most recent 8 quarterly monitoring events presented above indicates that there are detections of constituents above background in downgradient and crossgradient wells, and the following WAC 173-200 criteria exceedances were observed:

- MW-1—arsenic, manganese, and vinyl chloride
- MW-2—arsenic, iron, and manganese
- pH levels exceeded WAC 173-200 criteria in every well during the last 8 quarters of monitoring, including in the background well, MW-3.

The groundwater trend analysis indicated the majority of detected concentrations of parameters had a trend of zero or less, with ammonia in MW-2 and manganese in MW-9 having statistically significant decreasing trends. The only statistically significant increasing trend observed during the last eight monitoring events was sulfate in MW-1.

Because of these exceedances and handful of trends greater than zero at this time, the groundwater still shows signs of potential landfill impacts, and post-closure care with regards to groundwater cannot be terminated. However, there is sufficient evidence to support reducing the monitoring frequency and analyte list as proposed in the next section.

6.1.1.1 Groundwater Monitoring Analyte Evaluation

Table 9 presents the results of the evaluation of groundwater monitoring analytes. All of the analytes routinely monitored were evaluated based on total number of samples analyzed and number of detections; whether the analyte was historically present in leachate; if the background-to-leachate ratio is greater than 10; and if the parameter is

required under WAC 173-304. The table then identifies whether the analyte should be retained for future groundwater monitoring events, and the rationale behind that decision.

Parameters that are proposed to be retained for analysis in future monitoring events are:

- **Field Parameters**
  - DO
  - pH
  - Temperature
  - ORP
  - Specific Conductance
- **Conventionals**
  - TDS
  - TSS
  - Chloride
  - Sulfate
  - Alkalinity
  - Ammonia
  - TOC
  - Nitrate
- **Metals**
  - Arsenic
  - Calcium
  - Iron
  - Magnesium
  - Manganese
  - Potassium
  - Sodium
- **VOCs**
  - Vinyl Chloride
  - Acetone
  - chloromethane
  - Dichlorodifluoromethane
  - 1,2-Dibromoethane (EDB)

The parameters that have been selected for elimination from the routine sampling list have not been detected in groundwater above laboratory RDLs since at least 2010, were only sporadically detected above the RDL prior to 2014, or their detections were attributable to potential laboratory contamination.

Vinyl chloride is the VOC of concern and is the only VOC that will be analyzed during each monitoring event. Specifically, during the spring semi-annual sampling event vinyl chloride will be the only VOC that is analyzed, while during the fall event, the VOC analyte list will be expanded to also include acetone, chloromethane, dichlorodifluoromethane, and EDB. A constituent listed in the expanded fall list will continue to be analyzed until it is demonstrated by four consecutive sampling events that constituent is below its respective groundwater standard. If necessary, reporting to the method detection limit will be used to determine whether a constituent meets groundwater standards.

6.1.1.2 Groundwater Monitoring Network Evaluation

Each well was evaluated based on whether key parameters (arsenic, iron, manganese, and vinyl chloride) were non-detect, or if they were detected statistically above background;

if there have been any exceedances of WAC 173-200 criteria; and if there are concentration trends with slopes of zero or less. Table 10 presents the results of the monitoring well network evaluation. The results indicate that all of the wells should continue to be sampled. All wells were selected to remain in the routine monitoring network because of either ongoing exceedances of preliminary screening levels or detections are above background, or their location at the landfill (directly intercept discharge from landfill or are background).

However, the frequency of monitoring should be reduced from quarterly to semiannually (spring and fall). Reducing the frequency to semiannual sampling is sufficient for monitoring changes in concentrations relating to the high and low water seasons. A preliminary evaluation of the effect of water level to concentrations of key landfill indicator parameters was conducted, and it appears that MW-1 has an inverse relationship with water level in that concentrations increase with decreasing water levels. This may be due to water levels reducing in the well exposing portions of the screen that are then able to act as preferential pathway for LFG. The other wells at the ELF have a direct correlation between water levels and concentrations.

Water level monitoring should continue in all monitoring wells, and should also include collection of water levels from available shallow gas probes along the northern boundary of the landfill to monitor changes in seasonal shallow groundwater in the mudflow deposits.

6.1.2 Leachate Monitoring

No leachate collection system has been in place at the ELF since the Phase II Closure was completed in 1993. There is no evidence of leachate generation since landfill closure. There is no existing leachate collection infrastructure, and thus no leachate monitoring activities conducted at the ELF. The series of groundwater monitoring wells located throughout the site continue to provide groundwater quality data both upgradient and downgradient of the landfill site. Based on the stable or decreasing trends for leachate-indicator parameters attributed to landfilling, it is recommended that the frequency of monitoring at these groundwater wells be reduced to a biannual (two times/year) basis as requested by KCSWD in the ELF 2013 Annual Groundwater Data Evaluation Report.

6.1.3 Landfill Gas Monitoring

At this time, no modifications to the LFG post-closure monitoring schedule is recommended. Terminating active LFG collection and/or treatment may be considered in the future if, after the installation of the new low flow utility flare system, environmental monitoring confirms protection of human health and the environment.

6.1.4 Landfill Cover

6.1.4.1 Settlement

Recommendations related to the suitability of the ELF cover system cannot yet be made. Ecology guidance documentation requires a minimum of 2 years of monitoring data to determine whether settlement rates can be considered stable. However, based on the initial 6-month settlement survey interval, the following conclusions can be made:

- Slopes are between 2 percent and 33 percent, and maintain the design slope;
- No evidence of differential settlement;

- Not enough survey events have been conducted to establish a settlement trend; and
- Settlement in the first 6-month interval varied between 0.00 and 0.36 inch.

6.1.4.2 Cover at MW-10

It is recommended that no action be taken to extend the Phase I or Phase II cover systems over the inert material observed at MW-10. This recommendation is based on the recommendations from the Phase II Design Report (R.W. Beck, 1992; accepted by King County/Seattle DOH and Ecology), anecdotal and boring log evidence of the inert nature of the material located in this area, the relative age of the material, the lack of corresponding evidence of impacts from leachate indicating parameters in adjacent monitoring wells, and the sustainability impacts of removing the existing vegetation.

6.2 Data Gaps

At this time, the ELF has not demonstrated stable conditions, and has not satisfied Ecology's criteria for post-closure termination. This section presents data gaps that will need to be achieved before post-closure termination can be achieved at the ELF, and include:

- Continued groundwater monitoring for 2 years at a semiannual sampling frequency, and reassessment of regulatory criteria exceedance, and statistical and trend analysis. If statistically significant increases in groundwater quality are noted, then groundwater monitoring frequency will revert to quarterly.
- Achieve a detection limit for arsenic that is less than or equal to the groundwater protection standard of 0.05 ug/L.
- Reestablish water level monitoring of shallow, seasonal groundwater at gas probes installed in the mudflow deposits along the northern boundary of the landfill.
- Continued LFG monitoring and reevaluation after low-flow utility flare has been operational for 1 year.
- Continued 6-month settlement monitoring for at least an additional year, and reevaluate conditions at that time.

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8 Limitations

Work for this project was performed for the King County Solid Waste Division (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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TABLES

Table 1 - Current Groundwater Monitoring Schedule

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Monitoring Well	Installation Date	Decomissioned Date	Location Relative to Groundwater Flow	Sampling History	Current Sampling Frequency
MW-1	08/24/83	--	Sidegradient	Quarterly since 1987	Quarterly
MW-2	08/25/83	--	Downgradient	Quarterly since 1987	Quarterly
MW-3	08/26/83	--	Upgradient	Quarterly since 1987	Quarterly
MW-4	08/04/86	09/27/99	Downgradient	Quarterly since 1987 until 1999	None, replaced by MW-10
MW-5S	08/06/86	09/27/99	Downgradient	None, dry	None, replaced by MW-10
MW-5D	08/08/86	09/27/99	Downgradient	Quarterly since 1987 until 1999	None, replaced by MW-10
MW-6	08/14/86	06/15/93	Sidegradient	Quarterly since 1986 until 1993	None, replaced by MW-6A
MW-6A	07/09/93	--	Sidegradient	Quarterly since 1993	Quarterly
MW-7	08/22/86	June1988	Downgradient	Quarterly since 1987 until 1988	None
MW-8	01/20/87	09/29/99	Downgradient	Quarterly since 1987 until 1998	None, replaced by MW-9
MW-9	09/30/99	--	Downgradient	Quarterly since 1999	Quarterly
MW-10	10/26/99	--	Downgradient	Quarterly since 1999	Quarterly

Table 2 - Site Groundwater Quality Summary of Detections and Exceedances

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Analyte	Number of Sampled Locations	Number of Samples (excluding Field Dups)	First Sample Date	Most Recent Available Sample Date	Number of Samples with Detected Concentration	Detection Frequency (%)	Last Sample Date with Detected Concentration	Maxumim Detected Concentration	Minimum Detected Concentraion	Average Detected Concentration	Reporting Limit	Method Detection Limit	Units	Preliminary Screening Level[1]	Number of Exceedances of Preliminary Screening Level	Exceednace Frequency (%)	Date of Last Screening Level Exceedance	Number of NonDetects with Reporting Limit Above Preliminary Screening Level[2]	Number of Samples Since Last Exceedance
Conventionals																			
Alkalinity, Total (AS CACO3)	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	127	22.6	42.3	1	1	mg/l			0%			
Ammonia as N	6	48	2/10/2014	12/2/2015	22	46%	12/2/2015	0.141	0.0126	0.0519	0.01	0.002	mg/l			0%			
Chloride	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	20.5 / 317*	0.123	2.57 / 5.03*	0.1	0.05	mg/l	250	1*	2%*	12/3/2014*	0	4*
Nitrate as N	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	8.19	0.027	1.14	0.01	0.01	mg/l	10		0%			
Sulfate	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	35.7	1.2	5.95	0.1	0.1	mg/l	250		0%			
Total Dissolved Solids	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	193	51.7	86.1	5	10	mg/l	500		0%			
Total Organic Carbon	6	48	2/10/2014	12/2/2015	6	13%	11/25/2015	2.14	1.41	1.74	1	0.5	mg/l			0%			
Total Suspended Solids	6	48	2/10/2014	12/2/2015	4	8%	11/25/2015	5.01	1.4	2.32	1	0.5	mg/l			0%			
Field Parameters																			
Dissolved Oxygen	6	12	8/3/2015	12/2/2015	12	100%	12/2/2015	10.05	0.47	5.32			mg/L			0%			
Oxidation-Reduction Potential	6	12	8/3/2015	12/2/2015	12	100%	12/2/2015	365	86	256			mV			0%			
pH	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	7.48	5.75	6.4			pH units	6.5 - 8.5	31	65%	12/1/2015	0	2
Specific Conductance	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	269	58	107			uS/cm	700		0%			
Temperature	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	13	8.6	10.4			° C			0%			
Turbidity	6	7	8/3/2015	12/2/2015	7	100%	12/2/2015	5.197	-1.909	0.159			NTU			0%			
Metals																			
Antimony (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.001	0.0003	ug/l	6		0%			
Arsenic (dissolved)	6	48	2/10/2014	12/2/2015	8	17%	12/2/2015	9.51	1.05	2.87	0.001	0.0001	ug/l	0.05	8	17%	12/2/2015	40	0
Barium (dissolved)	6	48	2/10/2014	12/2/2015	31	65%	12/2/2015	7.43	1.22	2.59	0.001	0.00005	ug/l	1000		0%			
Beryllium (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.001	0.0001	ug/l	4		0%			
Cadmium (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.002	0.00005	ug/l	5		0%			
Calcium (dissolved)	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	29700	4410	11100	0.01	0.05	ug/l			0%			
Chromium (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.005	0.0002	ug/l	50		0%			
Cobalt (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.003	0.00005	ug/l			0%			
Copper (dissolved)	6	48	2/10/2014	12/2/2015	1	2%	12/3/2014	2.07	2.07	2.07	0.002	0.0002	ug/l	1000		0%			
Iron (dissolved)	6	48	2/10/2014	12/2/2015	16	33%	12/2/2015	887	17	258	0.01	0.01	ug/l	300	5	10%	5/12/2015	0	14
Lead (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.001	0.0001	ug/l	15		0%			
Magnesium (dissolved)	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	8150	1500	3040	0.015	0.05	ug/l			0%			
Manganese (dissolved)	6	48	2/10/2014	12/2/2015	20	42%	12/2/2015	1360	1.09	547	0.001	0.0001	ug/l	50	16	33%	12/2/2015	0	0
Mercury (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.0001	0.00005	ug/l	2		0%			
Nickel (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.01	0.0001	ug/l	100		0%			
Potassium (dissolved)	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	6510	503	1160	0.3	0.1	ug/l			0%			
Selenium (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.001	0.0005	ug/l	10		0%			
Silver (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.003	0.00004	ug/l	50		0%			
Sodium (dissolved)	6	48	2/10/2014	12/2/2015	48	100%	12/2/2015	9800	2950	4370	0.05	0.1	ug/l			0%			
Thallium (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.001	0.00004	ug/l	2		0%			
Vanadium (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.002	0.000075	ug/l			0%			
Zinc (dissolved)	6	48	2/10/2014	12/2/2015		0%					0.004	0.0005	ug/l	5000		0%			
VOCs																			
1,1,1,2-Tetrachloroethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
1,1,1-Trichloroethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	200		0%			
1,1,2,2-Tetrachloroethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
1,1,2-Trichloroethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	5		0%			
1,1-Dichloroethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	1		0%			
1,1-Dichloroethene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	7		0%			
1,2,3-Trichloropropane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
1,2-Dibromo-3-chloropropane	6	48	2/10/2014	12/2/2015		0%					1	0.2	ug/l	0.2		0%	12/2/2015	48	0
1,2-Dibromoethane (EDB)	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	0.001		0%	12/2/2015	48	0
1,2-Dichlorobenzene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	600		0%			
1,2-Dichloroethane (EDC)	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	0.5		0%			
1,2-Dichloropropane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	0.6		0%			
1,4-Dichloro-2-Butene	6	48	2/10/2014	12/2/2015		0%					100	0.2	ug/l			0%			
1,4-Dichlorobenzene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	4		0%			
2-Butanone	6	48	2/10/2014	12/2/2015		0%					4	2	ug/l			0%			
2-Hexanone	6	48	2/10/2014	12/2/2015		0%					4	2	ug/l			0%			
4-Methyl-2-pentanone	6	48	2/10/2014	12/2/2015		0%					4	2	ug/l			0%			
Acetone	6	48	2/10/2014	12/2/2015	3	6%	8/4/2015	8.5	4	6.2	4	2	ug/l			0%			
Acrylonitrile	6	48	2/10/2014	12/2/2015		0%					0.07	0.07	ug/l	0.07		0%			
Benzene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	1		0%			
Bromochloromethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Bromodichloromethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	0.3		0%			

Table 2 - Site Groundwater Quality Summary of Detections and Exceedances

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Analyte	Number of Sampled Locations	Number of Samples (excluding Field Dups)	First Sample Date	Most Recent Available Sample Date	Number of Samples with Detected Concentration	Detection Frequency (%)	Last Sample Date with Detected Concentration	Maxumim Detected Concentration	Minimum Detected Concentraion	Average Detected Concentration	Reporting Limit	Method Detection Limit	Units	Preliminary Screening Level[1]	Number of Exceedances of Preliminary Screening Level	Exceednace Frequency (%)	Date of Last Screening Level Exceedance	Number of NonDetects with Reporting Limit Above Preliminary Screening Level[2]	Number of Samples Since Last Exceedance
Bromoform	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	5		0%			
Bromomethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Carbon Disulfide	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Carbon Tetrachloride	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	0.3		0%			
Chlorobenzene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	100		0%			
Chloroethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Chloroform	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	7		0%			
Chloromethane	6	48	2/10/2014	12/2/2015	1	2%	8/6/2015	0.34	0.34	0.34	0.2	0.2	ug/l			0%			
cis-1,2-Dichloroethene (DCE)	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	70		0%			
cis-1,3-Dichloropropene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Dibromochloromethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	0.5		0%			
Dibromomethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Dichlorodifluoromethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Ethylbenzene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	700		0%			
Methylene Chloride	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	5		0%			
Methyliodide	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Styrene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	100		0%			
Tetrachloroethene (PCE)	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	0.8		0%			
Toluene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	1000		0%			
trans-1,2-Dichloroethene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	100		0%			
trans-1,3-Dichloropropene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Trichloroethene (TCE)	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l	3		0%			
Trichlorofluoromethane	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Vinyl Acetate	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			
Vinyl Chloride	6	48	2/10/2014	12/2/2015	1	2%	12/2/2015	0.0399	0.0399	0.0399	0.02	0.01	ug/l	0.02	1	2%	12/2/2015	0	0
o-Xylene	6	48	2/10/2014	12/2/2015		0%					0.2	0.2	ug/l			0%			

Notes:

[1] Preliminary screening levels are the lowest criteria from either WAC 173-200 or WAC 246-290-310.

[2] Several constituents have laboratory reporting limits that are above the preliminary screening level due to the screening levels being lower than analytical technical capabilities.

^{o}C = degrees Celsius; ug/L = micrograms per liter; mg/L = milligrams per liter; mV = millivolts; uS/cm = microsiemens per centimeter; NTU = nephelometric turbidity units.

* The detection of 317 mg/L chloride is a statistical outlier. This was the only exceedance of the chloride screening level. The maximum and average values were calculated with and without this outlier included in the dataset.

Table 3 - Regional Groundwater Quality Summary of Detections

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Source	Date	Analyte								Sample Composition	Sample Location	Sample Type
		Nitrate - N (mg/L)	Sulfate (mg/L)	Total Nitrate/ Nitrite (mg/L)	Conductivity (µmhos/cm)	Chloride (mg/L)	Hardness (mg/L)	Turbidity (NTU)	Sodium (mg/L)			
01 - Boise Spring	10/13/09	0.7								Single	tap outside bldg chlorine station	Pre-Treatment / Raw
01 - Boise Spring	07/20/10	0.7								Single	city reservoir sample line in ccf b	Post-Treatment / Finished
01 - Boise Spring	08/16/11	0.7								Single	in ccf bldg boise springs ph s/t	Post-Treatment / Finished
01 - Boise Spring	05/23/12	0.8								Single	tap inside ccf bldg	Post-Treatment / Finished
01 - Boise Spring	08/20/13	0.9	2	0.9	118	2	47	0.2	9	Single	city reservoir ccf bldg boise sprin	Post-Treatment / Finished
01 - Boise Spring	08/05/14	0.9								Single	1835 roosevelt ccf bldg ph sample l	Post-Treatment / Finished
01 - Boise Spring	09/15/15	0.8								Single	boise springs s/t	Post-Treatment / Finished
02 - Watercress Spring #1	07/07/09	1.9	7	1.9	110	3	65		6	Blended	wh hb	Pre-Treatment / Raw
02 - Watercress Spring #1	10/13/09	1.6								Blended	tap inside bldg	Pre-Treatment / Raw
02 - Watercress Spring #1	09/14/10	1.7								Single	sample line in ccf bldg	Post-Treatment / Finished
02 - Watercress Spring #1	10/04/11	1.8								Single	watercress	Post-Treatment / Finished
02 - Watercress Spring #1	05/23/12	2								Single	tap inside ccf bldg	Post-Treatment / Finished
02 - Watercress Spring #1	09/15/15	1.8								Blended	s/t on ccf bldg	Post-Treatment / Finished
08 - Watercress Spring #2	07/07/09	1.9	7	1.9	110	3	65		6	Blended	wh hb	Pre-Treatment / Raw
08 - Watercress Spring #2	10/13/09	1.6								Blended	tap inside bldg	Pre-Treatment / Raw
08 - Watercress Spring #2	09/14/10	1.7								Single	sample line in ccf bldg	Post-Treatment / Finished
08 - Watercress Spring #2	08/16/11	1.8								Single	watercress ccf bldg ph tap	Post-Treatment / Finished
08 - Watercress Spring #2	07/10/12	1.7	6	1.7	186	3	60	0.2	22	Single	ccf bldg	Post-Treatment / Finished
08 - Watercress Spring #2	08/20/13	1.7								Single	city reservoir ccf bldg watercress	Post-Treatment / Finished
08 - Watercress Spring #2	08/05/14	1.8								Single	1835 roosevelt ccf bldg watercress	Post-Treatment / Finished
08 - Watercress Spring #2	09/15/15	1.8								Blended	s/t on ccf bldg	Post-Treatment / Finished
Preliminary Screening Levels		**10**	**250**			**250**			**20**			

Notes:

Data obtained from Washington State Department of Health

Pink shading indicates exceedance of one of the preliminary screening level

µmhos/cm = micromhos per centimeter; mg/L = milligrams per liter; and NTU= nephelometric turbidity units.

Table 4 - Summary of Leachate Data

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Enumclaw Leachate Data (North Pond) 1986 - 1989

Sample ID	Sample Date	Ammonia - N mg/L	Chloride mg/L	Cyanide mg/L	Fluoride mg/L	Nitrate - N mg/L	Nitrite - N mg/L	Ortho Phosphate mg/L	Total Phosphate mg/L	Sulfate mg/L	Sulfur mg/L	Total Kjeldahl N mg/L	pH std units	Conductance mhos/cm	Total Solids mg/L	Total Dissolved Solids mg/L	Total Suspended Solids mg/L	Chemical Oxygen Demand mg/L	Total Organic Carbon mg/L
LEP-86514	5/14/1986	22.6	436.2		< 0.05				8.1	36		37.8	7.7	1644	1342	1341	0.3	714	
LEP-861105	11/5/1986												6.3				370	1300	
LEP-86016	12/16/1986			< 0.01															
LEP-87505	5/5/1987																		
LEP-89310	3/10/1989	7.2	20	< 0.005	< 0.2	1.5	0.016	< 0.005	0.054	40	17		7.1	490	300		23	28	9

Sample ID	Sample Date	Total Organic Halogens mg/L	Biological Oxygen Demand mg/L	Total Coliform MPN/100 mLs	Fecal Coliform MPN/100 mLs	Hardness mg/L	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Total Chromium mg/L	Copper mg/L	Iron mg/L	Lead mg/L	Manganese mg/L	Mercury mg/L	Nickel mg/L	Selenium mg/L	Silver mg/L	Zinc mg/L
LEP-86514	5/14/1986					490		0.122	< 0.004	0.02	< 0.02	45.2	0.04	4.05	0.0003	< 0.02		< 0.004	1.181
LEP-861105	11/5/1986								< 0.002	0.022	0.03	46	0.02			0.02			0.16
LEP-86016	12/16/1986			180			0.005		< 0.01	< 0.01	0.02	129	< 0.005	7.4	< 0.0005	< 0.04	< 0.005	< 0.005	0.02
LEP-87505	5/5/1987			1600			<0.002	0.46	< 0.01	< 0.02		206	< 0.002	19.3	< 0.0002		< 0.002	< 0.01	0.02
LEP-89310	3/10/1989	0.05	6	1600	2		< 0.005	0.06	< 0.002	< 0.005	0.014	3	< 0.01	1	< 0.001	0.02	< 0.005	< 0.002	0.02

Sample ID	Sample Date	Acetone ug/L	Benzene ug/L	Bromodichloromethane ug/L	Bromoform ug/L	Bromomethane ug/L	2-Butanone ug/L	Carbon Disulfide ug/L	Carbon Tetrachloride ug/L	Chlorobenzene ug/L	Chloroethane ug/L	Chloroform ug/L	Dibromochloromethane ug/L	p-Dichlorobenzene ug/L	1,1-Dichloroethane ug/L	1,2-Dichloroethane ug/L	1,2-Dichloethene ug/L
LEP-86514	5/14/1986																
LEP-861105	11/5/1986																
LEP-86016	12/16/1986	6200	<2	< 1	< 2	< 4	4400	< 2	< 2	< 1	15	< 3	< 2		19	< 2	50
LEP-87505	5/5/1987	5050	24	< 1.3	< 1.9	< 4.2	4560	< 2	< 1.7	< 1.3	16	< 2.5	< 1.6		62	< 2.3	90
LEP-89310	3/10/1989	12	<1	< 1	< 1	< 1	< 3	< 1	< 1	< 3	< 3	< 1	< 3	< 1	< 1	< 1	< 1

Sample ID	Sample Date	1,1-Dichloethene ug/L	1,-Dichlopropane ug/L	cis-1,3-Dichloropropene ug/L	trans-1,3-Dichloropropene ug/L	Ethylbenzene ug/L	2-Hexanone ug/L	Methylene Chloride ug/L	4-Methyl-2-Pentanone ug/L	Styrene ug/L	1,1,2,2-Tetrachloroethane ug/L	PCE ug/L	Toluene ug/L	1,1,1-Trichloroethane ug/L	1,1,2-Trichloroethene ug/L	Trichloroethene ug/L	Vinyl Acetate ug/L
LEP-86514	5/14/1986																
LEP-861105	11/5/1986																
LEP-86016	12/16/1986	< 5	< 2	< 2	< 2	38	118	208	309	< 3	< 2	< 1	534	< 1	< 2	2	< 6
LEP-87505	5/5/1987	< 4.5	< 1.6	< 1.7	< 1.7	35	13	77	140	< 2.7	< 2.1	< 1.2	1100	< 1.6	< 1.6	2.2	< 5.8
LEP-89310	3/10/1989	< 1	< 1	< 3	< 3	< 1	< 3	< 1	< 3	< 1	< 3	< 1	< 1	< 1	< 1	< 1	< 1

Sample ID	Sample Date	Vinyl Chloride ug/L	Total Xylenes ug/L	Chloromethane ug/L	2,4-D ug/L	2,4,5-TP (Silvex) ug/L	Endrin ug/L	Lindane ug/L	Methoxychlor ug/L	Toxaphene ug/L	Gross Alpha Acrivity pCi/L	Radium 226 pCi/L	Radium 28 pCi/L
LEP-86514	5/14/1986												
LEP-861105	11/5/1986												
LEP-86016	12/16/1986	11	129	< 3			< 0.1	< 0.05	< 0.5	< 1			
LEP-87505	5/5/1987	14	105	< 3.2	< 1		< 1	< 1	< 1	< 4			
LEP-89310	3/10/1989	< 1	2	< 1	< 0.5	< 0.5	< 0.1	< 0.05	< 0.5	< 1	< 2	< 0.6	< 1

Notes:

< = Analyte not detected above laboratory PQL.

ug/L = micrograms per liter; mg/L = milligrams per liter; mhos/cm = mhos per centimeter; MPN/100 mL = most probable number per 100 milliliters filtered, pCi/L = picocuries per liter.

Table 5 - Statistical Trend Summary

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

2010 - 2015 Dataset

Well ID	MW-1		MW-2		MW-3		MW-6a		MW-9		MW-10		
Analyte	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Notes
Ammonia	Decreasing	-0.0024	Decreasing	-0.0013	Increasing	0	NS	0	NS	0	NS	0	
Arsenic	Decreasing	-0.0001	Decreasing	-0.0002	--	--	--	--	--	--	--	--	MW-1 and MW-2 only detects
Chloride	Decreasing	-0.0174	NS	0.0015	NS	-0.0009	NS	-0.0057	NS	-0.0137	NS	-0.0133	
Iron	Decreasing	-0.0171	Decreasing	-0.0939	--	--	--	--	NS	0	--	--	MW-1, MW-2, MW-9 only detects
Manganese	Decreasing	-0.0178	Decreasing	-0.0449	--	--	--	--	Decreasing	-0.0005	--	--	MW-1, MW-2, MW-9 only detects
Nitrate	Increasing	0.0185	NS	0.0057	NS	0.0016	NS	0.0026	NS	0.0113	NS	0.0019	
pH	NS	0.012	NS	-0.01	NS	0.0021	Increasing	0.0113	NS	0.0038	NS	0.0107	
Specific Conductance	NS	0	Decreasing	-1.1661	NS	-0.1339	NS	0	NS	-0.605	NS	-1.0474	
Sulfate	NS	-0.0179	Decreasing	-0.1243	Decreasing	-0.0134	Decreasing	-0.01	NS	-0.0358	NS	-0.319	
Temp	NS	-0.0185	NS	-0.0182	NS	0.02	NS	0.0258	NS	0.0183	NS	0.0024	
TOC	Decreasing	0	NS	0	NS	0	NS	0	NS	-0.0096	Decreasing	0	
Vinyl Chloride	NS	0	--	--	--	--	--	--	--	--	--	--	MW-1 only detects.
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	All non-detect

Statistics:

Theil-Sen Slope

Mann-Kendall Trend Analysis

Statistical analyses were performed assuming non-parametric data distributions in accordance to the EPA Unified Guidance Document - Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA, 2009)

Statistical Analyses were performed using the 2010 to 2015 water quality data

-- Indicates parameter not detected above laboratory PQL.

ht Quarters (Q1 2014 - Q4 2015)

Well ID:	MW-1		MW-2		MW-3		MW-6A		MW-9		MW-10		
Parameters	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Statisically Significant Trend	Slope	Notes
Ammonia	NS	0.0084	Decreasing	-0.0048	NS	0	NS	0	NS	0	NS	0	
Arsenic	NS	0	NS	0	--	--	--	--	--	--	--	--	MW-1 and MW-2 only detects
Chloride	NS	0.021	NS	-0.105	NS	-0.0558	NS	0.005	NS	-0.0223	NS	-0.0133	
Iron	NS	-0.0128	NS	-0.0585	--	--	--	--	NS	0	--	--	MW-1, MW-2, MW-9 only detects
Manganese	NS	0.0158	NS	-0.0304	--	--	--	--	Decreasing	-0.0001	--	--	MW-1, MW-2, MW-9 only detects
Nitrate	NS	-0.0874	NS	-0.0662	NS	-0.0133	NS	0.0132	NS	0.0459	NS	-0.0067	
pH	NS	0.022	NS	0.0621	NS	0.0558	NS	0.0154	NS	-0.0063	NS	0.01	
Specific Conductance	NS	14.75	NS	0.8564	NS	1.1367	NS	1.7392	NS	0.4725	NS	-5.1167	
Sulfate	Increasing	0.2052	NS	-0.08	NS	-0.0083	NS	0.0183	NS	0.176	NS	-0.4	
Temp	NS	0.0471	NS	0.0307	NS	0.1179	NS	0.0618	NS	0.1608	NS	0.1667	
Total Organic Carbon	--	--	NS	0	--	--	--	--	NS	0	--	--	MW-2 and MW-9 only detects
Vinyl Chloride	NS	0	--	--	--	--	--	--	--	--	--	--	MW-1 only detects
Zinc	--	--	--	--	--	--	--	--	--	--	--	--	All non-detect

Statistics:

Mann-Kendall Trend Analysis

Statistical analyses were performed assuming non-parametric data distributions in accordance to the EPA Unified Guidance Document - Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA, 2009)

Statistical Analyses were performed using the 2014 to 2015 water quality data

Notes:

Decreasing - Indicates statistically significant decreasing trend.

Increasing - Indicates statistically significant increasing trend.

No shading indicates trend not statistically significant.

NS - Insufficient statistical evidence of a significant trend.

-- Indicates parameter not detected above laboratory PQL.

Table 6 - Upgradient Downgradient Comparison

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

2010 - 2015 Groundwater Dataset

Analyte	MW-1	MW-2	MW-6A	MW-9	MW-10
Ammonia	Above	Above	NS	NS	NS
Arsenic	Above	Above	-	-	-
Chloride	Above	Above	NS	NS	Above
Iron	Above	Above	-	NS	-
Manganese	Above	Above	-	Above	-
Specific Conductance	Above	NS	NS	NS	Above
Sulfate	Above	Above	NS	NS	Above
Total Organic Carbon	NS	NS	NS	Above	Above
Vinyl Chloride	NS	-	-	-	-

Last 8 Quarters (Q1 2014 - Q4 2015)

Analyte	MW-1	MW-2	MW-6A	MW-9	MW-10
Ammonia	Above	NS	NS	NS	NS
Arsenic	Above	NS	-	-	-
Chloride	NS	NS	NS	NS	Above
Iron	Above	Above	-	-	-
Manganese	Above	Above	-	NS	-
Specific Conductance	Above	NS	NS	NS	Above
Sulfate	Above	Above	NS	NS	Above
Total Organic Carbon	-	NS	-	Above	-
Vinyl Chloride	NS	-	-	-	-

Statistical Method:

Wells were evaluated relative to background well MW-3.
Evaluation performed on WAC 173-304 analytes and vinyl chloride
Statistical significance was evaluated using a one-sided non-parametric ANOVA at α=0.05.

Results:

NS (Not Significant) - Indicates that the downgradient results did not show statistical significance when compared against background results.
Above - Indicates that downgradient results showed a statistically significant difference above background results.
Shading indicates increasing trend.
Shading indicates decreasing trend.
No shading indicates trend not statistically significant.
-- Indicates parameter not detected above laboratory PQL.

Table 7 - Evaluation of Leachate Indicator Parameters

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Parameters	Max. Leachate Concentration	Max. MW-3 "Background" Concentration	Ratio Leachate to Background Well
AMMONIA AS N (mg/L)	22.6	0.0448	504
BARIUM (mg/L)	0.46	0.0005	920
CHLORIDE (mg/L)	436.2	2.21	197
FIELD pH	7.70	6.76	1
IRON (mg/L)	206	0.005	41,200
MANGANESE (mg/L)	19.3	0.0005	38,600
NITRATE (mg/L)	1.5	1.49	1
SPECIFIC CONDUCTANCE (uS/cr	1644	89.6	18
SULFATE (mg/L)	40	2.46	16
TOTAL DISSOLVED SOLIDS (mg/	1341	72.50	18
TOTAL ORGANIC CARBON (mg/L	9	0.5	18
TOTAL SUSPENDED SOLIDS (mg	370	0.5	740
VINYL CHLORIDE (ug/L)	14	0.01	1,400

Notes:

Ratio of leachate to groundwater >10, analyte considered good indicator for monitoring leachate impacts to groundwater.

Leachate concentration is the maximum concentration detected 1986-1989 from "Enumclaw Leachate (North Pond)"

Background is the maximum concentration at MW-3 collected over 8 quarters (Jan. 2014 - Dec. 2015)

Nondetect values taken at 1/2 of the detection limit

Parameters where leachate data were not evalable were omitted from this table.

Table 8 - Recent and Historical LFG Sampling Results

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Analyte	CAS Number	Molecular Weight	Units	9/19/2013 Sampling Results			Average Sampling Results				Normalized Loading Factors (mg/m^3 VOC)/(%v/v CH_4)	
				10:35	*11:05*	*11:35*	*7/16/1997*	*3/22/2001*	*2004*	*9/19/2013*	*3/22/2001*	*9/19/2013*
Major Gases												
Methane	74-82-8	16.04	(%v/v)	26.8	25.9	17.2		16.0	28.6	26.35		
Oxygen	7782-44-7	16	(%v/v)	0.05 U	0.05 U	5.92		2.6	1.8	0.05 U		
Carbon Dioxide	124-38-9	44.01	(%v/v)	17	16.6	10.6		19.7	24.2	16.80		
Carbon Monoxide	630-08-0	28.01	(%v/v)	0.05 U	0.05 U	0.05 U		0.1		0.05 U		
Nitrogen	7727-37-9	28	(%v/v)	30.2	31.6	36.3				30.90		
Hydrogen	1333-74-0	2	(%v/v)	0.05 U	0.05 U	0.05 U		0.5		0.05 U		
Volatile Organic Compounds (VOCs)												
1,1,1,2-Tetrachloroethane	630-20-6	167.85	mg/m^3					244 U			15	
1,1,1-Trichloroethane	71-55-6	133.42	mg/m^3	17.5 U	17.5 U	17.5 U	120	194 U		18 U	12	1
1,1,2,2-Tetrachloroethane	79-34-5	167.85	mg/m^3	33.0 U	33.0 U	33.0 U	27	244 U		33 U	15	1
1,1,2-Trichloro-1,2,2-Trifluoro	76-13-1	187.37	mg/m^3	61.3 U	61.3 U	61.3 U	10	273 U		61 U	17	2
1,1,2-Trichloroethane	79-00-5	133.42	mg/m^3	43.7 U	43.7 U	43.7 U	20	194 U		44 U	12	2
1,1-Dichloroethane	75-34-3	98.96	mg/m^3	22.7	13.0 U	13.0 U	12	155		18	10	1
1,1-Dichloroethene	75-35-4	96.94	mg/m^3	12.7 U	12.7 U	12.7 U	171	141 U		13 U	9	0
1,1-Dichloropropene	563-58-6	110.97	mg/m^3					161 U			10	
1,2,3-Trichloropropane	96-18-4	112.99	mg/m^3					164 U			10	
1,2,4-Trichlorobenzene	120-82-1	181.45	mg/m^3	35.6 U	35.6 U	35.6 U	369	264 U		36 U	17	1
1,2,4-Trimethylbenzene	95-63-6	120.19	mg/m^3	186	223	174	7,771	1,574		205	98	8
1,2-Dibromo-3-Chloropropane	96-12-8	236.33	mg/m^3					344 U			21	
1,2-Dibromoethane	106-93-4	187.86	mg/m^3	24.6 U	24.6 U	24.6 U	11 U	273 U		25 U	17	1
1,2-Dichloro-1,1,2,2-Tetrafluo	76-14-2	170.92	mg/m^3	236	230	160	7 U	858		233	54	9
1,2-Dichlorobenzene	95-50-1	147.01	mg/m^3	28.9 U	28.9 U	28.9 U	2,986	214 U		29 U	13	1
1,2-Dichloroethane	107-06-2	98.96	mg/m^3	13.0 U	13.0 U	13.0 U	16	144 U		13 U	9	0
1,2-Dichloropropane	78-87-5	112.99	mg/m^3	37.0 U	37.0 U	37.0 U	5 U	164 U		37 U	10	1
1,3,5-Trimethylbenzene	108-67-8	120.19	mg/m^3	98.3	116.0	70.8	4,106	610		107	38	4
1,3-Butadiene	106-99-0	54.09	mg/m^3	17.7 U	17.7 U	17.7 U		79 U		18 U	5	1
1,3-Dichlorobenzene	541-73-1	147.01	mg/m^3	28.9 U	28.9 U	28.9 U	2,188	214 U		29 U	13	1
1,4-Dichlorobenzene	106-46-7	147	mg/m^3	56.8	50.0	37.5	3,085	320		53	20	2
1,4-Dioxane	123-91-1	88.11	mg/m^3	57.7 U	57.7 U	57.7 U				58 U		2
2,2,4-Trimethylpentane	540-84-1	114.23	mg/m^3					651			41	
2,2-Dichloropropane	594-20-7	112.99	mg/m^3					164 U			10	
2-Hexanone	591-78-6	100.16	mg/m^3	65.5 U	65.5 U	65.5 U				66 U		2
4-Ethyltoluene	622-96-8	120.19	mg/m^3	29.9	33.8	25.2		302		32	19	1
Acetone	67-64-1	58.08	mg/m^3	62.3	93.5	47.5		693		78	43	3
Acrolein	107-02-8	56.06	mg/m^3	18.3 U	18.3 U	18.3 U				18 U		1
Acrylonitrile	107-13-1	53.06	mg/m^3					77 U			5	
Allyl Chloride	107-05-1	76.53	mg/m^3					111 U			7	
Benzene	71-43-2	78.11	mg/m^3	274	299	199	2,074	975		287	61	11
Benzyl chloride	100-44-7	126.58	mg/m^3	41.4 U	41.4 U	41.4 U		184 U		41 U	12	2
Bromodichloromethane	75-27-4	163.83	mg/m^3	32.2 U	32.2 U	32.2 U		238 U		32 U	15	1
Bromoform	75-25-2	252.72	mg/m^3	33.1 U	33.1 U	33.1 U		368 U		33 U	23	1
Bromomethane	74-83-9	94.9	mg/m^3	31.1 U	31.1 U	31.1 U	80	138 U		31 U	9	1
Carbon disulfide	75-15-0	76.13	mg/m^3					111 U			7	
Carbon tetrachloride	56-23-5	153.84	mg/m^3	20.1 U	20.1 U	20.1 U	6 U	224 U		20 U	14	1
Chlorobenzene	108-90-7	112.56	mg/m^3	247	278	183	1,882	693		263	43	10
Chlorodifluoromethane	75-45-6	86.47	mg/m^3					23,406			1463	
Chloroethane	75-00-3	64.51	mg/m^3	237	214	140	3 U	930		226	58	9
Chloroform	67-66-3	119.39	mg/m^3	15.6 U	15.6 U	15.6 U	6	174 U		16 U	11	1
Chloromethane	74-87-3	50.49	mg/m^3	16.5 U	16.5 U	16.5 U	204	73 U		17 U	5	1
Chloroprene	126-99-8	88.53	mg/m^3					129 U			8	
cis-1,2-Dichloroethene	156-59-2	96.94	mg/m^3	12.7 U	12.7 U	12.7 U	33	141 U		13 U	9	0
cis-1,3-Dichloropropene	10061-01-5	110.97	mg/m^3	36.3 U	36.3 U	36.3 U	5 U	161 U		36 U	10	1
Cyclohexane	110-82-7	84.08	mg/m^3	433	464	264		1,139		449	71	17
Dibromochloromethane	124-48-1	208.28	mg/m^3	68.2 U	68.2 U	68.2 U		303 U		68 U	19	3
Dichlorodifluoromethane	75-71-8	120.91	mg/m^3	214	216	155	196	1,900		215	119	8

Table 8 - Recent and Historical LFG Sampling Results

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Analyte	CAS Number	Molecular Weight	Units	9/19/2013 Sampling Results			Average Sampling Results				Normalized Loading Factors (mg/m^3 VOC)/(%v/v CH_4)	
				10:35	*11:05*	*11:35*	*7/16/1997*	*3/22/2001*	*2004*	*9/19/2013*	*3/22/2001*	*9/19/2013*
Dichlorofluoromethane	75-71-8	102.92	mg/m^3					150 U			9	
Ethyl Acetate	141-78-6	88.11	mg/m^3	58 U	58 U	58 U		128 U		58 U	8	2
Ethylbenzene	100-41-4	106.07	mg/m^3	1,040	1,150	773	16,186	5,384		1,095	336	42
Heptane	142-82-5	100.21	mg/m^3	1,150	1,180	761		3,404		1,165	213	44
Hexachlorobutadiene	87-68-3	260.76	mg/m^3	171 U	171 U	171 U	555	379 U		171 U	24	6
Hexachloroethane	67-72-1	202.29	mg/m^3					294 U			18	
Hexane	110-54-3	86.18	mg/m^3	1,460	1,250	921		4,543		1,355	284	51
Isopropyl Alcohol	67-63-0	60.06	mg/m^3	39.3 U	39.3 U	39.3 U		87 U		39 U	5	1
Isopropyl Benzene	98-82-8	120.19	mg/m^3					175 U			11	
m,p-Xylenes	106-42-3	106.16	mg/m^3	299	511	351	3,887	6,333		405	396	15
Methanol	67-56-1	32	mg/m^3					60			4	
Methyl ethyl ketone	78-93-3	72.11	mg/m^3	23.6 U	23.6 U	23.6 U		569		24 U	36	1
Methyl isobutyl ketone	108-10-1	72.11	mg/m^3	65.5 U	65.5 U	65.5 U		105 U		66 U	7	2
Methyl methacrylate	80-62-6	100.12	mg/m^3	19.7 U	19.7 U	19.7 U				20 U		1
Methylene Chloride	75-09-2	84.94	mg/m^3	27.8 U	27.8 U	27.8 U	36	124 U		28 U	8	1
MTBE	1634-04-4	88.15	mg/m^3	11.5 U	11.5 U	11.5 U		128 U		12 U	8	0
Naphthalene	91-20-3	128.17	mg/m^3	25.2 U	25.2 U	25.2 U				25 U		1
n-Butylbenzene	104-51-8	134.218	mg/m^3					195 U			12	
n-Propylbenzene	103-65-1	120.19	mg/m^3					175 U			11	
o-Xylene	95-47-6	106.16	mg/m^3	289	299	215	5,925	2,189		294	137	11
Pentachloroethane	76-01-7	202.09	mg/m^3					294 U			18	
p-Isopropyl Toluene	99-87-6	134.22	mg/m^3					195 U			12	
Propylene	115-07-1	42.08	mg/m^3	1,420	1,430	1,040		1,792		1,425	112	54
sec-Butylbenzene	135-98-8	134.22	mg/m^3					195 U			12	
Styrene	100-42-5	104.15	mg/m^3	20.4 U	20.4 U	20.4 U	807	153		20 U	10	1
tert-Butylbenzene	98-06-6	134.218	mg/m^3					195 U			12	
Tetrachloroethene	127-18-4	165.83	mg/m^3	32.6 U	32.6 U	32.6 U	211	241 U		33 U	15	1
Tetrahydrofuran	109-99-9	72.11	mg/m^3	114	112	65.6		732		113	46	4
Toluene	108-88-3	92.13	mg/m^3	183	198	127	6,020	2,514		191	157	7
trans-1,2-Dichloroethene	156-60-5	96.94	mg/m^3	12.7 U	12.7 U	12.7 U		141 U		13 U	9	0
trans-1,3-Dichloropropene	10061-02-6	110.9693	mg/m^3	36.3 U	36.3 U	36.3 U	8	161 U		36 U	10	1
Trichloroethene	79-01-6	131.39	mg/m^3	17.2 U	17.2 U	17.2 U	50	191 U		17 U	12	1
Trichlorofluoromethane	75-69-4	137.37	mg/m^3	44.0	45.8	34.2	156	303		45	19	2
Vinyl acetate	108-05-4	86.09	mg/m^3	155	145	74.4		125 U		150	8	6
Vinyl bromide	593-60-2	106.95	mg/m^3					156 U			10	
Vinyl chloride	75-01-4	62.5	mg/m^3	56	54	8.18 U	229	213		55	13	2
Non-Methane Organic Compounds (NMOC)												
NMOC			ppbC	115,000	113,000	80,200				114,000		
NMOC		86	ppm, as hexane	19	19	13		73		19		
Sulfur Containing Compounds												
Hydrogen sulfide	7783-06-4	34.08	mg/m^3	17,900	17,900	11,800		20,000		17,900	1250	679
Hydrogen sulfide			ppm	12.9	12.8	8.52						

Notes:

"U" indicates analyte was not detected at the reporting limit or practical quantification limit.

%v/v = percent volume/volume; ug/m^3 = micrograms per cubic meters; ppbC = parts per billion carbon; and ppm = parts per million.

Table 9 - Criteria for Reduction of Groundwater Analyte List

Project No. 090057-530.4.1, Enumclaw Landfill, King County, Washington

Analyte Last 8 rounds (Q1 2014-Q4 2015)	Total Analyzed	Total Detected	Analyte Detected in Leachate	Background to Leachate Ratio >20	WAC 173-304 Required Parameter	Retain Analyte	Rationale
DISSOLVED OXYGEN	12	12	NA	N/A	---	Yes	Fundamental parameter for monitoring geochemical processes.
FIELD pH	48	48	Yes	No	Yes	Yes	Fundamental parameter for monitoring geochemical processes; Detected above background in MW-2.
FIELD TEMPERATURE	48	48	Yes	N/A	Yes	Yes	Fundamental parameter for monitoring geochemical processes.
FIELD TURBIDITY	7	3	NA	N/A	---	Yes	Fundamental parameter for monitoring geochemical processes.
OXIDATION REDUCTION POTENTIAL	12	12	NA	N/A	---	Yes	Fundamental parameter for monitoring geochemical processes.
SPECIFIC CONDUCTANCE	48	40	Yes	No	Yes	Yes	Fundamental parameter for monitoring geochemical processes; Detected above background in select wells.
TOTAL DISSOLVED SOLIDS	48	40	Yes	No	---	Yes	Fundamental parameter for monitoring geochemical processes.
TOTAL SUSPENDED SOLIDS	48	2	Yes	Yes	---	Yes	Fundamental parameter for monitoring geochemical processes.
CHLORIDE	48	39	Yes	Yes	Yes	Yes	Conservative tracer, major ion.
SULFATE	48	40	Yes	No	Yes	Yes	Major ion; Detected above background in MW-1, MW-2, MW-10; statistical increasing trend in MW-1.
ALKALINITY, TOTAL (AS CACO3)	48	40	NA	N/A	---	Yes	Potential indicator of gas to groundwater pathway.
AMMONIA AS N	48	18	Yes	Yes	Yes	Yes	Detected above background in MW-1.
TOTAL ORGANIC CARBON	48	6	Yes	No	Yes	Yes	Fundamental parameter for monitoring geochemical processes; Detected above background in MW-9.
TOTAL SOLIDS	48	40	Yes	No	---	No	
NITRATE	48	40	Yes	No	Yes	Yes	Part of nitrogen balance.
ANTIMONY	48	0	NA	N/A	---	No	Not detected in groundwater.
ARSENIC	48	8	Yes	N/A	---	Yes	Detected in groundwater above preliminary screening levels.
BARIUM	48	22	Yes	Yes	---	No	Not detected in groundwater above preliminary screening levels.
BERYLLIUM	48	0	NA	N/A	---	No	Not detected in groundwater.
CADMIUM	48	0	No	N/A	---	No	Not detected in groundwater or leachate.
CALCIUM	48	40	NA	N/A	---	Yes	Major ion
CHROMIUM	48	0	Yes	N/A	---	No	Not detected in groundwater.
COBALT	48	0	NA	N/A	---	No	Not detected in groundwater.
COPPER	48	0	Yes	N/A	---	No	Not detected in groundwater.
IRON	48	15	Yes	Yes	Yes	Yes	Potential leachate indicator; Detected above preliminary screening levels and detected above background.
LEAD	48	0	Yes	N/A	---	No	Not detected in groundwater.
MAGNESIUM	48	40	NA	N/A	---	Yes	Major ion
MANGANESE	48	18	Yes	Yes	Yes	Yes	Potential leachate indicator; Detected above preliminary screening levels and detected above background.
NICKEL	48	0	No	N/A	---	No	Not detected in groundwater or leachate.
POTASSIUM	48	38	NA	N/A	---	Yes	Good leachate indicator.
SELENIUM	48	0	No	N/A	---	No	Not detected in groundwater or leachate.
SILVER	48	0	No	N/A	---	No	Not detected in groundwater or leachate.
SODIUM	48	38	NA	N/A	---	Yes	Conservative tracer, major ion.
THALLIUM	48	0	NA	N/A	---	No	Not detected in groundwater.
VANADIUM	48	0	NA	N/A	---	No	Not detected in groundwater.
ZINC	48	0	Yes	N/A	Yes	No	Not detected in groundwater.
MERCURY	48	0	Yes	N/A	---	No	Not detected in groundwater.
VINYL CHLORIDE	48	1	Yes	N/A	---	Yes	Retain to monitor LFG to groundwater pathway; Detected above preliminary screening levels in MW-1.

Notes:

This assessment evaluated only the last 8 quarters of data.

VOC's without screening level exceedances are not listed. VOCs detected in the last 8 quarters are proposed for monitoring (vinyl chloride, acetone, chloromethane, dichlorodifluoromethane), in addition to EDB.

Ratio of leachate to background >10, analyte considered good indicator for monitoring leachate impacts to groundwater (see Table 7).

Table 10 - Modifications to Groundwater Monitoring Well Network

Project No. 090057 Task 310.3, Enumclaw Landfill, King County, Washington

Well	Current Quarterly Monitoring	Proposed Monitoring	Proposed Monitoring Frequency[1]	Proposed Analytes[2]	Purpose
Downgradient					
MW-2	WQ, WL	WQ, WL	Biannual	Conventionals, Metals, VOCs	POC Well
MW-9	WQ, WL	WQ, WL	Biannual	Conventionals, Metals, VOCs	POC Well
MW-10	WQ, WL	WQ, WL	Biannual	Conventionals, Metals, VOCs	POC Well
Crossgradient					
MW-1	WQ, WL	WQ, WL	Biannual	Conventionals, Metals, VOCs	POC Well
MW-6A	WQ, WL	WQ, WL	Biannual	Conventionals, Metals, VOCs	POC Well
Background / Upgradient					
MW-3	WQ, WL	WQ, WL	Biannual	Conventionals, Metals, VOCs	POC Well

Notes:

1) Biannual sampling to be conducted twice per year in May and December.

2) VOCs = Vinyl Chloride (May event) / Acetone, chloromethane, dichlorodifluoromethane, 1,2-Dibromoethane (EDB), and vinyl chloride (December event*)

Metals = Arsenic, Calcium, Iron, Magnesium, Manganese, Potassium, Sodium

Conventionals = TDS, TSS, Chloride, Sulfate, Alkalinity, Ammonia, TOC, Nitrate

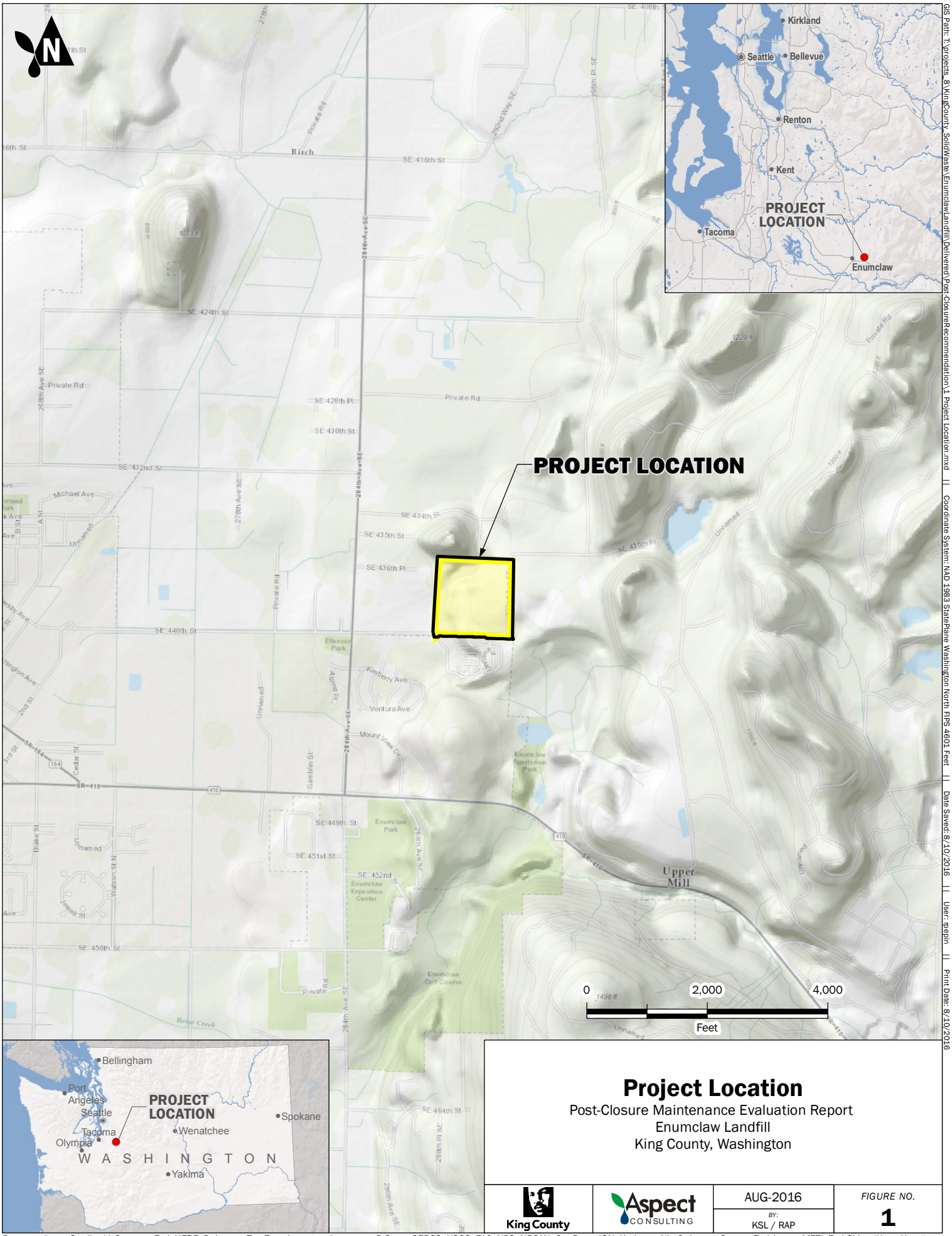
*A constituent listed in the expanded VOC list will continue to be analyzed until it is demonstrated by 4 consecutive sampling events that constituent is below its respective groundwater standard.

WQ = Water Quality Sampling

WL = Water Level Measurements

POC Well = Point of Compliance Well

FIGURES



Project Location

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County	Aspect CONSULTING	AUG-2016	FIGURE NO.
		BY: KSL / RAP	1

Basemap Layer Credits || Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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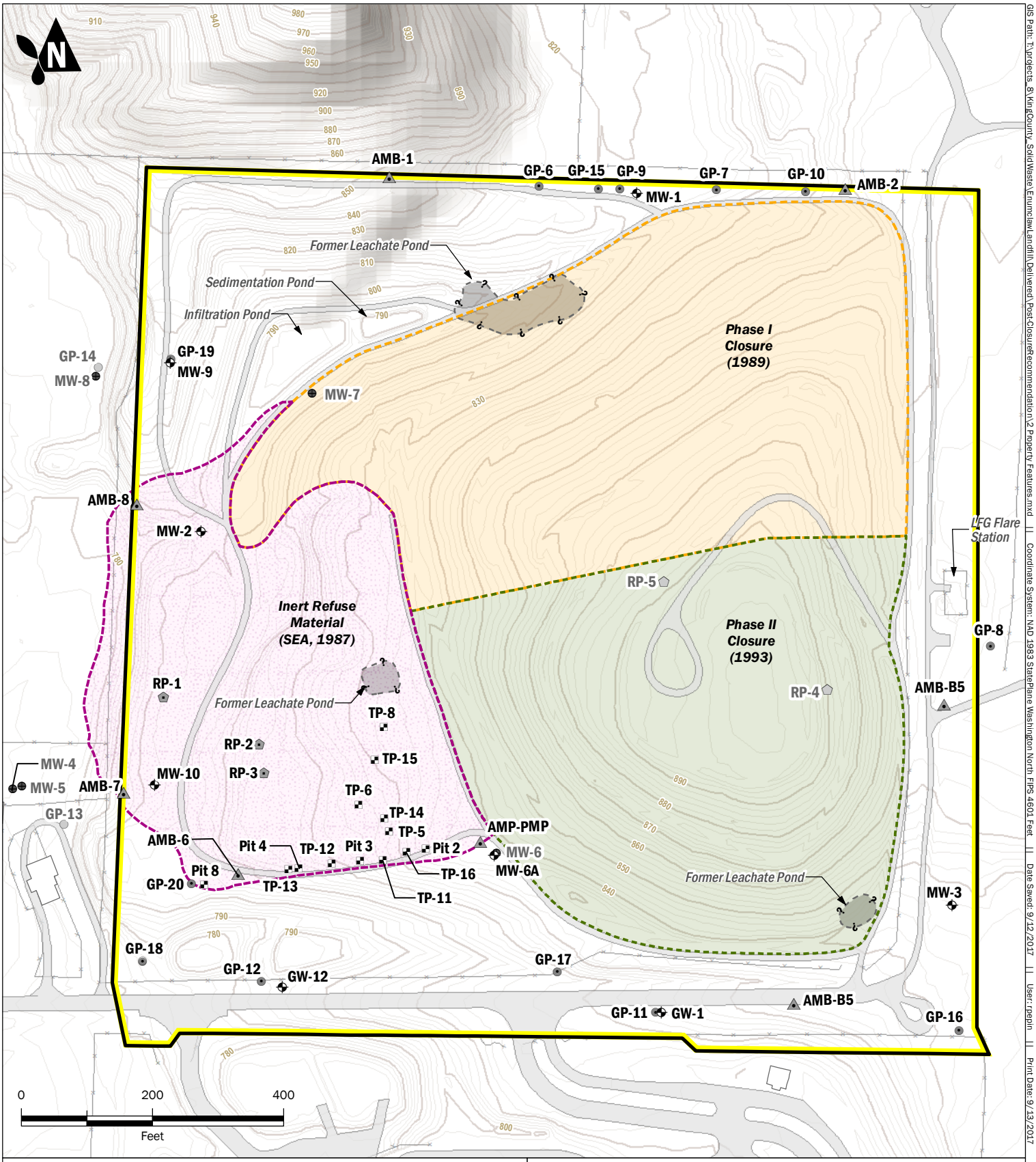


Gas Probe
Monitoring Well
Refuse Probe
Test Pit
Ambient Air
Monitoring Well (Decommissioned)
Refuse Probe (Decommissioned)
Gas Probe (Decommissioned)
Phase I Closure (1989)
Phase II Closure (1993)
Inert Refuse Material
Former Leachate Pond Approximate Location
Enumclaw Landfill Property
Building
Fence
Road

Note: Status of GW-12 and GW-1 unknown.
Topographic contours from King County survey dated May 18, 2016.

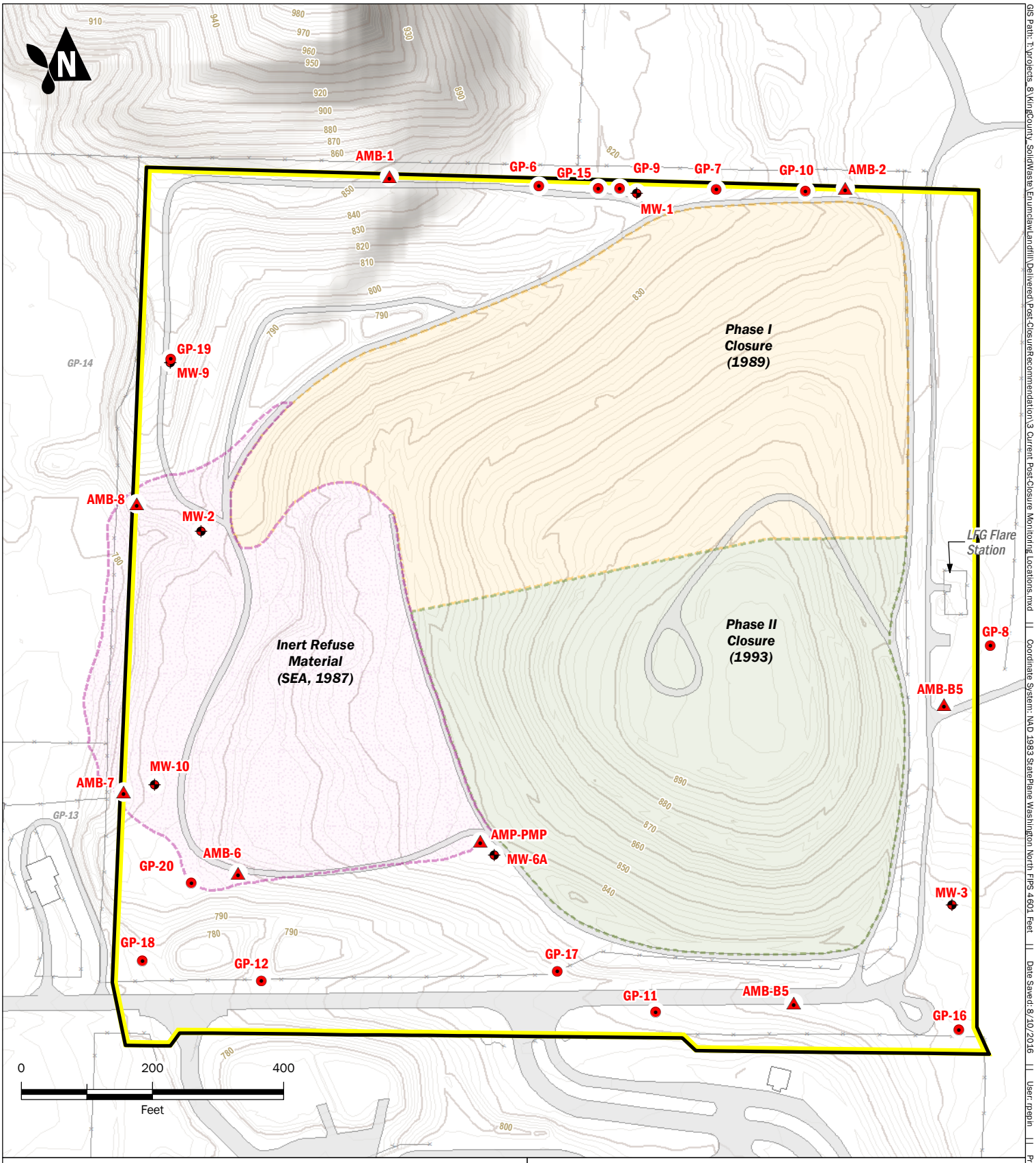
Enumclaw Landfill Property Features

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | SEP-2017 | BY: AHP / RAP | FIGURE NO. 2

Basemap Layer Credits || USGS, NGA, NASA, CGIAR,N Robinson,NCEAS,NLS,OS,NMA,Geodatastyrelsen

GIS Path: T:\projects_8\KingCounty_SolidWaste\EnumclawLandfill\Delivered\PostClosureRecommendation\2 Property Features.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 9/12/2017 || User: rpepin || Print Date: 9/13/2017



Post-Closure Monitoring Locations

- Gas Probe
- Monitoring Well
- Ambient Air

- Phase I Closure (1989)
- Phase II Closure (1993)
- Inert Refuse Material
- Enumclaw Landfill Property

- Building
- Fence
- Road

Note: Topographic contours from King County survey dated May 18, 2016.

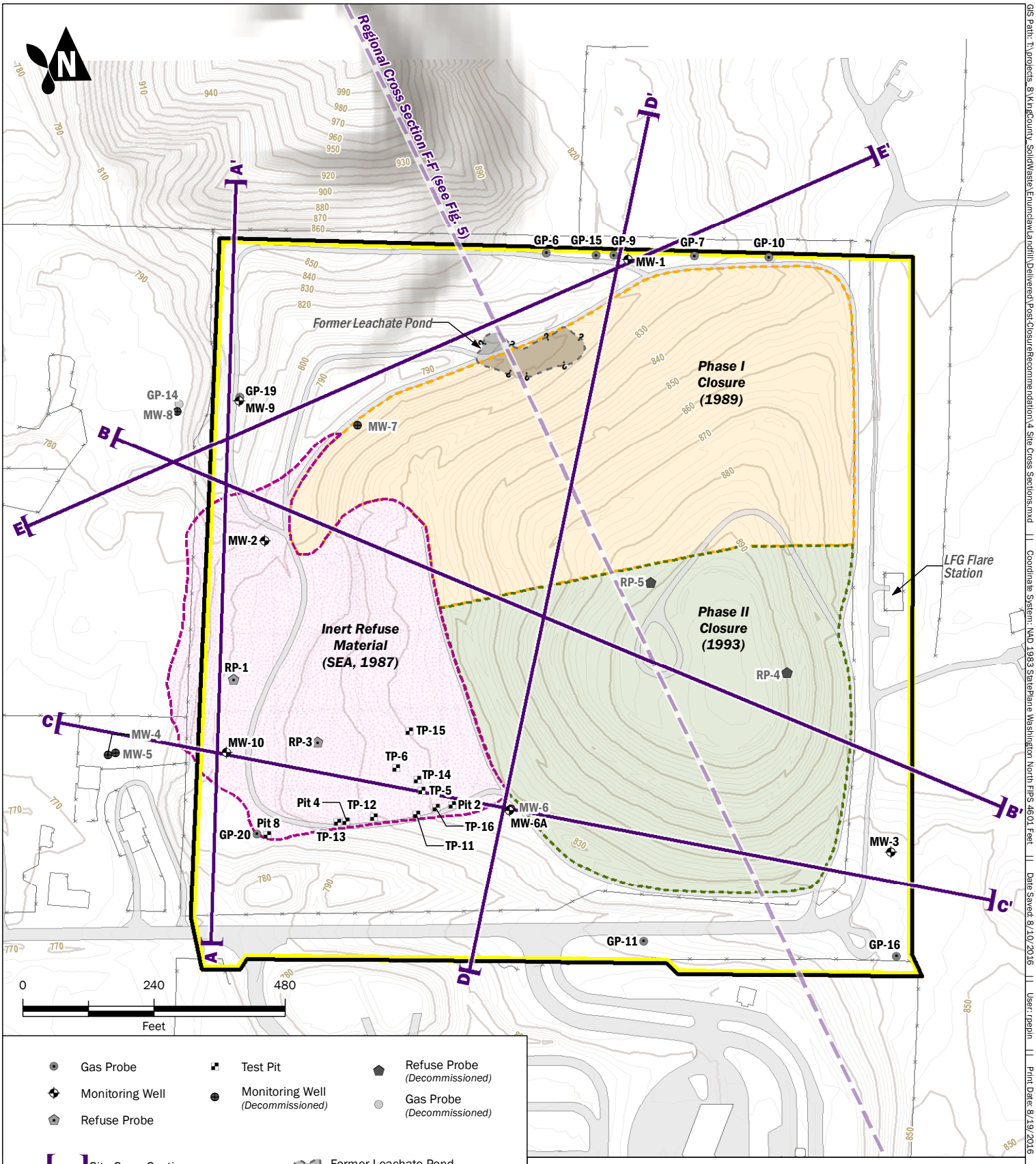
Current Post-Closure Monitoring Locations

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | AUG-2016 | BY: KSL / RAP | FIGURE NO. 3

Basemap Layer Credits || USGS, NGA, NASA, CGIAR,N Robinson,NCEAS,NLS,OS,NMA,Geodatastyrelsen

GIS Path: T:\projects_8\KingCounty_SolidWaste\Enumclaw\Landfill\Delivered\Post-ClosureRecommendation\3 Current Post-Closure Monitoring Locations.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: rpgph || Print Date: 8/10/2016



Note: Status of GW-12 and GW-1 unknown.
Topographic contours from King County survey dated May 18, 2016.

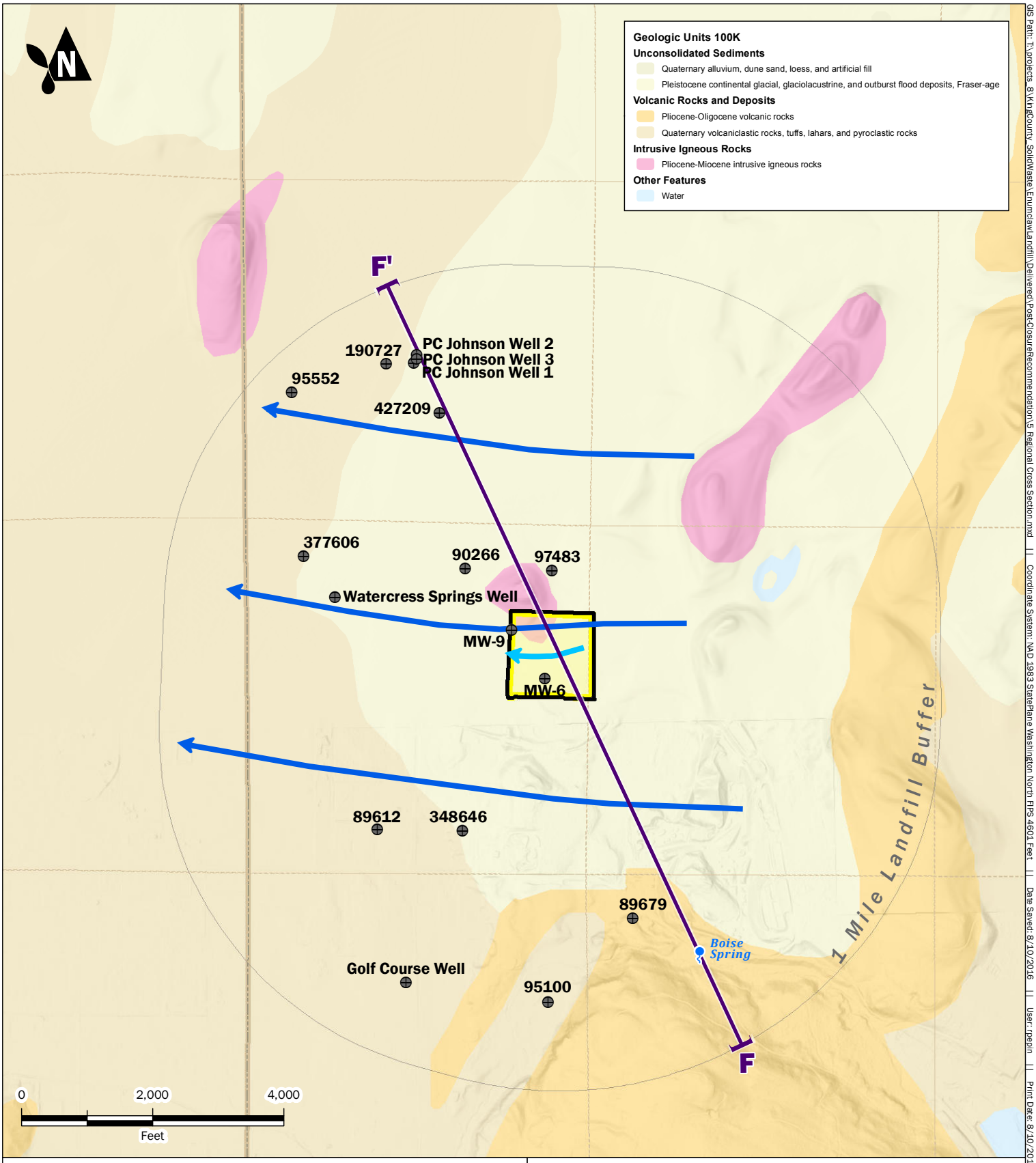
Site Cross-Section Location Map

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County	Aspect Consulting	AUG-2016	FIGURE NO.
		BY: AHP / RAP	4

Basemap Layer Credits || USGS, NGA, NASA, CGIAR,N Robinson,NCEAS,NLS,OS,NMA,Geodatastyrelsen

GIS Path: T:\projects_8\KingCounty_SolidWaste\EnumclawLandfill\Delivered\Post-ClosureRecommendation\4 Site Cross Sections.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: rpepin || Print Date: 8/19/2016



Cross Section Well
Cross Section
Local Groundwater Flow Direction in Vashon Recessional Outwash Aquifer *(see Figure 12)*
Regional Groundwater Flow Direction in Vashon Advance Outwash Aquifer *(USGS, 2015)*
Spring
Enumclaw Landfill Property
Township & Range
Section

Note: Refer to Appendix E for well logs.

Regional Cross-Section Location Map

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | AUG-2016 | BY: AHP / RAP | *FIGURE NO.* 5

Basemap Layer Credits || USGS, NGA, NASA, CGIAR,N Robinson,NCEAS,NLS,OS,NMA,Geodatastyrelsen

GIS Path: T:\projects_8\KingCounty_SolidWaste\EnumclawLandfill\Delivered\Post-ClosureRecommendation\5_Regional Cross Section.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: rpepin || Print Date: 8/10/2016

A (South)

A' (North)

Inert Refuse Material

Cross Section C-C'

Cross Section B-B'

Cross Section E-E'

GP-20 (Offset 55' E)

MW-10

RP-1 (Offset 17' E)

MW-2 (Offset 59' E)

MW-7 (Offset 229' E)
MW-8 (Offset 102' W)
GP-14 (Offset 98' W)
GP-19
MW-9

Fill

Inert Refuse Material

Qom

Qvr

Qvt

Tv

ATD

Elevation in Feet (NAVD88)

860
840
820
800
780
760
740
720
700
680

0 100 200 300 400 500 600 700 800 900 1000 1100

Distance in Feet

Legend

Qom	Osceola Mudflow
Qvr	Vashon Recessional Outwash
Qvt	Vashon Till
Tv	Tertiary Volcanics
▽	Static Water Level
	Screen Interval
ATD	At Time of Drilling

Horizontal Scale: 1" = 100'
Vertical Scale: 1" = 20'
Vertical Exaggeration 5x

0 100 200 Feet

Geologic Cross-Section A-A'

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | JUL-2016 | BY: AHP/SCC | FIGURE NO. 6

CAD Path: Q:\King County\0900S7 Enumclaw Landfill\2016-04 Cross Sections\090057-AA.dwg 1.1x17 Landscape || Date Saved: Jul 18, 2016 9:43am || User: scudd

B (West)

B' (East)

Cross Section E-E'

Inert Refuse Material

Phase 1 Closure

Inert Refuse Material

Phase 1 Closure

Cross Section D-D'

Phase 2 Closure

Cross Section F-F'

(Offset 133' N) **RP-5**

(Offset 76' N) **RP-4**

MW-3 (Offset 156' S)

LF Refuse

Inert Refuse Material

LF Refuse

Inert Refuse Material

Qom

Qvr

GP-19 (Offset 138' N)
MW-9 (Offset 145' N)

MW-2 (Offset 75' S)

MW-7 (Offset 192' N)

GP-14 (Offset 102' N)
MW-8 (Offset 88' N)

Elevation in Feet (NAVD88)

900
880
860
840
820
800
780
760
740
720

0 100 200 300 400 500 600 700 800 900 1000 1100 1200

Distance in Feet

Total Depth 120'

Legend

Qom	Osceola Mudflow
Qvr	Vashon Recessional Outwash
Qvt	Vashon Till
Tv	Tertiary Volcanics

Static Water Level
Screen Interval

Horizontal Scale: 1" = 100'
Vertical Scale: 1" = 20'
Vertical Exaggeration 5x

0 100 200 Feet

Geologic Cross-Section B-B'

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | JUL-2016 | BY: AHP/SCC | FIGURE NO. 7

CAD Path: Q:\King County\090057 Enumclaw Landfill\2016-04 Cross Sections\090057-BB.dwg Section B West || Date Saved: Jul 18, 2016 9:44am || User: scudd

C (West)

C' (East)

Inert Refuse Material

Phase 2 Closure

Cross Section A-A'

Cross Section D-D'

Cross Section F-F'

Elevation in Feet (NAVD88)

860
840
820
800
780
760
740
720
700
680

MW-4 (Offset 40' S)
MW-5 (Offset 33' S)
MW-10
GP-20 (Offset 139' S)
PIT 8 (Offset 129' S)
RP-3 (Offset 50' N)
TP-13 (Offset 82' S)
PIT 4 (Offset 77' S)
TP-12 (Offset 61' S)
TP-6 (Offset 35' N)
TP-15 (Offset 107' N)
TP-8 (Offset 158' N)
PIT 3 (Offset 49' S)
TP-14 (Offset 22' N)
TP-11 (Offset 41' S)
TP-5 (Offset 41' S)
TP-16 (Offset 22' S)
PIT-2 (Offset 12' S)
MW-6A (Offset 5' S)
MW-6
GP-11 (Offset 191' S)
MW-3 (Offset 53' N)
GP-16 (Offset 121' S)

ATD

Inert Refuse Material

Landfill Refuse

Qom

Qvr

Distance in Feet

100 200 300 400 500 600 700 800 900 1000 1100 1200

Legend

Qom	Osceola Mudflow
Qvr	Vashon Recessional Outwash
Qvt	Vashon Till
Tv	Tertiary Volcanics
▽	Static Water Level
▭	Screen Interval
ATD	At Time of Drilling

Horizontal Scale: 1" = 100'
Vertical Scale: 1" = 20'
Vertical Exaggeration 5x

0 100 200 Feet

Geologic Cross-Section C-C'

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | JUL-2016 | BY: AHP/SCC | FIGURE NO. 8

CAD Path: Q:\King County\090057 Enumclaw Landfill\2016-04 Cross Sections\090057-CC.dwg Section C West || Date Saved: Jul 18, 2016 9:45am || User: scudd

D (South)

D' (North)

"Inert" Refuse Material

Phase 2 Closure

(Offset 171' E) **RP-5**

Phase 1 Closure

Former Leachate Pond (Offset 122' W)

Cross Section C-C'

Cross Section B-B'

Cross Section F-F'

Cross Section E-E'

Elevation in Feet (NAVD88)

880
860
840
820
800
780
760
740
720

GP-11 (Offset 191' S)

MW-6A (Offset 5' S)

MW-6 (Offset 41' S)

Inert Refuse Material

Landfill Refuse

GP-15 (Offset 57' E)

MW-1 (Offset 25' E)

GP-9 (Offset 25' E)

GP-7 (Offset 118' E)

ATD

Qom

Qvr

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 700

Distance in Feet

Legend

Qom	Osceola Mudflow
Qvr	Vashon Recessional Outwash
Qvt	Vashon Till
Tv	Tertiary Volcanics
▽	Static Water Level
	Screen Interval
ATD	At Time of Drilling

Horizontal Scale: 1" = 100'
Vertical Scale: 1" = 20'
Vertical Exaggeration 5x

0 100 200 Feet

Geologic Cross-Section D-D'

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | JUL-2016 | BY: AHP/SCC | FIGURE NO. 9

CAD Path: Q:\King County\090057 Enumclaw Landfill\2016-04 Cross Sections\090057-DD.dwg Section D West || Date Saved: Jul 18, 2016 9:46am || User: scudd

E (Southwest)

E' (Northeast)

Cross Section B-B'

Cross Section A-A'

Cross Section F-F'

Cross Section D-D'

Former Leachate Pond Location ? (Offset 18' SE)

Elevation in Feet (NAVD88)

860
840
820
800
780
760
740
720
700
680

MW-8 (Offset 88' N)

GP-19 (Offset 58' N)
MW-9 (Offset 61' N)

MW-7 (Offset 68' S)

GP-6 (Offset 87' N)

GP-15 (Offset 46' N)

GP-9 (Offset 33' N)

MW-1 (Offset 15' N)

GP-7 (Offset 27' S)

GP-10 (Offset 85' S)

ATD

Wet ATD

ATD

Wet to Saturated ATD

Former Leachate Pond

Qom

Qvr

Qvt

Distance in Feet

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300

Legend

Qom	Osceola Mudflow
Qvr	Vashon Recessional Outwash
Qvt	Vashon Till
Tv	Tertiary Volcanics
▽	Static Water Level
	Screen Interval
ATD	At Time of Drilling

Horizontal Scale: 1" = 100'
Vertical Scale: 1" = 20'
Vertical Exaggeration 5x

0 100 200 Feet

Geologic Cross-Section E-E'

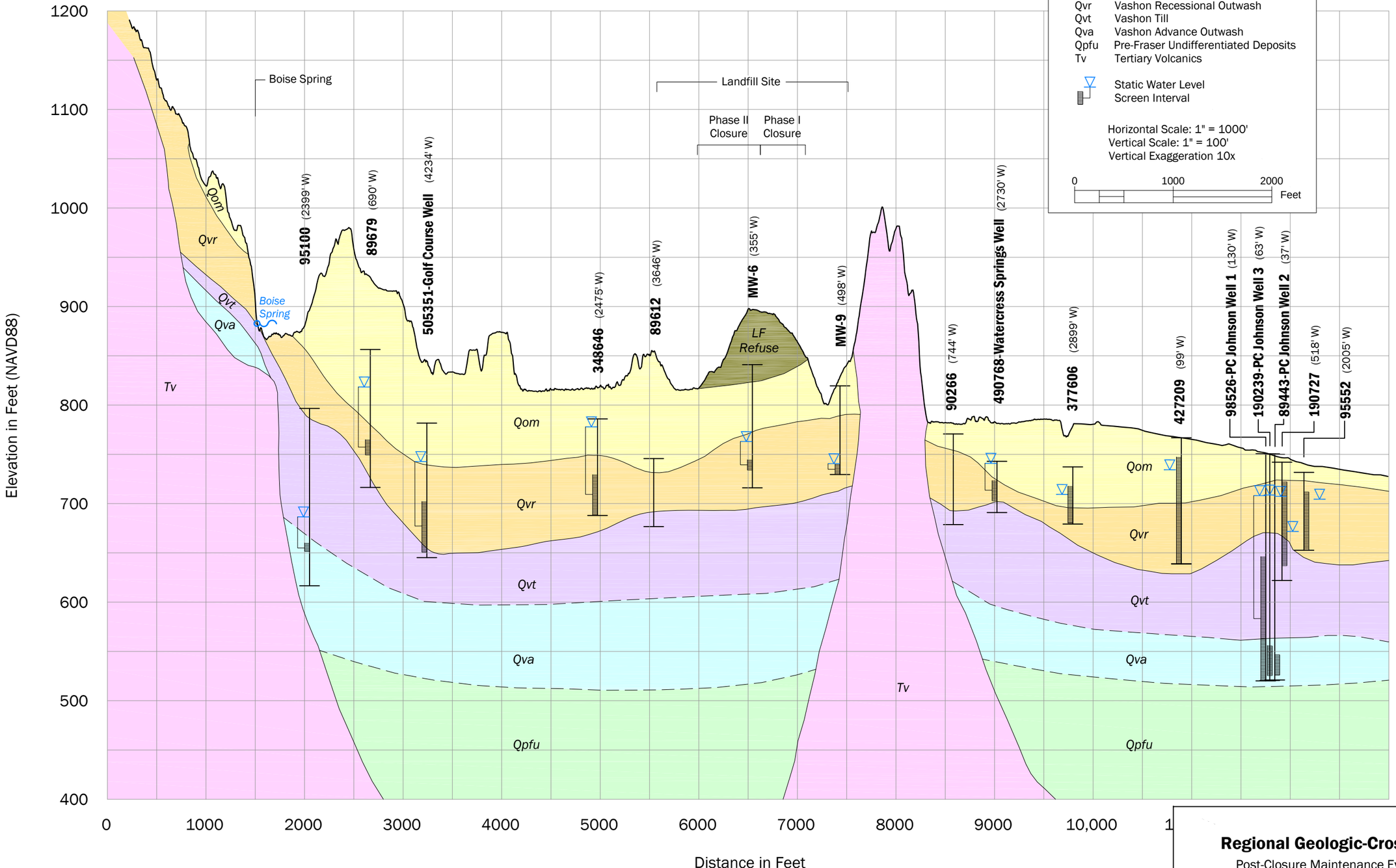
Post-Closure Maintenance Evaluation
Report Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | JUL-2016 | BY: AHP/SCC | FIGURE NO. 10

CAD Path: Q:\King County\090057 Enumclaw Landfill\2016-04 Cross Sections\090057-EE.dwg Section E West || Date Saved: Aug 10, 2016 12:22pm || User: scudd

F
(Southeast)

F'
(Northwest)



Legend

Qom	Osceola Mudflow
Qvr	Vashon Recessional Outwash
Qvt	Vashon Till
Qva	Vashon Advance Outwash
Qpfu	Pre-Fraser Undifferentiated Deposits
Tv	Tertiary Volcanics

Static Water Level
Screen Interval

Horizontal Scale: 1" = 1000'
Vertical Scale: 1" = 100'
Vertical Exaggeration 10x

0 1000 2000 Feet

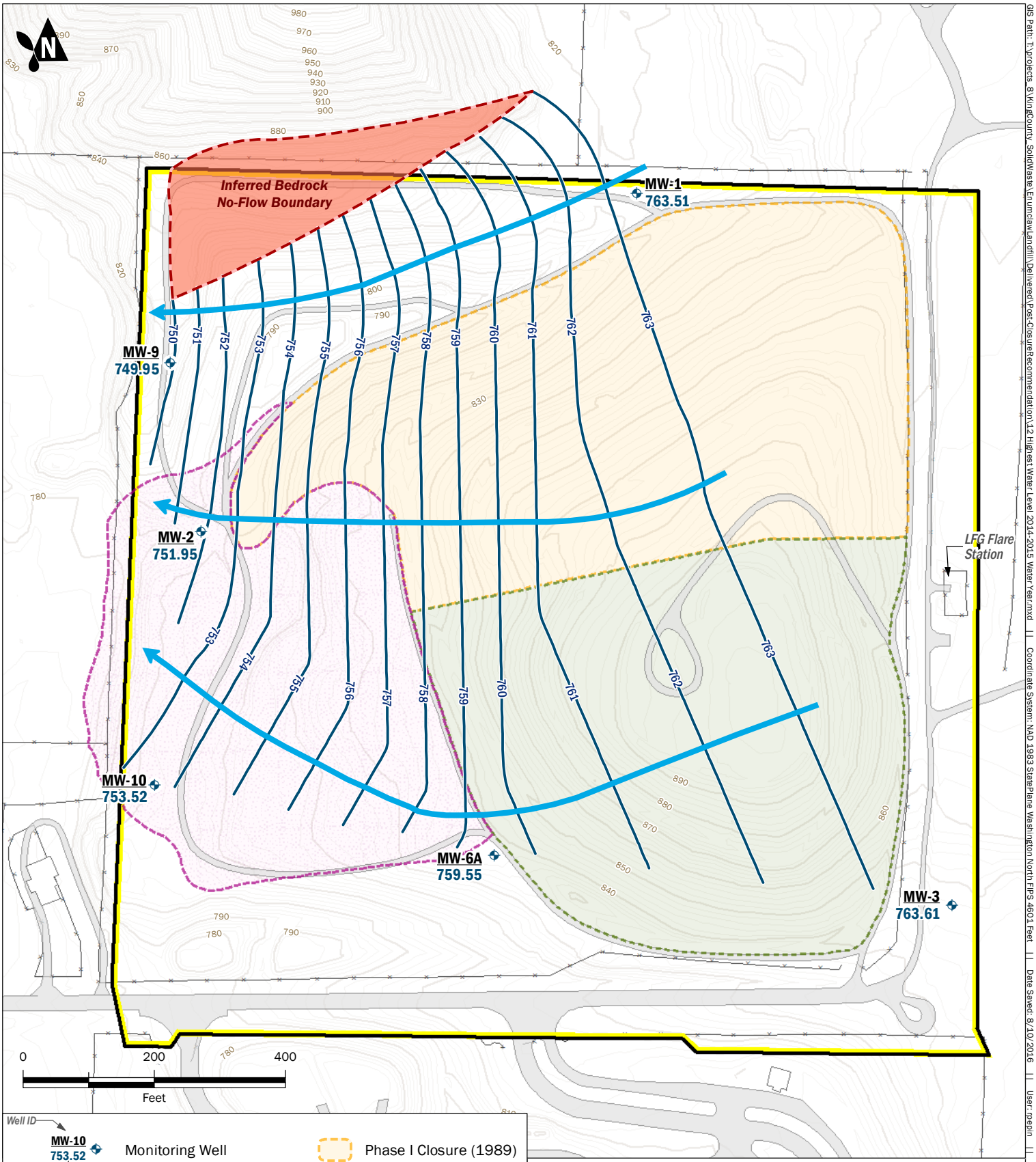
Note: Well logs available in Appendix E.

Regional Geologic-Cross Section F-F'

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | JUL-2016 | BY: AHP/SCC | FIGURE NO. 11

CAD Path: Q:\King County\090057 Enumclaw Landfill\2016-04 Cross Sections\090057-FF Shortened.dwg 11x17 Landscape || Date Saved: Jul 18, 2016 9:52am || User: scudd



Well ID
MW-10
753.52
Water Elevation (ft)

- Monitoring Well
- Groundwater Contour
- Groundwater Flow Direction
- Inferred Bedrock No-Flow Boundary
- Enumclaw Landfill Property
- Phase I Closure (1989)
- Phase II Closure (1993)
- Inert Refuse Material
- Building
- Fence
- Road

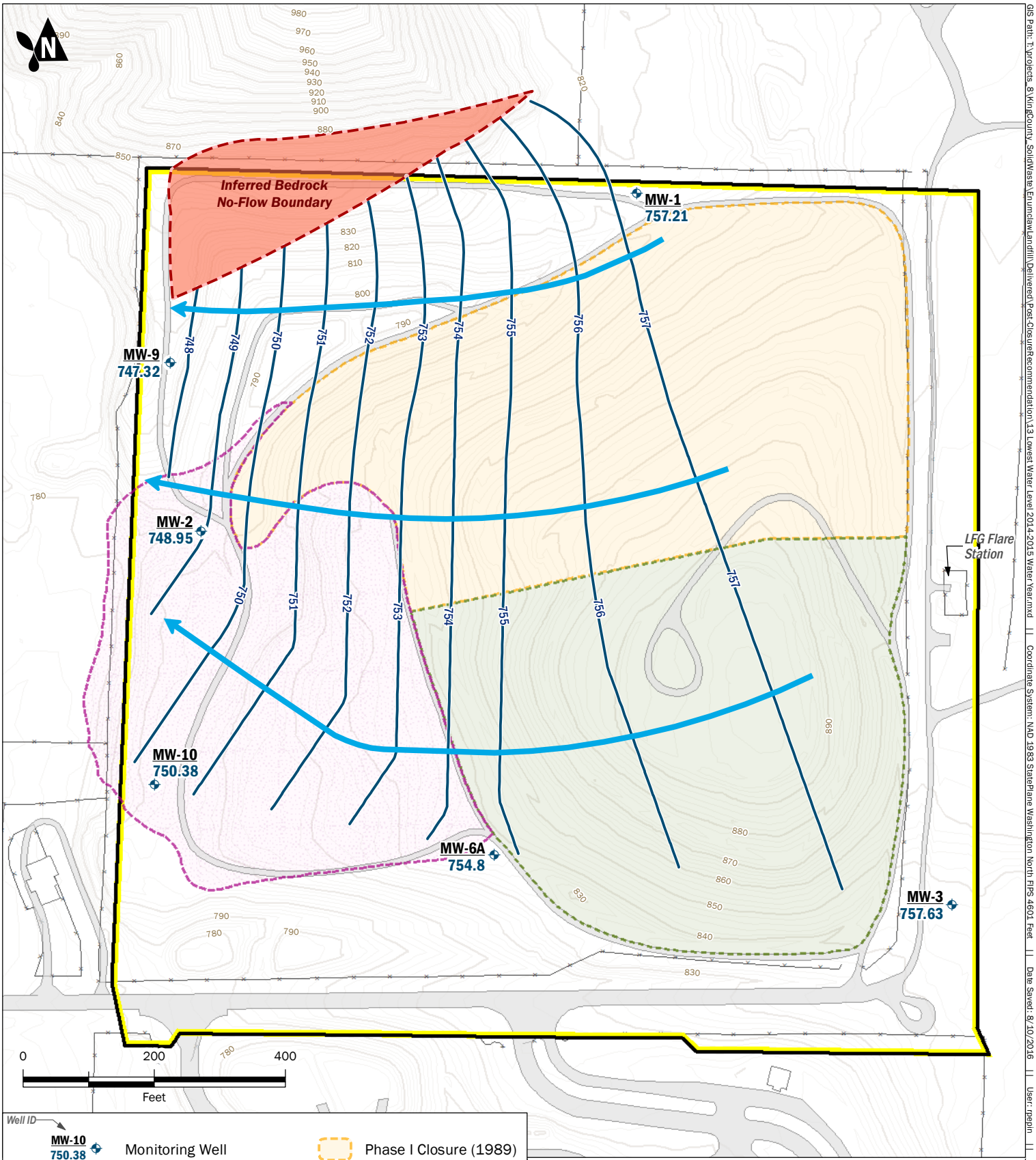
Note: Water level measurements completed by KCSWD on May 11, 2015.
Topographic contours from King County survey dated May 18, 2016.

Highest Water Level 2014-2015 Water Year

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | AUG-2016 | BY: AHP / RAP | FIGURE NO. 12

GIS Path: T:\projects_8\KingCounty_SolidWaste\Enumclaw\Landfill\Delivered\Post-ClosureRecommendation\12 Highest Water Level 2014-2015 Water Year.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: rpapin || Print Date: 8/10/2016



Note: Water level measurements completed by KCSWD on Nov 14, 2015.
Topographic contours from King County survey dated May 18, 2016.

Lowest Water Level
2014-2015 Water Year

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County	Aspect CONSULTING	AUG-2016 BY: AHP / RAP	FIGURE NO. 13

GIS Path: T:\projects_8\KingCounty_SolidWaste\Enumclaw\Landfill\Delivered\Post-ClosureRecommendation\13 Lowest Water Level 2014-2015 Water Year.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: jpepin || Print Date: 8/10/2016

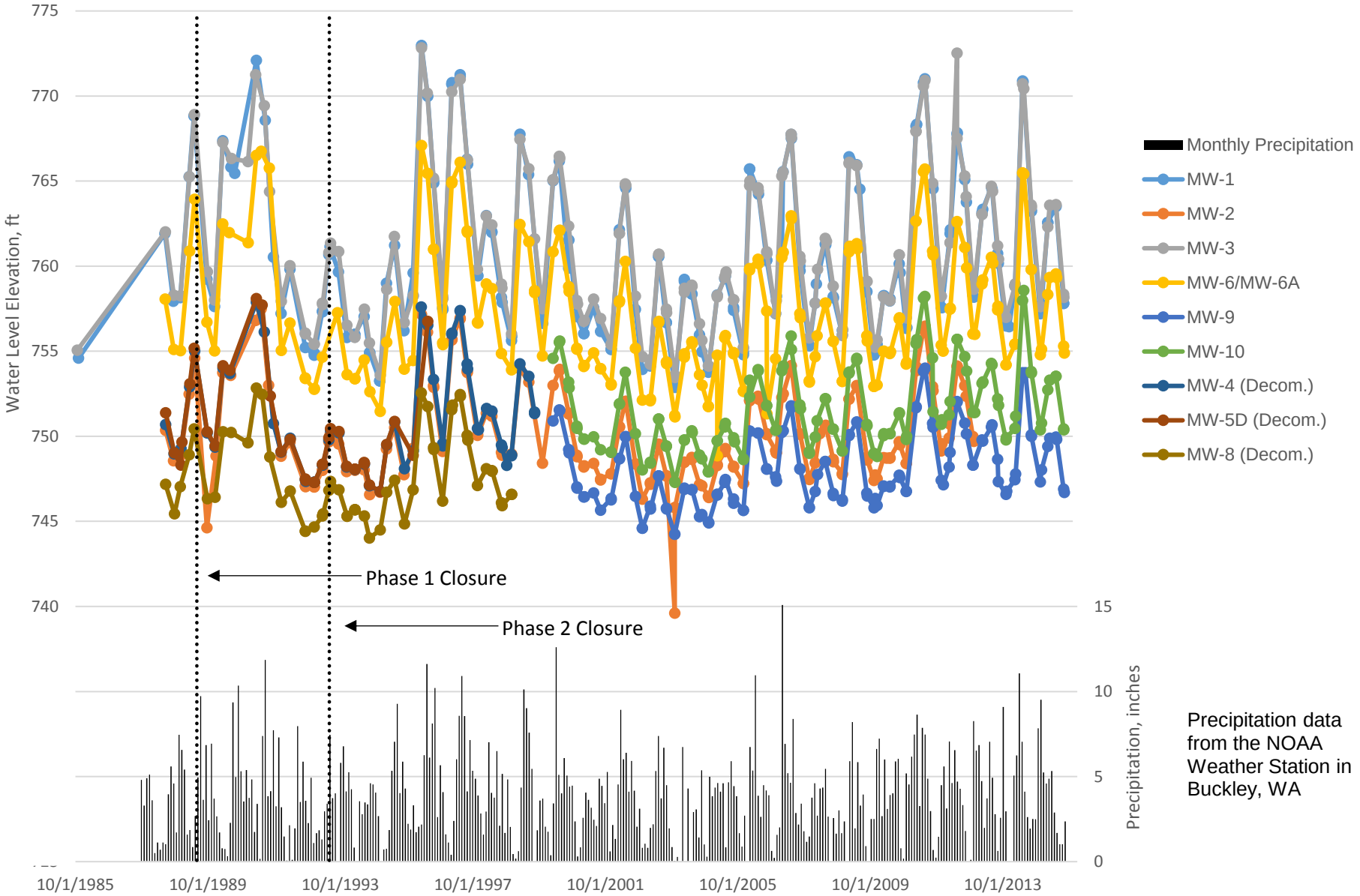
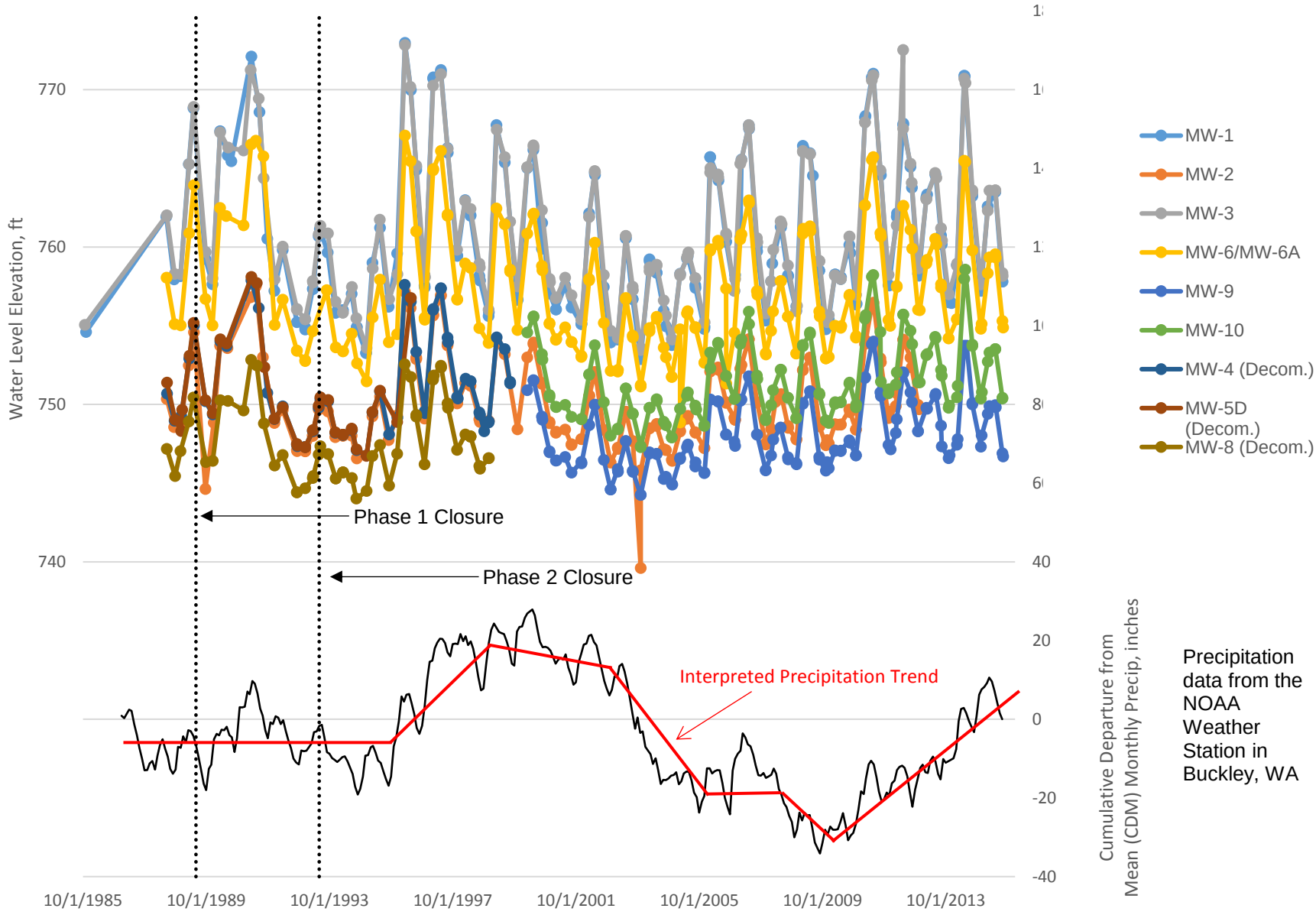


Figure 14a
Hydrographs with Precipitation
Post-Closure Maintenance Evaluation Report
Enumclaw Landfill



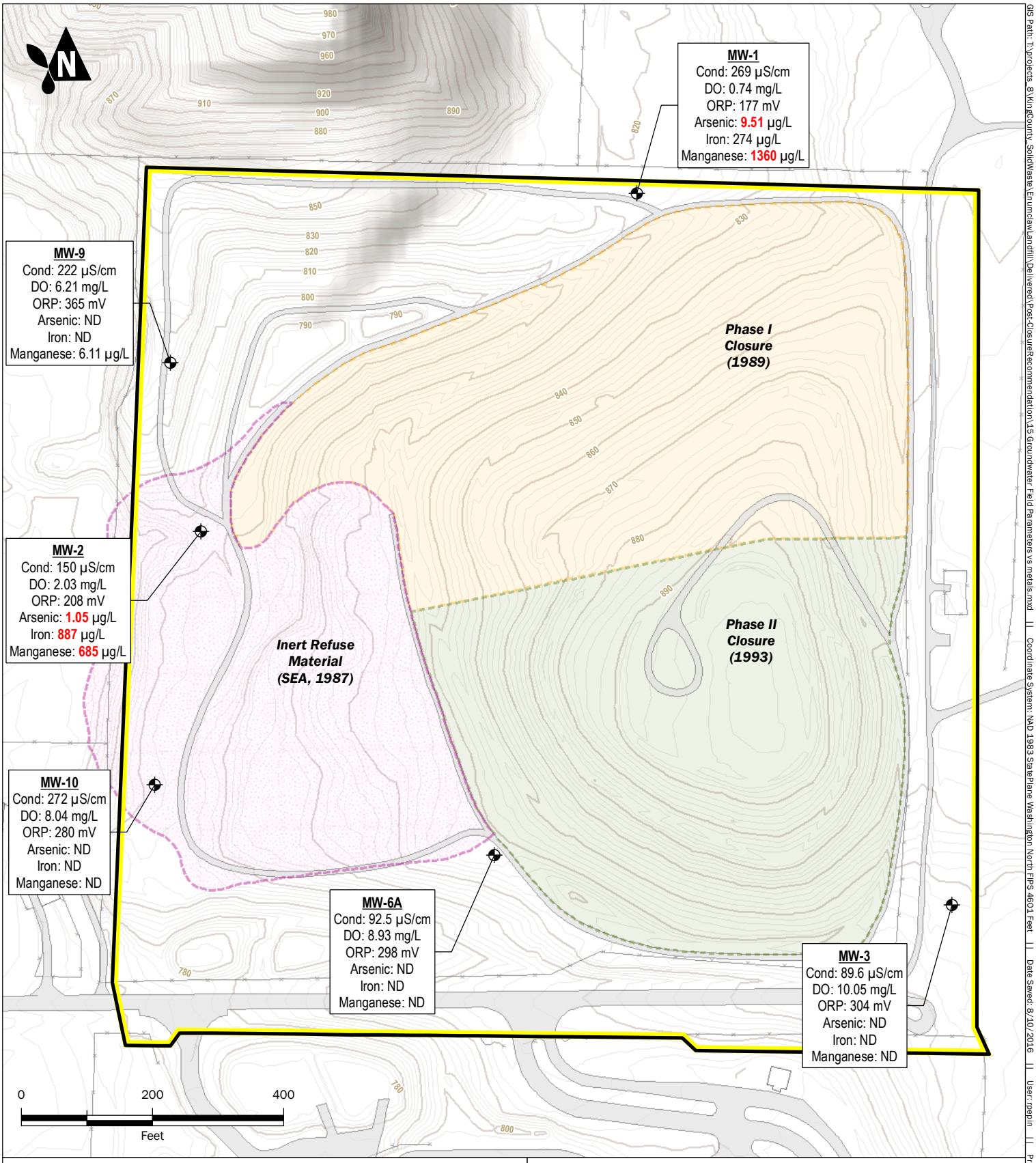
Precipitation data from the NOAA Weather Station in Buckley, WA

Figure 14b

Hydrographs with CDM from Precipitation

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill

Aspect Consulting
9/15/2017
V:\090057 ClosedLandfill\Deliverables\Enumclaw\Task 530\530.4.0 Post-Closure Mainten Eval. Rpt\Final\Figures



Monitoring Well
Phase I Closure (1989)
Phase II Closure (1993)
Inert Refuse Material
Enumclaw Landfill Property
Building
Fence
Road

Groundwater Field Parameters vs. Metals

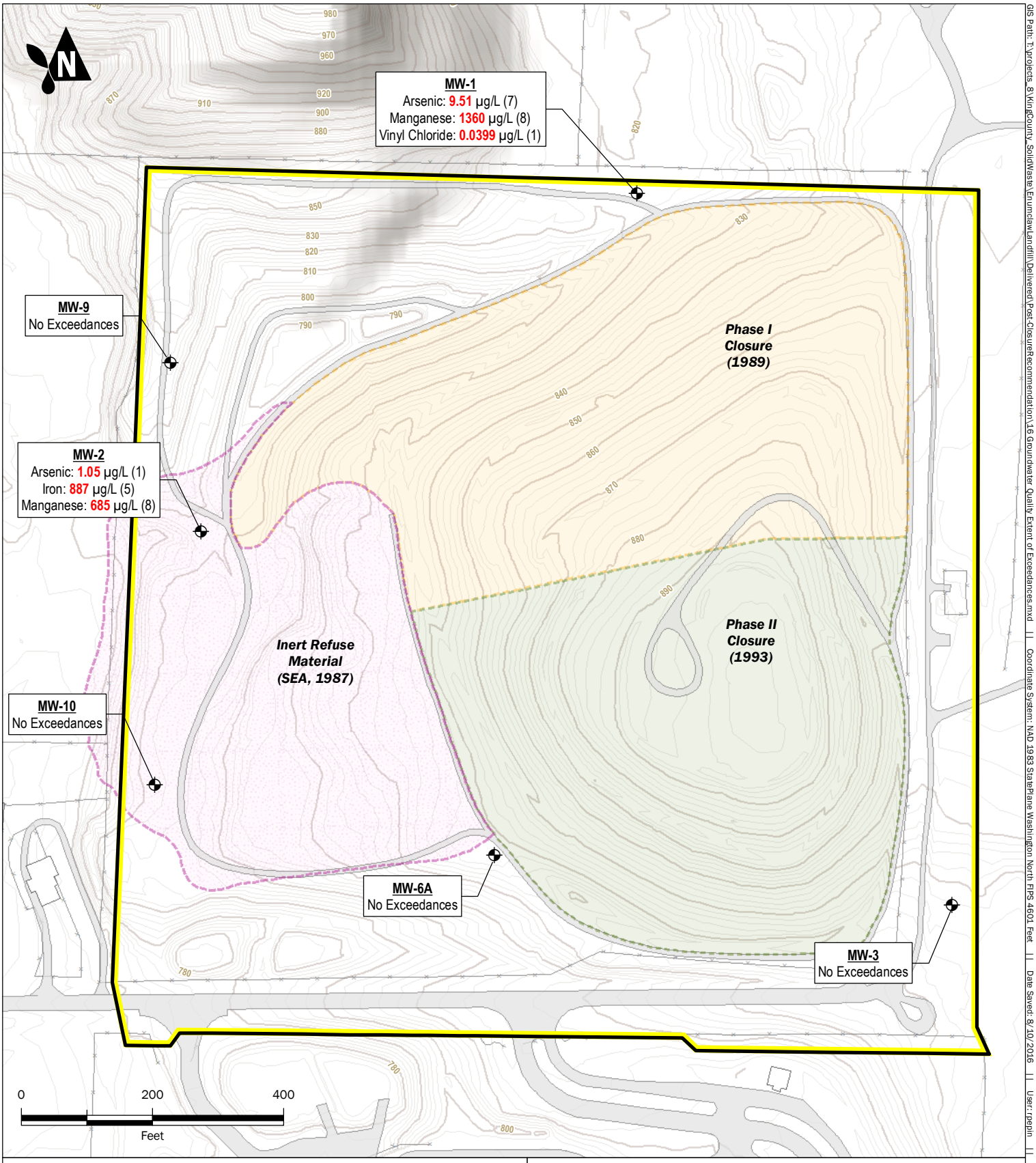
Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

Note: Results displayed are the maximum concentration detected 2014-2015. Values in red, bold text indicate screening level exceedance. ND indicates a non-detect result.
Topographic contours from King County survey dated May 18, 2016.

King County | Aspect Consulting | AUG-2016 | BY: KSL / RAP | FIGURE NO. 15

Basemap Layer Credits || USGS, NGA, NASA, CGIAR,N Robinson,NCEAS,NLS,OS,NMA,Geodatastyrelsen

GIS Path: T:\projects_8\KingCounty_SolidWaste\Enumclaw\Landfill\Delivered\Post-ClosureRecommendation\15 Groundwater Field Parameters vs metals.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: rpepin || Print Date: 8/10/2016



Monitoring Well
Phase I Closure (1989)
Phase II Closure (1993)
Inert Refuse Material
Enumclaw Landfill Property
Building
Fence
Road

Note: Results displayed are the maximum screening level exceedances from 2014-2015. Numbers in parentheses indicate the number of exceedances (if any) between 2014-2015. No Exceedances indicates no exceedance of screening levels within that well. Appendix C presents all of the analytical data evaluated for this figure.
Topographic contours from King County survey dated May 18, 2016.

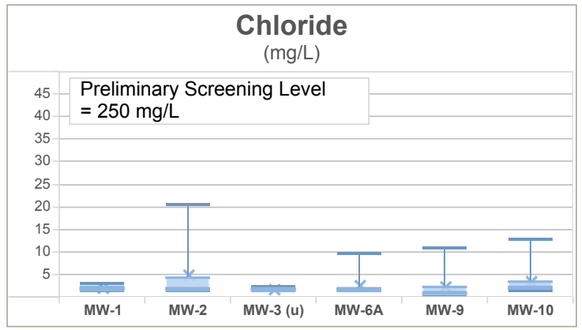
Groundwater Quality Extent of Exceedances

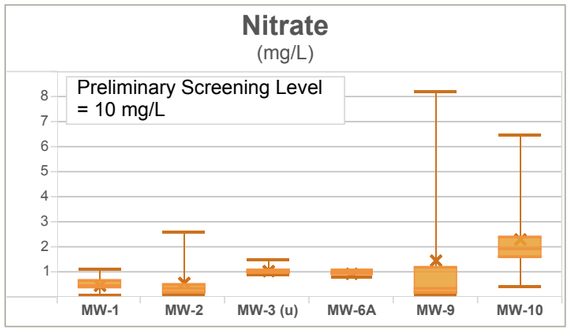
Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

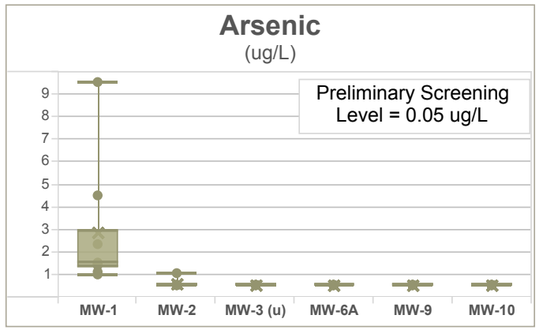
King County | Aspect CONSULTING | AUG-2016 | BY: KSL / RAP | FIGURE NO. 16

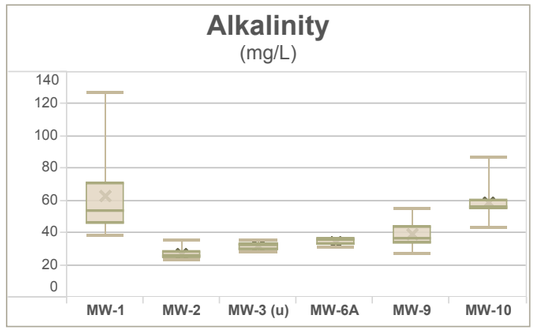
Basemap Layer Credits || USGS, NGA, NASA, CGIAR,N Robinson,NCEAS,NLS,OS,NMA,Geodatastyrelsen

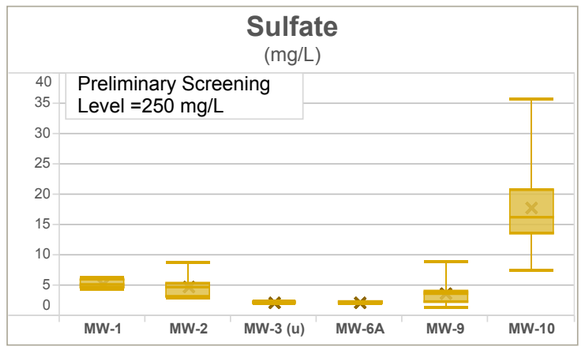
GIS Path: T:\projects_8\KingCounty_SolidWaste\EnumclawLandfill\Delivered\Post-ClosureRecommendation\16 Groundwater Quality Extent of Exceedances.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: rpepin || Print Date: 8/10/2016

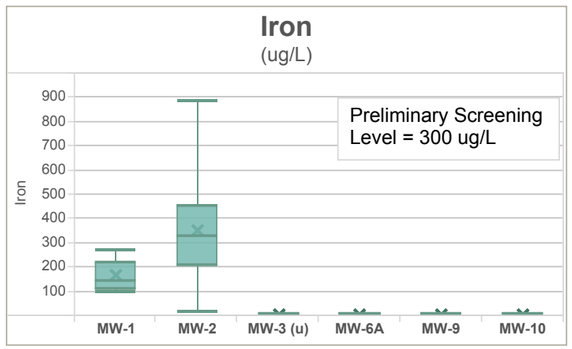


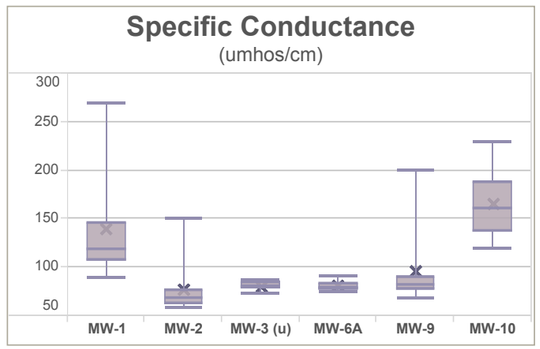


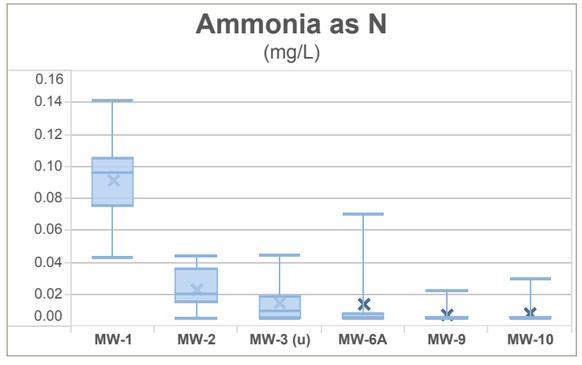


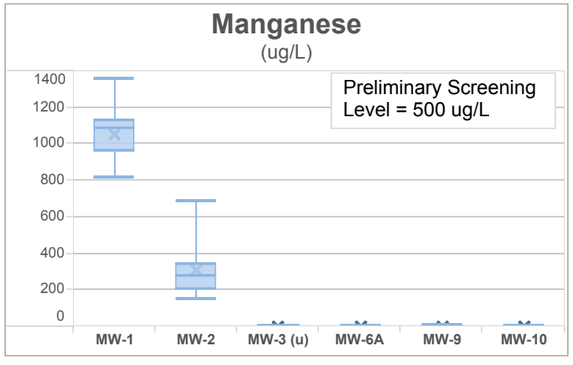


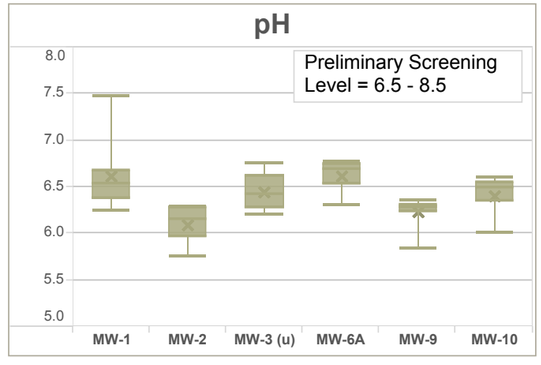




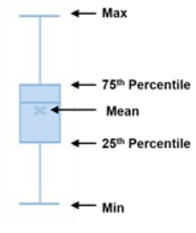








Preliminary screening levels are the lowest criteria from either WAC 173-200 or WAC 246-290-310.
Non-detect values represented by 1/2 reporting limit.
Data represents last 8 quarters (Q1 2014 through Q4 2015)
Statistically significant chloride outlier for MW-2 was removed from the dataset used to develop the box plots.
Box plot legend:



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9/15/2017
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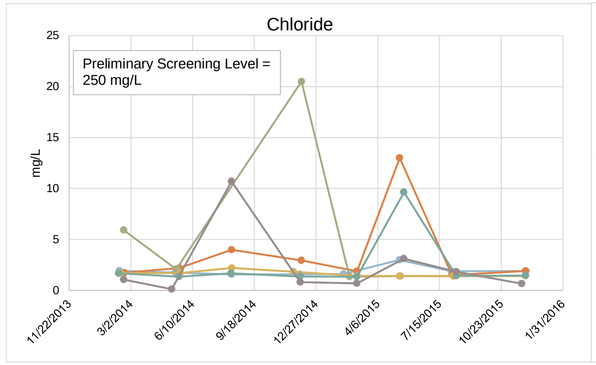
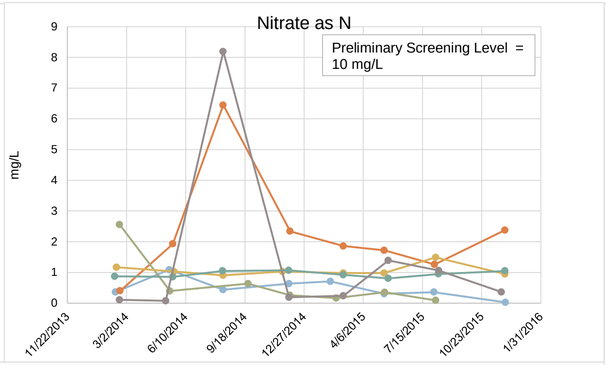
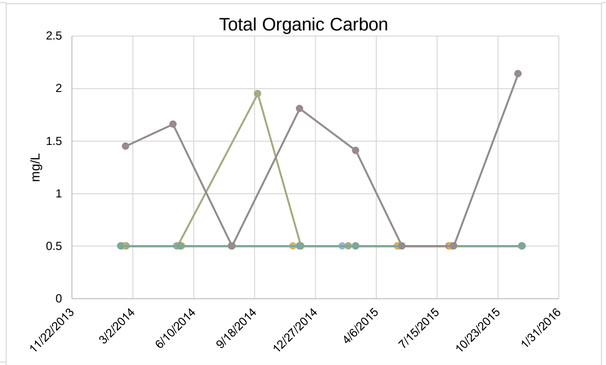
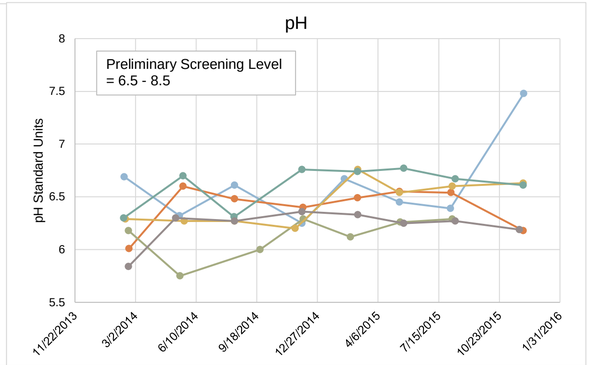
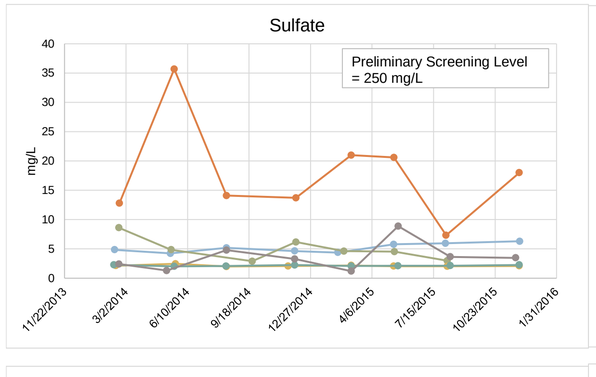
Figure 17
Water Quality Box Plots
Post-Closure Maintenance Evaluation Report
Enumclaw, WA

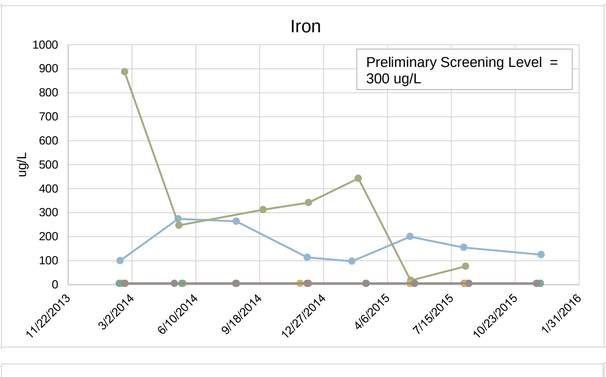


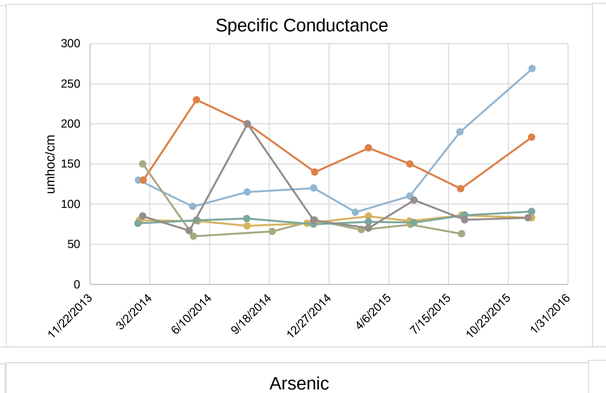


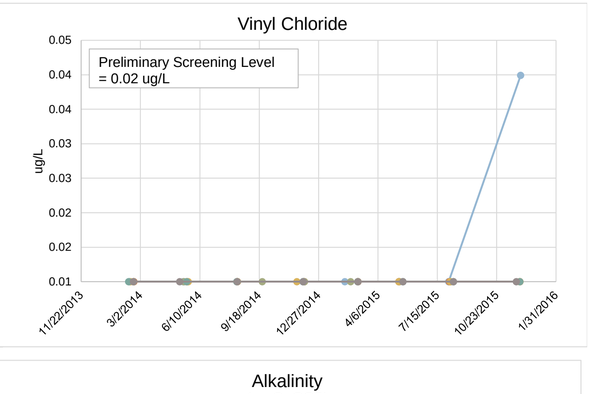


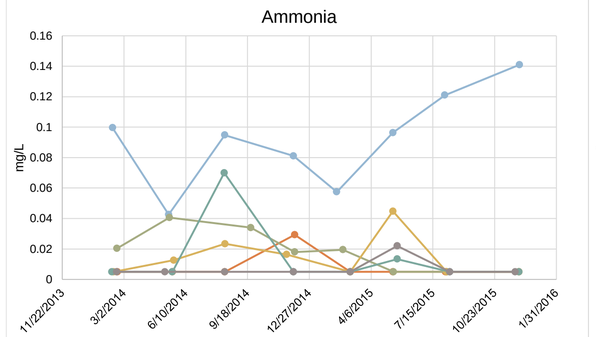


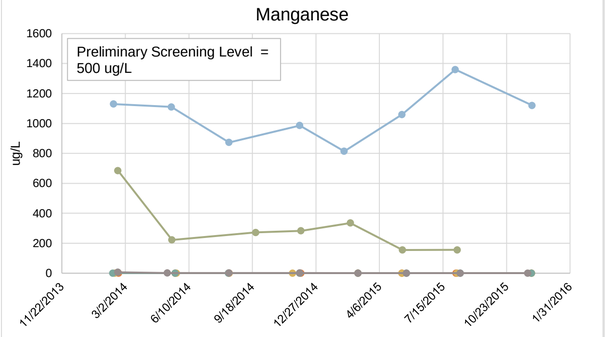


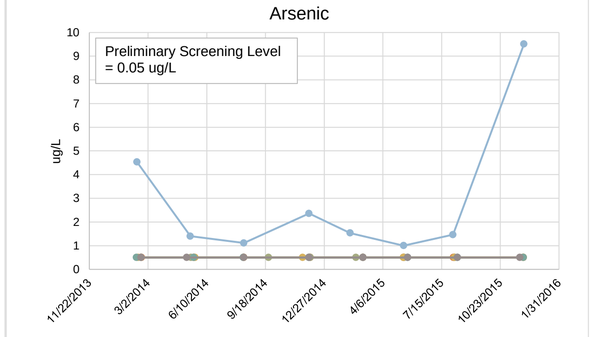


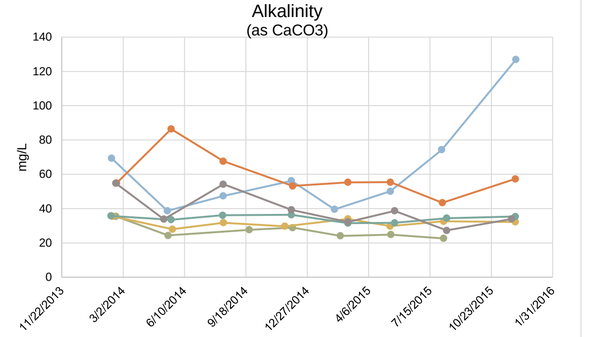










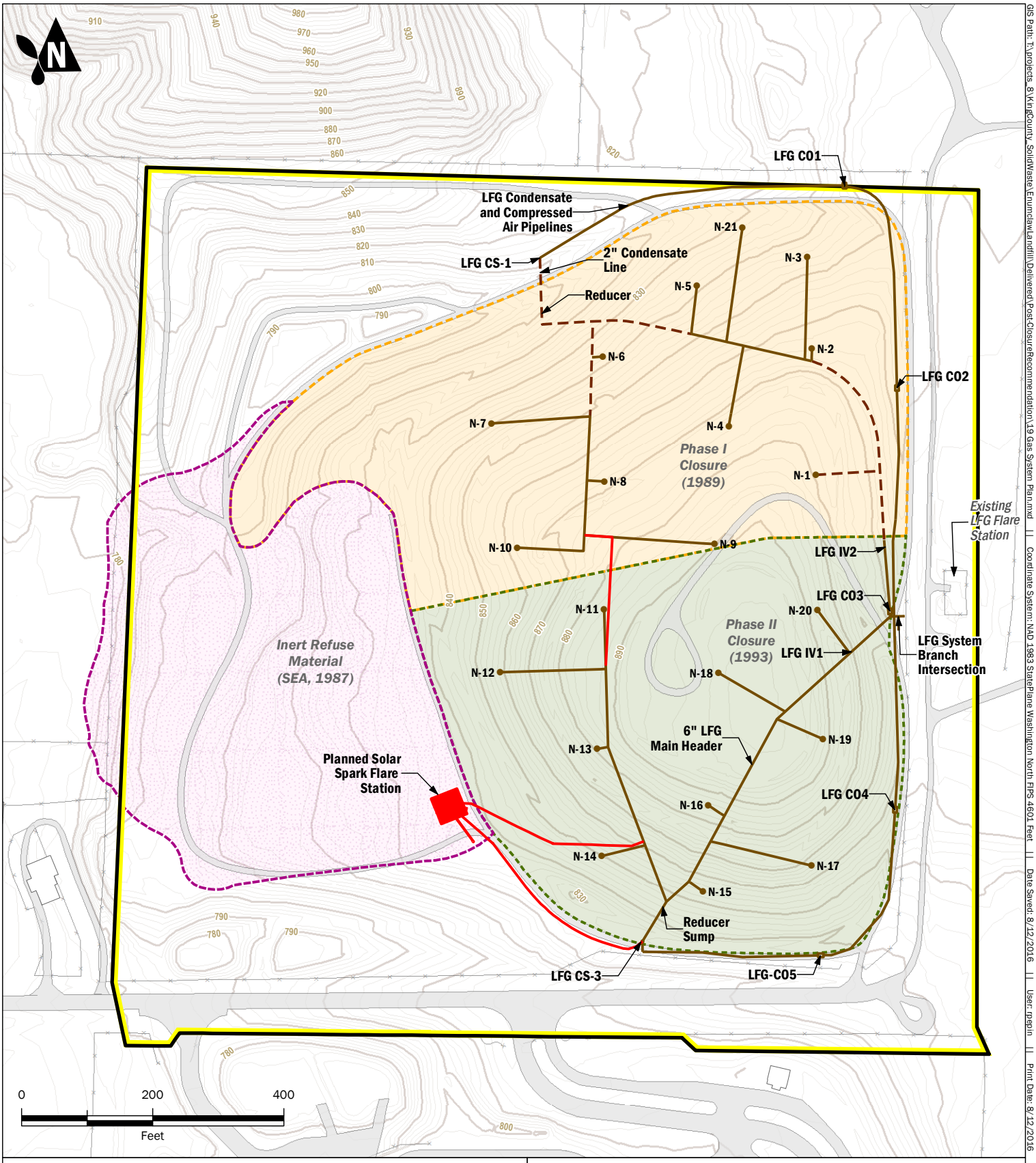


Legend

- MW-1
- MW-10
- MW-2
- MW-3 (u)
- MW-6A
- MW-9

Notes:
(u) = upgradient/background well
Non-detects are plotted at 1/2 the detection limit
Preliminary screening levels are the lowest criteria from either WAC 173-200 or WAC 246-290-310.
Dotted lines are linear interpolations of best fit
Data represents last 8 quarters (Q1 2014 through Q4 2015)
Statistically significant chloride outlier for MW-2 was removed from the dataset used for graphing data

Figure 18
Water Quality Graphs
Post-Closure Maintenance Evaluation Report
Enumclaw, WA



Proposed Solar Spark Flare and Gas System Modifications

Existing Gas System *(dashed where as-built unavailable)*

Existing Well

Phase I Closure (1989)

Phase II Closure (1993)

Inert Refuse Material

Enumclaw Landfill Property

Building

Fence

Road

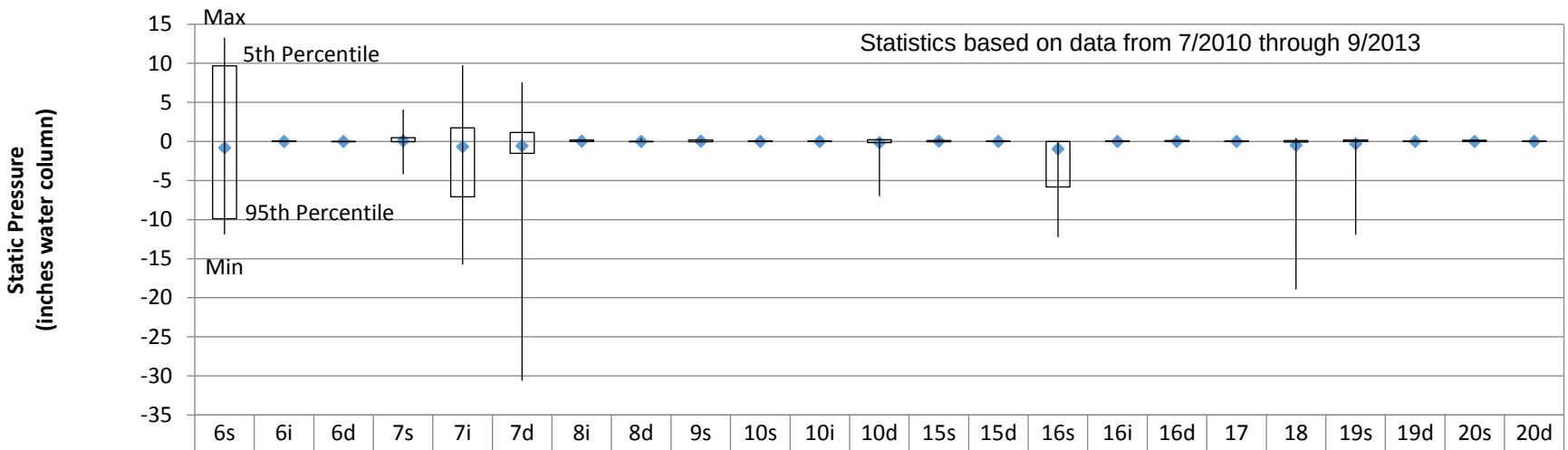
Note: Topographic contours from King County survey dated May 18, 2016.

Gas System Plan

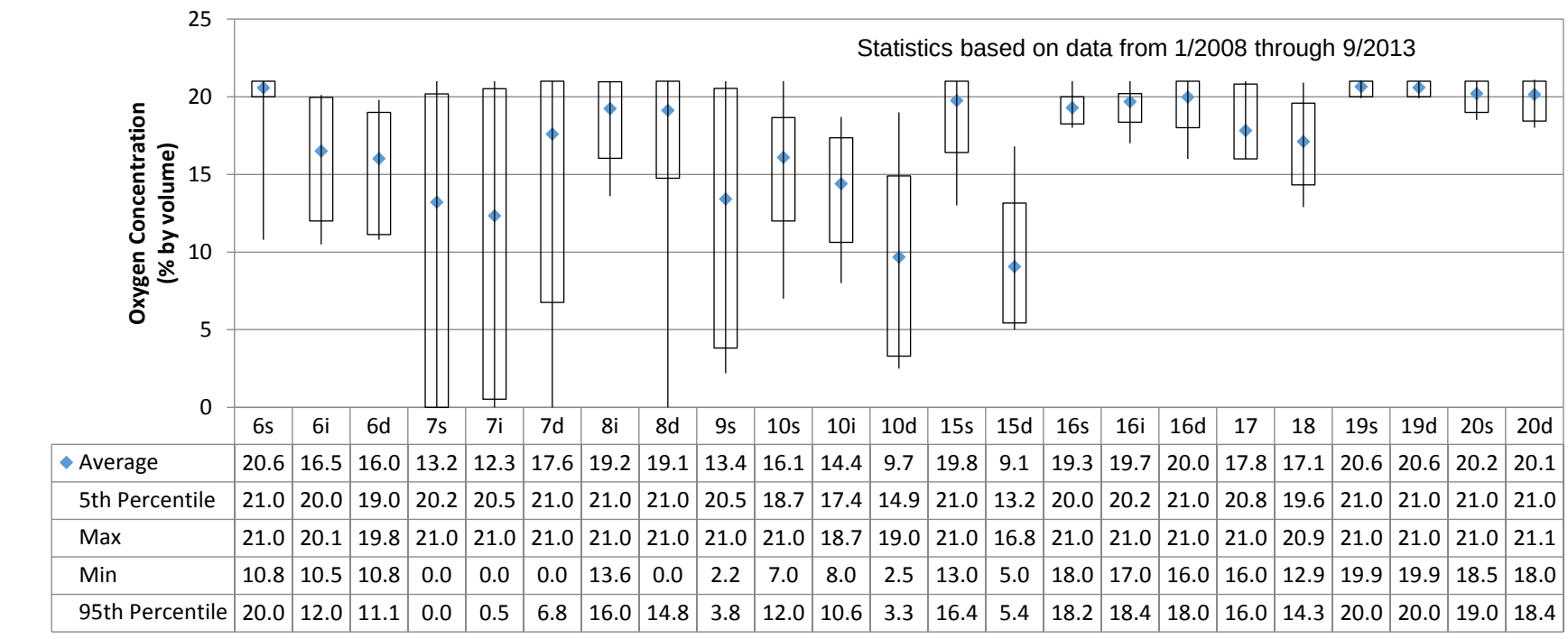
Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | AUG-2016 | BY: AHP / RAP | FIGURE NO. 19

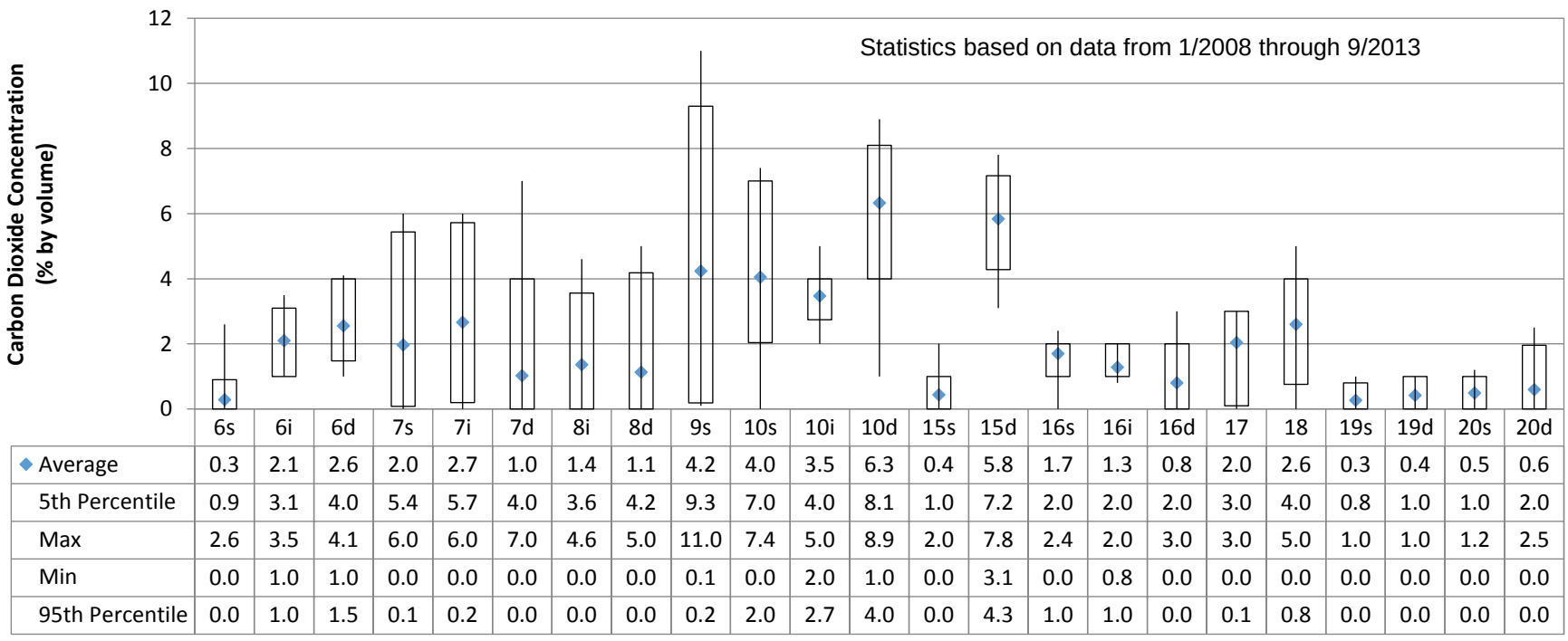
GIS Path: T:\projects_8\KingCounty_SolidWaste\EnumclawLandfill\Delivered\Post-ClosureRecommendation\19 Gas System Plan.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/12/2016 || User: mgpin || Print Date: 8/12/2016



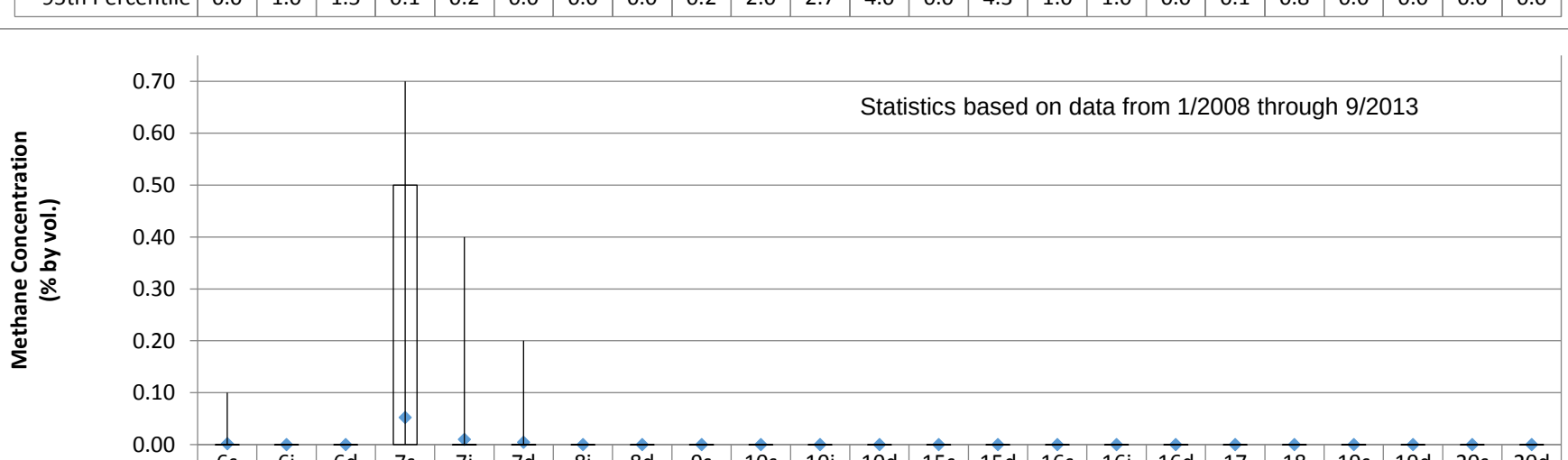
	6s	6i	6d	7s	7i	7d	8i	8d	9s	10s	10i	10d	15s	15d	16s	16i	16d	17	18	19s	19d	20s	20d
Average	-0.8	0.0	0.0	0.1	-0.7	-0.6	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-1.0	0.0	0.0	0.0	-0.5	-0.3	0.0	0.0	0.0
5th Percentile	9.7	0.0	0.0	0.5	1.7	1.1	0.2	0.0	0.2	0.1	0.0	0.2	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.1
Max	13.3	0.1	0.1	4.1	9.8	7.6	0.2	0.4	0.2	0.1	0.1	0.4	0.3	0.1	0.1	0.1	0.2	0.1	0.4	0.3	0.3	0.2	0.2
Min	-11.9	0.0	0.0	-4.2	-15.7	-30.6	0.0	0.0	-0.1	-0.1	0.0	-7.0	-0.1	0.0	-12.2	0.0	0.0	0.0	-18.9	-11.9	0.0	0.0	0.0
95th Percentile	-9.9	0.0	0.0	0.0	-7.1	-1.5	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-5.8	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0



	6s	6i	6d	7s	7i	7d	8i	8d	9s	10s	10i	10d	15s	15d	16s	16i	16d	17	18	19s	19d	20s	20d
Average	20.6	16.5	16.0	13.2	12.3	17.6	19.2	19.1	13.4	16.1	14.4	9.7	19.8	9.1	19.3	19.7	20.0	17.8	17.1	20.6	20.6	20.2	20.1
5th Percentile	21.0	20.0	19.0	20.2	20.5	21.0	21.0	21.0	20.5	18.7	17.4	14.9	21.0	13.2	20.0	20.2	21.0	20.8	19.6	21.0	21.0	21.0	21.0
Max	21.0	20.1	19.8	21.0	21.0	21.0	21.0	21.0	21.0	21.0	18.7	19.0	21.0	16.8	21.0	21.0	21.0	21.0	20.9	21.0	21.0	21.0	21.1
Min	10.8	10.5	10.8	0.0	0.0	0.0	13.6	0.0	2.2	7.0	8.0	2.5	13.0	5.0	18.0	17.0	16.0	16.0	12.9	19.9	19.9	18.5	18.0
95th Percentile	20.0	12.0	11.1	0.0	0.5	6.8	16.0	14.8	3.8	12.0	10.6	3.3	16.4	5.4	18.2	18.4	18.0	16.0	14.3	20.0	20.0	19.0	18.4

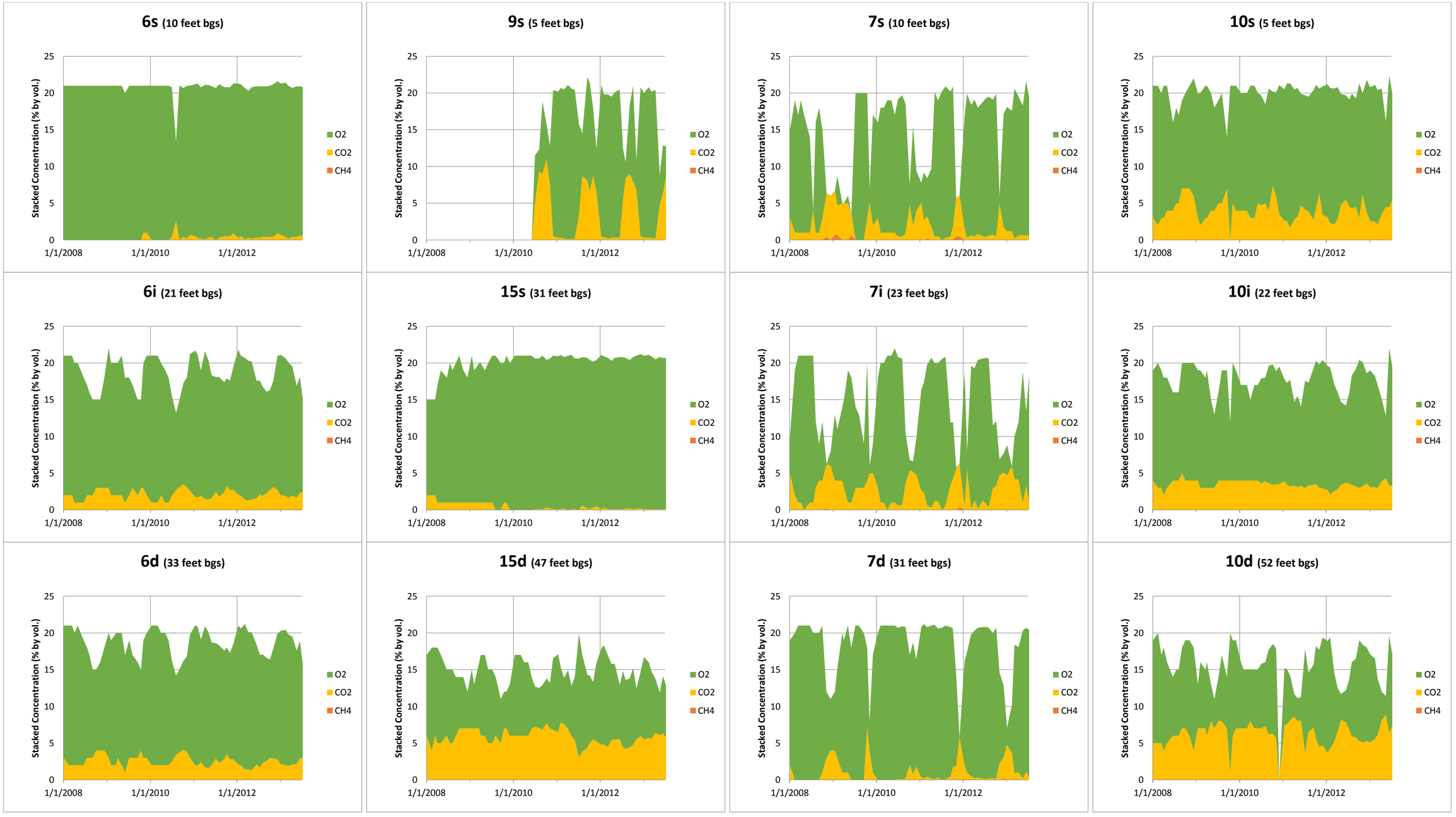


	6s	6i	6d	7s	7i	7d	8i	8d	9s	10s	10i	10d	15s	15d	16s	16i	16d	17	18	19s	19d	20s	20d
Average	0.3	2.1	2.6	2.0	2.7	1.0	1.4	1.1	4.2	4.0	3.5	6.3	0.4	5.8	1.7	1.3	0.8	2.0	2.6	0.3	0.4	0.5	0.6
5th Percentile	0.9	3.1	4.0	5.4	5.7	4.0	3.6	4.2	9.3	7.0	4.0	8.1	1.0	7.2	2.0	2.0	2.0	3.0	4.0	0.8	1.0	1.0	2.0
Max	2.6	3.5	4.1	6.0	6.0	7.0	4.6	5.0	11.0	7.4	5.0	8.9	2.0	7.8	2.4	2.0	3.0	3.0	5.0	1.0	1.0	1.2	2.5
Min	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	2.0	1.0	0.0	3.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95th Percentile	0.0	1.0	1.5	0.1	0.2	0.0	0.0	0.0	0.2	2.0	2.7	4.0	0.0	4.3	1.0	1.0	0.0	0.1	0.8	0.0	0.0	0.0	0.0



	6s	6i	6d	7s	7i	7d	8i	8d	9s	10s	10i	10d	15s	15d	16s	16i	16d	17	18	19s	19d	20s	20d
Average	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5th Percentile	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max	0.1	0.0	0.0	0.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95th Percentile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 20
LFG Probe Monitoring Parameters – Statistics
Post-Closure Maintenance Evaluation Report
Enumclaw Closed Landfill



Aspect Consulting
9/15/2017
V:\090057 ClosedLandfill\Deliverables\Enumclaw\Task 530\530.4.0 Post-Closure Mainten Eval. Rpt\Final\Figures\Figure 21

Figure 21
LFG Concentrations at Selected Probes
Post-Closure Maintenance Evaluation Report
Enumclaw Closed Landfill

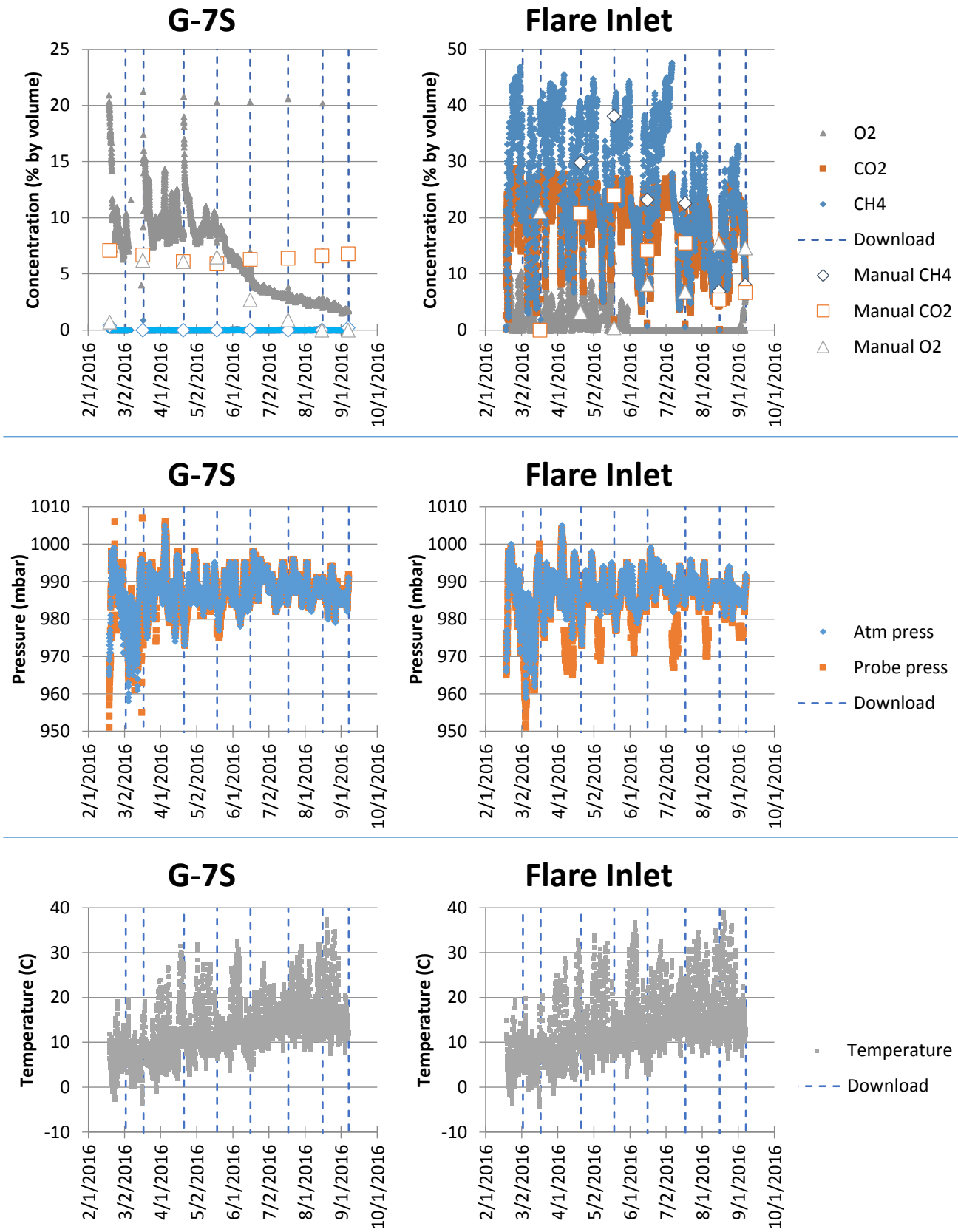
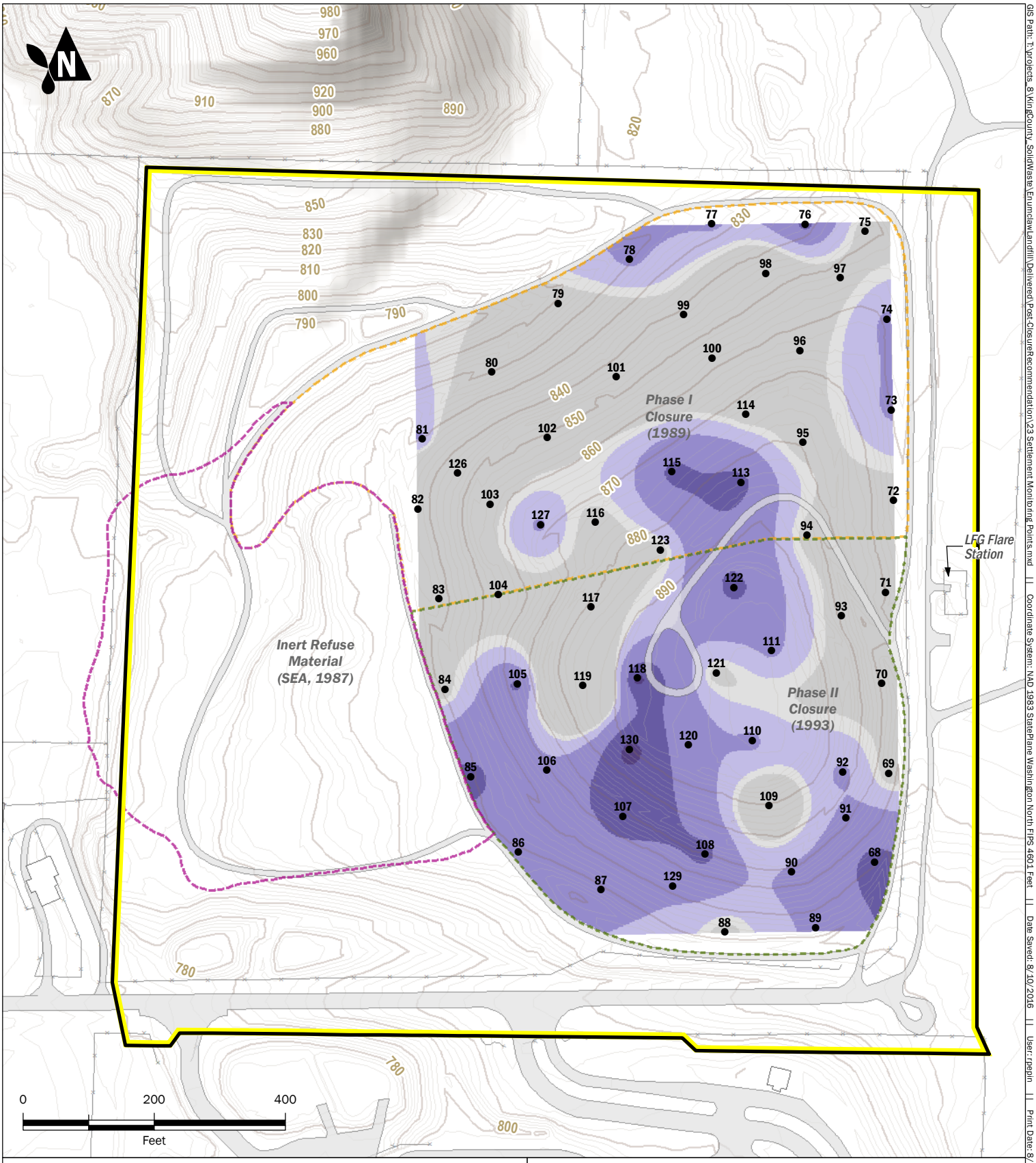


Figure 22

GasClam Continuous Monitoring Graphs

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill



Settlement
in inches
- 0.3 - 0.4
- 0.2 - 0.3
- 0.1 - 0.2
- 0.05 - 0.1
- >0 - 0.05
- Settlement Not Occurring

- Settlement Monitoring Point
- Phase I Closure (1989)
- Phase II Closure (1993)
- Inert Refuse Material
- Enumclaw Landfill Property
- Building
- Fence
- Road

Note: Settlement baseline surveyed on November 19, 2015, update surveyed May 18, 2016.
Topographic contours from King County survey dated May 18, 2016.

Settlement Monitoring Points

Post-Closure Maintenance Evaluation Report
Enumclaw Landfill
King County, Washington

King County | Aspect CONSULTING | AUG-2016 | BY: KSL / RAP | FIGURE NO. 23

Basemap Layer Credits || USGS, NGA, NASA, CGIAR,N Robinson,NCEAS,NLS,OS,NMA,Geodatastyrelsen

GIS Path: T:\projects_8\KingCounty_SolidWaste\Enumclaw\Landfill\Delivered\Post-ClosureRecommendation\23 Settlement Monitoring Points.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 8/10/2016 || User: rpepin || Print Date: 8/10/2016

APPENDIX A

Site Boring Logs (on CD)

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Enumclaw **Page** 1 **of** 2

Location North side **Boring No.** MW-1

Surface Elevation 818.39 ft. **Drilling Method** Air Rotary

Total Depth 85 ft. **Drilled By** Unitas/Johnson

Date Completed 8/24/83 **Logged By** CEWells

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite; 3" dia. PVC riser; Bentonite Pellets			1	Bag		GM-ML	0.0'-6.0' Gravelly sandy silt, tan, soft, saturated.	
						SM-GM	6.0'-33.0' Gravelly silty sand, silty gravelly sand, dark grey, loose, well graded, with some cobbles, wet.	
		10	2	"				
			3	"				
		20	4	"				
			5	"				
		30	6	"				
			7	"		GM	33.0'-38.0' Silty sandy gravel, dark grey, with some cobbles, wet to saturated.	
		40	8	"		GM-ML	38.0'-42.0' Gravelly sandy silt, dark grey with some cobbles, wet to saturated.	
			9	"		SP	42.0'-44.0' Sand, brown, fine to medium grained, poorly graded, with some silt, damp.	
		50	10	"		SW-GW	44.0'-78.0' Gravelly sand, sandy gravel, brown, grey, loose, well graded, dry to damp.	
			11	"				
		60	12	"				
			13	"				
		70	14	"				

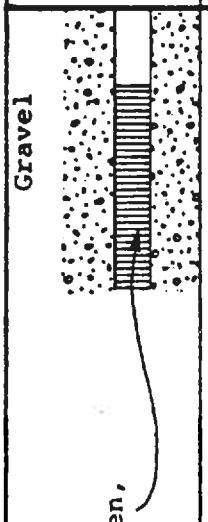
SEA-300-02a

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Enumclaw

Boring No. MW-1

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
						SW-GW		
			15	Bag				
		80	16	"		GM	78.0'-81.0' Silty sandy gravel, dark grey, loose, wet.	
						GW		
			17	"		GM	81.0'-83.0' Sandy gravel, grey, loose, coarse, water bearing (pumped 5 gpm)	Temp.= 10°C Cond.= 335
		90					83.0'-85.0' Silty sandy gravel, dark grey, loose, wet.	
		100						
		110						
		120						
		130						
		140						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Enumclaw **Page** 1 **of** 1

Location West side **Boring No.** MW-2

Surface Elevation 796.51 ft. **Drilling Method** Air Rotary

Total Depth 65 ft. **Drilled By** Unitas/Johnson

Date Completed 8/25/83 **Logged By** CEWells

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite; 3" dia. PVC riser; Sand Heave; 3" dia. PVC screen, 0.010" slots			1	Bag		SW-SP	0.0'-18.0' Sand, grey-brown, brown, medium to coarse, moderately well graded, loose, damp.	
		10	2	"				
			3	"				
		20	4	"		SW	18.0'-22.0' Gravelly sand, grey brown, medium to coarse, well graded sand, with 1/2"-3/4" gravel, some silt, wet.	
			5	"				
		30	6	"		SP-SM	31.0'-37.0' Sand, silty sand, brown, fine grained, damp.	
			7	"				
						SW-SP	37.0'-62.0' Sand, dark grey, medium to coarse grained, moderately well graded, loose, damp to 45 ft., saturated below 45 ft.	
		40	8	"				
			9	"				
		50	10	"				
			11	"				
		60	12	"				
			13	"		SP-SM	62.0'-65.0' Sand, silty sand, brown to grey-brown, fine to medium grained, moderately well graded, saturated.	EC=165
		70						

SEA-300-02a

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Enumclaw

Location Southeast corner
Boring No. MW-3
Surface Elevation 845.52 ft.
Drilling Method Air Rotary
Total Depth 110 ft.
Drilled By Unitas/Johnson
Date Completed 8/26/83
Logged By CEWells

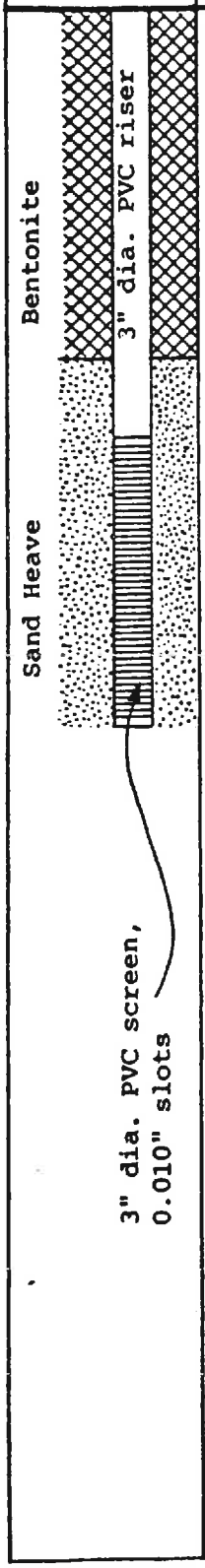
WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite; 3" dia. PVC riser			1	Bag		SW-SP	0.0'-13.0' Sand, brown, fine to medium grained, moderately well graded, with few gravels to 3/4" diameter, damp to wet.	
		10	2	"				
			3	"		SW	13.0'-22.0' Sand, gravelly sand, grey brown, fine to coarse, well graded, with some cobbles, damp.	
		20	4	"			22.0'-28.0' Silty sandy gravel, brown, hard, wet.	
			5	"				
		30	6	"		GW-Sw	28.0'-33.0' Gravelly sand, snady gravel, grey, hard, with some cobbles, dry.	
			7	"		SW-SP	33.0'-42.0' Sand, dark brown, medium to coarse, moderately well graded, small amount of gravel to 1/2" diameter, loose, damp.	
		40	8	"				
			9	"		SW-SP	42.0'-94.0' Sand, brown to dark brown, moderately poorly graded to well graded, occasional gravelly zones with gravel to 1/2" diameter, loose, damp.	
		50	10	"				
			11	"				
		60	12	"				
			13	"				
		70	14	"				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT King County Ground Water Study - Enumclaw

Boring No. MW-3

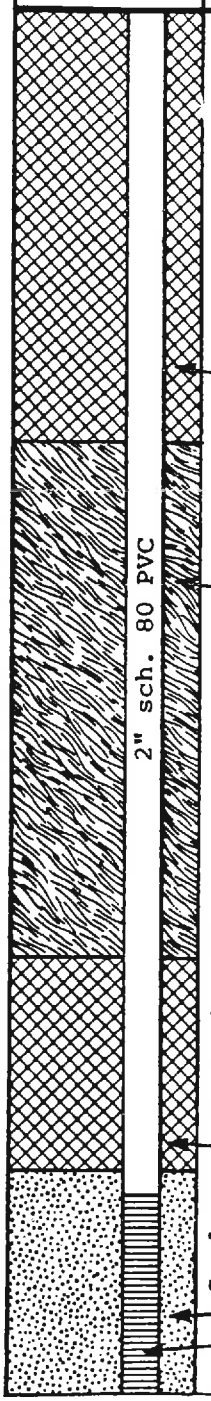
WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			15	Bag				
						SW-SP		
		80	16	"				
			17	"				
		90	18	"				
			19	"		SP	94.0'-11.0' Sand, dark grey, poorly graded to moderately poorly graded, loose, wet to saturated. Angular coal fragments occured below 107 ft.	
		100	20	"				
			21	"				
		110	22	"				3-4 gpm T=11°C EC= 75
		120						
		130						
		140						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location North of Sonneson house
Boring No. MW-4
Surface Elevation Top PVC 771.65 ft.
Drilling Method Air Rotary
Total Depth 95 feet
Drilled By Johnson Drilling Co.
Date Completed 8/4/86
Logged By G.S. Mack



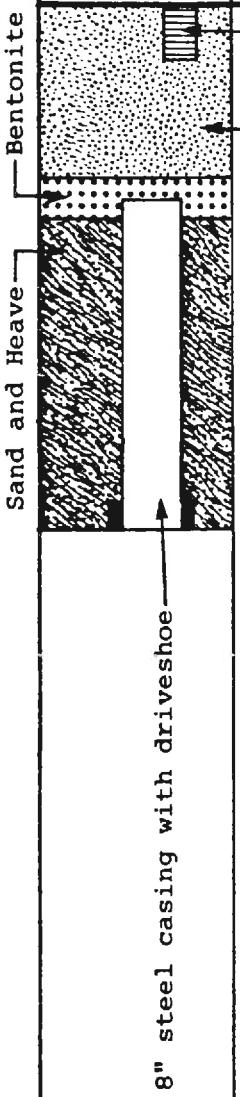
PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
	5	5	Cuttings		SW/GM	0-14' SILTY GRAVEL/SILTY SAND, dark yellowish brown, with fine sand, gravel, cobbles, and boulders, wet to moist, saturated 10 ft.	▽
	10	10	"				
		15	"		SW	14-20' GRAVELLY SAND, dark olive gray, with some silt and sand, well graded, lost moisture at 18 feet.	
	20	20	"		GW	20-51' SANDY GRAVEL, dark yellowish brown, little to no fines, medium to coarse sand and gravel, well graded, saturated at 25 ft	▽
		25	"				
	30	30	"				
		35	"				
	40	40	"			Sand is fine to coarse color change to olive gray	EC = 180
		45	"				
	50	50	"				
		55	"		GC	51-65' CLAYEY GRAVEL/ GRAVEL with clay lenses, olive gray.	
					CL	55-58' SILTY CLAY/ trace of sand and gravel, olive gray, lost water.	
	60	60	"		SP	58-95' SAND, dark yellowish brown to olive gray, trace of silt and clay, poorly graded, saturated.	
		65	"				
	70	70	"				EC = 105

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Boring No. MW-4



WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		70	70	Cuttings		SP	58-95' See page 1 for description.	
			75	"				
		80	80	"				
			85	"			Coal chips appear less than 1/8" diameter.	
		90	90	"				
		100					Total depth 95 feet.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Norht of Sonneson home.

Boring No. MW-5

Surface Elevation Top PVC S 772.88 ft. Top PVC D 772.65 ft.

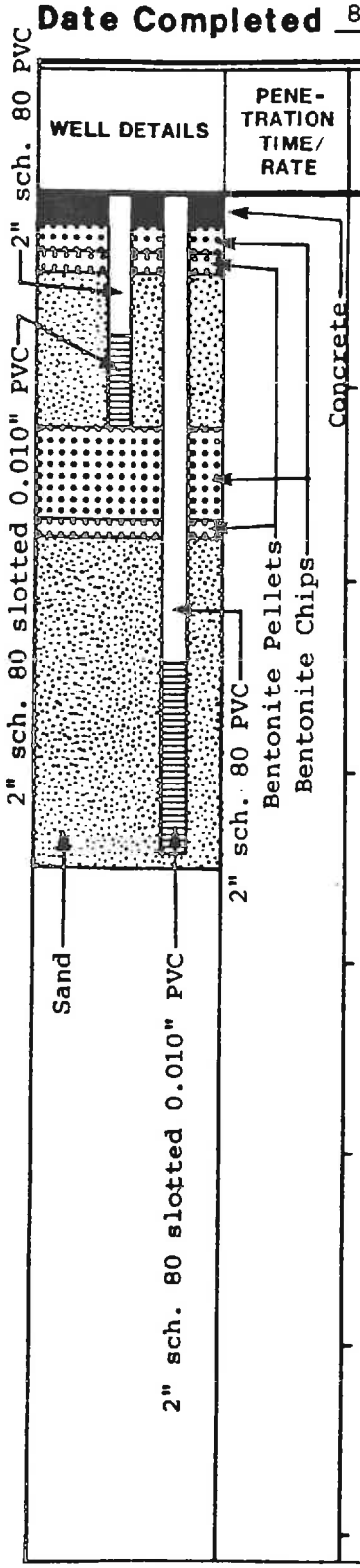
Drilling Method Air Rotary

Total Depth 35 feet

Drilled By Johnson Drilling Co.

Date Completed 8/6/86

Logged By G. S. Mack/L.M. West



WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		5		Cuttings		SW/GW	0-8' GRAVELLY SAND/SANDY GRAVEL, dark yellowish brown, medium to coarse sand and gravel, well graded, moist.	
		10	10	"		GM/GW	8-20' SILTY GRAVEL, medium brown, boulders greater than 8 inch at top, increase silt at bottom. Saturated at 10 feet, dry at 15 feet, and saturated at 20 feet.	▽
		15	15	"				
		20	20	"				▽ EC = 150
		25	25	"		GW/GP	25-35' SAND AND GRAVEL, numerous cobbles.	
		30	30	"				
		35	35	"				
		40						

SEA-300-02a

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Main gate, east side.

Boring No. MW-6

Surface Elevation Top PVC 838.16 ft.

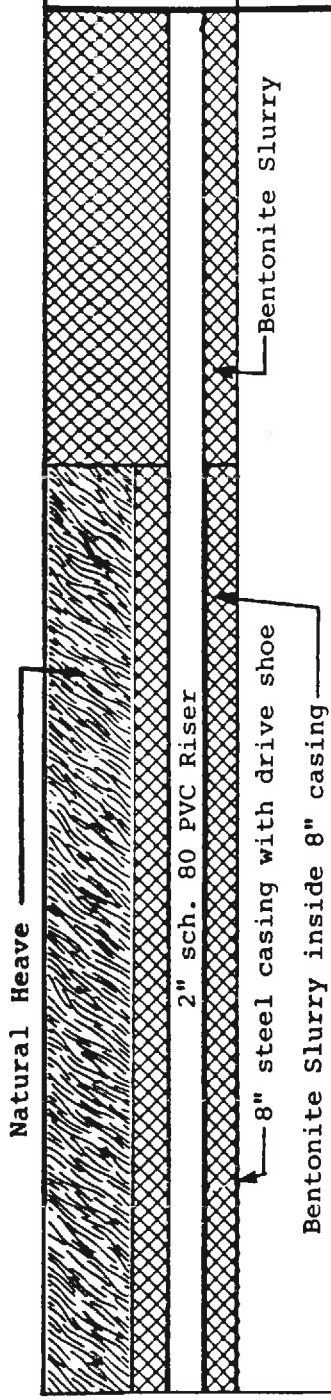
Drilling Method Air Rotary

Total Depth 125 feet

Drilled By Johnson Drilling Co.

Date Completed 8/14/86

Logged By G. S. Mack



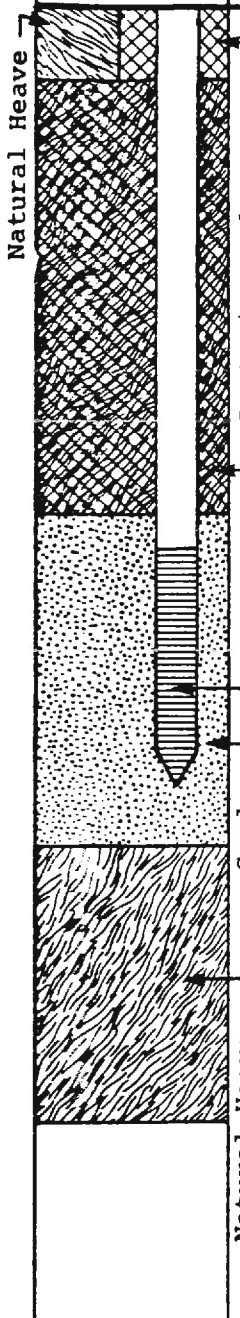
WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		5	5	Cuttings		GW	0-15' SANDY GRAVEL, olive gray, some boulders, medium to coarse sand, well graded, dry.	
		10	10	"				
			15	"		SW	15-20' GRAVELLY SAND, dark olive gray, fine to medium sand, well graded, moist.	
		20	20	"		GW/GM	20-57' SANDY GRAVEL, medium gray, medium to coarse gravel with some cobbles, clay and silt layers, well graded, dry.	
			25	"				
		30	30	"				
			35	"				
		40	40	"				
			45	"				
		50	50	"			increase in fine material	
			55	"		SM/GM	57-61' SILTY SAND, with gravel, olive gray, well graded, dry, gravel layer at base.	
		60	60	"		SP/SW	61-125' See page 2 for description.	
		65	65	"				
		70	70	"				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Boring No. MW-6



WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		70	70	Cuttings		SP/SW	61-125' SAND, dark yellowish brown, fine to medium sand with silt and some gravel layers, moderately poorly graded, slightly damp.	
		80	75	"			moisture in sand.	
		90	80	"				
		100	85	"			cuttings are wet.	
		110	90	"			saturated.	
		120	95	"				EC = 120
		130	100	"				
			105	"				
			110	"			fine to coarse sand.	
			115	"			gravel appears in sand coal chips appear.	
			120	"				
			125	"				
							Total depth 125 feet.	

S v R

D E S I G N C O M P A N Y

Civil Engineering
Planning
Landscape Architecture

911 Western Avenue
Suite 302
Seattle, WA 98104
Phone 206.223.0326

Principals:
Maureen A. Kwolek, PE
Peg Staeheli, RLA
Tom von Schrader, PE
John W. Rundall, PE

June 15, 1993

Mr. Bernard Breyen
Scoccolo Construction, Inc.
2825 South 154th Street
Seattle, WA 98188

Re: Enumclaw Landfill Closure Project, Phase II
Contract No. C10388C, Project No. 013115
Monitoring Well No. 6, SvR File No. 93002

Dear Mr. Breyen:

This letter is to confirm our discussions regarding abandoning MW-6 and replacing it with a new well (MW-6a). The abandonment of MW-6 shall be in accordance with WAC 173-160. A copy of the boring log is attached and it shows that between 23 feet and 73 feet there is still 50 feet of casing.

The new well (MW-6a) is to be located within five to ten feet of the MW-6 location. We will determine the precise location prior to drilling. MW-6a should be constructed similar to MW-6 and shall be in accordance with WAC 173-160. It should be noted that the WAC requires installation by a licensed driller; we understand Hayes meets that criteria.

There has been some discussion about reducing the size of the well to six inch diameter. Apparently the materials in the formations that the well is expected to encounter are hard and make drilling a straight well difficult. In order for the County to fit their sampling equipment in the well, after completion, the well must be straight enough to pass a "dummy" through the length of the two inch, Schedule 80 pipe. Discuss this requirement with Hayes and also be aware that drilling a six inch diameter straight can be more difficult than an eight inch diameter. The County will accept a six inch well if the above criteria is met.

Let us know what your schedule is for accomplishing this work so we can have someone on-site to log the well. King County Solid Waste and the Health Department want the abandonment complete by mid-July. Please let us know if you have any questions.

Sincerely,
SvR Design Company

John W. Rundall, PE
Project Manager

cc: Jeff Bunnell, King County Solid Waste Division
Sue Byers, R.W. Beck and Associates
Mike Spillane, Herrera Environmental Consultants
Doug Hartsock, EMCON Northwest

f:93002\scocc.le8

(1) OWNER: Name ENUMCLAW LANDFILL Address 28600 SE 440TH ST ENUMCLAW, WA 98022-

(2) LOCATION OF WELL: County PIERCE ? KING - NW 1/4 SE 1/4 Sec 19 T 20 N., R 7E WM

(2a) STREET ADDRESS OF WELL (or nearest address) 288010 SE 440TH ST

(3) PROPOSED USE: MONITORING

(4) TYPE OF WORK: Owner's number of well (If more than one) MW-6A

NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches

Drilled 120 ft. Depth of completed well 108 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Dia. from +3 ft. to 2 ft.

THREADED 2 " Dia. from +2 ft. to 98 ft.

PVC Dia. from ft. to ft.

Perforations: NO

Type of perforator used

SIZE of perforations in. by in.

perforations from ft. to ft.

perforations from ft. to ft.

perforations from ft. to ft.

Screens: YES

Manufacturer's Name MONOFLEX

Type PVC Model No

Diam. 2 slot size 10 from 98 ft. to 108 ft.

Diam. slot size from ft. to ft.

Gravel packed: YES Size of gravel 10/20

Gravel placed from 96 ft. to 111 ft.

Surface seal: YES To what depth? 96 ft.

Material used in seal BENTONITE

Did any strata contain unusable water? NO

Type of water? Depth of strata ft.

Method of sealing strata off

(7) PUMP: Manufacturer's Name

Type H.P.

(8) WATER LEVELS: Land-surface elevation 835.76 above mean sea level ... ft.

Static level 80 ft. below top of well Date 07/09/93

Artesian pressure lbs. per square inch Date

Artesian water controlled by

TOP of PVC? Yes, per Scott Begars 11/22/93 Jenny

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.

Was a pump test made? NO If yes, by whom?

Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /

Bailer test gal/min. ft. drawdown after hrs.

Air test gal/min. w/ stem set at ft. for hrs.

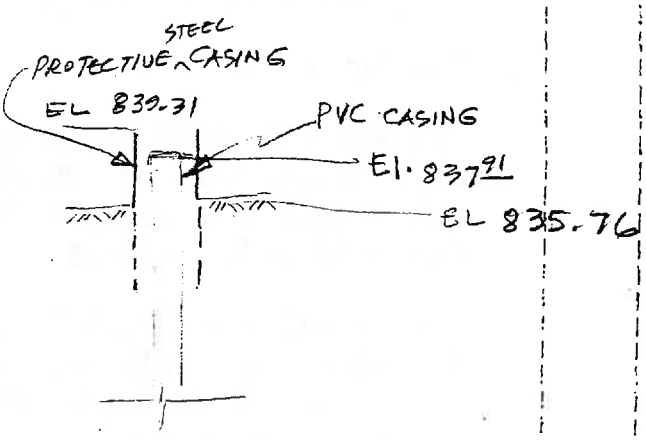
Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
BROWN GRAVEL SAND COBBLES	0	15
BROWN SAND & GRAVEL	15	43
BROWN GRAVEL SILT & SAND	43	47
BROWN GRAVEL & SAND	47	60
BROWN SAND	60	70
BROWN SAND & GRAVEL	70	



BRANNON HAYES DRILLING (206) 266-6110

Work started 07/08/93 Completed 07/09/93

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME HAYES DRILLING, INC.

(Person, firm, or corporation) (Type or print)

ADDRESS 556 ERSHIG RD. BDW, WA

[SIGNED] B License No. 1825

Contractor's Registration No. HAYESDI106J5 Date 07/12/93

3109

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 5

To Mike Spillane	From Brannon
Co.	Co. Hayes Drilling
Dept.	Phone # 206 766-6110
Fax # 825-2521	Fax #

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL **Page** 1 **of** 2

Location On bench near north fence **Boring No.** MW-7

Surface Elevation Top PVC 813.36 ft. **Drilling Method** Air Rotary

Total Depth 120 feet **Drilled By** Johnson Drilling Co.

Date Completed 8/22/86 **Logged By** G.S. Mack

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
			5	Cuttings		GW	0-13' SANDY GRAVEL, tan, boulders to 6 inches, trace of fines, well graded, dry.	
2" sch. 80 PVC Riser; Bentonite Slurry		10	10	"				
			15	"		SW	13-20" GRAVELLY SAND, medium gray, trace fines, fine to coarse, well graded, dry, charcoal or coal at 16 ft.	
		20	20	"				
			25	"		SP	20-62' SAND, dark yellowish brown, gravel layers, generally poorly graded, coal pieces, 25-33' dark brown.	
		30	30	"				
			35	"			fine to coarse sand.	
		40	40	"			fine to medium sand, dark brown.	
			45	"				
Bentonite Chips		50	50	"			Dark yellowish brown, damp.	
			55	"				
2" sch. 80 slotted 0.010" PVC		60	60	"				
			65	"		SW	62-92' See page 2 for description.	
Sand		70	70	"				

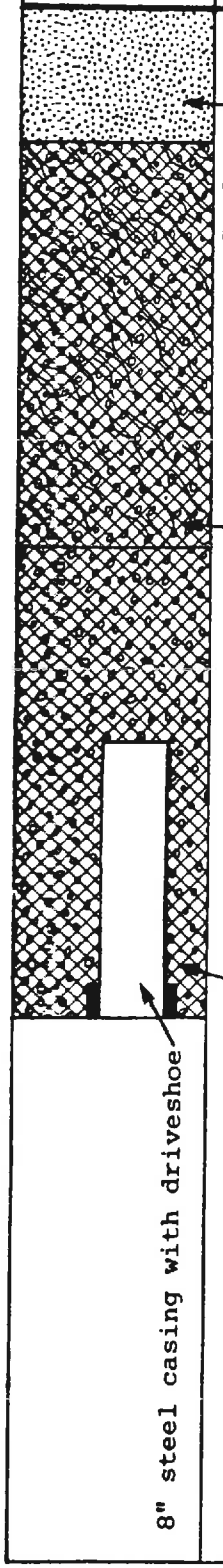
SEA-300-02a

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Boring No. MW-7



DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
70	70	Cuttings	SW	62-92' GRAVELLY SAND/SAND, with gravel layers, dark brown, medium to coarse sand, well graded, saturated at 70 ft.	
	75	"			
80	80	"			EC = 130
	85	"			
90	90	"			
	95	"	GP/GW	92-97' SANDY GRAVEL, dark yellowish brown, gravel to 2 inches, moderately poorly graded, saturated.	EC = 145
100	100	"	SC/GC	97-116' CLAYEY SAND, olive gray, with gravel or gravel layers and silt, little water flowing, water stopped at 106 feet.	
	105	"			
110	110	"		Gravel increases.	
	115	"	GP	116-120' GRAVEL, olive gray, some clay and silt, moderately poorly graded, wet.	EC = 240
120	120	"		Total depth 120 feet.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Gierke
Boring No. MW-8
Surface Elevation 787.14 ft. (Top PVC)
Drilling Method 5" ODEX
Total Depth 56 feet
Drilled By Kring Drilling
Date Completed 1-20-87
Logged By G.S. Mack

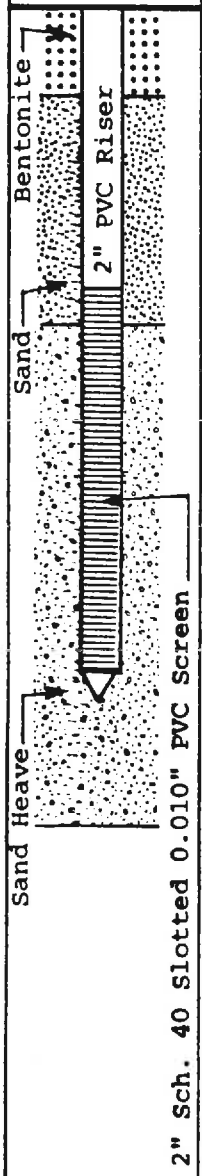
WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Bentonite Envirogel; 2" Sch. 80 PVC Riser; Sand Heave; Bentonite Pellets		5	5	SS		SW	0-5' SILTY SAND, yellowish brown, with some gravel, well graded.	
		10	10	SS		SP	5-56' SAND, yellowish gray to olive gray, mottled, fine to medium sand, trace of silt, poorly graded, damp.	
		15	15	SS				
		20	20	SS				
		25	25	SS			25 ft. charcoal or coal chips less than 1/4", trace of gravel and silt.	
		30	29	SS				
		35	34	SS				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Boring No. MW-8

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		35				SP	5-56' SAND, continued. 42 ft. heaving sands.	▽ EC=500µs
		40						
		45						
		50						
		55						
		60						

ASSOCIATED EARTH SCIENCES, INC

Geologic & Monitoring Well Construction Log

Project Number	Well Number	Sheet
BV99072B	MW-9	1 of 3

Project Name	Enumclaw Landfill	Surface Elevation	823.74
Location	Enumclaw, Washington	Water Depth (ft toc)	79.36
Drilling Method	Hollow-Stem Auger 8" OD/4" ID	Start Date	September 30, 1999
Sampling Method	3.25" OD D&M Split-Spoon Ring Sampler, 300 lb hammer	Finish Date	September 30, 1999

Depth feet	Well Construction	Methane %	Lab Test	S T	Blows/ 6"	Sample ID	Mtl. Graphic	Description
	8" Above-Grade Locking Steel Monument w/ Bollards; Concrete Seal	0						FILL
	Bentonite chips							-grades very gravelly and cobbly
5								-drills easier from 4 to 7 feet
		0			27 27 44	S-1		MUDFLOW
10								Very dense, moist, brown GRAVEL with SILT; few sand
		0			25 50/6"	S-2		
15								
		0	G		29 50/5"	S-3		
20	2-inch ID SCH 40 PVC Well Casing							
		0			24 50/5"	S-4		
25								
		0			20 25 28	S-5		RECESSIONAL OUTWASH
30								Very dense, damp, brown SAND; trace gravel, sand fine to medium
		0			27 23 28	S-6		-sand fine to coarse
35	Bentonite Grout at 30%							
		0			26 28 29	S-7		-grades moist

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split-Spoon Sampler

Lab Tests:
- G - Grain Size
- P - Permeability
- M - Moisture Content

▼ Water Level (ATD) ▽ Static Water Level

Logged by: RRH
Approved by: JJS
Figure No. B - 6

SPARKMW ENUMCLAW.GPJ May 25, 2000

ASSOCIATED EARTH SCIENCES, INC

Geologic & Monitoring Well Construction Log

Project Number	Well Number	Sheet
BV99072B	MW-9	2 of 3

Project Name	Enumclaw Landfill	Surface Elevation	823.74
Location	Enumclaw, Washington	Water Depth (ft toc)	79.36
Drilling Method	Hollow-Stem Auger 8" OD/4" ID	Start Date	September 30, 1999
Sampling Method	3.25" OD D&M Split-Spoon Ring Sampler, 300 lb hammer	Finish Date	September 30, 1999

Depth feet	Well Construction	Methane %	Lab Test	S T	Blows/ 6"	Sample ID	Mtl. Graphic	Description
								Very dense, damp, brown SAND; trace gravel, sand fine to medium
		0			41 30 30	S-8		-trace organics
45	Bentonite Grout at 30%							
		0	G		29 28 28	S-9		-trace silt clasts
50								
		0			27 32 32	S-10		
55								
		0			30 28 32	S-11		-trace organics
60								
		0			22 34 35	S-12		
65								
		0			20 26 29	S-13		-sand fine to medium
70								
		0			34 50/6"	S-14		-trace organics
75	Bentonite chips							
	77' - ATD 77.13' (11/18/99)							
		0	G		13 17 24	S-15		-grades dense and wet
	Filter Pack, 10x20 Colorado silica sand							

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split-Spoon Sampler

Lab Tests:
- G - Grain Size
- P - Permeability
- M - Moisture Content

▼ Water Level (ATD) ▽ Static Water Level

Logged by: RRH
Approved by: JJS
Figure No. B - 6

3PARKMW ENUMCLAW.GPJ May 25, 2000

ASSOCIATED EARTH SCIENCES, INC

Geologic & Monitoring Well Construction Log

Project Number	Well Number	Sheet
BV99072B	MW-9	3 of 3

Project Name	Enumclaw Landfill	Surface Elevation	823.74
Location	Enumclaw, Washington	Water Depth (ft toc)	79.36
Drilling Method	Hollow-Stem Auger 8" OD/4" ID	Start Date	September 30, 1999
Sampling Method	3.25" OD D&M Split-Spoon Ring Sampler, 300 lb hammer	Finish Date	September 30, 1999

Depth feet	Well Construction	Methane %	Lab Test	ST	Blows/ 6"	Sample ID	Mtl. Graphic	Description
85	Filter Pack, 10x20 Colorado silica sand Well Screen 2" ID SCH 40 PVC, 0.01" slot size	0			10 27 28	S-16		Very dense, wet, brown SAND; trace gravel, sand fine to medium -grades very dense
90	Threaded end cap, 2" ID SCH 40 PVC	0 0	G		12 25 29	S-17		Bottom of boring at 90.1 ft. depth. Monitoring well installed to depth of 90 feet.
95								
100								
105								
110								
115								

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split-Spoon Sampler

Lab Tests:
- G - Grain Size
- P - Permeability
- M - Moisture Content

Water Level (ATD) ▽ Static Water Level

Logged by: RRH
Approved by: JJS
Figure No. B - 6

SPARKMW ENUMCLAW.GPJ May 25, 2000

ASSOCIATED EARTH SCIENCES, INC

Geologic & Monitoring Well Construction Log

Project Number	Well Number	Sheet
BV99072B	MW-10	1 of 2

Project Name	Enumclaw Landfill	Surface Elevation	797.74
Location	Enumclaw, Washington	Water Depth (ft toc)	49.9
Drilling Method	Cable Tool: 10" casing above 32', 6" casing below 32'	Start Date	October 21, 1999
Sampling Method	2.0" Split-Spoon Sampler; 3.25" Split-Spoon Ring Sampler and bailer	Finish Date	October 26, 1999

Depth feet	Well Construction	Methane %	Lab Test	ST	Blows/ 6"	Sample ID	Mtl. Graphic	Description
	8" Above-Grade Locking Steel Monument w/ Bollards; Concrete seal							LANDFILL REFUSE
		0.2						-cuttings include glass, metal, styrofoam, plastic, cloth and paper
	Bentonite grout							
5		0.2		N O	28 50/4"	S-1		Very dense, moist, brown GRAVEL with SAND, with SILT; trace glass, metal and wood
10		0.3		N	50/5"	S-2		Very dense, moist, brown GRAVEL with SAND; trace silt, trace debris including metal, glass and wood
		0.3		O	22 23 46	S-3		
15		0.2		N O	10 14 30	S-4		Very dense, wet, brown GRAVEL with SAND; trace silt, trace glass, plastic, and wood in shoe
		0.4		O	100/6"	S-5		
20	2-inch ID SCH 40 PVC Well Casing	0.4		O	15 50/3"	S-6		Very dense, wet, brown to dark gray GRAVEL with SAND; 5% debris including glass, plastic, and metal
		0.3		N O	10 11 20	S-7		Dense, wet, dark brown GRAVEL with SAND; 5% debris including metal and glass
25		0.2		O	18 12 24	S-8		
		0.2		N	50/5"	S-9		Very dense, wet, brown SAND with GRAVEL; trace silt, trace debris including metal and glass
								MUDFLOW
30		0		N	50/4"	S-10		Very dense, wet, medium brown GRAVEL with SAND; trace silt; no debris observed
		0		O	50/4"	S-11		
								-increase in gravel content
35		0.2	G	O	13 10 10	S-12		Dense, dark gray SILTY GRAVEL with SAND; trace clay; gravel fine to coarse, subrounded to well-rounded; sand fine to coarse, primarily fine
								RECESSIONAL OUTWASH

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split-Spoon Sampler

Lab Tests:
- G - Grain Size
- P - Permeability
- M - Moisture Content

▼ Water Level (ATD) ▽ Static Water Level

Logged by: RRH/SJS

Approved by: JJS

Figure No. B - 7

GPARKMW ENUMCLAW.GPJ May 25, 2000

ASSOCIATED EARTH SCIENCES, INC

Geologic & Monitoring Well Construction Log

Project Number	Well Number	Sheet
BV99072B	MW-10	2 of 2

Project Name	Enumclaw Landfill	Surface Elevation	797.74
Location	Enumclaw, Washington	Water Depth (ft toc)	49.9
Drilling Method	Cable Tool: 10" casing above 32', 6" casing below 32'	Start Date	October 21, 1999
Sampling Method	2.0" Split-Spoon Sampler; 3.25" Split-Spoon Ring Sampler and bailer	Finish Date	October 26, 1999

Depth feet	Well Construction	Methane %	Lab Test	ST	Blows/ 6"	Sample ID	Mtl. Graphic	Description
	Hydrated bentonite chips	0.1			35 38 42	S-13		
		0.4						-gravel and cobble content increasing; harder drilling -decrease in fines; clearer bail water
45								
	47' - ATD 47.54' (11/18/99)	0.1			35 50/2"	S-14		-increase in sand content; little fines
		0.1						
50		0			30 30 30	S-15		Very dense, gray GRAVEL; few sand; gravel fine to coarse, clasts subrounded to well-rounded, primarily mafic lithologies; sand fine to coarse, primarily medium to coarse
								-slight increase in fines
55	Filter Pack, 10x20 Colorado silica sand	0.1			25 30 35	S-16		
		0						-slight increase in fines, sand and fine gravel; mineralogy of sand grains is ~50% mafic, 30% quartz, 20% other
	Well screen 2" ID SCH 40 PVC, 0.01" slot size							Dense, light gray SAND; little silt; sand fine to medium, very angular to subrounded; no bedding
60		0	G		10 7 17	S-17		
		0						
	Threaded end cap, 2" ID SCH 40 PVC							-grades very dense, few silt
65		0	G		27 17 25	S-18		-few gravel and cobbles
	Slough Backfill							Bottom of boring at 66.5 ft. depth. Borehole completed with a 10-inch casing temporarily installed through the landfill debris to a depth of 32 feet. Bentonite grout slurry tremied in 10-inch casing annulus. A 6-inch casing was used to complete the boring to 66.5 feet. Monitoring well installed to depth of 65 feet.
70								
75								

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split-Spoon Sampler

Lab Tests:
- G - Grain Size
- P - Permeability
- M - Moisture Content

▼ Water Level (ATD) ▽ Static Water Level

Logged by: RRH/SJS

Approved by: JJS

Figure No. B - 7

SPARKMW ENUMCLAW.GPJ May 25, 2000

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Near West fence

Boring No. RP-1

Surface Elevation NA

Drilling Method 4" Hollow Stem Auger

Total Depth 60 feet

Drilled By Kring Drilling Co.

Date Completed 6/20/86

Logged By G.S. Mack

WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
							0-4' SANDY GRAVEL, cover material.	
	Bentonite Slurry	10	1 2	Soil "			4-20' REFUSE, mixed with sandy gravel, metal, glass, ash, wood products, little organic material.	
		20	3	"		GW/GM	20-55' SANDY GRAVEL, grayish brown with silt and boulders, well graded, dry.	
	25' of Auger twisted off	30	4	"				
			5	"				
		40	6	"				
			7	"				▽
		50						EC = 510
	Heave		9	"				
		60						
		70						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Lower level of trees

Boring No. RP-2

Surface Elevation NA

Drilling Method 4" Hollow Stem Auger

Total Depth 7 feet

Drilled By Kring Drilling Co.

Date Completed 6/20/86

Logged By G.S. Mack

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Natural Fill		10				GM	0-7' SANDY GRAVEL, medium brown, with silt, cobbles and boulders, well graded, cover material.	
							Hole collapsed on Auger.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Western section in trees.

Surface Elevation Top PVC 814.64 ft / 814.33 ft.

Total Depth 38.5 feet

Date Completed 7/1/86

Boring No. RP-3

Drilling Method 4" Hollow Stem Auger

Drilled By Kring Drilling Co.

Logged By G.S. Mack

WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		10					0-1.4' SANDY GRAVEL, with boulders, cover.	
							1.4-29' REFUSE, corroded metal, burnt paper, wood fragments, little organic material.	
			17.5	Soil				
		20	22.5	"				
			27.5	"				
		30	32.5	"		GW	29-38.5' SANDY GRAVEL, medium brown with silt, moist.	
			37.5	"				
		40					Total Depth 38.5 feet.	
		50						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Near East side fence.
Top PVC 857.92 ft.

Surface Elevation 857.17 ft.

Total Depth 38.5 feet

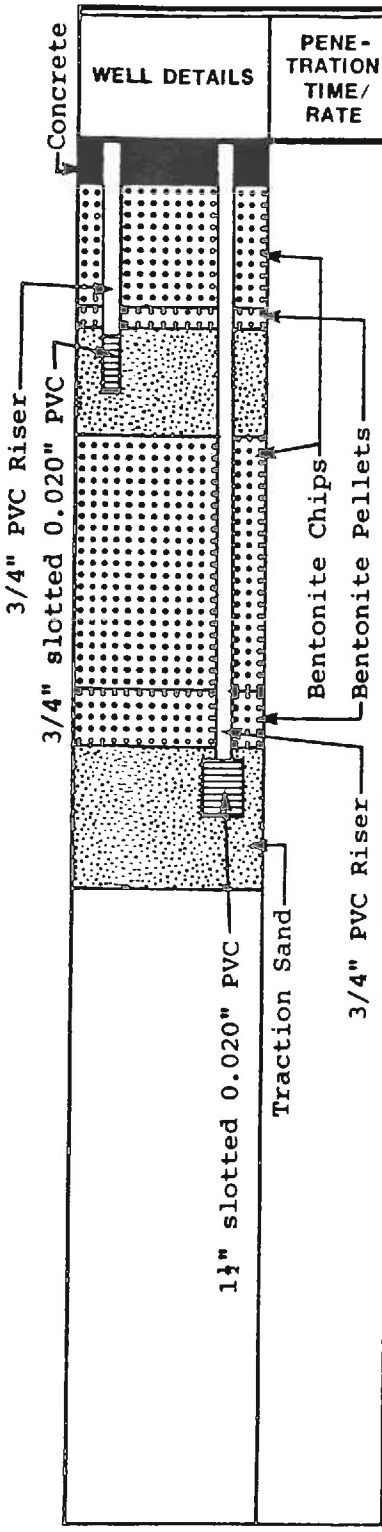
Date Completed 7/2/86

Boring No. RP-4

Drilling Method 4" Hollow Stem Auger

Drilled By Kring Drilling Co.

Logged By G.S. Mack



WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		10					0-2.2' GRAVELLY SAND, with some silt and boulders, medium sand, cover.	
		20					2.2-25' REFUSE, metal, old tires, glass, wood, organic material.	
			23.5	Refuse			25-30' SAND, gray with reddish brown streaks, occasional gravel and silt	
			28.5	Soil		SP/SW	30-31' SILTY CLAY, with gravel, grayish brown.	
		30	32.5	"		CL		
			38.5	"		SW	30-38.5' GRAVELLY SAND, medium gray with streaks of orangish brown and black, with silt, well graded.	
		40					Total Depth 38.5'.	
		50						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location Central upper plateau

Surface Elevation Top PVC 857.92 ft. / 857.17 ft.

Total Depth 42 feet

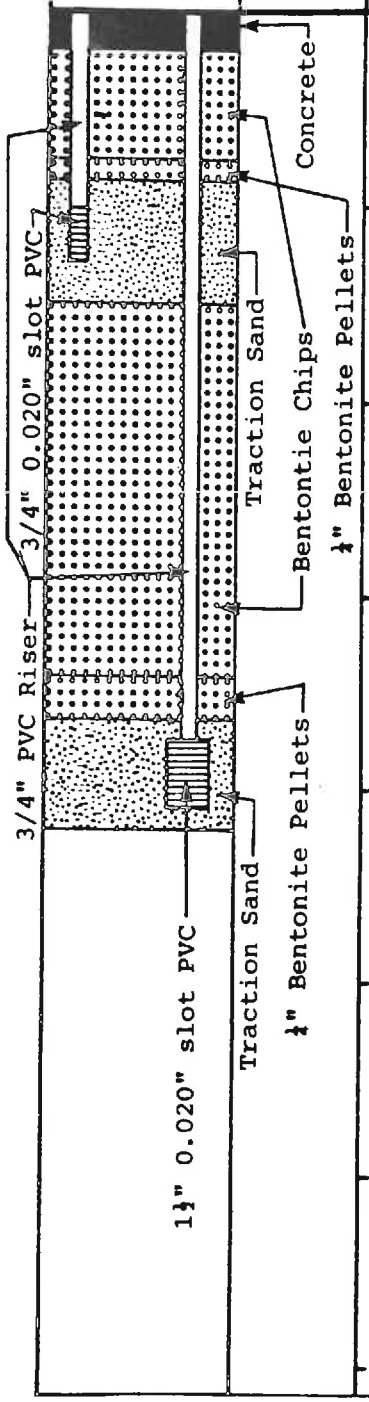
Date Completed 7/7/86

Boring No. RP-5

Drilling Method 4" HOllow Stem Auger

Drilled By Kring Drilling Co.

Logged By G.S. Mack



WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		10					0-0.8' SANDY GRAVEL WITH SILT, cover material.	
		20					0.8-42' REFUSE, glass, plastic, metal, wood products, organic material.	
		30						
		40	1	Refuse				
		50					Total Depth 42 feet Auger hit refusal.	
							Abandoned April 1987 by removing casings and tremie backfill w/cement grout.	

SEA-300-02a

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location On north fence line
Top PVC

Boring No. G-6

Surface Elevation 819.90, 820.09, 820.20 ft

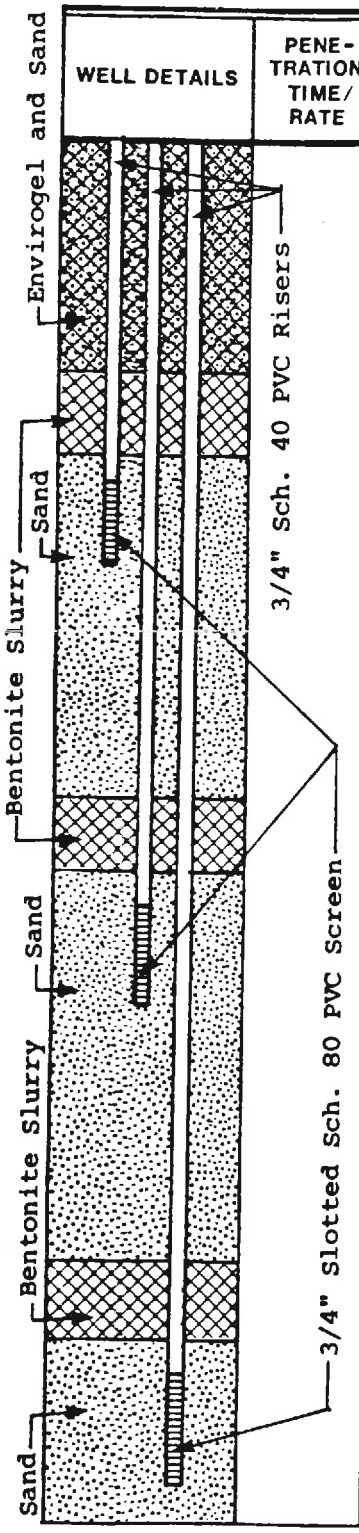
Drilling Method 5" ODEX

Total Depth 40 feet

Drilled By Kring Drilling

Date Completed 1-14-87

Logged By G.S. Mack



WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
							0-2' FILL.	
						SM	2-9' SILTY SAND, medium yellowish brown, fine to coarse sand, some gravel well graded, moist.	
						SM	9-18' SILTY SAND, light olive gray to dark blueish gray, very fine to fine sand, some gravel, moderately well graded, moist.	
						SW	18-40' GRAVELLY SAND, light olive gray to olive gray, fine to coarse sand, trace of silt, wet to 35 ft., damp 35 ft. to 40 ft.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Boring No. G-6

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Sand		35				SW	18-40' GRAVELLY SAND, continued.	
		40						
		45						
		50						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location North fence line

Boring No. G-7

Surface Elevation 820.89, 820.97, 821.05 (Top PVC) ft.

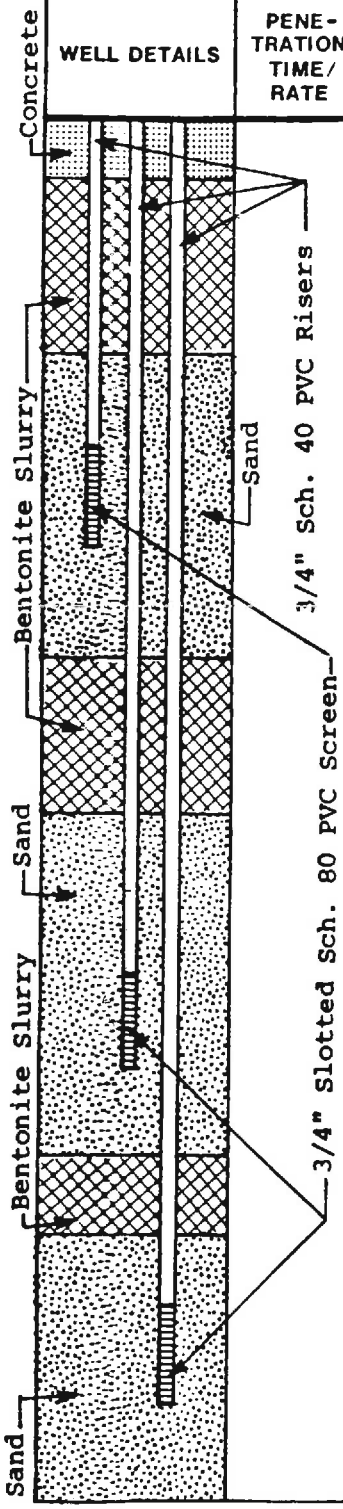
Drilling Method 5" ODEX

Total Depth 40 feet

Drilled By Kring Drilling

Date Completed 1-15-87

Logged By G.S. Mack



WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
							0-3' FILL, gravel, sand, wood chips.	
						SM	3-21' SILTY SAND, dark yellowish brown to yellowish brown, fine sand, some gravel in places, trace of clay, moist.	
						SW	21-40' SILTY SAND, olive gray to dark olive gray, fine to medium sand, some gravel, trace of clay, less gravel at depth, moist.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Boring No. G-7

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Sand		35				SW	21-40' SILTY SAND, continued.	
		40						
		45						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Location East side of landfill

Boring No. G-8

Surface Elevation Top PVC 864.20, 864.24, 864.16 ft

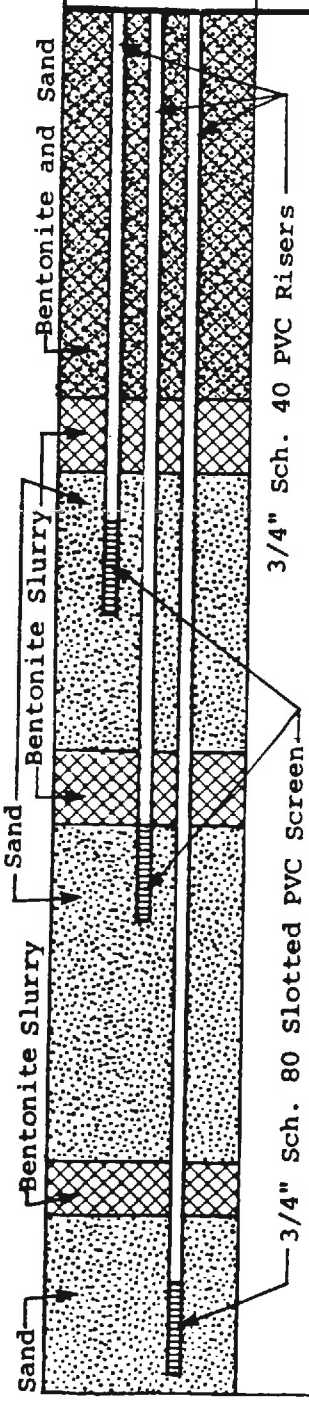
Drilling Method 5" ODEX

Total Depth 40 feet

Drilled By Kring Drilling

Date Completed 1-16-87

Logged By G.S. Mack



WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
							0-2' FILL.	
						SP	2-12' SILTY SAND, dark yellowish brown, fine sand with some gravel, trace of clay, well graded, wet.	
						GP	12-40' GRAVEL, light olive gray to light blueish gray, some boulders, trace of silt and clay. 36 ft. increasing in silt.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT ENUMCLAW LANDFILL

Boring No. G-8

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Sand		35				GP	12-40' GRAVEL, continued.	
		40						
		45						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Location North Fence Line, West of MW-1

Boring No. G-9

Surface Elevation

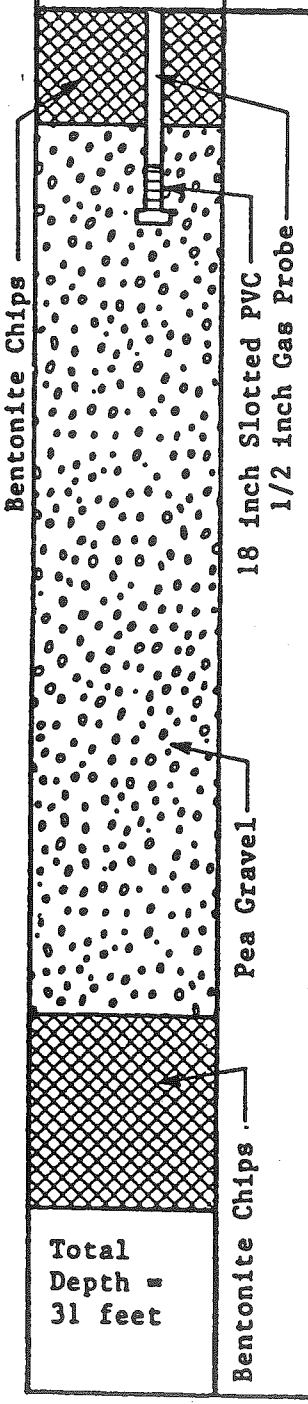
Drilling Method 5 inch ODEX

Total Depth 31 feet

Drilled By Kring Drilling Company

Date Completed Nov. 18, 1987

Logged By G.S. Mack



WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
						SM	0-13 SILTY SAND, light olive grey to moderate brown, with some gravel, well graded, moist.	
		5	1	SPT	6/6/5			
		10	2	SPT	5/6/7		-12' increase in gravel	
		15	3	SPT	3/4/5	SM	13-31 SILTY SAND, medium grey to greenish grey to olive grey, sand is medium to fine, well graded occasional gravel, boulders.	
		20	4	SPT	3/4/24			
		25	5	SPT	13/18/13			
		30	6	SPT	50 for 6"		Boulders to several feet diameter.	
		35					SPT = Standard Penetration Test	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Location North Fence Line

Boring No. G-10

Surface Elevation

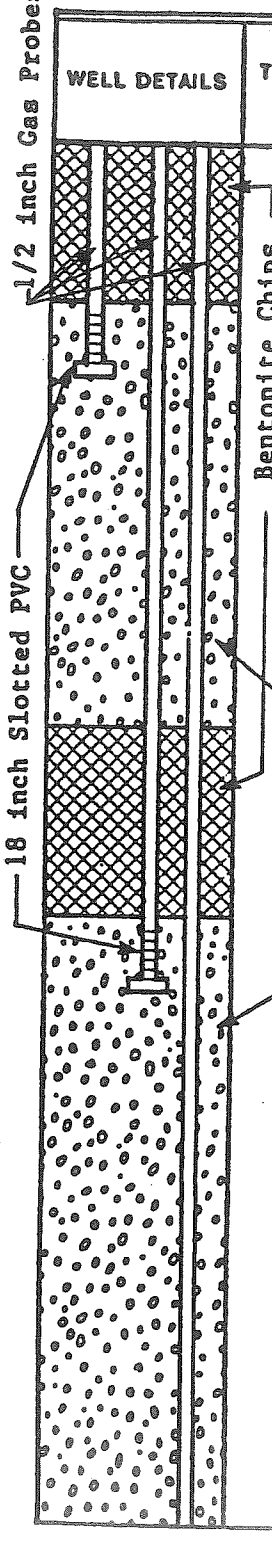
Drilling Method 5-inch ODEX

Total Depth 75 feet

Drilled By Kring Drilling Company

Date Completed 11/21/87

Logged By G.S. Mack



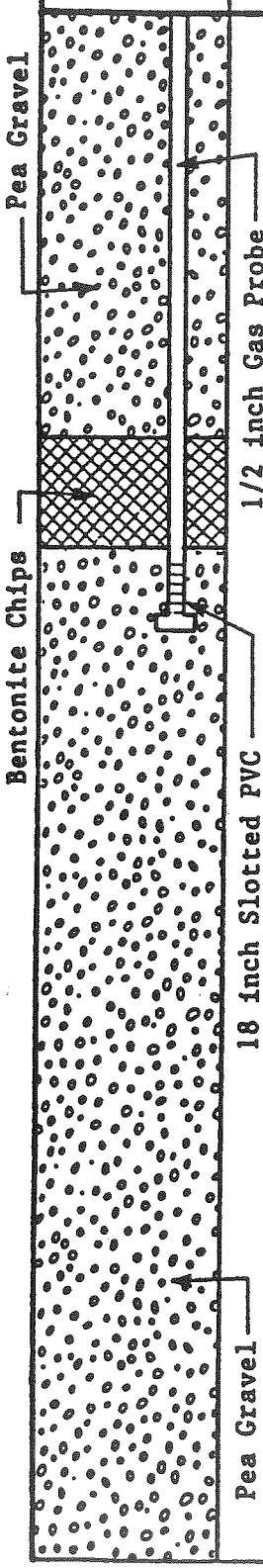
WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
							0-7 FILL, sandy gravel with trace of silt, moderate yellowish brown, dry, wood chips.	
		5	1	SS	26/14/8			
						GW	7-18 SANDY GRAVEL, moderate yellowish brown, light olive grey when saturated, coarse sand, trace silt, gravel to several inches, boulders to several feet, well graded.	▽ Perched
		10	2	SS	4/6/9			
		15	3	SS	45 for 6			
		20	4	SS	8/8/9	SP/GW	18-22 SAND/SANDY GRAVEL, moderate yellowish brown fine to coarse sand interbed with layers of gravel and sand, poor to well graded, moist.	
		25	5	SS	9/16/21	GW	22-27 SANDY GRAVEL, mottled light grey to moderate yellowish brown to light olive grey, fine to coarse sand, gravel subangular to subrounded, well graded, moist.	
		30	6	SS	12/17/16	SW	27-37 GRAVELLY SAND, olive grey, fine to coarse sand, gravel subangular to subrounded, well graded, moist.	
		35	7	SS				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Boring No. G - 10



WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		35				SW	GRAVELLY SAND - Description above.	
		40	8	SS	32/17/7	GW	37-75 SANDY GRAVEL, yellowish grey to light olive grey, weathered, sand is fine with some coarse, gravel is subangular to rounded up to 0.3-inches. Dry, well graded.	
		45	9	SS	50 for 6"		- 45 feet boulders	
		50	10	SS	50 for 6"			
		55	11	SS	50 for 6"			
		60	12	SS	50 for 6"			
		65	13	SS	50 for 6"			
		70	14	SS	50 for 5"			

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Boring No. G - 10

WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Pea Gravel		70				GW	SANDY GRAVEL cont.	
			15	SS	9/37/40			
Total Depth = 75 feet							SS = Split Spoon Sample driven with Jar Hammer.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Location South side south of road

Boring No. G - 11

Surface Elevation

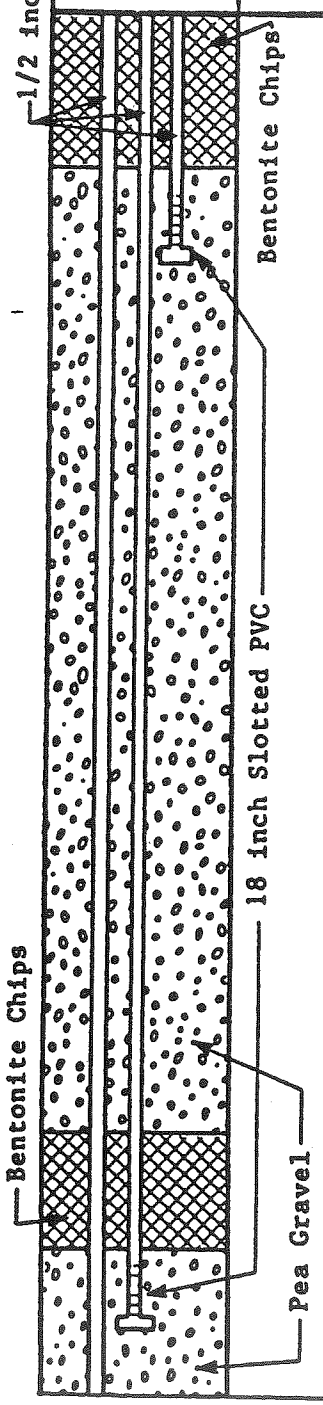
Drilling Method 8 inch Air Rotary

Total Depth 80 feet

Drilled By Tacoma Pump and Drill

Date Completed 12/3/87

Logged By G.S. Mack



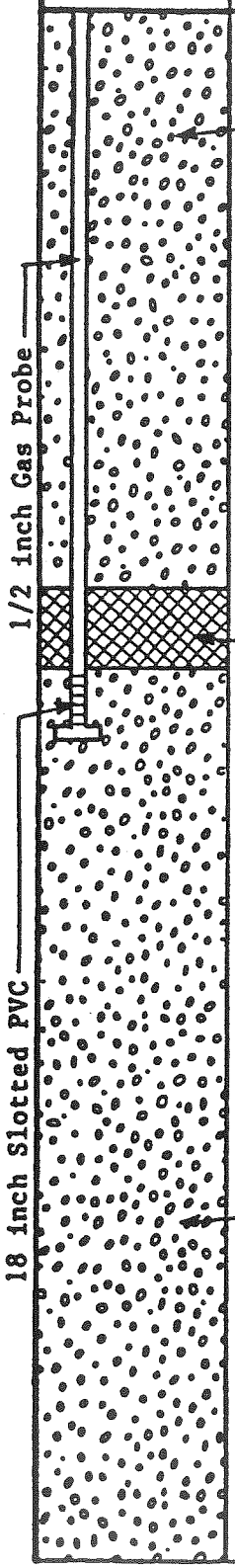
WELL DETAILS	PENETRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		5	1	Cutting		GW	0-12 Sandy boulders, moderate yellowish brown, with some silt near surface, fine to coarse sand and gravel intermixed with boulders and cobbles, very well graded, dry.	
		10	2	Cutting				
		15	3	Cutting			12-43 SANDY GRAVEL, moderate yellowish brown to medium grey with some boulders and cobbles, trace of silt, well graded, dry.	
		20	4	Cutting				
		25	5	Cutting		GW		
		30	6	Cutting				
		35	7	Cutting				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Boring No. G - 11



WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		35	7	Cutting		GW	12-43 SANDY GRAVEL, cont.	
		40	8	Cutting				
		45	9	Cutting		SP	43-80 SAND, moderate yellowish brown, fine to medium sand, with some gravel, moderately poorly graded.	
		50	10	Cutting				
		55	11	Cutting				
		60	12	Cutting			- little gravel	
		65	13	Cutting				
		70	14	Cutting				

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Boring No. G - 11

WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
Pea Gravel		70	14	Cutting		SP	43-80 SAND, continued	
		75	15	Cutting				
		80	16	Cutting				
Total Depth = 80 feet		85						
		90						

G12 missing

ASSOCIATED EARTH SCIENCES, INC

Probe Decommissioning Diagram

Project Number	Well Number	Sheet
BV99072B	GP-13	1 of 1

Project Name	Enumclaw Landfill	Surface Elevation (ft)	775
Geographic Location	Enumclaw, Washington	Water Depth (ft toc)	
Specific Location	Auman Residence	Start Date	September 28, 1999
Drilling Method	Mobile B-61 Hollow-Stem Auger, 4" ID, 6" OD	Finish Date	September 28, 1999

Depth feet	Elevation feet	Methane %	Probe Decommissioning Construction	Remarks
			Native Soil	
			Hydrated Bentonite Chips	
5	770	0		
10	765			
15	760	0	Bentonite Slurry (20% Solids by Weight)	
20	755	0		
		0.1		

Completion Material:
- Native Soil
- Bentonite Chips
- Bentonite Slurry

Static Water Level
Water Level (ATD)

Logged by: SJS
Approved by: JJS

Figure No. B - 4

AESI_WELL_ABAND ENUMCLAW.GPJ May 22, 2000

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Location Northeast of Sonneson's House

Boring No. G - 13

Surface Elevation

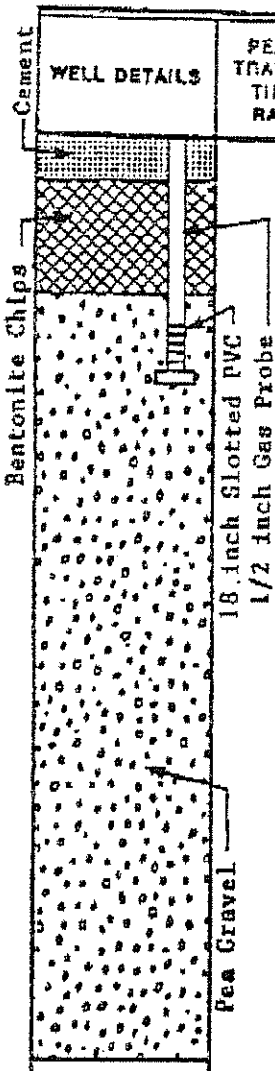
Drilling Method 4-1/4 inch Hollow Stem Auger

Total Depth 25 feet

Drilled By Tacoma Pump & Drilling

Date Completed November 9, 1987

Logged By G.S. Mack



WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		5	1	no sample		GW	0-26 SANDY GRAVEL, moderate yellowish brown. Coarse to fine sand, trace of silt, gravel is subangular to subrounded, moist, very well graded.	
		10						
		15	2	DM				
		20	3	DM				
		25	4	DM				
Total Depth = 25 feet		30					DM = Split Core Barrel Sample using Standard Hammer.	

SEA-300-02a

ASSOCIATED EARTH SCIENCES, INC

Probe Decommissioning Diagram

Project Number	Well Number	Sheet
BV99072B	GP-14	1 of 1

Project Name	Enumclaw Landfill	Surface Elevation (ft)	786.5
Geographic Location	Enumclaw, Washington	Water Depth (ft toc)	29.40
Specific Location	Gierke Residence	Start Date	September 28, 1999
Drilling Method	Mobile B-61 Hollow-Stem Auger, 4" ID, 6" OD	Finish Date	September 28, 1999

Depth feet	Elevation feet	Methane %	Probe Decommissioning Construction	Remarks
0	785		Native Soil	Water level from grade based on measured depth to water from TOC and estimated casing stickup on day of decommissioning.
5		0		
	780			
10				
	775		Hydrated Bentonite Chips	
15		0		
	770			
20				
	765			
25		0		
	760		26.9' (9/28/99)	
30				
	755		Bentonite Slurry (20% Solids by Weight)	
35		0		
	750			
40		0.4		
	745			

Completion Material:
- Native Soil
- Bentonite Chips
- Bentonite Slurry

Static Water Level
Water Level (ATD)

Logged by: SJS
Approved by: JJS

Figure No. B - 5

AESI_WELL_ABAND ENUMCLAW.GPJ May 22, 2000

Sweet, Edwards & Associates, Inc.

BORING LOC

PROJECT Enumclaw Landfill

Location Adjacent to MW-8, West Side

Boring No. G - 14

Surface Elevation

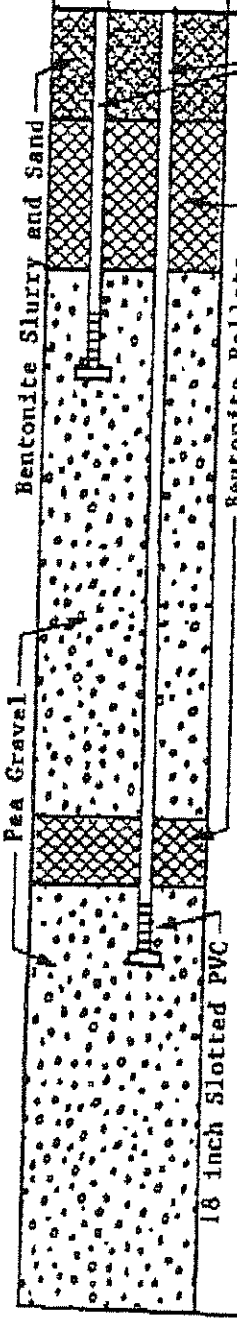
Drilling Method 4-1/4 inch Hollow Stem Auger

Total Depth 40 feet

Drilled By Tacoma Pump & Drilling

Date Completed November 6, 1987

Logged By G.S. Mack



WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		0					0-1 SOIL, moderate yellowish brown, organic material.	
		5	1	DM		SP	1-20 SAND, olive grey to moderate yellowish brown, medium to fine sand, laminated light and dark minerals, poorly graded, dry.	
		10	2	DM				
		15	3	DM				
		20	4	DM				
		25	5	DM		SP	20-40 SAND, olive grey, to moderate yellowish brown, fine to medium sand, trace of coarse sand and gravel, coal chips.	
		30	6	DM				
		35						

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Location North Fence Line

Boring No. G - 15

Surface Elevation

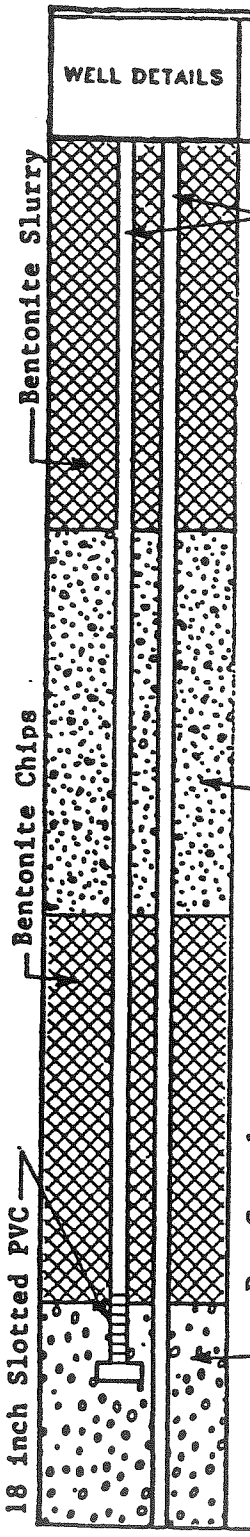
Drilling Method 5 inch ODEX

Total Depth 60 feet

Drilled By Kring Drilling

Date Completed November 19,1987

Logged By G S Mack



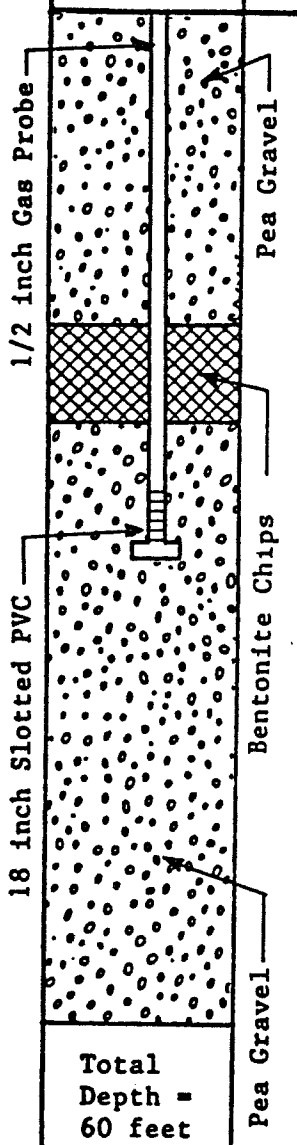
WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
							See G - 9 for Geology	▽
			7	SS		SP	30-37 SAND, light olive brown to dark yellowish brown, fine to medium sand, trace of gravel and silt, poorly graded, moist.	

Sweet, Edwards & Associates, Inc.

BORING LOG

PROJECT Enumclaw Landfill

Boring No. G - 15

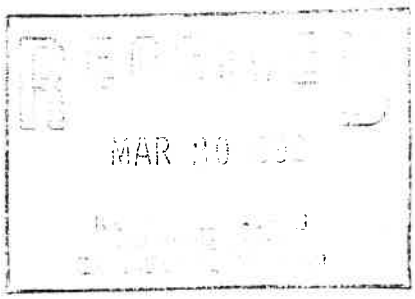


WELL DETAILS	PENE-TRATION TIME/ RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		35	7	SS		SP	SAND, continued.	
		40	8	SS		GW	37-56 SANDY GRAVEL, weathered, dark yellowish orange to moderate reddish brown, iron stain, fine to medium sand, with trace of silt, well graded, moist.	
		45	9	SS				
		50	10	SS				
		55	11	SS			Boulders	
		60	12	SS		GW	56-60 SILTY GRAVEL, light olive grey, weathered, some fine sand, boulders, well graded.	
		65					SS = Split Spoon Sample using Jar Hammer.	

NF

Sweet-Edwards/EMCON, Inc.
Ground Water, Engineering, Waste Management, & Drilling Services

18912 N. Creek Parkway, Suite 210 • Bothell, WA 98011
Office (206) 485-5000 • FAX (206) 486-9766



March 19, 1990
Project S01-04.02

Mr. Tim Spencer
R. W. Beck
Fourth & Ballard Building
2621 Fourth Avenue
Seattle, Washington 98121

RE: Abandonment of G-11 and Drilling G-16 at Enumclaw Landfill

Dear Tim:

Gas probe G-11 was abandoned and replacement gas probe G-16 was completed at Enumclaw Landfill. Work began on February 13, 1990, and was completed on February 19, 1990.

ABANDONMENT OF G-11

Gas probe G-11 had been destroyed by heavy equipment. The security casing had been pulled off and the PVC casings were broken off. The steel security casing was found nearby and was reused for the completion of G-16. G-11 was located on the south side of the landfill and had been buried by the daily-cover haul road. To locate G-11, King County surveyors had to resurvey and mark the location.

G-11 was abandoned by drilling with 6-inch air rotary to a depth of 78 feet. The hole was backfilled with a cement-bentonite mixture. Settlement of the backfill occurred overnight. In the morning, the hole was topped with Enviroplug medium, a bentonite chip designed to seal boreholes.

DRILLING OF G-16

G-16 was installed to replace the monitoring point lost when G-11 was destroyed. The location of G-16 was selected to be the southeast corner of the landfill. An access road

was constructed by the landfill operator after an underground utilities locator had been to the site.

G-16 was drilled to a depth of 80 feet using 6-inch air-rotary. Construction of G-16 was designed to monitor three depth zones. Each of the three monitoring zones were constructed of a porous backfill of pea gravel. Each gas probe was installed in the upper 3 feet of the backfill, then the backfill in each zone was sealed with bentonite chips. The enclosed boring log shows the completion details. The monitoring zone depths are summarized in Table 1.

Table 1
SUMMARY OF G-16 CONSTRUCTION

Monitoring Zone	Monitoring Zone Length (ft)	Monitoring Zone Interval (ft bgs)
Shallow	17	7-1/2 - 24
Middle	26-1/2	26-1/2 - 53
Deep	22	56 - 78

The geology encountered during drilling of G-16 was similar to the geology encountered in earlier borings. The upper 8-feet was composed of the Oceola Mudflow, mainly boulders, cobbles, and gravel with a silty sand matrix. The bottom 72 feet of drilling encountered glacial outwash, deposits consisting of unconsolidated sands and gravels.

LANDFILL GAS

Landfill gas was monitored during abandonment of G-11 and construction of G-16 using a Gastech GX-3N. Measurements were conducted of the atmosphere around and inside the casing. No gas was detected during abandonment or construction.

After the completion of G-16, the three gas probes were monitored for landfill gas. No gas was detected at that time. Disturbance from air rotary drilling may have caused the gas levels to be abnormally low. Probe G-16 should be monitored on a regular schedule.

Respectfully submitted,

Sweet-Edwards/EMCON, Inc.

Gregory S. Mack
Staff Geologist

GSM/klm

Enclosure

LOG OF EXPLORATORY BORING

PROJECT NAME	R.W. Beck	BORING NO.	GP-16
LOCATION	Enumclaw Landfill	PAGE	1 OF 4
DRILLED BY	Tacoma Pump & Drill	REFERENCE ELEV.	
DRILL METHOD	Air Rotary	TOTAL DEPTH	80.00'
LOGGED BY	Greg Mack	DATE COMPLETED	2/19/90

SAMPLE NUMBER	SAMPLING METHOD	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
1	C		5				0 - 8 feet: SILTY SAND with GRAVEL, COBBLES, and BOULDERS; yellowish brown at surface to greenish grey at base; boulders and cobbles occur throughout section, increase in occurrence at the base; little to some subangular to subrounded and hard gravel; mostly fine sand with little medium and coarse; little fines; well graded; moist (SM). (OCEOLA MUDFLOW) -- @ 6 feet: Boulders.
2	C		10				8 - 13 feet: GRAVELLY SAND with COBBLES; yellowish brown; trace of cobbles; some gravel up to 2 inches, mostly fine and hard; mostly fine to coarse sand; trace of fines; well graded; moist (SW). (OUTWASH)
3	C		15				13 - 27 feet: SAND; yellowish brown; little gravel up to 1-1/2 inch and hard, gravel occurs in seams of less than 2 feet; mostly fine sand with little medium and coarse; trace of fines; poorly graded; moist (SP). (OUTWASH)
4	C		20				

REMARKS

C = Cutting; 6-inch Air Rotary; Field location: Southeast corner.

LOG OF EXPLORATORY BORING

PROJECT NAME	R.W. Beck	BORING NO.	GP-16
LOCATION	Enumclaw Landfill	PAGE	2 OF 4
DRILLED BY	Tacoma Pump & Drill	REFERENCE ELEV.	
DRILL METHOD	Air Rotary	TOTAL DEPTH	80.00'
LOGGED BY	Greg Mack	DATE COMPLETED	2/19/90

SAMPLE NUMBER	SAMPLING METHOD	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
5	C		25				
6	C		30				27 - 42 feet: SANDY GRAVEL with COBBLES and BOULDERS; yellowish brown; few cobbles; mostly fine to coarse gravels; some fine to coarse sand; trace of fines; moist; well graded (GW). (OUTWASH)
7	C		35				
8	C		40				

REMARKS

C = Cutting; 6-inch Air Rotary; Field location: Southeast corner.

LOG OF EXPLORATORY BORING

PROJECT NAME	R.W. Beck	BORING NO.	GP-16
LOCATION	Enumclaw Landfill	PAGE	3 OF 4
DRILLED BY	Tacoma Pump & Drill	REFERENCE ELEV.	
DRILL METHOD	Air Rotary	TOTAL DEPTH	80.00'
LOGGED BY	Greg Mack	DATE COMPLETED	2/19/90

SAMPLE NUMBER	SAMPLING METHOD	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
							decrease in sand
							42 - 56 feet: GRAVEL with SAND; yellowish brown; mostly fine to coarse gravel, hard; some sand fine to coarse; trace of fines; moist; well graded (GW). (OUTWASH)
9	C		45				
10	C		50				
11	C		55				
							56 - 58 feet: SANDY GRAVEL; dark yellowish brown; mostly gravel, fine to coarse, up to several inches; some sand fine to coarse; trace of fines; moist; well graded (GW). (OUTWASH)
12	C		60				58 - 80 feet: SAND; dark yellowish brown; few fine gravel; mostly fine sand with little

REMARKS

C = Cutting; 6-inch Air Rotary; Field location: Southeast corner.

LOG OF EXPLORATORY BORING

PROJECT NAME	R.W. Beck	BORING NO.	GP-16
LOCATION	Enumclaw Landfill	PAGE	4 OF 4
DRILLED BY	Tacoma Pump & Drill	REFERENCE ELEV.	
DRILL METHOD	Air Rotary	TOTAL DEPTH	80.00'
LOGGED BY	Greg Mack	DATE COMPLETED	2/19/90

SAMPLE NUMBER	SAMPLING METHOD	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-LOGIC COLUMN	WELL DETAILS	LITHOLOGIC DESCRIPTION
							medium to coarse; trace of fines; moist to 78 feet, wet below 78 feet; poorly graded (SP). (OUTWASH)
13	C		65				
14	C		70				-- @ 72 feet: Increase in moisture.
15	C		75				-- @ 78 feet: Water discharging with cuttings.
			80				Bottom of boring at 80 feet.

REMARKS

C = Cutting; 6-inch Air Rotary; Field location: Southeast corner.

SWEET-EDWARDS/EMCON

GP-17 Missing

GP-18 Missing

ASSOCIATED EARTH SCIENCES, INC

Geologic & Gas Probe Construction Log

Project Number	Well Number	Sheet
BV99072B	GP-19	1 of 2

Project Name	Enumclaw Landfill	Surface Elevation	824.24
Location	Enumclaw, Washington	Water Depth (ft bgs)	
Drilling Method	Hollow-Stem Auger 8" OD/4" ID	Start Date	October 1, 1999
Sampling Method	3.25" OD D&M Split-Spoon Ring Sampler	Finish Date	October 1, 1999

Depth feet	Gas Probe Construction	Methane %	Lab Test	S T	Blows/ 6"	Sample ID	Mtl. Graphic	Description
	8" Above-Grade Locking Steel Monument w/ Bollards							FILL
	Concrete seal							
		0						-grades very gravelly and cobbly
	Hydrated bentonite chips							
	3/4" ID SCH 80 PVC Casing							-drills easier from 4 to 7 feet
5								
	Filter pack, pea gravel							
		0						MUDFLOW
	Well screen 3/4" ID SCH 80 PVC, 0.04" slot size							Very dense, moist, brown GRAVEL with SILT; few sand
10								
		0						
15	Hydrated bentonite chips							
		0						

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split Spoon Sampler

Lab Tests:
- G - Grain Size
- M - Moisture Content
- Water Level (Date of Measurement)
- Water Level (ATD)

Logged by: RRH
Approved by: JJS
Figure No. B - 8

SPARKGP ENUMCLAW.GPJ May 22, 2000

ASSOCIATED EARTH SCIENCES, INC

Geologic & Gas Probe Construction Log

Project Number	Well Number	Sheet
BV99072B	GP-19	2 of 2

Project Name	Enumclaw Landfill	Surface Elevation	824.24
Location	Enumclaw, Washington	Water Depth (ft bgs)	
Drilling Method	Hollow-Stem Auger 8" OD/4" ID	Start Date	October 1, 1999
Sampling Method	3.25" OD D&M Split-Spoon Ring Sampler	Finish Date	October 1, 1999

Depth feet	Gas Probe Construction	Methane %	Lab Test	S T	Blows/ 6"	Sample ID	Mtl. Graphic	Description
	Hydrated bentonite chips	0			25 24 28	S-1		Very dense, damp, brown GRAVEL with SAND; few silt
25								RECESSIONAL OUTWASH
								-drills easier 26-27 ft. due to SAND content
	Filter pack, pea gravel	0			50/5"			-gravels in auger
30	Well screen 3/4" ID SCH 80 PVC, 0.04" slot size							-drills like SAND
								-gravels in auger
		0			50/3"			
35								Bottom of boring at 32.5 ft. depth. GP-19 located approximately 5 feet south of MW-9. The log for MW-9 was used for lithology description for GP-19. Nested gas probes installed in borehole per Ecology variance. Gas probe installed at 10 feet depth and 32 feet depth.

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split Spoon Sampler

Lab Tests:
- G - Grain Size
- M - Moisture Content

Water Level (Date of Measurement)
Water Level (ATD)

Logged by: RRH
Approved by: JJS

Figure No. B - 8

SPARKGP ENUMCLAW.GPJ May 22, 2000

ASSOCIATED EARTH SCIENCES, INC

Geologic & Gas Probe Construction Log

Project Number	Well Number	Sheet
BV99072B	GP-20	1 of 2

Project Name	Enumclaw Landfill	Surface Elevation	801.55
Location	Enumclaw, Washington	Water Depth (ft bgs)	
Drilling Method	10" Casing Cable Tool	Start Date	October 19, 1999
Sampling Method	3" OD California Split-Spoon Sampler, 300 lb hammer and bailer	Finish Date	October 21, 1999

Depth feet	Gas Probe Construction	Methane %	Lab Test	ST	Blows/ 6"	Sample ID	Mtl. Graphic	Description
	8" Above-Grade Locking Steel Monument w/ Bollards							FILL
	Concrete seal							Grass/Topsoil over GRAVEL; trace sand
	Bentonite chips							No landfill material in bailer cuttings from 0 to 5 feet.
5		0			36 50/4"	S-1		Very dense, moist, brown GRAVEL with SAND, with SILT, few cobbles
								No landfill material in bailer cuttings from 5 to 10 feet.
	Filter pack, pea gravel							Brown SAND with GRAVEL; trace silt
10		0			50/5"	S-2		
		0						No landfill material in bailer cuttings from 10 to 15 feet.
	Well screen 3/4" ID SCH 80 PVC, 0.04" slot size							GRAVEL with SAND
15	Threaded end cap, 3/4" ID SCH 80 PVC	0	G		50/5"	S-3		Very dense, moist, brown SAND; trace silt; sand fine to medium
		0						MUDFLOW
	Bentonite chips		G		100/6"	S-4		Very dense, moist, brown GRAVEL with SAND and SILT
20		0						
		0						
					50/6" 50/4"	S-5		

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split Spoon Sampler

Lab Tests:
- G - Grain Size
- M - Moisture Content
- Water Level (Date of Measurement)
- Water Level (ATD)

Logged by: RRH
Approved by: JJS
Figure No. B - 9

SPARKGP ENUMCLAW GPJ May 22, 2000

ASSOCIATED EARTH SCIENCES, INC

Geologic & Gas Probe Construction Log

Project Number	Well Number	Sheet
BV99072B	GP-20	2 of 2

Project Name	Enumclaw Landfill	Surface Elevation	801.55
Location	Enumclaw, Washington	Water Depth (ft bgs)	
Drilling Method	10" Casing Cable Tool	Start Date	October 19, 1999
Sampling Method	3" OD California Split-Spoon Sampler, 300 lb hammer and bailer	Finish Date	October 21, 1999

Depth feet	Gas Probe Construction	Methane %	Lab Test	S T	Blows/ 6"	Sample ID	Mtl. Graphic	Description
		0			50/5"	S-6		Very dense, moist, brown GRAVEL with SAND and SILT
30	Filter pack, pea gravel	0			75/6"	S-7		RECESSIONAL OUTWASH -less fines, rounded gravel -grades very dense, well rounded gravel in drive shoe of sampler and bailer cuttings
	Well screen 3/4" ID SCH 80 PVC, 0.04" slot size	0	G		50/6" 50/3"	S-8		Very dense, gray GRAVEL; few SAND
35		0			40 50/4"	S-9		-rounded to well-rounded gravels and cobbles; trace sand
	Threaded end cap, 3/4" ID SCH 80 PVC Bentonite chips							
40		0			50/5"	S-10		Bottom of boring at 40 ft. depth. Nested gas probes installed in borehole per Ecology variance. Gas probe installed at 15 feet depth and 37 feet depth.
45								

Sampler Type (ST):
- Grab Sample
- No Recovery
- 2" OD Split Spoon Sampler

Lab Tests:
- G - Grain Size
- M - Moisture Content
- Water Level (Date of Measurement)
- Water Level (ATD)

Logged by: RRH
Approved by: JJS
Figure No. B - 9

SPARKGP ENUMCLAW.GPJ May 22, 2000

ASSOCIATED EARTH SCIENCES, INC

Exploration Log

Project Number	Exploration Number	Sheet
BV99072B	SB-1	1 of 1

Project Name: Enumclaw Landfill
Location: Enumclaw, Washington
Driller/Equipment: Tacoma Pump and Drilling/Mobile B-61 Hollow-Stem Auger, 4" ID, 6" OD
Hammer Weight/Drop: 300 lb/30 inches
Ground Surface Elevation (ft): ~ 802
Datum:
Date Start/Finish: 09/29/1999-09/29/1999
Hole Diameter (in): 6 inch

This log is part of the report prepared by Associated Earth Sciences (AESI) for the named project and should be read together only with that report for complete interpretation. This summary applies only to the location of this exploration and at the time of exploration. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth, ft	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Blows/6"	Blows/Foot (10 20 30 40)
		S-1		Dry, brown SAND with roots and organics; sand fine to coarse			
				Dry, tan GRAVEL with SAND; gravel fine to coarse, sand fine to coarse, few cobbles			
5		S-2		Landfill material (cloth) appeared in auger cuttings at 6 feet).			
10		S-3		-grades trace cobbles			
				-grades very hard, little return			
15		S-4		-grades slightly moist			
20		S-5		-grades softer			
25		S-6				100/6"	50+
				Bottom of boring at 27 ft. depth. Very hard soil conditions prevented drive samples from being collected between 0 to 25 feet. Attempted three borings: refusal at 2, 7, and 27 feet. Abandoned borehole with bentonite chips.			

Sampler Type (ST):
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler
- Grab Sample

Lab tests:
- C - Chemical Properties
- P - Permeability
- M - Moisture
- Static Water Level
- Water Level at time of drilling (ATD)

Logged by: SJS
Approved by: JJS
Figure No. B - 10

AESIBOR ENUMCLAW.GPJ February 25, 2000

ASSOCIATED EARTH SCIENCES, INC

Exploration Log

Project Number	Exploration Number	Sheet
BV99072B	SB-2	1 of 1

Project Name: Enumclaw Landfill
Location: Enumclaw, Washington
Driller/Equipment: Tacoma Pump and Drilling/Hollow-Stem Auger, 4" ID, 8" OD
Hammer Weight/Drop: 300 lb/30 inches

Ground Surface Elevation (ft): ~ 800
Datum:
Date Start/Finish: 10/04/1999-10/04/1999
Hole Diameter (in): 4 inch

This log is part of the report prepared by Associated Earth Sciences (AESI) for the named project and should be read together only with that report for complete interpretation. This summary applies only to the location of this exploration and at the time of exploration. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth, ft	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Blows/6"	Blows/Foot (10 20 30 40)	Methane %
		S-1		LANDFILL DEBRIS		5 8 22		0
5		S-2 S-3		-Glass, metal, cloth, plastic debris with est. 20% GRAVEL in SAND matrix; few cobbles and gravels		22 30 34	50+	0
		S-4 S-5		-cobble and gravel content decreases		28 32 33	50+	0
				Bottom of boring at 7.5 feet. Backfilled with hydrated bentonite chips.				

Sampler Type (ST):
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler
- Grab Sample

Lab tests:
- C - Chemical Properties
- P - Permeability
- M - Moisture
- Static Water Level
- Water Level at time of drilling (ATD)

Logged by: RRH
Approved by: JJS
Figure No. B - 11

AESIBOR ENUMCLAW.GPJ February 24, 2000

Exploration Log

ASSOCIATED EARTH SCIENCES, INC

Project Number	Exploration Number	Sheet
BV99072B	SB-3	1 of 1

Project Name: Enumclaw Landfill
Location: Enumclaw, Washington
Driller/Equipment: Tacoma Pump and Drilling/Hollow-Stem Auger, 4" ID, 8" OD
Hammer Weight/Drop: 300 lb/30 inches

Ground Surface Elevation (ft): ~ 802
Datum:
Date Start/Finish: 10/04/1999-10/04/1999
Hole Diameter (in): 4 inch

This log is part of the report prepared by Associated Earth Sciences (AESI) for the named project and should be read together only with that report for complete interpretation. This summary applies only to the location of this exploration and at the time of exploration. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

Depth, ft	S T	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Blows/ 6"	Blows/Foot (10 20 30 40)	Methane %
				GRAVEL; very few cuttings				
				-No recovery		50/4"		0
5				Refusal at 3.5 feet; backfilled with Bentonite chips. Second attempt refusal at 4.0 feet; backfilled with Bentonite chips.				

Sampler Type (ST):
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler
- Grab Sample

Lab tests:
- C - Chemical Properties
- P - Permeability
- M - Moisture
- ▽ Static Water Level
- ▼ Water Level at time of drilling (ATD)

Logged by: RRH
Approved by: JJS
Figure No. B - 12

AESIBOR ENUMCLAW.GPJ February 24, 2000

Table B-1
Survey Data
Enumclaw Landfill

Well or Probe	Northing	Easting	Elevation			
			Top of Monument	Top of PVC Casing		Ground Surface
MW-09	11002.21	11436.68	826.48	825.97		823.74
MW-10	10358.60	11409.77	800.63	800.10		797.74
GP-19	11007.80	11437.88	827.03	826.31 S	826.45 D	824.24
GP-20	10210.97	11457.86	804.37	803.51 S	803.45 D	801.55

Notes:
1. Data provided by King County; surveyed 1/13/00.
2. S and D refer to shallow and deep, respectively.
3. The top of the PVC casing elevations for gas probes GP-19 and GP-20 are the top of the PVC adapter, not the reducer or labcock.

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01-04.02	Pit #1	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION Southside Fence line LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhoe DATE EXCAVATED 18 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 7 ft.

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SOIL DESCRIPTION: SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
	1			Top Soil, dark brown, abundant organic material.		
	2			Silty Sand, upper part moderate yellowish brown grading to light olive grey, at 2 feet, patches of yellowish brown, with some sub-rounded to subangular cobbles and boulders, massive, dry (SM) (Oceola Mud Flow)		Water seeps, water ponds at surface.
	3					
	4					
	5					
	6					
	7			Total depth 7 feet.		
	8					
	9					
	10					

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01.04.03	Pit # 2	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION South fence line LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhow DATE EXCAVATED 18 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 12 ft.

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SOIL DESCRIPTION: SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
	1			Cover Material, sandy gravel, pale olive, some cobbles.		
	2			Refuse, glass, metal, bottles, buried garbage, ash.		
	3					
	4					
	5					
	6					
	7			Silty sand, pale olive, with some subrounded cobbles and boulders, massive, dry. (SM) (Oceola Mud Flow)		
	8					
	9					
	10					
	11					
	12			Total depth 12 feet.		
	13					
	14					
	15					

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01-04.03	Pit #3	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION South fence line LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhoe DATE EXCAVATED 18 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 10 ft.

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SOIL DESCRIPTION: SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
	1			Refuse, demolition waste, wood, concrete blocks, sheet metal, bed springs, burned garbage.		
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10			Total depth 10 feet.		
	11					
	12					
	13					
	14					
	15					

S-E/E 300-07

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01-04.02	Pit # 4	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION South fence line LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhoe DATE EXCAVATED 18 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 8 ft.

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SOIL DESCRIPTION: SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
	1			Cover, sandy gravel, moderate yellowish brown, with some cobbles.		
	2			Refuse, iron, burned garbage, alternating layers of dusky red to dusky brown or black.		
	3					
	4					
	5					
	6					
	7					
	8			Total depth 8 feet.		
	9					
	10					
	11					
	12					
	13					
	14					
	15					

S-E/E 300-07

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01-04.02	Pit #5	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION South of gate LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhoe DATE EXCAVATED 17 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 9'

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE: INTERVAL	SAMPLE: TYPE AND NUMBER	SOIL DESCRIPTION: SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
	1			Top Soil, dark brown, sand and gravel.		
	2			Silty Sand, medium grey, with some boulders and cobbles, slightly plastic, damp, well graded. (SM) (Oceola Mud Flow)		
	3					
	4					
	5					
	6					
	7					
	8			Sandy gravel, moderate yellowish brown with trace of silt, sand is fine to coarse with some cobbles and boulders. (GP) (Outwash)		
	9			Total depth 9 feet.		
	10					
	11					
	12					
	13					
	14					
	15					

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01-04.02	Pit # 6	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION West of G-11 LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhoe DATE EXCAVATED 17 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 10'

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SOIL DESCRIPTION (SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL)	SYMBOLIC LOG	COMMENTS (DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION)
	1			Topsoil, dark brown, organic material.		
	2			Silty Sand, olive grey, with some subangular cobbles and boulders, massive. (SM) (Oceola Mud Flow)		
	3					
	4					
	5			Sandy Gravel, moderate yellowish brown, gravel is subrounded to subangular, with some cobbles. (GW) (Outwash Deposits)		
	6					
	7					
	8					
	9					
	10			Total depth 10 feet.		
	11					
	12					
	13					
	14					
	15					

S-E/E 300-07

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01-04.02	Pit #7	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION Southwest of fence LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhoe DATE EXCAVATED 18 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 10'

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SOIL DESCRIPTION: SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL	SYMBOLIC LOG	COMMENTS: DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION
	1			Sandy Gravel, moderate yellowish brown to yellow grey, with some subangular to subrounded cobbles and boulders. (GW) (Outwash)		
	2					
	3	Grab		Silty Gravel, yellowish grey, subangular to subrounded gravel, cobbles. Each grain is coated with silt, little sand. (GM) (Outwash)		
	4					
	5	Tube				
	6					
	7					
	8					
	9					
	10			Total depth 10 feet.		
	11					
	12					
	13					
	14					
	15					

S-E/E 300-07

Sweet-Edwards / EMCON, Inc.

PROJECT NO.	TEST PIT NO.	
S01-04.02	Pit # 8	SHEET 1 OF 1

TEST PIT LOG

PROJECT Enumclaw Landfill LOCATION Southwest fence line LOGGER Mack

ELEVATION _____ CONTRACTOR _____

EXCAVATION METHOD Backhoe DATE EXCAVATED 18 Oct. 1988

WATER LEVEL AND DATE _____ APPROX. DIMENSIONS: Length _____ Width _____ Maximum Depth 8'

ELEVATION ( )	DEPTH BELOW SURFACE ( )	SAMPLE INTERVAL	SAMPLE TYPE AND NUMBER	SOIL DESCRIPTION (SOIL NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, STRUCTURE, USCS GROUP SYMBOL)	SYMBOLIC LOG	COMMENTS (DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTATION)
	1			Cover fill, sand and gravel, moderate yellowish brown, trace of refuse (nonburned).		
	2					
	3					
	4			Refuse, ash, burned refuse, bottles, metal items.		
	5					
	6					
	7					
	8			Total depth 8 feet.		
	9					
	10					
	11					
	12					
	13					
	14					
	15					

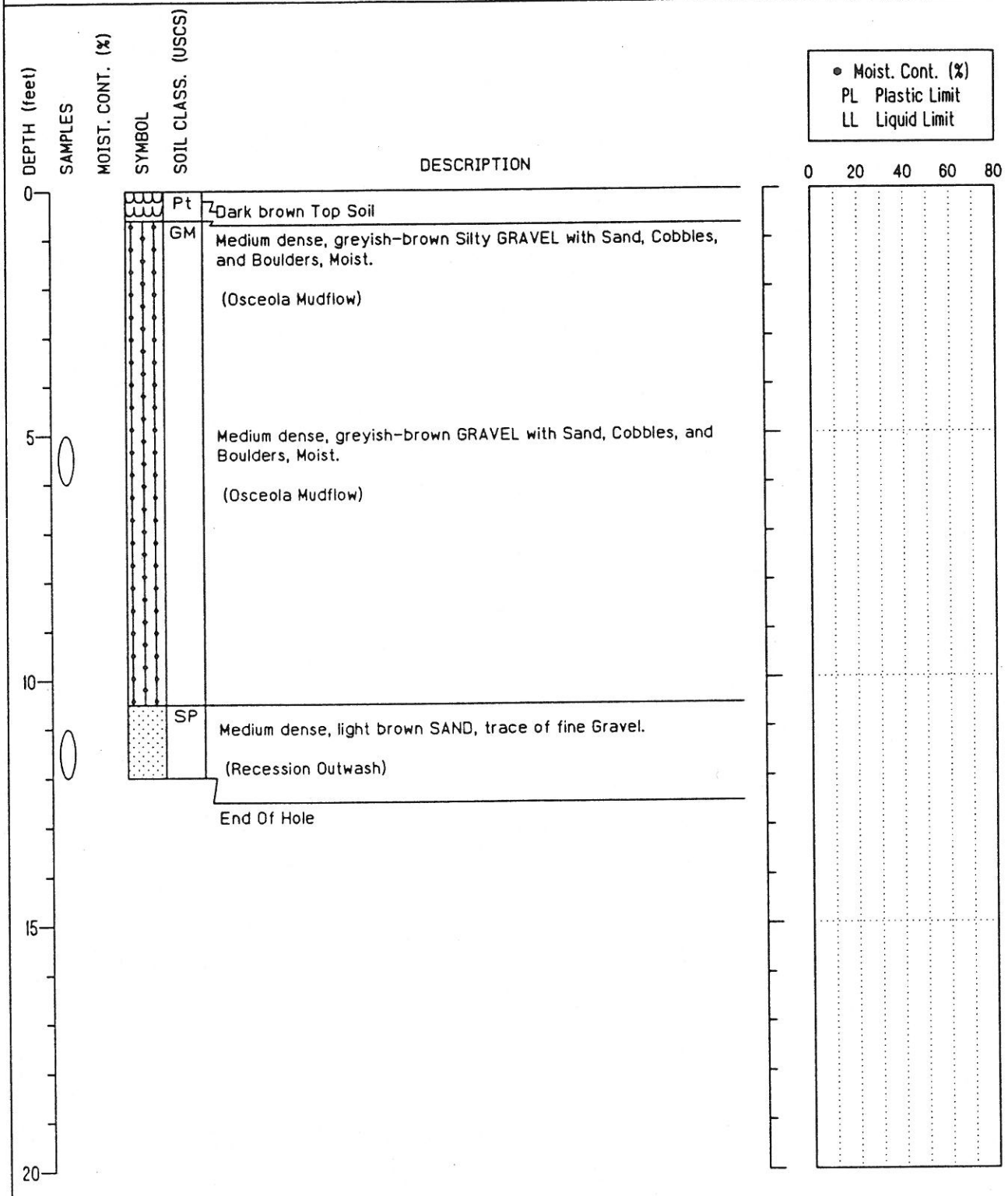
S-E/E 300-07

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tired Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 12.0 Feet
SURFACE ELEVATION: 831 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 2/26/92
LOGGED BY: Chris Behrens

TEST PIT: TP-1

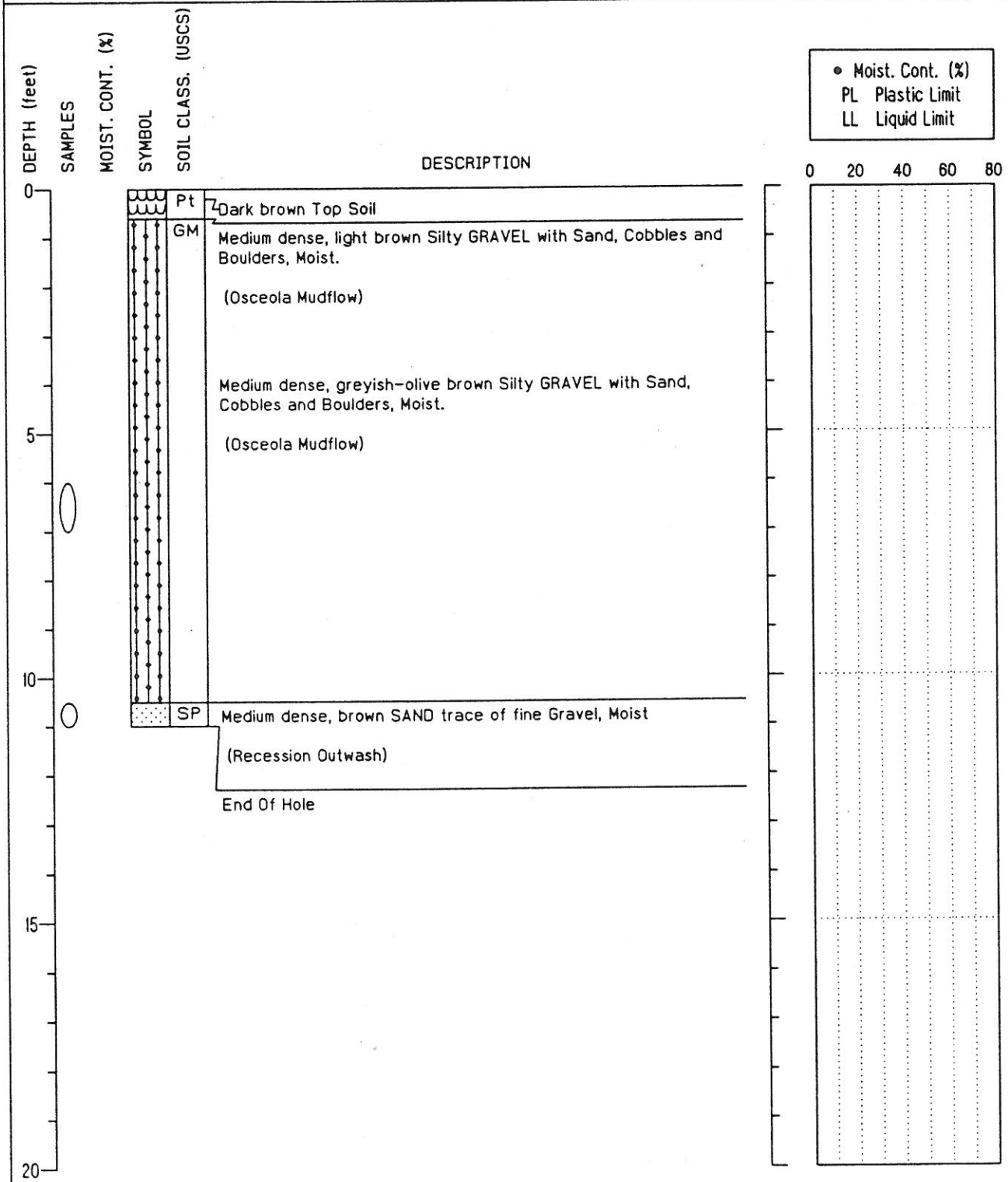
PROJECT NUMBER: 92021, Task 2

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 11.0 Feet
SURFACE ELEVATION: 831 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-2

LOCATION: S.E.440th St. Enumclaw WA
DATE COMPLETED: 2/26/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 2

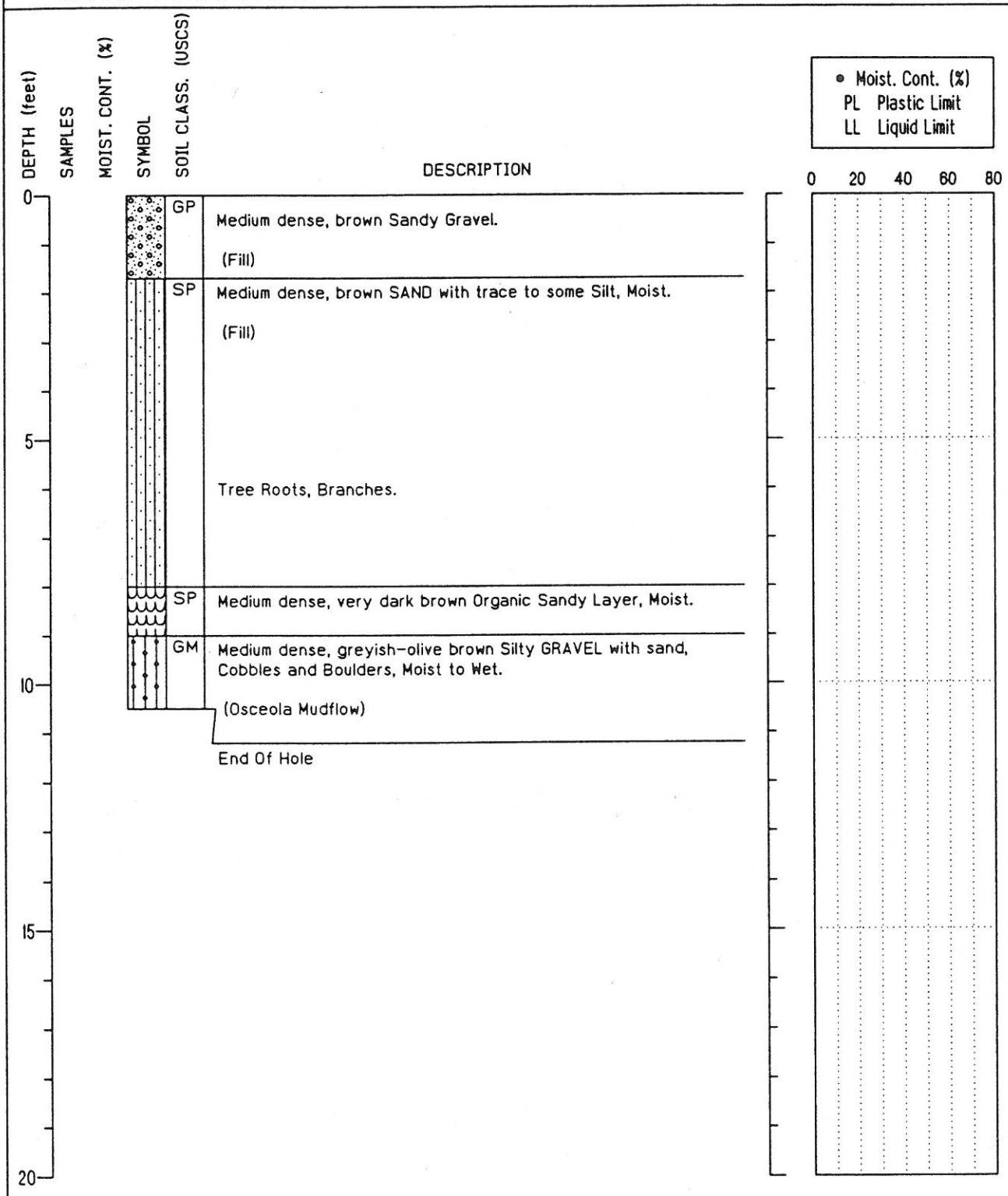
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 10.5 Feet
SURFACE ELEVATION: 782 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

LOCATION: S.E. 440th St. Enumclaw WA
DATE COMPLETED: 2/26/92
LOGGED BY: Chris Behrens

TEST PIT: TP-3

PROJECT NUMBER: 92021, Task 2

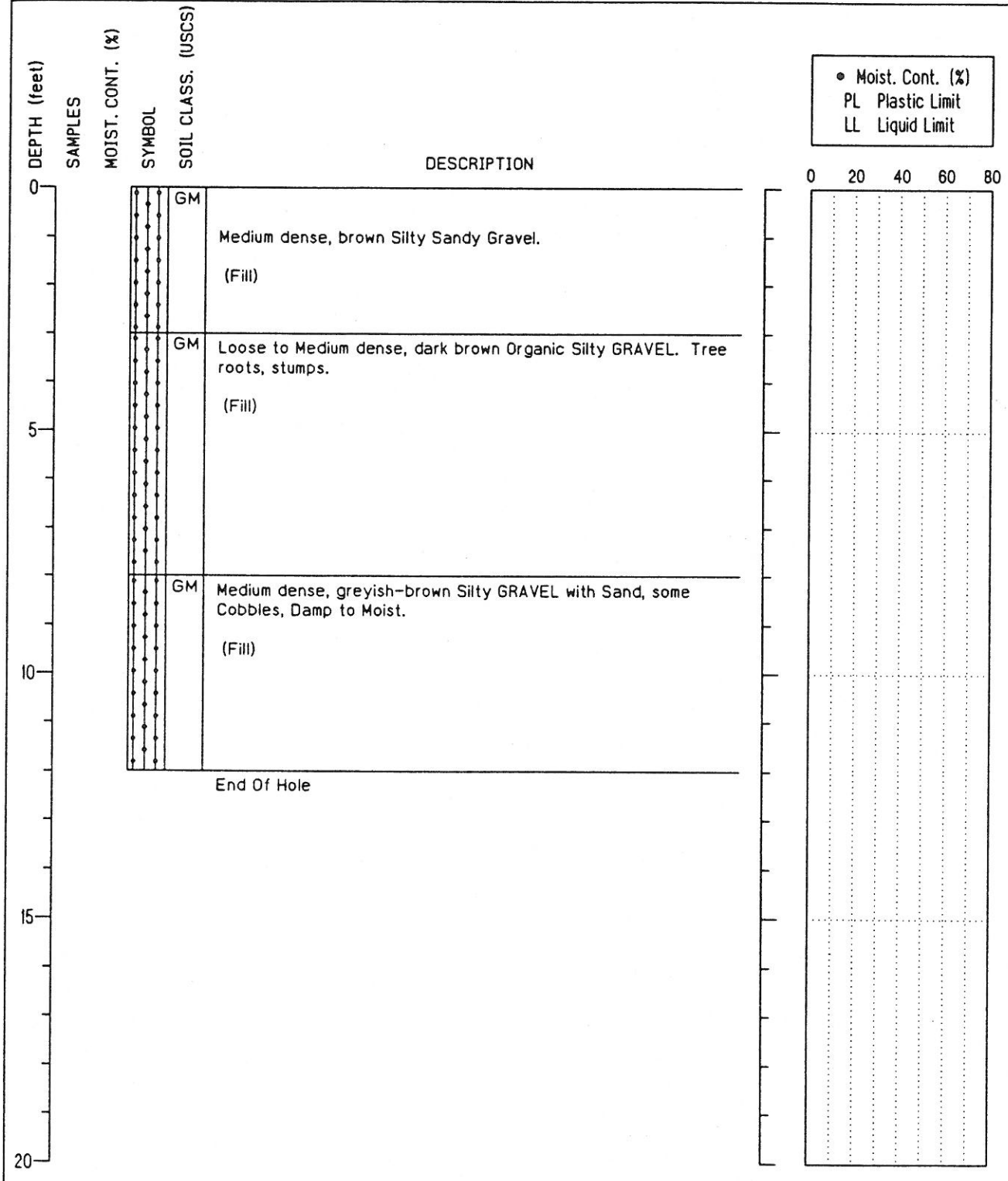
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 12.0 Feet
SURFACE ELEVATION: 784 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-4

LOCATION: S.E. 440th St. Enumclaw WA
DATE COMPLETED: 2/26/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 2

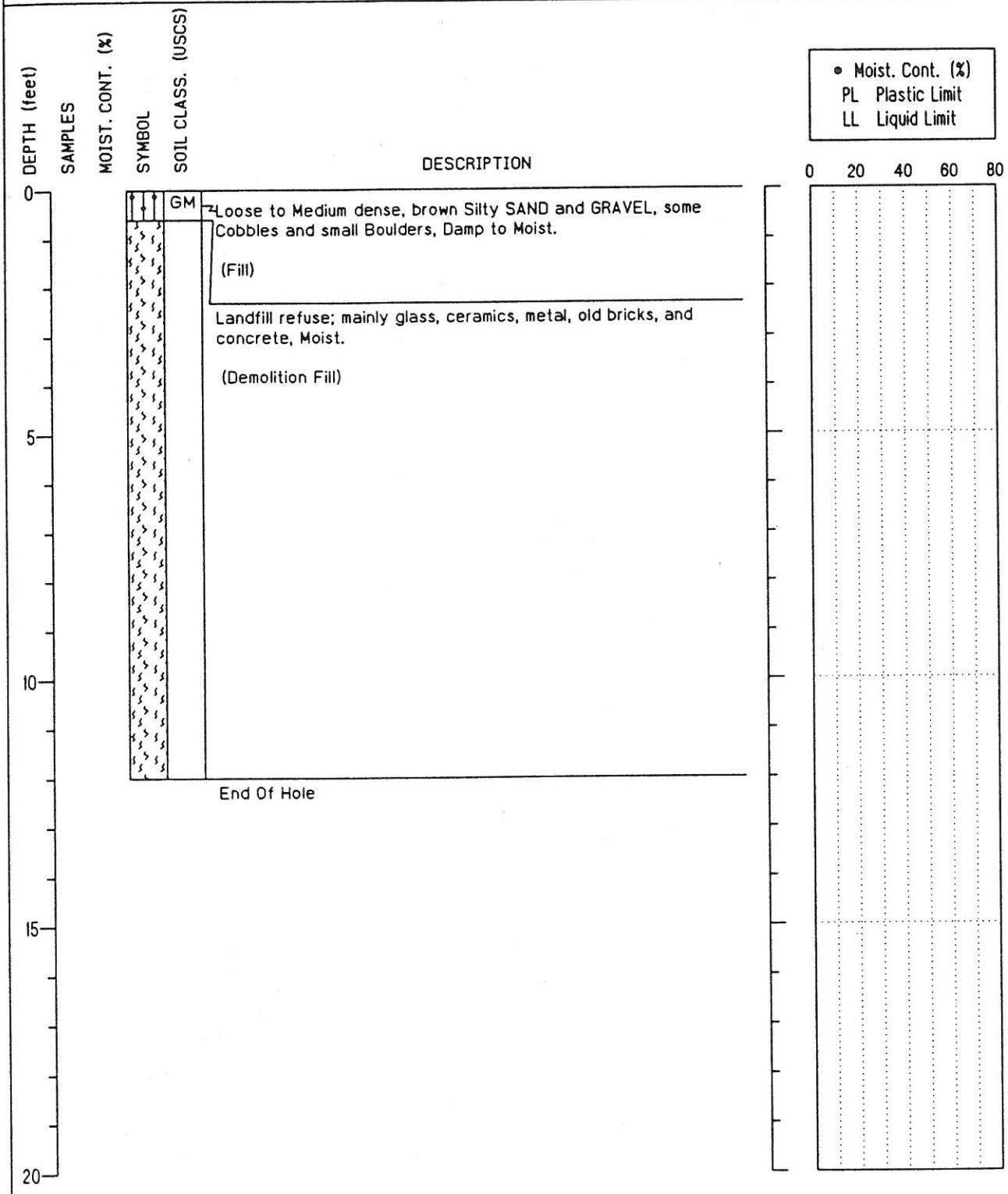
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 12.0 Feet
SURFACE ELEVATION: 823 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-5

LOCATION: S.E. 440th St. Enumclaw WA
DATE COMPLETED: 2/27/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

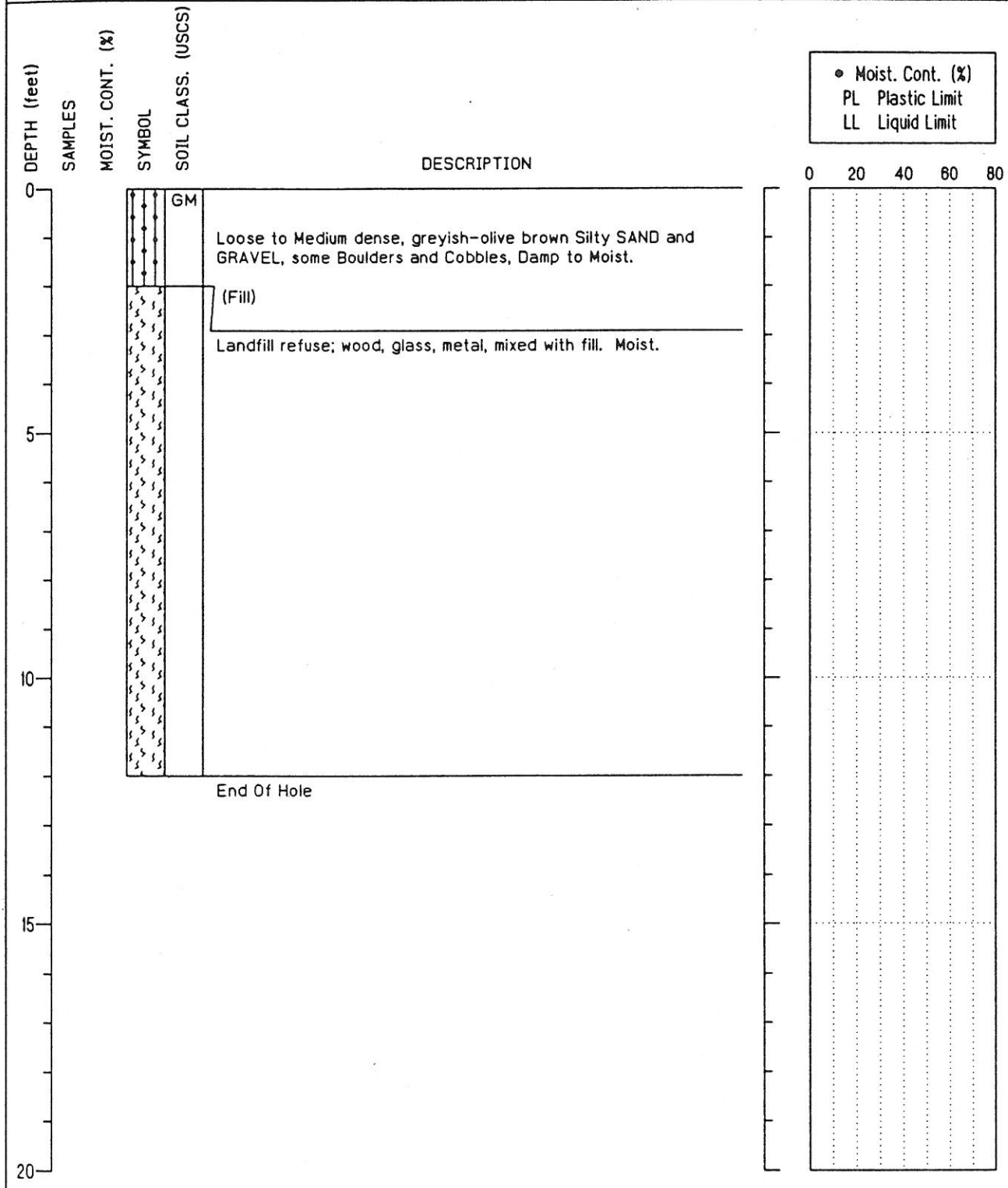
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 12.0 Feet
SURFACE ELEVATION: 821 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-6

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 2/27/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

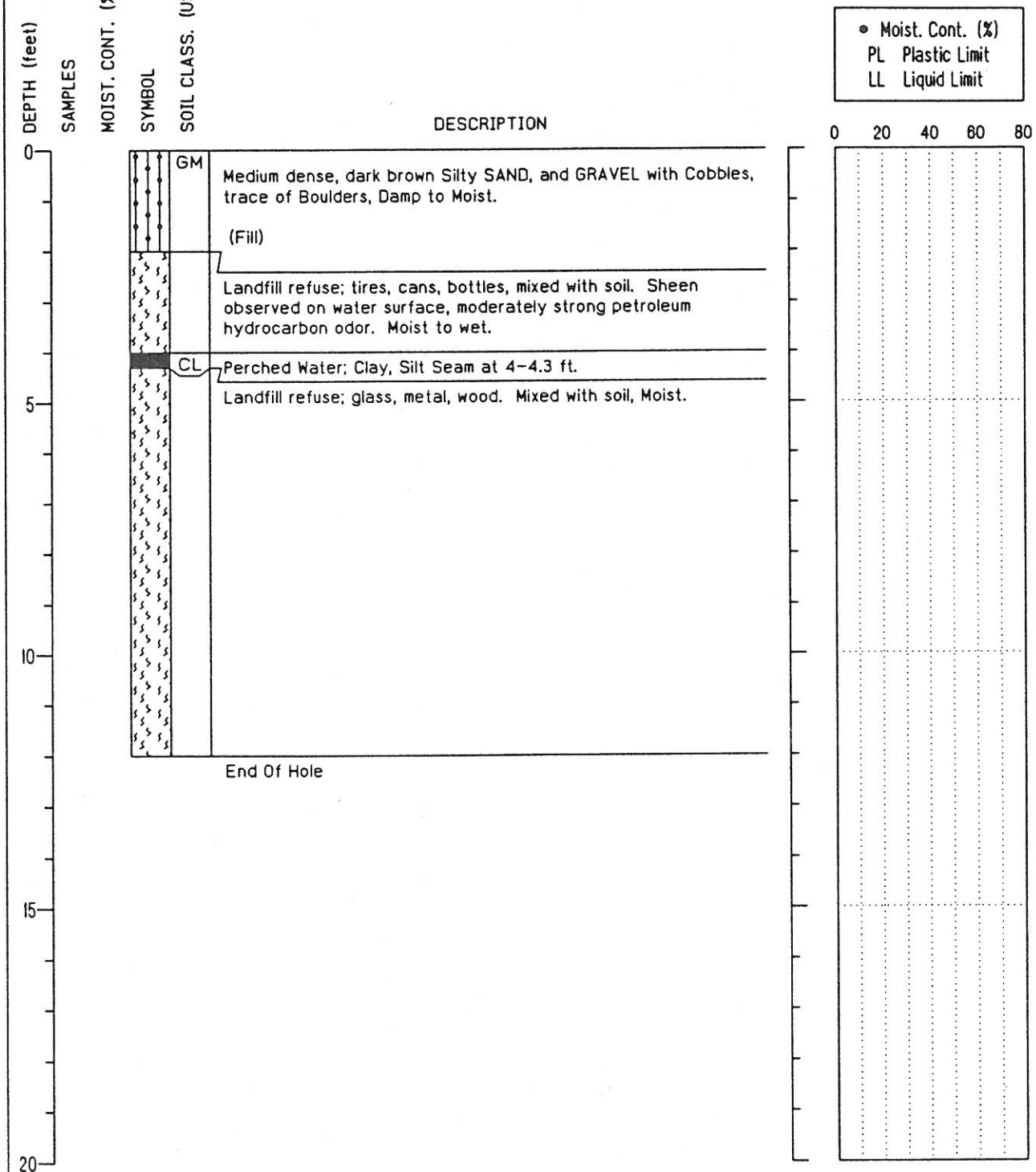
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 12.0 Feet
SURFACE ELEVATION: 825 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 2/27/92
LOGGED BY: Chris Behrens

TEST PIT: TP-7

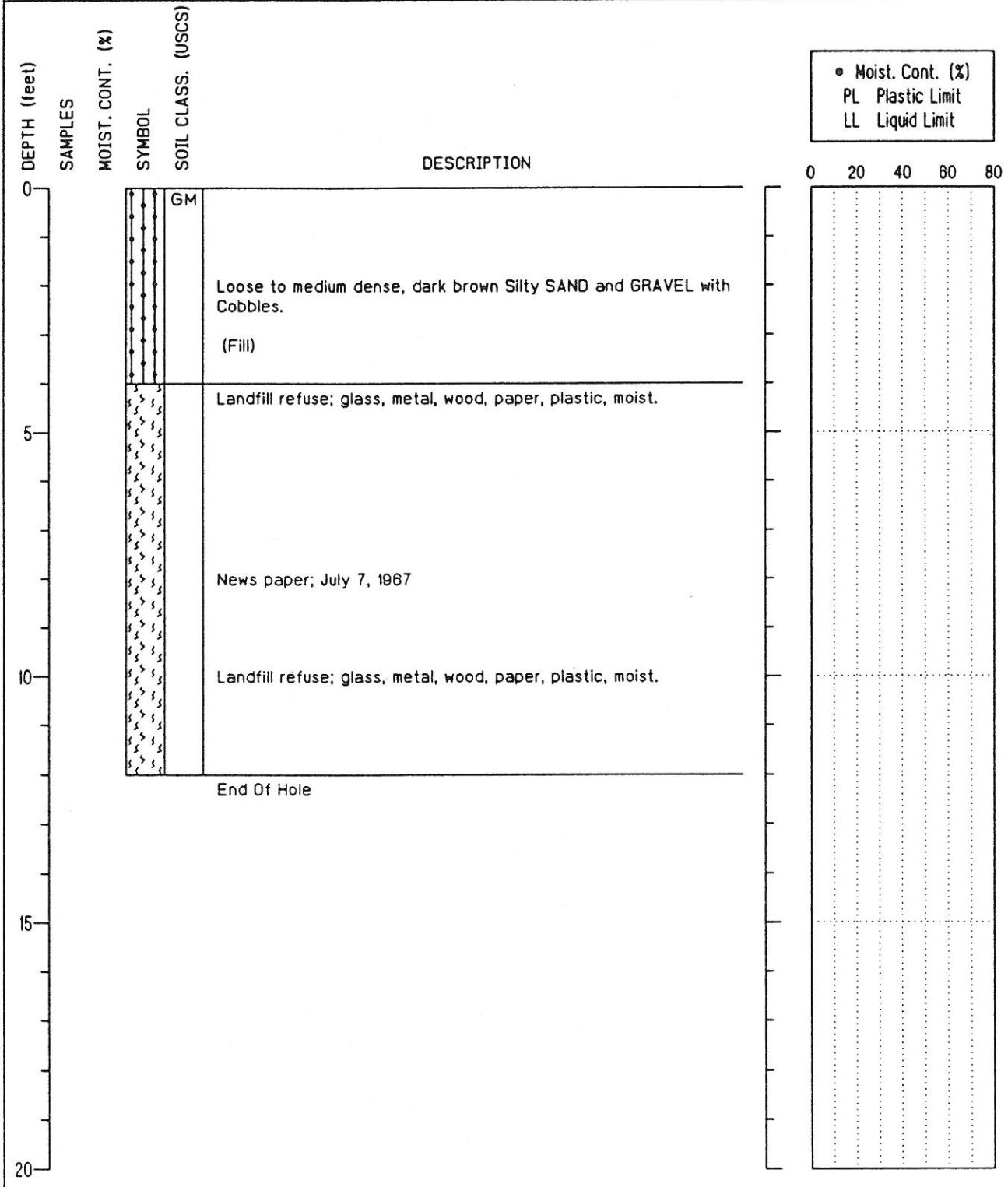
PROJECT NUMBER: 92021, Task 3

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 12.0 Feet
SURFACE ELEVATION: 828 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-8

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 2/27/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

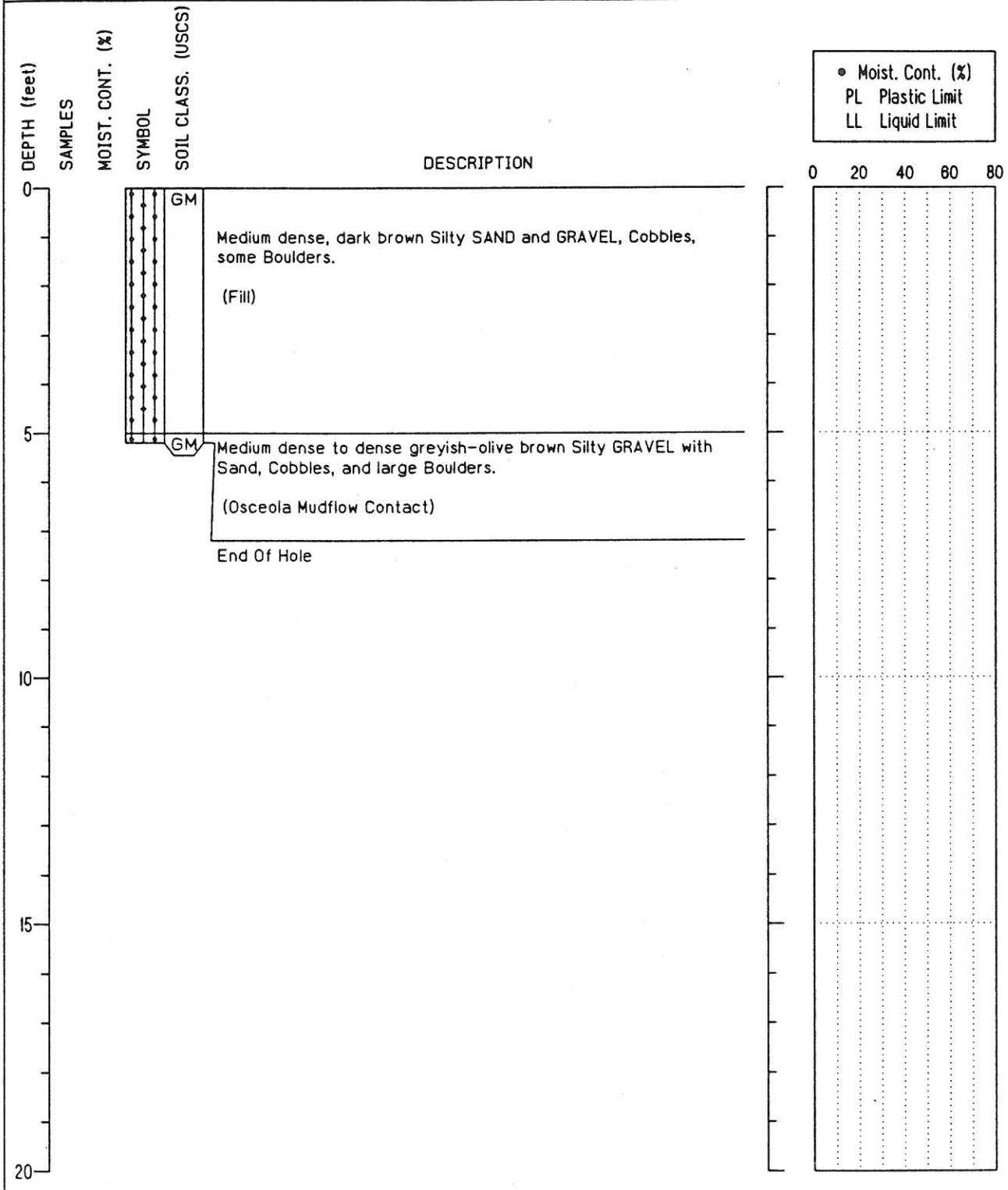
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 5.2 Feet
SURFACE ELEVATION: 830 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-9

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 2/27/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

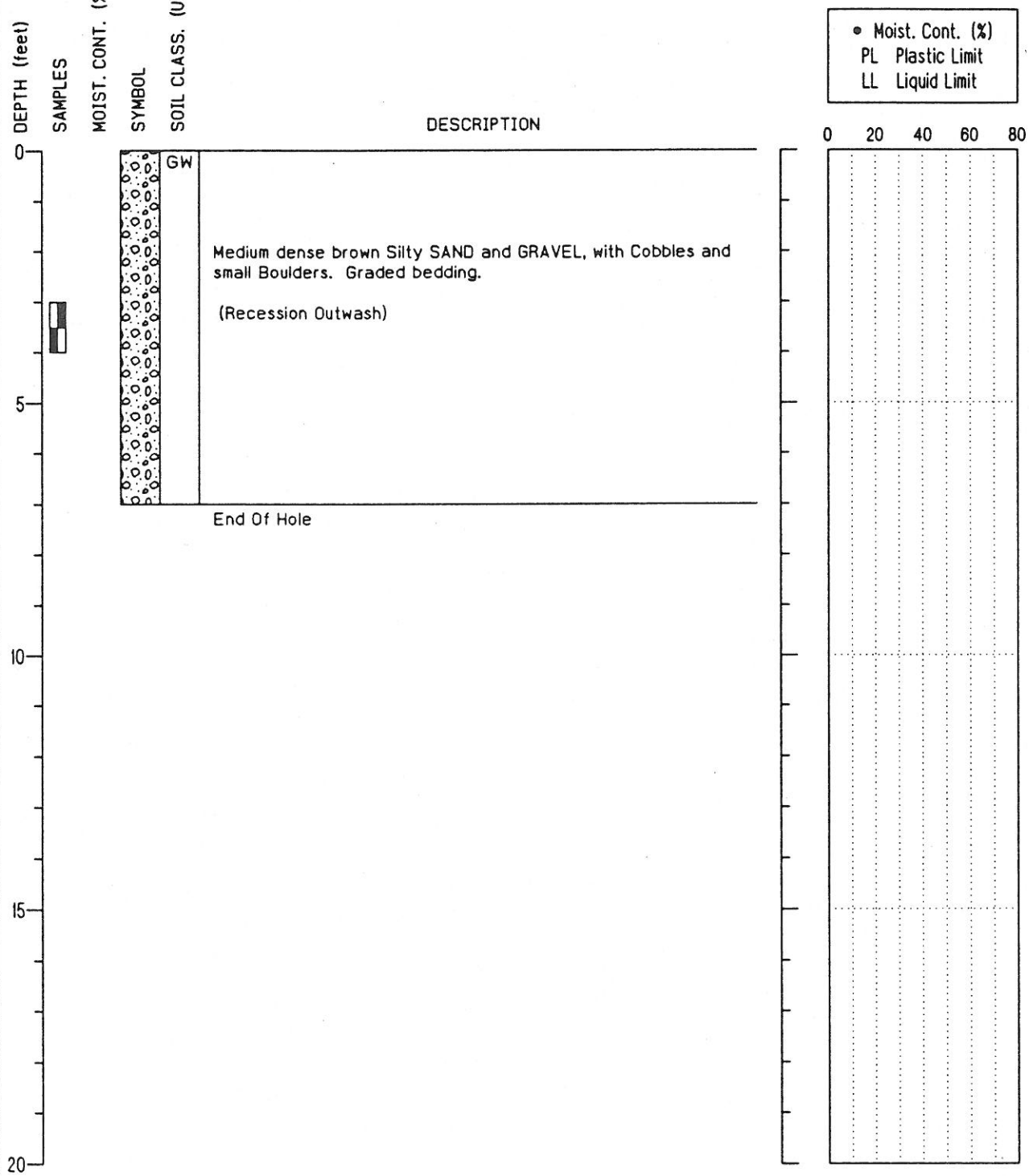
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Rubber-Tire Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 7.0 Feet
SURFACE ELEVATION: 800 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-10

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 2/27/92
LOGGED BY: Chris Behrens

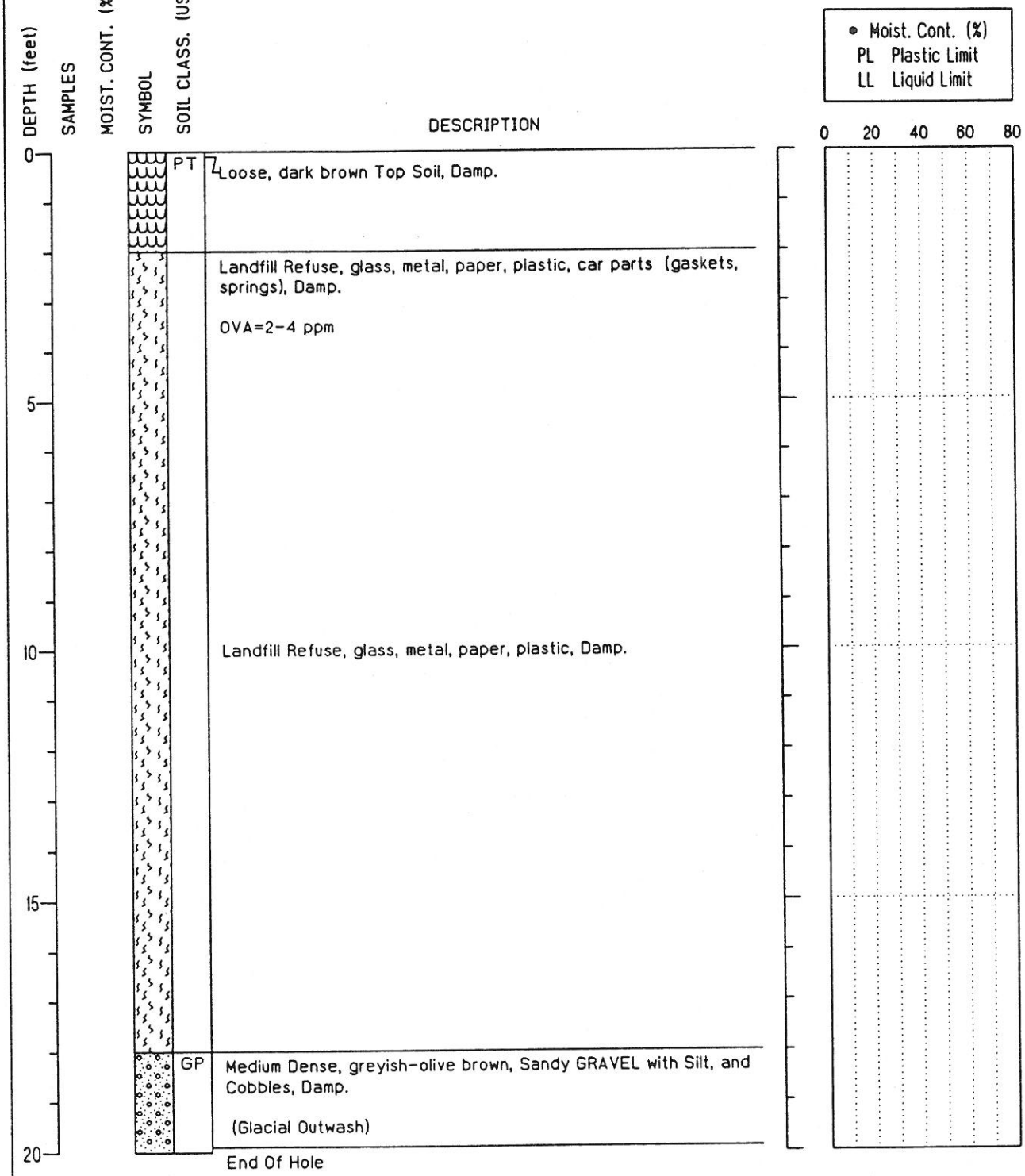
PROJECT NUMBER: 92021, Task 2

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 20.0 Feet
SURFACE ELEVATION: 826 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-11

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

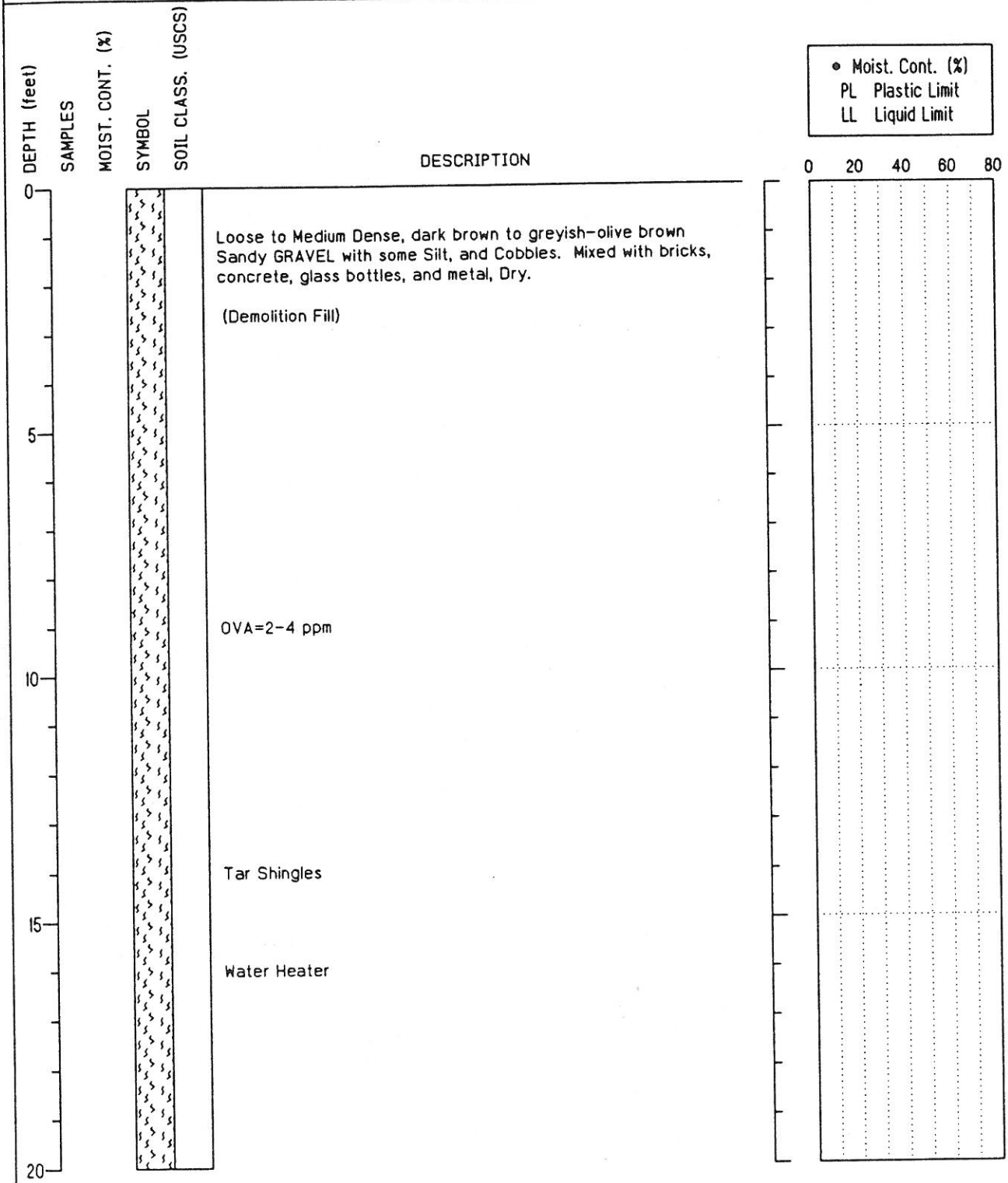
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 26.0 Feet
SURFACE ELEVATION: 817 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

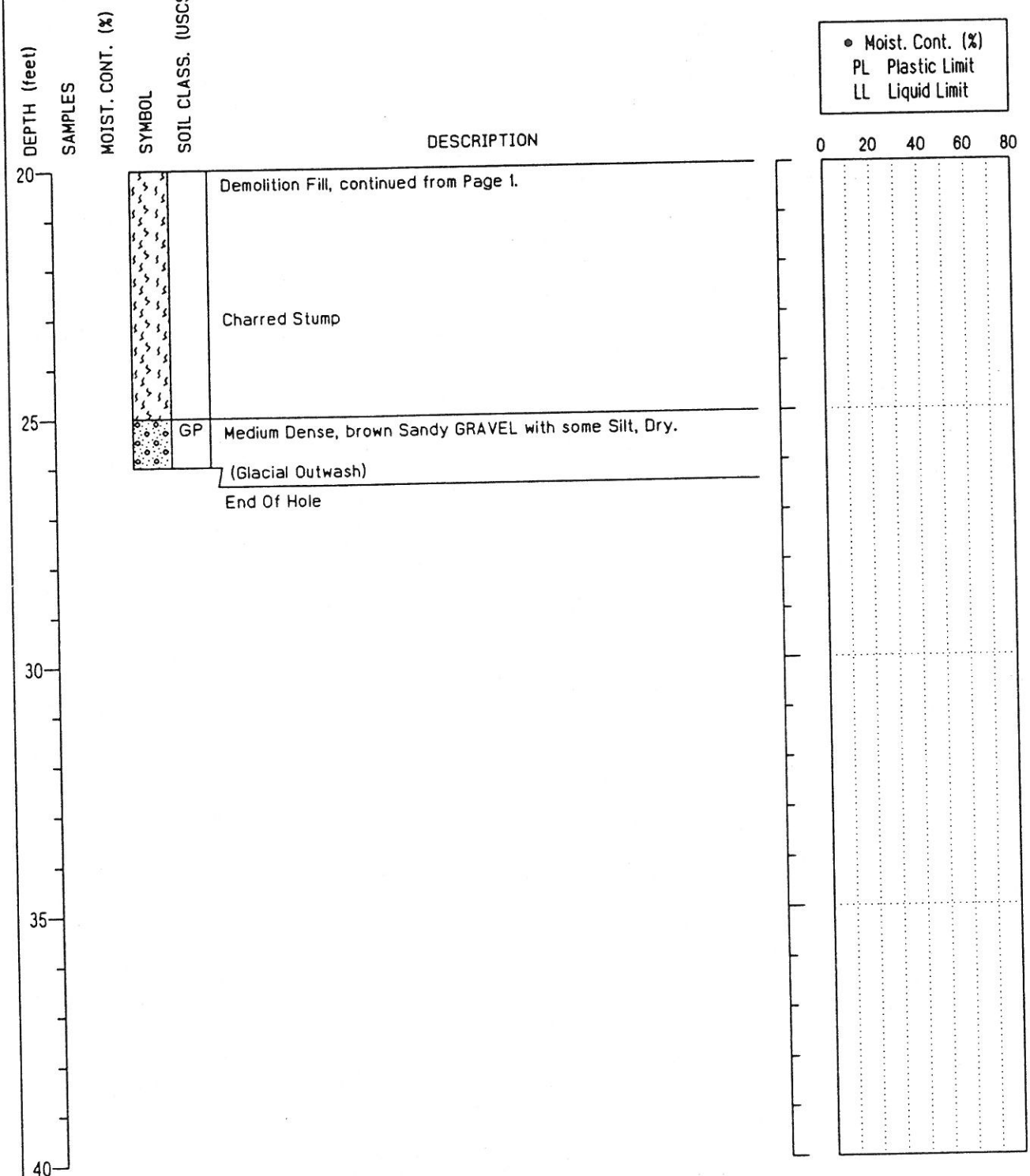
PROJECT: Enumclaw Landfill

TEST PIT: TP-12

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

HONG WEST & ASSOCIATES, INC.
TEST PIT LOG



PROJECT: Enumclaw Landfill

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

TEST PIT: TP-12

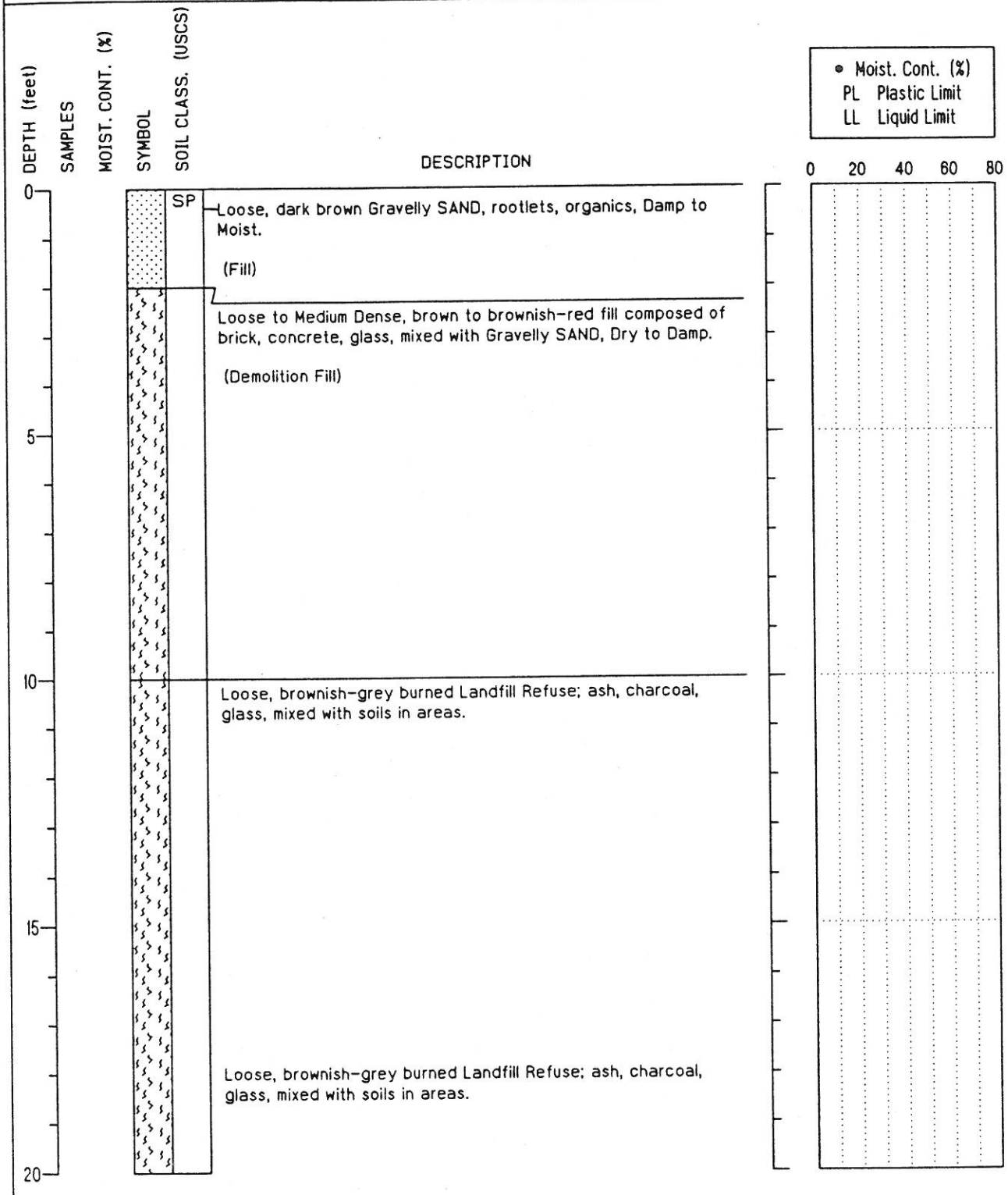
PROJECT NUMBER: 92021, Task 3

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 30.0 Feet
SURFACE ELEVATION: 812 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

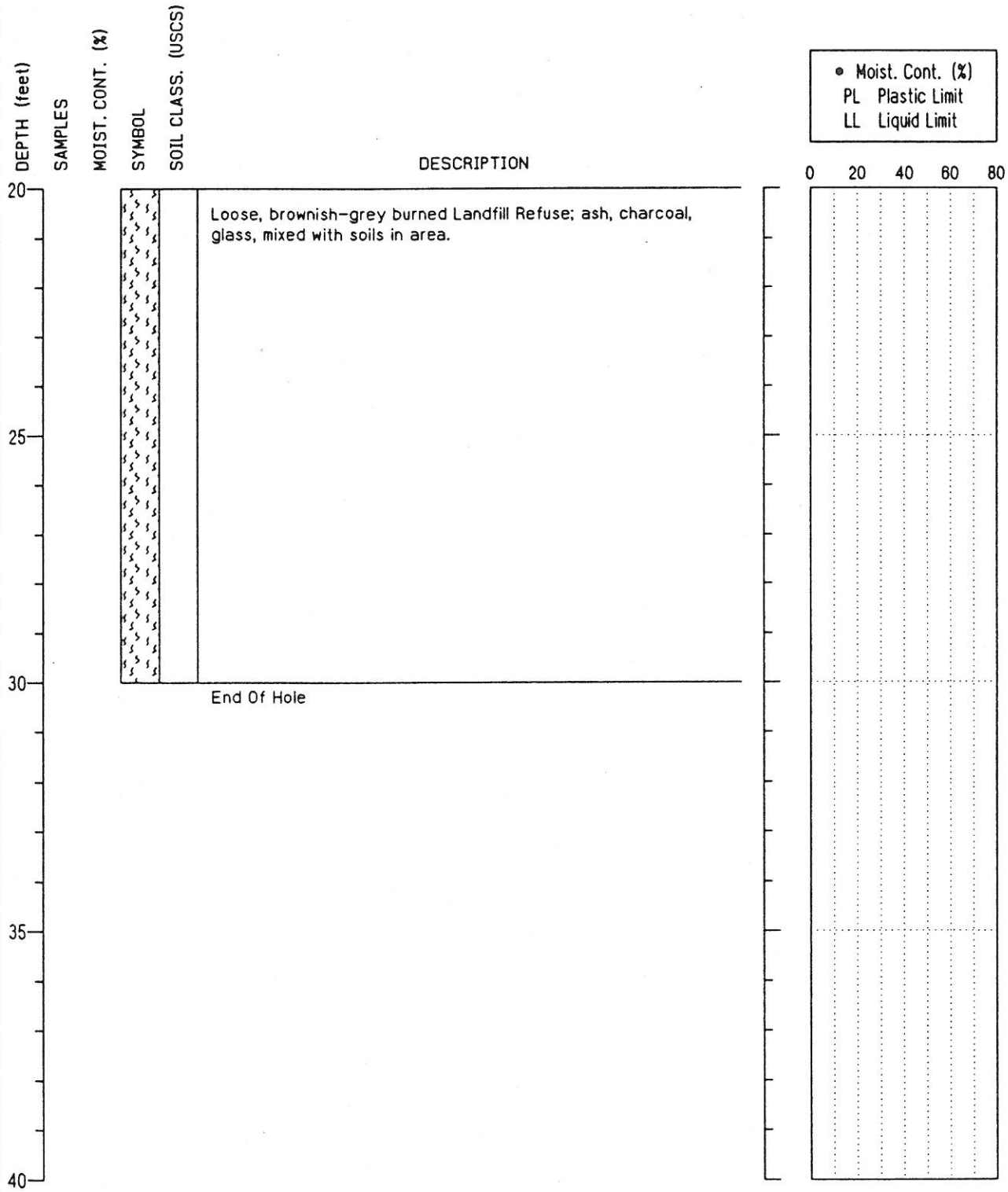
PROJECT: Enumclaw Landfill

TEST PIT: TP-13

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

HONG WEST & ASSOCIATES, INC.
TEST PIT LOG



PROJECT: Enumclaw Landfill

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

TEST PIT: TP-13

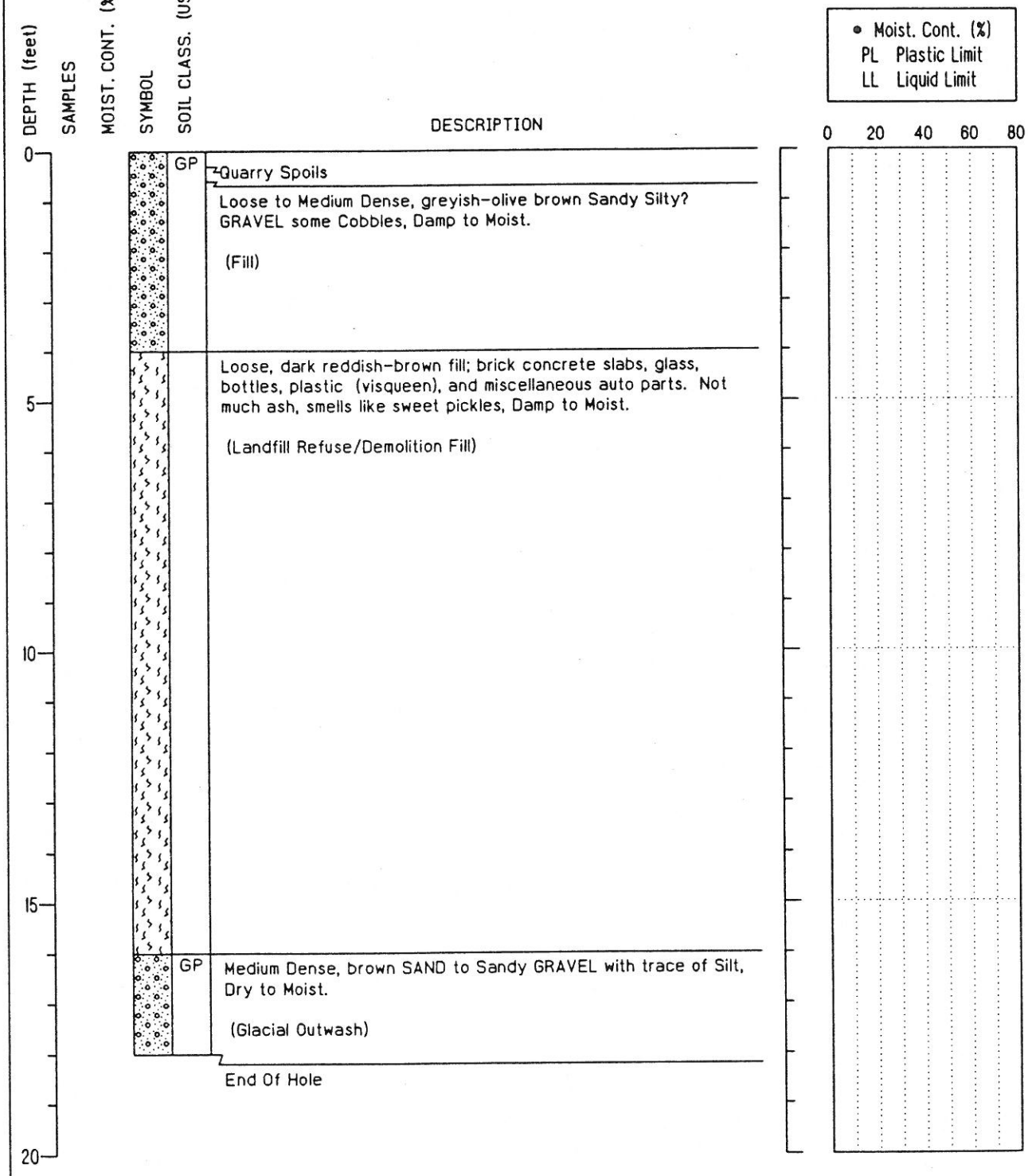
PROJECT NUMBER: 92021, Task 3

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 20.0 Feet
SURFACE ELEVATION: 823 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-14

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

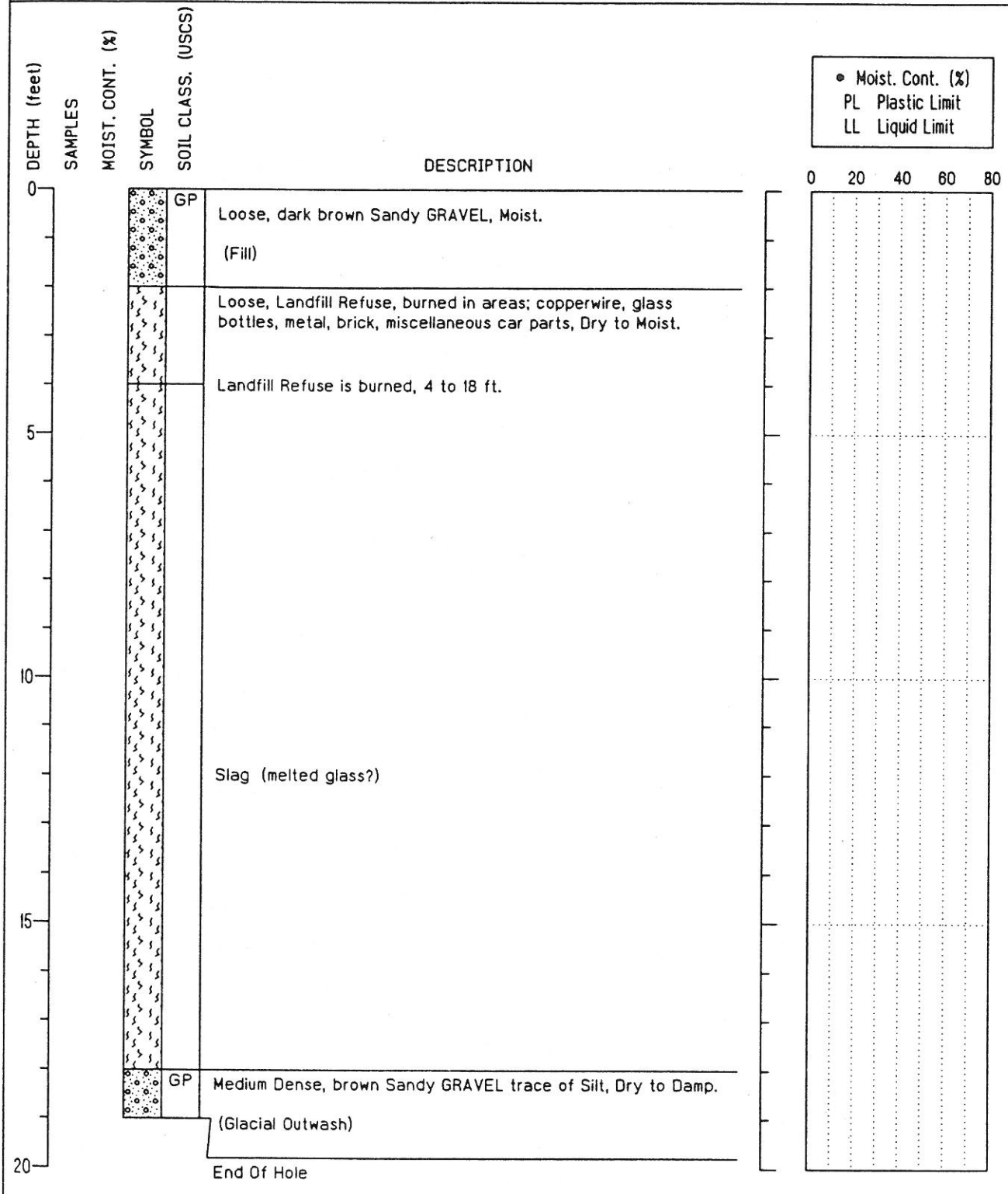
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 19.0 Feet
SURFACE ELEVATION: 827 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-15

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

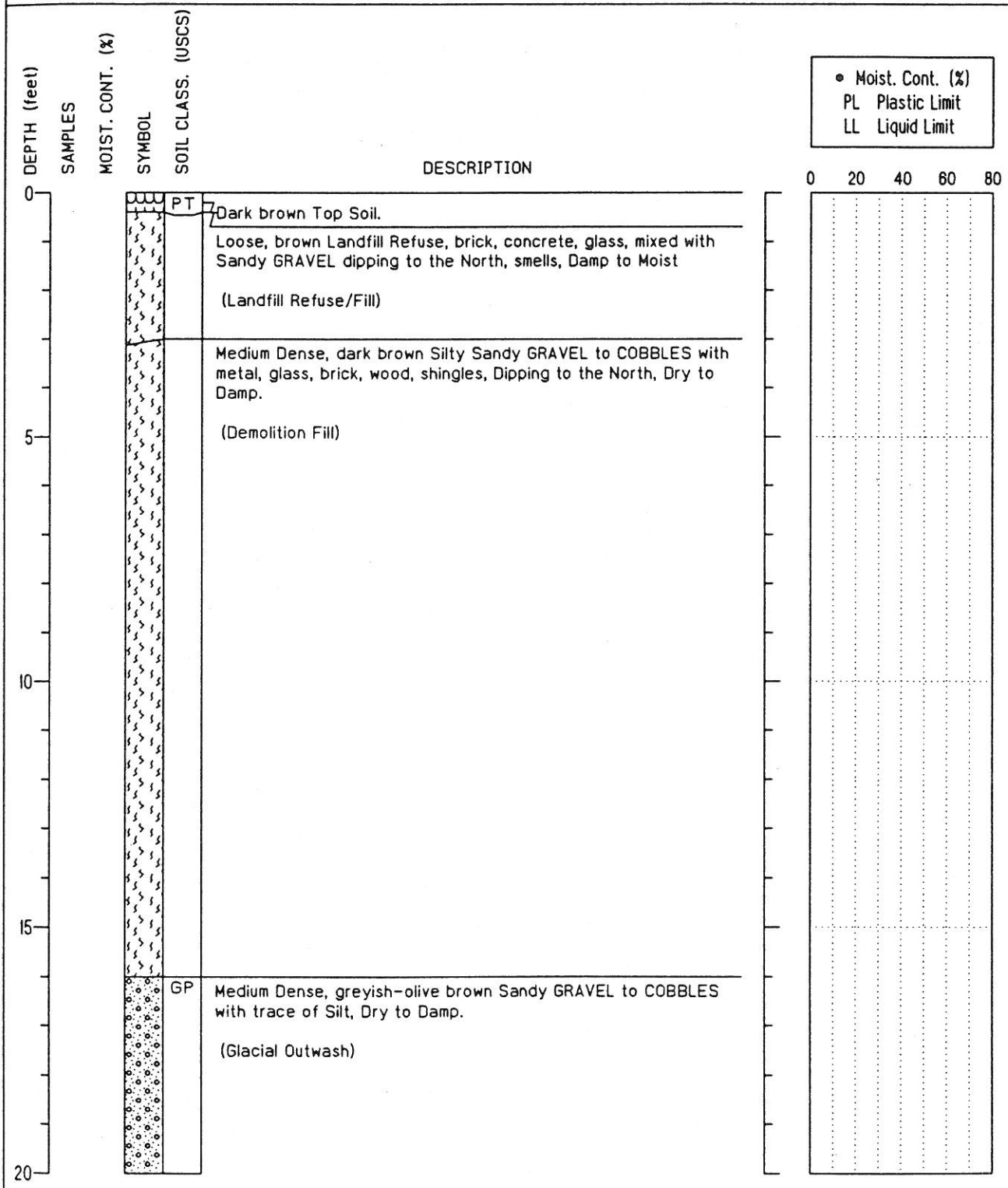
PROJECT NUMBER: 92021, Task 3

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 20.0 Feet
SURFACE ELEVATION: 830 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-16

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 3

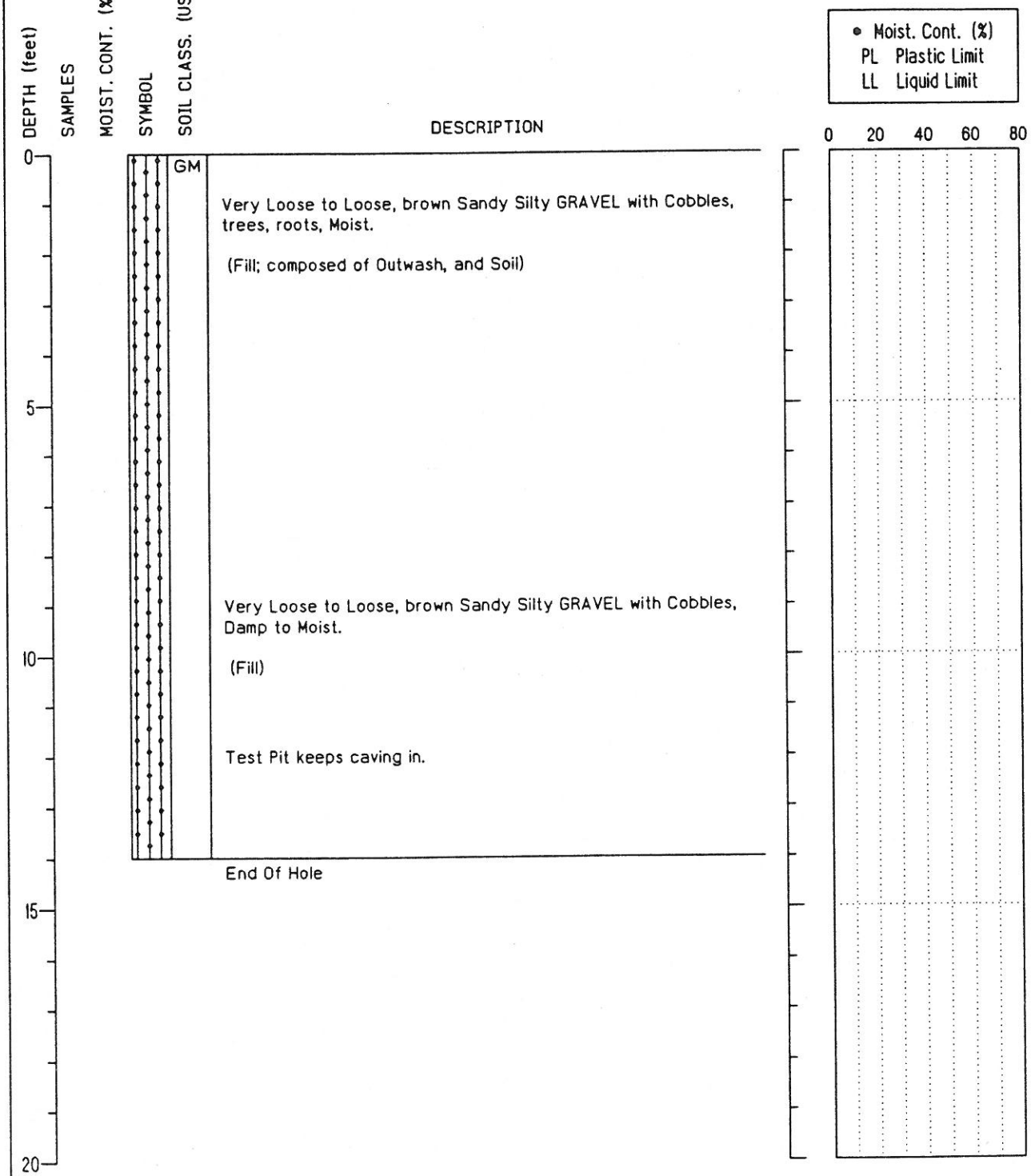
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 14.0 Feet
SURFACE ELEVATION: 790 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-17

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

PROJECT NUMBER: 92021, Task 2

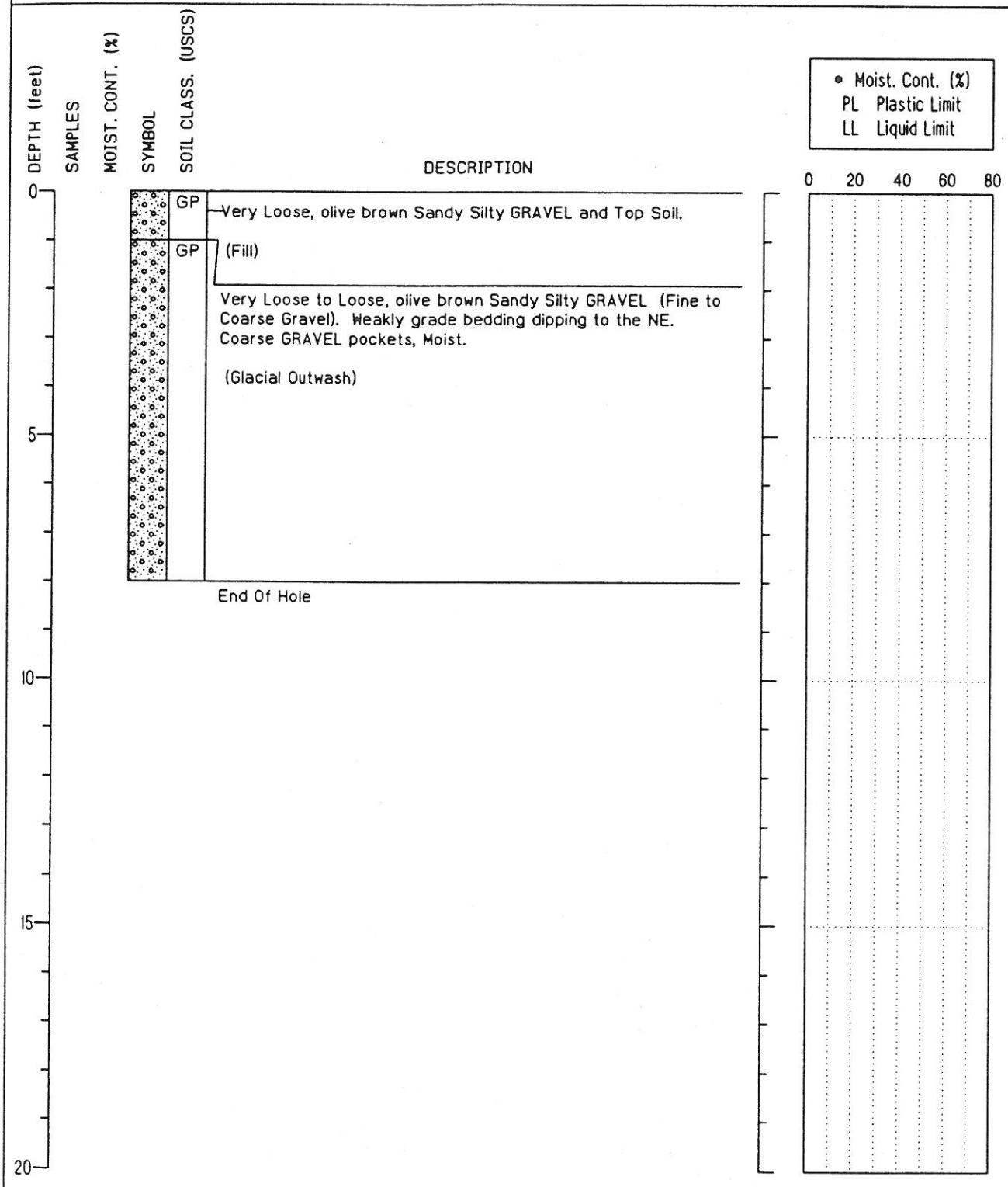
PAGE: 1 OF 1

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: CAT-225, Track Backhoe
SAMPLING METHOD: Grab

TOTAL DEPTH: 8.0 Feet
SURFACE ELEVATION: 804 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-18

LOCATION: S.E. 440th St. Enumclaw, WA
DATE COMPLETED: 3/5/92
LOGGED BY: Chris Behrens

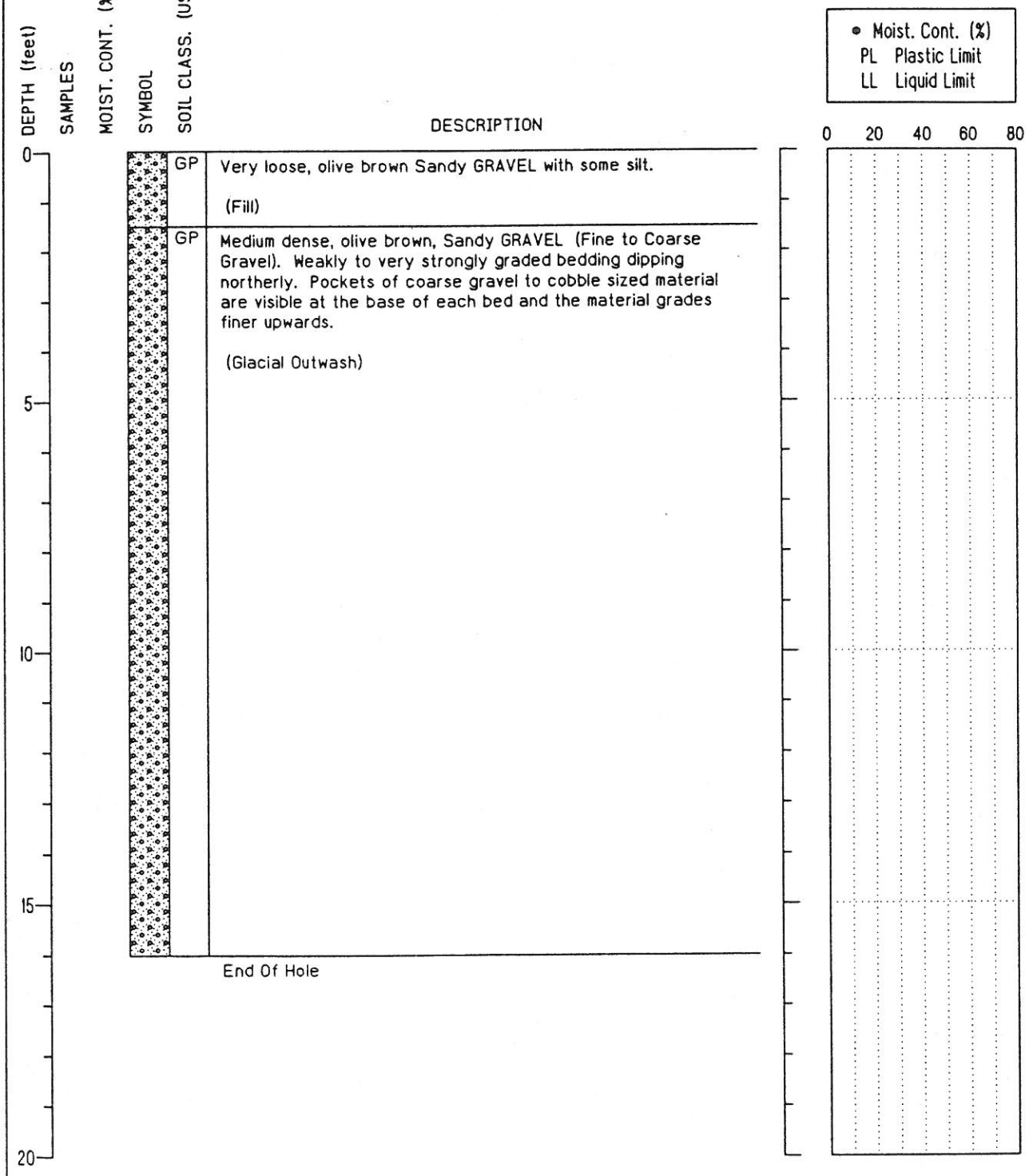
PROJECT NUMBER: 92021, Task 2

HONG WEST & ASSOCIATES, INC.

TEST PIT LOG

EXCAVATION COMPANY: King County
EXCAVATION METHOD: Backhoe
SAMPLING METHOD: grab

TOTAL DEPTH: 16 Feet
SURFACE ELEVATION: 782 Feet



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated.

PROJECT: Enumclaw Landfill

TEST PIT: TP-19

LOCATION: S.E. 440th St., Enumclaw, WA
DATE COMPLETED: 8/5/92
LOGGED BY: SEG

PROJECT NUMBER: 92021, Task 2

PAGE: 1 OF 1

APPENDIX B

Groundwater Analytical Data - 2010-2015

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

			Conventionals									Field Parameters					
Well ID	Date	Depth to Water ft	Alkalinity, Total (AS CACO3) mg/l	Ammonia as N mg/l	Chloride mg/l	Nitrate as N mg/l	Specific Conductance umhos/cm	Sulfate mg/l	Total Dissolved Solids mg/l	Total Organic Carbon mg/l	Total Suspended Solids mg/l	DO mg/L	ORP mV	pH pH units	Specific Conductance uS/cm	Temperature deg C	Turbidity NTU
MW-1	3/1/2010	60.1	112	0.191	2.31	0.0442	240	6.42	134	1.39	1 U			6.54	205	10.3	
	5/7/2010	60.28	73.4	0.166	2.29	0.0471	164	6	102	1.24	1 U			6.33	145	10.4	
	8/25/2010	58.74	67	0.249	2.62	0.015 T	156	6.92	104	1 U	1 U			6.13	160	10.7	
	11/8/2010	61.97	63.1	0.136	2.52	0.044	141	5.08	96	1.03	1 U			6.52	140	10.2	
	2/23/2011	50.03	43	0.116	2.15	0.01 U	101	5.89	67	1 U	1 U			6.26	100	10.2	
	5/26/2011	47.35	28	0.0824	2.28	0.687	85.3	4.84	61	1.17	1.1			6.08	86	10	
	8/22/2011	53.8	39.5	0.121	1.71	0.325	80.3	5.22	64	1 U	1 U			6.2	100	11.5	
	11/29/2011	60.8	41.1	0.0938	1.78	0.575	105	4.29	69	1.14	1 U			6.31	115	10	
	3/1/2012	56.22	45.6	0.0967	1.62	0.393	105	4.47	84	1 U	1 U			6.14	100	9.5	
	5/16/2012	50.52	38.1	0.0544	1.7	0.706	97.3	4.54	67.3	1 U	1 U			6.2	105	10.2	
	8/24/2012	54.59	48.1	0.16	1.71	0.308	108	5.86	78.8	1 U	1 U			6.02	90	9.9	
	11/16/2012	60.18	44.8	0.0522	1.65	0.419	107	5.77	81.5	1 U	1 U			6.25	100	9.6	
	2/21/2013	55.02	43.7	0.1	2.31	0.265	105	5.4	77.1	1 U	1 U			5.99	91	9.5	
	6/3/2013	53.71	47.3	0.127	1.95	0.415	119	5.09	88.5	1 U	1 U			6.05	90	9.8	
	8/13/2013	58.19	64.7	0.188	10.1	0.475	161	7.51	108	1 U	1 U			6.3	150	10.5	
	11/8/2013	61.88	57	0.1	2.27	0.567	135	5.19	97.2	1 U	1 U			6.26	120	9.7	
	2/11/2014	59.5	69.3	0.0996	1.92	0.362	156	4.86	99.9	1 U	1 U			6.69	130	9.6	
	5/13/2014	47.52	38.7	0.0426	1.76	1.09	103	4.24	75	1 U	1 U			6.32	97	10.4	
	8/12/2014	55.13	47.4	0.0948	1.57	0.436	112	5.17	87.1	1 U	1 U			6.61	115	11.6	
	12/1/2014	60.61	56.2	0.0811	1.58	0.638	129	4.63	90.2	1 U	1 U			6.25	120	9.6	
	2/9/2015	55.79	39.6	0.0575	1.6	0.712	104	4.38	72.9	1 U	1 U			6.67	90	9.8	
	5/11/2015	54.85	50.1	0.0964	3	0.308	126	5.78	83	1 U	1 U			6.45	110	10.1	
	8/3/2015	60.55	74.3	0.121	1.87	0.359	169	5.95	109	1 U	1 U	0.74	86	6.39	189.9	10.7	1.017
	12/2/2015	62.08	127	0.141	1.91	0.027 T	267	6.31	154	1 U	1 U	0.47	177	7.48	269	9.91	-1.623
MW-2	3/31/2010	48.22	40.1	0.0405	1.86	0.115	105	7.53	69	1.12	2.2			6.33	100	9.9	
	5/6/2010	48.2	35.1	0.0423	1.74	0.113	89.4	6.28	63	1 U	3.4			6.02	84	10.6	
	8/24/2010	47.43	35.2	0.0384	1.52	0.0519	94.4	8.14	74	1 U	1.7			6.49	94	10.4	
	11/2/2010	48.52	31.4	0.043	1.64	0.0723	68.4	3.35	45	1 U	1			6.37	71	10.6	
	2/24/2011	42.87	34.6	0.0341	1.81	0.168	87.8	6.57	57	1	1.1			6.32	93	10.4	
	5/27/2011	40.46	41.9	0.0634	10.2	1.6	170	14.2	118	1.01	2.5			6.18	160	11.2	
	8/22/2011	44.25	35.6	0.0426	3.63	0.103	80.9	5.77	71	1 U	2.3			6.17	100	11.7	
	11/30/2011	47.37	30.9	0.0307	1.46	0.0696	70.9	2.97	60	1 U	1 U			6.26	73	10.6	
	2/17/2012	47.03	38.7	0.0272	1.97	0.286	95.1	4.73	76	1 U	2			6.39	105	10.2	
	5/16/2012	42.84	35.6	0.0285	1.54	0.381	94.9	7.26	73.3	1 U	1.2			6.28	105	10.3	
	8/23/2012	44.58	37.2	0.0226	1.87	0.494	102	10.1	85.5	1.09	1.16			6.39	115	10.7	
	11/16/2012	47.23	27.9	0.01 U	1.81	0.34	67.4	7.72	61.5	1.15	1.1			5.91	62	9.8	
	2/22/2013	45.28	27.6	0.02 T	1.67	0.216	71.4	4.04	59.4	1 U	1 U			5.8	65	9.5	
	5/29/2013	44.31	25.4	0.017 T	1.39	0.243	69.1	3.14	62.7	1 U	1.1			5.94	65	10	
	8/15/2013	48.75	22.4	0.0154	6.05	0.125	61.8	3.08	63	1 U	1 U			6.19	60	10.4	
	11/14/2013	48.58	21.8	0.0211	1.95	0.118	63.2	2.91	62.9	1 U	1 U			5.93	61	9.8	
	2/18/2014	47.51	26.2	0.0435	1.72	0.0795	65.9	3.11	60.8	1 U	1 U			5.84	58	9.6	
	5/14/2014	40.65	35.5	0.0203 B	5.91	2.56	133	8.61	107	1 U	1 U			6.18	150	11.5	
	9/23/2014	46.83	24.3	0.0406	2.09	0.396	65.6	4.85	54.1	1 U	1 U			5.75	60	10.4	
	12/3/2014	47.35	27.6	0.034	317*	0.636	71.7	2.9	57.7	1.95	1 U			6	66	9.5	
	2/19/2015	45.28	28.9	0.018 T	20.5	0.254	86.2	6.18	64.9	1 U	1 U			6.29	80	10.1	
	5/12/2015	44.98	24.1	0.0195	1.35	0.167	72	4.61	59.1	1 U	1.47			6.12	68	10.4	
	8/6/2015	48.26	24.8	0.01 U	1.41	0.352	73.3	4.53	66.1	1 U	1 U	1.17	208	6.26	74.69	11.2	
	11/25/2015	48.51	22.6	0.01 U	1.41	0.089	64.3	2.99	68	1 U	1.4 T	2.03	199	6.29	62.99	10.03	5.197

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

			Conventionals									Field Parameters					
Well ID	Date	Depth to Water ft	Alkalinity, Total (AS CACO3) mg/l	Ammonia as N mg/l	Chloride mg/l	Nitrate as N mg/l	Specific Conductance umhos/cm	Sulfate mg/l	Total Dissolved Solids mg/l	Total Organic Carbon mg/l	Total Suspended Solids mg/l	DO mg/L	ORP mV	pH pH units	Specific Conductance uS/cm	Temperature deg C	Turbidity NTU
MW-3	2/24/2010	87.24	33.4	0.01 U	1.84	1.4	93.4	2.45	57	1 U	1 U			6.33	82	9.6	
	5/4/2010	87.45	38.5	0.01 U	1.67	1.17	100	3.11	69	1 U	1 U			6.34	87	10	
	8/16/2010	84.77	36.6	0.01 U	1.54	1.16	91.4	2.31	55	1 U	1 U			6.35	85	11	
	11/1/2010	88.46	39.2	0.01 U	1.54	0.882	74.4	2.21	47	1 U	1 U			6.58	90	10.5	
	2/17/2011	77.51	38.5	0.01 U	1.32	0.915	84.7	2.35	61	1 U	1 U			6.49	91	9.5	
	5/25/2011	74.52	29.6	0.01 U	1.56	0.88	76.5	2.23	62	1 U	1 U			6.57	72	10.5	
	8/19/2011	80.55	31.6	0.01 U	1.41	0.642	66.5	2.18	57	1 U	1 U			6.29	71	9.6	
	11/21/2011	87.19	32.9	0.01 U	1.28	0.863	83.9	1.98	65	1 U	1 U			6.49	85	10.9	
	2/28/2012	84.05	35.7	0.01 U	1.62	0.9	85.3	2.2	74	1 U	1 U			6.23	81	9	
	5/14/2012	77.91	33	0.01 U	1.41	1.06	82.8	2.13	78	4.38	1 U			6.29	77	10	
	8/23/2012	81.34	32.5	0.01 U	1.59	0.781	74.7	2.08	62.7	1 U	1 U			6.86	78	11.2	
	11/15/2012	86.78	35	0.01 U	1.5	0.977	84.2	1.75	63.9	1 U	1 U			6.29	76	9.6	
	2/13/2013	82.39	37.3	0.01 U	1.38	1.07	88.2	2.13	67.7	1 U	1 U			6.23	80	9.5	
	6/10/2013	81.03	32.3	0.013 T	7.85	1.02	86.1	2.02	65.9	11.4	1 U			6.42	76	10.4	
	8/16/2013	85.02	32	0.01 U	1.76	0.833	80.8	1.95	64.8	1 U	1 U			6.54	80	10.5	
	11/5/2013	88.43	31.8	0.01 U	1.16	1.04	85.8	2.01	65	1 U	1 U			6.78	83	10.7	
	2/13/2014	86.47	35.5	0.01 U	1.71	1.17	89.6	2.13	72.5	1 U	1 U			6.29	80	9.7	
	5/21/2014	75	28	0.0126	1.72	1.03	75.8	2.46	59.4	1 U	1 U			6.27	79	10.2	
	8/12/2014	81.95	31.8	0.0234	2.21	0.906	77.6	2	68.4	1 U	1 U			6.27	73	10.3	
	11/20/2014	87.8	29.7	0.0163 B	1.82	1.03	82.8	2.06	51.7	1 U	1 U			6.2	76	10.2	
	3/3/2015	81.85	34	0.01 U	1.43	0.978	87.5	2.18	62.3	1 U	1 U			6.76	85	10.6	
	5/11/2015	81.82	29.8	0.0448	1.41	0.981	83.9	2.05	60.9	1 U	1 U			6.54	79	10.9	
	8/6/2015	87.26	32.6	0.01 U	1.4	1.49	88.3	2.04	67.2	1 U	1 U	10.05	304	6.6	86.14	10.71	
	12/1/2015	89.19	32.2	0.01 U	1.42	0.944	84.6	2.09	65.3	1 U	1 U	9.71	265	6.63	83	10.16	-1.909
MW-6A	2/26/2010	83.2	33.2	0.01 U	1.66	0.893	90.1	2.24	51	1 U	1 U			6.35	78	10.5	
	5/12/2010	83.23	33.2	0.01 U	1.67	0.763	82.6	2.42	60	1 U	1 U			6.34	74	10.4	
	8/17/2010	82.4	34.5	0.01 U	1.54	1.05	86.7	2.34	56	1 U	1 U			6.44	77	10.8	
	11/4/2010	85.02	37.1	0.012 T	1.6	1.11	92.9	2.75	52	1 U	1 U			6.67	92	10.5	
	2/17/2011	76.71	38.8	0.01 U	1.4	0.951	85.2	2.56	58	1 U	4.3			6.52	88	9.2	
	5/26/2011	73.65	36.2	0.01 U	1.54	0.928	92.1	2.25	64	1 U	1 U			6.23	82	9.7	
	8/22/2011	78.7	40.3	0.01 U	1.48	0.948	75.9	2.32	65	1 U	1 U			6.35	87	10.6	
	12/12/2011	84.36	33.3	0.01 U	1.46	0.88	86.8	2.15	60	1 U	1 U			6.43	80	9.6	
	2/29/2012	81.83	33.2	0.01 U	1.4	0.733	78.3	2.17	71	1 U	1 U			6.64	79	9.8	
	5/15/2012	76.74	34	0.01 U	1.44	0.723	81.6	2.1	61.8	1 U	1 U			6.35	76	9.9	
	8/27/2012	79.46	35.6	0.01 U	1.51	0.921	82.8	2.12	67	1 U	1 U			6.25	80	10.4	
	11/26/2012	83.37	35.9	0.012 T	1.34	0.94	87.7	2.15	72.6	1.16	1 U			6.25	79	9.4	
	2/22/2013	80.17	34.5	0.01 U	1.37	0.807	82.7	2.19	59.3	1 U	1 U			6.25	74	9.5	
	6/11/2013	79.18	33.2	0.01 U	15.1	0.999	88.5	1.69	66.4	1 U	1 U			6.33	76	10.1	
	8/6/2013	81.72	34.8	0.0182	1.97	1.03	88.8	2.36	72.1	1.32	1 U			6.55	80	10.8	
	11/4/2013	85.16	34.2	0.01 U	1.32	0.98	90.4	2.08	62.7	1 U	1 T			6.74	86	10.5	
	2/10/2014	83.94	35.7	0.01 U	1.61	0.872	87.6	2.28	69.2	1 U	1 U			6.3	76	9.8	
	5/19/2014	73.95	33.5	0.01 U	1.35	0.858	83.2	2.02	66.3	1 U	1 U			6.7	80	10.5	
	8/11/2014	79.56	36.1	0.07	1.68	1.05	87.5	2.06	71.5	1 U	1 U			6.31	82	13	
	12/1/2014	84.24	36.4	0.01 U	1.37	1.07	87.8	2.24	66.5	1 U	1 U			6.76	75	10.2	
	3/3/2015	80.02	31.5	0.01 U	1.35	0.925	81.6	2.06	62	1 U	1 U			6.74	78	10.1	
	5/18/2015	80.03	31.7	0.0133	9.64	0.806	82.6	2.11	62.8	1 U	1 U			6.77	77	11	
	8/11/2015	84.47	34.4	0.01 U	1.44	0.951	87.5	2.14	64.5	1 U	1 U	8.93	298	6.67	86.31	11.35	
	12/1/2015	85.96	35.4	0.01 U	1.46	1.05	92.5	2.26	62.7	1 U	1 U	8.72	272	6.61	90.8	10.14	-1.631

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

			Conventionals									Field Parameters					
Well ID	Date	Depth to Water ft	Alkalinity, Total (AS CACO3) mg/l	Ammonia as N mg/l	Chloride mg/l	Nitrate as N mg/l	Specific Conductance umhos/cm	Sulfate mg/l	Total Dissolved Solids mg/l	Total Organic Carbon mg/l	Total Suspended Solids mg/l	DO mg/L	ORP mV	pH pH units	Specific Conductance uS/cm	Temperature deg C	Turbidity NTU
MW-9	2/25/2010	78.92	33.6	0.01 U	1.65	0.148	83.9	1.95	60	1.88	1 U			5.94	70	10	
	5/6/2010	78.9	54.2	0.01 U	2.09	0.231	129	6.07	87	1.25	1 U			5.86	115	9.8	
	8/24/2010	78.4	46.7	0.01 U	1.93	0.177	128	8.56	94	1 T	1 U			6.33	115	10.9	
	11/2/2010	79.2	43.8	0.01 U	2.43	0.0749	86	3.51	67	1 U	1 U			6.22	100	10.2	
	2/18/2011	74.24	25	0.01 U	0.573	0.193	52.4	1.39	51	1.85	1 U			6.2	58	7.5	
	5/27/2011	71.97	44.6	0.01 U	0.118	0.163	97	1.66	73	2.27	1 U			6.48	94	9.4	
	8/24/2011	75.44	63.1	0.01 U	16.1	4.72	217	15.9	172	1.67	1 U			6.19	270	10.8	
	12/16/2011	78.82	48.8	0.01 U	2.22	0.358	127	7.6	112	1.74	1 U			6.06	135	10.4	
	2/17/2012	77.78	36	0.01 U	0.754	0.239	78.3	1.75	63	2.2	1 U			6.28	78	9.2	
	5/15/2012	73.97	34.4	0.01 U	0.22	0.0899	70.7	0.886	84.6	2.27	1 U			6.06	65	7.6	
	8/24/2012	75.83	88.9	0.01 U	5.21	2.67	221	7.99	154	1.14	1 U			5.92	180	10	
	11/6/2012	77.67	36.3	0.01 U	2.52	0.0768	88.7	4.08	72.2	1.21	1 U			5.97	80	9.7	
	2/21/2013	76.25	36.5	0.01 U	0.831	0.308	78.4	1.48	73.7	1.65	1 U			5.9	70	8.4	
	6/4/2013	75.3	49.7	0.01 U	1.59	0.585	127	6.57	103	1.31	1 U			6	100	9.2	
	8/13/2013	78.64	36.4	0.01 U	1.85	0.491	95.8	4.44	83.1	1 U	1 U			6.19	92	10.2	
	11/14/2013	79.2	32.4	0.01 U	2.07	0.446	93.3	4.08	89.8	1 U	1 U			5.92	83	9.8	
	2/18/2014	78.18	54.7	0.01 U	1.06	0.107	116	2.43	88.3	1.45	1 U			5.84	85	9.8	
	5/7/2014	72.23	33.8	0.01 U	0.123	0.0766	71.6	1.31	66.6	1.66	1 U			6.3	67	8.7	
	8/12/2014	75.97	54.2	0.01 U	10.7	8.19	222	4.78	193	1 U	1 U			6.27	200	11.5	
	12/1/2014	77.94	39.3	0.01 U	0.812	0.191	85.9	3.27	80.7	1.81	1 U			6.36	80	10.1	
	3/3/2015	76.08	32.2	0.01 U	0.699	0.239	73.6	1.2	67.7	1.41	1 U			6.33	70	8.6	
	5/18/2015	76.16	38.7	0.022	3.11	1.39	119	8.88	92.7	1 U	1 U			6.25	105	11	
	8/11/2015	79.27	27.3	0.01 U	1.82	1.06	82.2	3.65	78.7	1 U	1 U	1.05	340	6.27	80.57	11.32	
	11/25/2015	78.87	34	0.01 U	0.671	0.366	86.1	3.47	74.7	2.14	1.4	6.21	365	6.19	83.02	10.03	1.599
MW-10	2/26/2010	49.95	45.4	0.01 U	2.44	1.72	165	19.1	106	1.08	1 U			6.03	140	10.5	
	5/6/2010	49.95	45.7	0.01 U	2.16	1.53	147	16.4	102	1 U	1 U			6.1	130	10.3	
	8/17/2010	48.72	48.9	0.01 U	2.06	1.6	158	18.7	100	1.12	1.9			6.31	160	11.3	
	11/4/2010	50.1	53.1	0.01 U	1.77	1.9	128	7.66	82	1 U	2.1			6.3	140	10.5	
	2/24/2011	44.42	107	0.01 U	2.45	2.37	334	52.4	217	2.29	1 U			6.61	315	10.3	
	5/26/2011	41.88	88.8	0.01 U	4.19	1.82	342	51.3	211	2.42	1 U			6.31	260	10.4	
	8/22/2011	48.65	72.4	0.01 U	7.69	7.72	253	28.2	197	1.37	1 U			6.25	250	10.7	
	11/28/2011	49.13	53.9	0.01 U	2.08	2.01	163	12.4	111	1.16	1 U			6.25	170	10.2	
	2/17/2012	48.83	59.7	0.01 U	2.15	2.12	192	20.6	132	1.22	1 U			6.36	195	10.4	
	5/16/2012	44.4	80.6	0.01 U	2.83	1.91	272	41.3	173	1 T	1 U			6.51	265	10.7	
	8/27/2012	46.27	49.2	0.01 U	1.96	1.18	147	16.4	108	1 U	1 U			6.64	155	10.7	
	11/26/2012	48.7	51.1	0.01 U	1.58	1.14	155	16.7	118	1.21	1 U			6.15	130	9.7	
	2/25/2013	46.9	53.8	0.01 U	2.2	1.72	190	28.1	129	1 U	1 U			6.13	150	9.7	
	6/4/2013	45.9	64.1	0.01 U	1.98	1.77	215	27.1	152	1.1	1 U			6.38	170	9.8	
	8/15/2013	48.28	42.1	0.01 U	4.07	1.39	132	13.5	106	1 U	1 U			6.4	120	9.9	
	11/8/2013	50.18	43.9	0.01 U	1.88	1.78	126	5.19	98	1 U	1 U			6.02	100	9.8	
	2/19/2014	48.92	54.9	0.01 U	1.74	0.4	159	12.8	113	1 U	1 U			6.01	130	9.7	
	5/19/2014	42.23	86.4	0.01 U	2.2	1.93	272	35.7	182	1 U	1 U			6.6	230	10.8	
	8/12/2014	46.38	67.6	0.01 U	3.98	6.45	214	14.1	169	1 U	1 U			6.48	200	11.7	
	12/3/2014	49.32	53.2	0.0293	2.94	2.34	162	13.7	120	1 U	5.01			6.4	140	9.9	
	3/3/2015	46.8	55.3	0.01 U	1.87	1.86	183	21	128	1 U	1 U			6.49	170	10.4	
	5/11/2015	46.58	55.4	0.01 U	13	1.72	183	20.6	120	1 U	1 U			6.55	150	10.6	
	8/4/2015	49.72	43.4	0.01 U	1.5	1.26	120	7.33	87.3	1 U	1 U	8.04	276	6.54	119.2	11.19	
	12/1/2015	50.76	57.3	0.01 U	1.91	2.38	187	18	131	1 U	1 U	6.69	280	6.18	183.5	10.89	-1.537
	WAC 246-290-310				**250**	**10**	**700**	**250**	**500**						**700**		
	WAC 173-200[1]				**250**	**10**		**250**	**500**					**6.5-8.5**			

Pink shading indicates exceedance of one of the screening levels
Yellow shaded waterе level values were collected on dates different than the sample colleciton date.
Reported metals are dissolved.
[1]WAC 173-200 metals criteria are for total metals.
* The detection of 317 mg/L chloride is a statistical outlier. This was the only exceedance of the chloride screening level.

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	Dissolved Metals														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MW-1	3/1/2010	1 U	9	6.29	1 U	2 U	25200	5 U	3 U	2 U	373	1 U	6560	1570	0.1 U	10 U
	5/7/2010	1 U	6.08	4.57	1 U	2 U	15000	5 U	3 U	2 U	212	1 U	4480	1140	0.1 U	10 U
	8/25/2010	1 U	4.4	5.28	1 U	2 U	14900	5 U	3 U	2 U	409	1 U	4410	1380 D	0.1 U	10 U
	11/8/2010	1 U	7.59	4.03	1 U	2 U	13800	5 U	3 U	2 U	508	1 U	3680	1200 D	0.1 U	10 U
	2/23/2011	1 U	4.5	3.82	1 U	2 U	9370	5 U	3 U	2 U	1470	1 U	2520	1590	0.1 U	10 U
	5/26/2011	1 U	2.03	2.64	1 U	2 U	6200	5 U	3 U	2 U	668	1 U	1700	1430 D	0.1 U	10 U
	8/22/2011	1 U	2.06	3	1 U	2 U	9190	5 U	3 U	2 U	620	1 U	2130	1500	0.1 U	10 U
	11/29/2011	1 U	2.73	2.88	1 U	2 U	11200	5 U	3 U	2 U	260	1 U	2500	1220	0.1 U	10 U
	3/1/2012	1 U	3.64	2.94	1 U	2 U	9730	5 U	3 U	2 U	255	1 U	2530	1120	0.1 U	10 U
	5/16/2012	1 U	1.91	2.69	1 U	2 U	8190	5 U	3 U	2 U	479	1 U	2160	1380	0.1 U	10 U
	8/24/2012	1 U	1.59	3.31	1 U	2 U	10100	5 U	3 U	2 U	485	1 U	2830	1460	0.1 U	10 U
	11/16/2012	1 U	2.14	3.03 D	1 U	2 U	10000	5 U	3 DU	2 U	257	1 U	2580	1220 D	0.1 U	10 U
	2/21/2013	1 U	1.52	3.02	1 DU	2 U	10500	5 U	3 U	2 U	259	1 U	2790 D	1220 D	0.1 U	10 U
	6/3/2013	1 U	1.3	3.15	1 U	2 U	10000	5 U	3 U	2 U	398	1 U	2920	1400	0.1 U	10 U
	8/13/2013	1 U	1.17	4.98	1 DU	2 U	14900	5 U	3 DU	2 U	431	1 U	4430	2040	0.1 U	10 DU
	11/8/2013	1 U	3.26	3.46	1 U	2 U	13800	5 U	3 U	2 U	174	1 U	3460	1120 D	0.1 U	10 U
	2/11/2014	1 U	4.53	3.75	1 U	2 U	16200	5 U	3 U	2 U	99.4	1 U	3910	1130 D	0.1 U	10 U
	5/13/2014	1 U	1.4	2.78	1 U	2 U	8900	5 U	3 U	2 U	274	1 U	2580	1110	0.1 U	10 U
	8/12/2014	1 U	1.11	2.77	1 U	2 U	10100	5 U	3 U	2 U	264	1 U	3490	873 D	0.1 U	10 U
	12/1/2014	1 U	2.36	3.28	1 U	2 U	12900	5 U	3 U	2 U	113	1 U	3120	986	0.1 U	10 U
	2/9/2015	1 U	1.53	2.54	1 U	2 U	9260	5 U	3 U	2 U	97.4	1 U	2600	814 D	0.1 U	10 U
	5/11/2015	1 U	1 U	3.3 D	1 U	2 U	11700	5 U	3 U	2 U	200	1 U	3340	1060 D	0.1 U	10 U
	8/3/2015	1 U	1.46	3.81	1 U	2 U	17300	5 U	3 U	2 U	155	1 U	4420	1360	0.1 U	10 U
	12/2/2015	1 U	9.51	4.82	1 U	2 U	29700	5 U	3 U	2 U	125	1 U	7340	1120	0.1 U	10 U
MW-2	3/31/2010	1 U	4.84	2.77	1 U	2 U	9410	5 U	3 U	2 U	2730	1 DU	2410	1370 D	0.1 U	10 U
	5/6/2010	1 U	4.22	2.02	1 U	2 U	6570	5 U	3 U	2 U	2000	1 U	2170	973	0.1 U	10 U
	8/24/2010	1 U	3.65	2.3	1 U	2 U	7840	5 U	3 U	2 U	2150	1 U	2300	1160 D	0.1 U	10 U
	11/2/2010	1 U	3.74	1.75	1 U	2 U	5910	5 U	3 U	2 U	1820	1 U	1740	877	0.1 U	10 U
	2/24/2011	1 U	4.58	2.37	1 U	2 U	8010	5 U	3 U	2 U	2110	1 U	2540	1240	0.1 U	10 U
	5/27/2011	1 U	5.11	4.31	1 U	2 U	13200	5 U	3 U	2 U	3560	1 U	4260	2050 D	0.1 U	10 U
	8/22/2011	1 U	2.98	2.42	1 U	2 U	8530	5 U	3 U	2 U	1470	1 U	2140	974	0.1 U	10 U
	11/30/2011	1 U	2.56	1.51	1 U	2 U	6500	5 U	3 U	2 U	911	1 U	1690	647	0.1 U	10 U
	2/17/2012	1 U	2.64	2.2	1 U	2 U	7710	5 U	3 U	2 U	1030	1 U	2580	725 D	0.1 U	10 U
	5/16/2012	1 U	2.66	2	1 U	2 U	7770	5 U	3 U	2 U	997	1 U	2420	723	0.1 U	10 U
	8/23/2012	1 U	2.16	2.44	1 U	2 U	9050	5 U	3 U	2 U	961	1 U	2730	783	0.1 U	10 U
	11/16/2012	1 U	1.64	1.43 D	1 U	2 U	5350	5 U	3 DU	2 U	732	1 U	1710	535 D	0.1 U	10 U
	2/22/2013	1 U	1.6	1.54	1 DU	2 U	6010	5 U	3 U	2 U	673	1 U	1810 D	508 D	0.1 U	10 U
	5/29/2013	1 U	1.5	1.38	1 U	2 U	5020	5 U	3 U	2 U	608	1 U	1670	411	0.1 U	10 U
	8/15/2013	1 U	1.06	1.25	1 DU	2 U	4700	5 U	3 DU	2 U	417	1 U	1660	349	0.1 U	10 DU
	11/14/2013	1 U	1.27	1.17	1 U	2 U	4880	5 U	3 U	2 U	451	1 U	1570	361	0.1 U	10 U
	2/18/2014	1 U	1.05	1.23	1 U	2 U	4810	5 U	3 U	2 U	483	1 U	1590	365	0.1 U	10 U
	5/14/2014	1 U	1 U	3.12	1 U	2 U	11500	5 U	3 U	2 U	887	1 U	3950	685	0.1 U	10 U
	9/23/2014	1 U	1 U	1.22	1 U	2 U	4410	5 U	3 U	2 U	247	1 U	1540	222	0.1 U	10 U
	12/3/2014	1 U	1 U	1.4	1 U	2 U	5010	5 U	3 U	2 U	312	1 U	1500	272	0.1 U	10 U
	2/19/2015	1 U	1 U	1.81	1 U	2 U	6500	5 U	3 U	2 U	342	1 U	2300	283	0.1 U	10 U
	5/12/2015	1 U	1 U	1.48	1 DU	2 U	5930	5 U	3 U	2 U	443	1 DU	1790	335	0.1 U	10 U
	8/6/2015	1 U	1 U	1.32	1 U	2 U	5870	5 U	3 U	2 U	17 T	1 U	1930	155	0.1 U	10 U
	11/25/2015	1 U	1 U	1 U	1 U	2 U	5130	5 U	3 U	2 U	76.6	1 U	1600	156	0.1 U	10 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	Dissolved Metals														
		Antimony ug/l	Arsenic ug/l	Barium ug/l	Beryllium ug/l	Cadmium ug/l	Calcium ug/l	Chromium ug/l	Cobalt ug/l	Copper ug/l	Iron ug/l	Lead ug/l	Magnesium ug/l	Manganese ug/l	Mercury ug/l	Nickel ug/l
MW-3	2/24/2010	1 U	1 U	1 U	1 U	2 U	9060	5 U	3 U	2 U	10 U	1 U	2580	1 U	0.1 U	10 U
	5/4/2010	1 U	1 U	1 U	1 U	2 U	8590	5 U	3 U	2 U	10 U	1 U	2750	1 U	0.1 U	10 U
	8/16/2010	1 U	1 U	1 U	1 U	2 U	9480	5 U	3 U	2 U	10 U	1 U	2650	1 DU	0.1 U	10 U
	11/1/2010	1 U	1 U	1 U	1 U	2 U	9090	5 U	3 U	2 U	10 U	1 U	2550	1 U	0.1 U	10 U
	2/17/2011	1 U	1 U	1 U	1 U	2 U	9530	5 U	3 DU	2 U	10 U	1 U	2860	1 U	0.1 U	10 U
	5/25/2011	1 U	1 U	1 U	1 U	2 U	7050	5 U	3 U	2 U	10 U	1 U	2120	1 U	0.1 U	10 U
	8/19/2011	1 U	1 U	1 U	1 U	2 U	8290	5 U	3 U	2 U	10 U	1 U	2100	1 U	0.1 U	10 U
	11/21/2011	1 U	1 U	1 U	1 U	2 U	9400	5 U	3 U	2 U	10 U	1 U	2370	1 U	0.1 U	10 U
	2/28/2012	1 U	1 U	1 U	1 U	2 U	8260	5 U	3 U	2 U	10 U	1 U	2480	1 U	0.1 U	10 U
	5/14/2012	1 U	1 U	1 U	1 U	2 U	7630	5 U	3 U	2 U	10 U	1 U	2110	1 U	0.1 U	10 U
	8/23/2012	1 U	1 U	1 U	1 U	2 U	7640	5 U	3 U	2 U	10 U	1 U	2140	1 U	0.1 U	10 U
	11/15/2012	1 U	1 U	1 DU	1 U	2 U	8370	5 U	3 DU	2 U	10 U	1 U	2350	1 DU	0.1 U	10 U
	2/13/2013	1 U	1 U	1 U	1 U	2 U	8770	5 U	3 U	2 U	10 U	1 U	2680	1 U	0.1 U	10 U
	6/10/2013	1 U	1 U	1 U	1 U	2 U	8560	5 U	3 U	2 U	10 U	1 U	2340	1 U	0.1 U	10 U
	8/16/2013	1 U	1 U	1 U	1 DU	2 U	7640	5 U	3 DU	2 U	10 U	1 U	2360	1 U	0.1 U	10 DU
	11/5/2013	1 U	1 U	1 U	1 U	2 U	8910	5 U	3 U	2 U	10 U	1 U	2480	1 U	0.1 U	10 U
	2/13/2014	1 U	1 U	1 U	1 U	2 U	8900	5 U	3 U	2 U	10 U	1 U	2510	1 U	0.1 U	10 U
	5/21/2014	1 U	1 U	1 U	1 U	2 U	7540	5 U	3 U	2 U	10 U	1 U	2080	1 U	0.1 U	10 U
	8/12/2014	1 U	1 U	1 U	1 U	2 U	7530	5 U	3 U	2 U	10 U	1 U	2520	1 DU	0.1 U	10 U
	11/20/2014	1 U	1 U	1 U	1 U	2 U	7950	5 U	3 U	2 U	10 U	1 U	2310	1 U	0.1 U	10 U
	3/3/2015	1 U	1 U	1 U	1 U	2 U	8950	5 U	3 U	2 U	10 U	1 U	2370	1 U	0.1 U	10 U
	5/11/2015	1 U	1 U	1 DU	1 U	2 U	8060	5 U	3 U	2 U	10 U	1 U	2320	1 DU	0.1 U	10 U
	8/6/2015	1 U	1 U	1 U	1 U	2 U	8250	5 U	3 U	2 U	10 U	1 U	2300	1 U	0.1 U	10 U
	12/1/2015	1 U	1 U	1 U	1 U	2 U	7940	5 U	3 U	2 U	10 U	1 U	2550	1 U	0.1 U	10 U
MW-6A	2/26/2010	1 U	1 U	1 U	1 U	2 U	8610	5 U	3 U	2 U	10 U	1 U	2470	1 U	0.1 U	10 U
	5/12/2010	1 DU	1 U	1 U	1 U	2 U	8250	5 U	3 U	2 U	10 U	1 U	2020	1 U	0.1 U	10 U
	8/17/2010	1 U	1 U	1 U	1 U	2 U	8990	5 U	3 U	2 U	10 U	1 U	2450	1 DU	0.1 U	10 U
	11/4/2010	1 U	1 U	1 U	1 U	2 U	9340	5 U	3 U	2 U	10 U	1 U	2640	1 U	0.1 U	10 U
	2/17/2011	1 U	1 U	1 U	1 U	2 U	9690	5 U	3 DU	2 U	10 U	1 U	2810	1 U	0.1 U	10 U
	5/26/2011	1 U	1 U	1 U	1 U	2 U	8940	5 U	3 U	2 U	10 U	1 U	2640	1 DU	0.1 U	10 U
	8/22/2011	1 U	1 U	1 U	1 U	2 U	11600	5 U	3 U	2 U	10 U	1 U	2710	1 U	0.1 U	10 U
	12/12/2011	1 U	1 U	1 U	1 U	2 U	8700	5 U	3 U	2 U	10 U	1 U	2470	1 DU	0.1 U	10 U
	2/29/2012	1 U	1 U	1 U	1 U	2 U	7350	5 U	3 U	2 U	10 U	1 U	2130	1 U	0.1 U	10 U
	5/15/2012	1 U	1 U	1 U	1 U	2 U	7670	5 U	3 U	2 U	10 U	1 U	2080	1 U	0.1 U	10 U
	8/27/2012	1 U	1 U	1 U	1 U	2 U	8610	5 U	3 U	2 U	10 U	1 U	2370	1 U	0.1 U	10 U
	11/26/2012	1 U	1 U	1 U	1 U	2 U	9050	5 U	3 U	2 U	10 U	1 U	2270	1 U	0.1 U	10 U
	2/22/2013	1 U	1 U	1 U	1 DU	2 U	8750	5 U	3 U	2 U	10 U	1 U	2370 D	1 DU	0.1 U	10 U
	6/11/2013	1 U	1 U	1 U	1 U	2 U	8990	5 U	3 U	2 U	10 U	1 U	2420	1 U	0.1 U	10 U
	8/6/2013	1 U	1 U	1 U	1 DU	2 U	9220	5 U	3 U	2 U	10 U	1 U	2680	1 DU	0.1 U	10 U
	11/4/2013	1 U	1 U	1 U	1 U	2 U	9560	5 U	3 U	2 U	10 U	1 U	2580	1 U	0.1 U	10 U
	2/10/2014	1 U	1 U	1 U	1 U	2 U	8560	5 U	3 U	2 U	10 U	1 U	2390	1 U	0.1 U	10 U
	5/19/2014	1 U	1 U	1 DU	1 U	2 DU	8050	5 U	3 DU	2 U	10 U	1 U	2170	1 U	0.1 U	10 U
	8/11/2014	1 U	1 U	1 U	1 U	2 U	8550	5 U	3 U	2 U	10 U	1 U	2730	1 DU	0.1 U	10 U
	12/1/2014	1 U	1 U	1 U	1 U	2 U	8610	5 U	3 U	2 U	10 U	1 U	2230	1 DU	0.1 U	10 U
	3/3/2015	1 U	1 U	1 U	1 U	2 U	8180	5 U	3 U	2 U	10 U	1 U	2160	1 U	0.1 U	10 U
	5/18/2015	1 U	1 U	1 U	1 DU	2 U	8060	5 U	3 U	2 U	10 U	1 DU	2150	1 U	0.1 U	10 U
	8/11/2015	1 U	1 U	1 U	1 U	2 U	8200	5 U	3 U	2 U	10 U	1 U	2260	1 U	0.1 U	10 U
	12/1/2015	1 U	1 U	1 U	1 U	2 U	9010	5 U	3 U	2 U	10 U	1 U	2710	1 U	0.1 U	10 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	Dissolved Metals														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MW-9	2/25/2010	1 U	1 U	1.4	1 U	2 U	7410	5 U	3 U	2 U	10 U	1 U	2020	11	0.1 U	10 U
	5/6/2010	1 U	1 U	2.18	1 U	2 U	10500	5 U	3 U	2 U	10 U	1 U	3270	11.5	0.1 U	10 U
	8/24/2010	1 U	1 U	2.39	1 U	2 U	12500	5 U	3 U	2 U	10 U	1 U	3460	13 D	0.1 U	10 U
	11/2/2010	1 U	1 U	1.97	1 U	2 U	10300	5 U	3 U	2 U	10 T	1 U	2760	24.6	0.1 U	10 U
	2/18/2011	1 U	1 U	1 U	1 U	2 U	6100	5 U	3 DU	2 U	10 U	1 U	1750	12.8	0.1 U	10 U
	5/27/2011	1 U	1 U	1.53	1 U	2 U	10400	5 U	3 U	2 U	15 T	1 U	3040	21.7	0.1 U	10 U
	8/24/2011	1 U	1 U	4.26	1 U	2 U	33700	5 U	3 U	2 U	10 U	1 U	6980	16.6	0.1 U	10 U
	12/16/2011	1 U	1 U	2.31	1 U	2 U	13300	5 U	3 U	2 U	10 U	1 U	3380	4.91	0.1 U	10 U
	2/17/2012	1 U	1 U	1.49	1 U	2 U	7530	5 U	3 U	2 U	10 U	1 U	2200	3.39	0.1 U	10 U
	5/15/2012	1 U	1 U	1.07	1 U	2 U	6770	5 U	3 U	2 U	10 U	1 U	1800	1.17	0.1 U	10 U
	8/24/2012	1 U	1 U	3.95	1 U	2 U	26900	5 U	3 U	2 U	10 U	1 U	6710	4.74	0.1 U	10 U
	11/6/2012	1 U	1 U	1.26	1 U	2 U	6580	5 U	3 U	2 U	10 U	1 U	1920	1 U	0.1 U	10 U
	2/21/2013	1 U	1 U	1.39	1 DU	2 U	8830	5 U	3 U	2 U	10 U	1 U	2180 D	5.67 D	0.1 U	10 U
	6/4/2013	1 U	1 U	2.14	1 U	2 U	12500	5 U	3 U	2 U	10 U	1 U	3550	1.3 D	0.1 U	10 U
	8/13/2013	1 U	1 U	1.45	1 DU	2 U	8870	5 U	3 DU	2 U	10 U	1 U	2620	1.28	0.1 U	10 DU
	11/14/2013	1 U	1 U	1.46	1 U	2 U	8420	5 U	3 U	2 U	10 U	1 U	2320	1.23	0.1 U	10 U
	2/18/2014	1 U	1 U	1.75	1 U	2 U	9130	5 U	3 U	2 U	10 U	1 U	2560	6.11	0.1 U	10 U
	5/7/2014	1 U	1 U	1.25	1 U	2 U	6880	5 U	3 U	2 U	10 U	1 U	1950	1.09	0.1 U	10 U
	8/12/2014	1 U	1 U	3.52	1 U	2 U	22700	5 U	3 U	2 U	10 U	1 U	8150	1.42 D	0.1 U	10 U
	12/1/2014	1 U	1 U	1.56	1 U	2 U	8080	5 U	3 U	2 U	10 U	1 U	2240	1.39 D	0.1 U	10 U
	3/3/2015	1 U	1 U	1.36	1 U	2 U	7110	5 U	3 U	2 U	10 U	1 U	2020	1 U	0.1 U	10 U
	5/18/2015	1 U	1 U	1.92	1 DU	2 U	11000	5 U	3 U	2 U	10 U	1 DU	3170	1 U	0.1 U	10 U
	8/11/2015	1 U	1 U	1.42	1 U	2 U	7320	5 U	3 U	2 U	10 U	1 U	2150	1 U	0.1 U	10 U
	11/25/2015	1 U	1 U	1.42	1 U	2 U	8160	5 U	3 U	2 U	10 U	1 U	2150	1 U	0.1 U	10 U
MW-10	2/26/2010	1 U	1 U	2.71	1 U	2 U	17100	5 U	3 U	2 U	10 U	1 U	4490	1 U	0.1 U	10 U
	5/6/2010	1 U	1 U	2.2	1 U	2 U	13000	5 U	3 U	2 U	10 U	1 U	3890	1 U	0.1 U	10 U
	8/17/2010	1 U	1 U	2.25	1 U	2 U	17200	5 U	3 U	2 U	10 U	1 U	4360	1 DU	0.1 U	10 U
	11/4/2010	1 U	1 U	2.06	1 U	2 U	14200 D	5 U	3 U	2 U	10 U	1 U	4430	1 DU	0.1 U	10 U
	2/24/2011	1 U	1 U	9.41	1 U	2 U	43200	5 U	3 U	2 U	10 U	1 U	8750	1 U	0.1 U	10 U
	5/26/2011	1 U	1 U	10.1	1 U	2 U	39200	5 U	3 U	2 U	10 U	1 U	7690	1 DU	0.1 U	10 U
	8/22/2011	1 U	1 U	5.82	1 U	2 U	36800	5 U	3 U	2 U	10 U	1 U	6970	1 U	0.1 U	10 U
	11/28/2011	1 U	1 U	2.96	1 U	2 U	19400	5 U	3 U	2 U	10 U	1 U	4300	1 U	0.1 U	10 U
	2/17/2012	1 U	1 U	3.72	1 U	2 U	20200	5 U	3 U	2 U	10 U	1 U	5430	1 U	0.1 U	10 U
	5/16/2012	1 U	1 U	5.23	1 U	2 U	29500	5 U	3 U	2 U	10 U	1 U	6000	1 U	0.1 U	10 U
	8/27/2012	1 U	1 U	3.15	1 U	2 U	16500	5 U	3 U	2 U	10 U	1 U	3400	1 U	0.1 U	10 U
	11/26/2012	1 U	1 U	2.72	1 U	2 U	17000	5 U	3 U	2 U	10 U	1 U	3830	1 U	0.1 U	10 U
	2/25/2013	1 U	1 U	3.44	1 DU	2 U	21800	5 U	3 U	2 U	10 U	1 U	4870 D	1 DU	0.1 U	10 U
	6/4/2013	1 U	1 U	4.15	1 U	2 U	22100	5 U	3 U	2 U	10 U	1 U	4780	1 U	0.1 U	10 U
	8/15/2013	1 U	1 U	2.04	1 DU	2 U	13300	5 U	3 DU	2 U	10 U	1 U	3430	1 U	0.1 U	10 DU
	11/8/2013	1 U	1 U	1.8	1 U	2 U	12800	5 U	3 U	2 U	10 U	1 U	3330	1 DU	0.1 U	10 U
	2/19/2014	1 U	1 U	2.25	1 U	2 U	15300	5 U	3 U	2 U	10 U	1 U	4130	1 U	0.1 U	10 U
	5/19/2014	1 U	1 U	7.43 D	1 U	2 DU	29500	5 U	3 DU	2 U	10 U	1 U	5620	1 U	0.1 U	10 U
	8/12/2014	1 U	1 U	4.25	1 U	2 U	23200	5 U	3 U	2 U	10 U	1 U	5530	1 U	0.1 U	10 U
	12/3/2014	1 U	1 U	2.97	1 U	2 U	16600	5 U	3 U	2.07	10 U	1 U	3720	1 DU	0.1 U	10 U
	3/3/2015	1 U	1 U	3.21	1 U	2 U	20200	5 U	3 U	2 U	10 U	1 U	4590	1 U	0.1 U	10 U
	5/11/2015	1 U	1 U	3.07 D	1 U	2 U	20000	5 U	3 U	2 U	10 U	1 U	4330	1 DU	0.1 U	10 U
	8/4/2015	1 U	1 U	1.5	1 U	2 U	11900	5 U	3 U	2 U	10 U	1 U	3130	1 U	0.1 U	10 U
	12/1/2015	1 U	1 U	2.85	1 U	2 U	20100	5 U	3 U	2 U	10 U	1 U	5650	1 U	0.1 U	10 U
WAC 246-290-310		**6**	**10**	**2000**	**4**	**5**		**100**		**1300**	**300**	**15**			**2**	**100**
WAC 173-200[1]			**0.05**	**1000**		**10**		**50**		**1000**	**300**	**50**		**50**	**2**	

Pink shading indicates exceedance of one of the screening levels
Yellow shaded watere level values were collected on dates different than the sample colleciton date.
Reported metals are dissolved.
[2]WAC 173-200 metals criteria are for total metals.

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

		Dissolved Metals continued							VOCs							
Well ID	Date	Potassium ug/l	Selenium ug/l	Silver ug/l	Sodium ug/l	Thallium ug/l	Vanadium ug/l	Zinc ug/l	1,1,1,2-Tetrachloroethane ug/l	1,1,1-Trichloroethane ug/l	1,1,2,2-Tetrachloroethane ug/l	1,1,2-Trichloroethane ug/l	1,1-Dichloroethane ug/l	1,1-Dichloroethene ug/l	1,2,3-Trichloropropane ug/l	1,2-Dibromo-3-chloropropane ug/l
MW-1	3/1/2010	2000	1 U	3 U	9520	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/7/2010	1610	1 U	3 U	7700	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/25/2010	1880	1 U	3 U	7640	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/8/2010	1530	1 U	3 U	7070	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/23/2011	1210	1 U	3 U	5900	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/26/2011	930	1 U	3 U	5670	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/22/2011	1030 D	1 U	3 U	5230	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/29/2011	1190	1 U	3 U	4950	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	3/1/2012	1030	1 U	3 U	4860	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/16/2012	902	1 U	3 U	4460	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/24/2012	1250	1 U	3 U	5390	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/16/2012	1160	1 U	3 DU	4750	1 DU	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/21/2013	1190	1 U	3 U	5410 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	6/3/2013	1150	1 U	3 DU	5180	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/13/2013	1850	1 U	3 U	7340	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/8/2013	1260	1 U	3 U	5430	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/11/2014	1310	1 U	3 U	6140	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/13/2014	895	1 U	3 U	5780	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/12/2014	1190	1 U	3 U	5220	1 DU	2 DU	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/1/2014	1140	1 U	3 U	5050	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/9/2015	913	1 U	3 U	4780	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/11/2015	1240	1 U	3 U	5210	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/3/2015	1510	1 U	3 U	6050	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/2/2015	1820	1 U	3 U	9800	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
MW-2	3/31/2010	856	1 U	3 U	4900 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/6/2010	739	1 U	3 U	4360	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/24/2010	792	1 U	3 U	4360	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/2/2010	783	1 U	3 U	3770	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/24/2011	863	1 U	3 U	4420	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/27/2011	1240	1 U	3 U	6460	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/22/2011	953 D	1 U	3 U	5380	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/30/2011	882	1 U	3 U	4310	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/17/2012	998	1 U	3 U	5100	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/16/2012	884	1 U	3 U	4110	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/23/2012	1020	1 U	3 U	4360	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/16/2012	825	1 U	3 DU	3560	1 DU	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/22/2013	880	1 U	3 U	4720 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/29/2013	791	1 U	3 DU	3960	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/15/2013	779	1 U	3 U	3770	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/14/2013	774	1 U	3 U	3570	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/18/2014	674	1 U	3 U	3350	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/14/2014	1170	1 U	3 U	5470	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	9/23/2014	763	1 U	3 U	4780	1 U	2 U	4 DU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/3/2014	899	1 U	3 U	4590	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/19/2015	1070	1 U	3 U	5300	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/12/2015	827 D	1 U	3 DU	3370 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/6/2015	896	1 U	3 U	3740	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/25/2015	707	1 U	3 U	3290	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

		Dissolved Metals continued							VOCs							
Well ID	Date	Potassium ug/l	Selenium ug/l	Silver ug/l	Sodium ug/l	Thallium ug/l	Vanadium ug/l	Zinc ug/l	1,1,1,2-Tetrachloroethane ug/l	1,1,1-Trichloroethane ug/l	1,1,2,2-Tetrachloroethane ug/l	1,1,2-Trichloroethane ug/l	1,1-Dichloroethane ug/l	1,1-Dichloroethene ug/l	1,2,3-Trichloropropane ug/l	1,2-Dibromo-3-chloropropane ug/l
MW-3	2/24/2010	640	1 U	3 U	3590	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/4/2010	593	1 U	3 U	3720	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/16/2010	606	1 U	3 U	3640	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/1/2010	709	1 U	3 U	3670	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/17/2011	660	1 U	3 U	4000	1 U	2 U	4 DU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/25/2011	640	1 U	3 U	3330	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/19/2011	626 D	1 U	3 U	3070	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/21/2011	683	1 U	3 U	3500	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/28/2012	679	1 U	3 U	3710	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/14/2012	609	1 U	3 U	3270	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/23/2012	622	1 U	3 U	3160	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/15/2012	644	1 U	3 DU	3410	1 DU	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/13/2013	640	1 U	3 U	3740	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	6/10/2013	656	1 U	3 U	3560	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/16/2013	632	1 U	3 U	3580	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/5/2013	611	1 U	3 U	3790	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/13/2014	635	1 U	3 U	3660	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/21/2014	622	1 U	3 U	3360	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/12/2014	639	1 U	3 U	3180	1 DU	2 DU	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/20/2014	638	1 U	3 U	3330	1 U	2 U	4 DU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	3/3/2015	683	1 U	3 U	3480	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/11/2015	648	1 U	3 U	3520	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/6/2015	643	1 U	3 U	3430	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/1/2015	626	1 U	3 U	3330	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
MW-6A	2/26/2010	650	1 U	3 U	3700	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/12/2010	522	1 U	3 U	3160	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/17/2010	588	1 U	3 U	3620	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/4/2010	688	1 U	3 U	3880	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/17/2011	667	1 U	3 U	4060	1 U	2 U	4 DU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/26/2011	691	1 U	3 U	3930	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/22/2011	697 D	1 U	3 U	3830	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/12/2011	724	1 U	3 U	3790	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/29/2012	591	1 U	3 U	3590	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/15/2012	581	1 U	3 U	3370	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/27/2012	636	1 U	3 U	3450	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/26/2012	614	1 U	3 U	3410	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/22/2013	696	1 U	3 U	3810 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	6/11/2013	640	1 U	3 U	3850	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/6/2013	770	1 U	3 U	4130	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/4/2013	642	1 U	3 U	4050	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/10/2014	631	1 U	3 U	3790	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/19/2014	622	1 U	3 DU	3530	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/11/2014	651	1 U	3 U	3560	1 DU	2 DU	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/1/2014	679	1 U	3 U	3500	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	3/3/2015	660	1 U	3 U	3470	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/18/2015	503 D	1 U	3 DU	3230 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/11/2015	651	1 U	3 U	3470	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/1/2015	655	1 U	3 U	3700	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U

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Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

		Dissolved Metals continued							VOCs							
Well ID	Date	Potassium ug/l	Selenium ug/l	Silver ug/l	Sodium ug/l	Thallium ug/l	Vanadium ug/l	Zinc ug/l	1,1,1,2-Tetrachloroethane ug/l	1,1,1-Trichloroethane ug/l	1,1,2,2-Tetrachloroethane ug/l	1,1,2-Trichloroethane ug/l	1,1-Dichloroethane ug/l	1,1-Dichloroethene ug/l	1,2,3-Trichloropropane ug/l	1,2-Dibromo-3-chloropropane ug/l
MW-9	2/25/2010	814	1 U	3 U	4060	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/6/2010	950	1 U	3 U	4940	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/24/2010	972	1 U	3 U	4200	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/2/2010	941	1 U	3 U	3730	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/18/2011	588	1 U	3 U	2940	1 U	2 U	4 DU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/27/2011	764	1 U	3 U	2610	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/24/2011	1120 D	1 U	3 U	3030	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/16/2011	873	1 U	3 U	4170	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/17/2012	731	1 U	3 U	3600	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/15/2012	566	1 U	3 U	2680	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/24/2012	1140	1 U	3 U	4170	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/6/2012	621	1 U	3 U	2920	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/21/2013	710	1 U	3 U	3610 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	6/4/2013	807	1 U	3 DU	3910	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/13/2013	718	1 U	3 U	3210	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/14/2013	742	1 U	3 U	3870	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/18/2014	728	1 U	3 U	4100	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/7/2014	610	1 U	3 U	3650	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/12/2014	1070	1 U	3 U	3680	1 DU	2 DU	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/1/2014	718	1 U	3 U	3390	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	3/3/2015	663	1 U	3 U	3290	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/18/2015	694 D	1 U	3 DU	3660 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/11/2015	692	1 U	3 U	2950	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/25/2015	635	1 U	3 U	3580	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
MW-10	2/26/2010	2040	1 U	3 U	5520	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/6/2010	1780	1 U	3 U	5070	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/17/2010	1460	1 U	3 U	5540	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/4/2010	1290	1 U	3 U	4530	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/24/2011	6140	1 U	3 U	13000	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/26/2011	7750	1 U	3 U	9860	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/22/2011	3690 D	1 U	3 U	6810	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/28/2011	2890	1 U	3 U	5000	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/17/2012	2920	1 U	3 U	6050	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/16/2012	4010	1 U	3 U	7960	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/27/2012	3390	1 U	3 U	4830	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/26/2012	2430	1 U	3 U	4450	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/25/2013	2670	1 U	3 U	6020 D	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	6/4/2013	3510	1 U	3 DU	6770	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/15/2013	2070	1 U	3 U	4630	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	11/8/2013	1780	1 U	3 U	4090	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	2/19/2014	1800	1 U	3 U	4630	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/19/2014	6510	1 U	3 DU	8440	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/12/2014	3540	1 U	3 U	6550	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/3/2014	2810	1 U	3 U	4480	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	3/3/2015	2420	1 U	3 U	5630	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	5/11/2015	2570	1 U	3 U	5560	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	8/4/2015	1410	1 U	3 U	3950	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
	12/1/2015	1740	1 U	3 U	4920	1 U	2 U	4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U
WAC 246-290-310			**50**		**20000**	**2**				**200**		**5**		**7**		**0.2**
WAC 173-200[1]			**10**	**50**				**5000**		**200**			**1**			

Pink shading indicates exceedance of one of the screening levels
Yellow shaded watere level values were collected on dates different than the sample colleciton date.
Reported metals are dissolved.
[2]WAC 173-200 metals criteria are for total metals.

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued													
		1,2-Dibromoethane (EDB) ug/l	1,2-Dichlorobenzene ug/l	1,2-Dichloroethane (EDC) ug/l	1,2-Dichloropropane ug/l	1,4-Dichloro-2-Butene ug/l	1,4-Dichlorobenzene ug/l	2-Butanone ug/l	2-Hexanone ug/l	4-Methyl-2-pentanone ug/l	Acetone ug/l	Acrylonitrile ug/l	Benzene ug/l	Bromochloromethane ug/l	Bromodichloromethane ug/l
MW-1	3/1/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/7/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/25/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/8/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/23/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/29/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	3/1/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	6.73	0.07 U	0.2 U	0.2 U	0.2 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/24/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/21/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	6/3/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.31	0.07 U	0.2 U	0.2 U	0.2 U
	8/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	5.63	0.07 U	0.2 U	0.2 U	0.2 U
	11/8/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/11/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/13/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/9/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/2/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
MW-2	3/31/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/2/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	8.92	0.07 U	0.2 U	0.2 U	0.2 U
	2/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/27/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/30/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	6.2	0.07 U	0.2 U	0.2 U	0.2 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.36	0.07 U	0.2 U	0.2 U	0.2 U
	8/23/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/22/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/29/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/15/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	6.19	0.07 U	0.2 U	0.2 U	0.2 U
	11/14/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/18/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 T	0.07 U	0.2 U	0.2 U	0.2 U
	5/14/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	9/23/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/3/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/19/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	8.5 T	0.07 U	0.2 U	0.2 U	0.2 U
	5/12/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/6/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/25/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued													
		1,2-Dibromoethane (EDB) ug/l	1,2-Dichlorobenzene ug/l	1,2-Dichloroethane (EDC) ug/l	1,2-Dichloropropane ug/l	1,4-Dichloro-2-Butene ug/l	1,4-Dichlorobenzene ug/l	2-Butanone ug/l	2-Hexanone ug/l	4-Methyl-2-pentanone ug/l	Acetone ug/l	Acrylonitrile ug/l	Benzene ug/l	Bromochloromethane ug/l	Bromodichloromethane ug/l
MW-3	2/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/16/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/1/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/17/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/25/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/19/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/21/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/28/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.05	0.07 U	0.2 U	0.2 U	0.2 U
	5/14/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/23/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 LU	0.07 U	0.2 U	0.2 U	0.2 U
	11/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	6/10/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/16/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/5/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/13/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/21/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 GU	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/20/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/6/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
MW-6A	2/26/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/12/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/17/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/17/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/12/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/29/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	10	0.07 U	0.2 U	0.2 U	0.2 U
	5/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.02	0.07 U	0.2 U	0.2 U	0.2 U
	8/27/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/26/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/22/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	6/11/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/6/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.47 B	0.07 U	0.2 U	0.2 U	0.2 U
	2/10/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 GU	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/11/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/18/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued													
		1,2-Dibromoethane (EDB) ug/l	1,2-Dichlorobenzene ug/l	1,2-Dichloroethane (EDC) ug/l	1,2-Dichloropropane ug/l	1,4-Dichloro-2-Butene ug/l	1,4-Dichlorobenzene ug/l	2-Butanone ug/l	2-Hexanone ug/l	4-Methyl-2-pentanone ug/l	Acetone ug/l	Acrylonitrile ug/l	Benzene ug/l	Bromochloromethane ug/l	Bromodichloromethane ug/l
MW-9	2/25/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/2/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.46	0.07 U	0.2 U	0.2 U	0.2 U
	2/18/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/27/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/16/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.95	0.07 U	0.2 U	0.2 U	0.2 U
	5/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	6.31	0.07 U	0.2 U	0.2 U	0.2 U
	8/24/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/6/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/21/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	6/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	6.18	0.07 U	0.2 U	0.2 U	0.2 U
	11/14/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/18/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/7/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/18/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/25/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
MW-10	2/26/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/17/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.19 B	0.07 U	0.2 U	0.2 U	0.2 U
	2/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/28/2011	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4.82	0.07 U	0.2 U	0.2 U	0.2 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/27/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/26/2012	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/25/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	6/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/15/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	11/8/2013	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	2/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	12/3/2014	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	8/4/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	6.1 T	0.07 U	0.2 U	0.2 U	0.2 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	100 U	0.2 U	4 U	4 U	4 U	4 U	0.07 U	0.2 U	0.2 U	0.2 U
	WAC 246-290-310	**0.05**	**600**	**5**	**5**		**75**						**5**		**80**
	WAC 173-200[1]	**0.001**		**0.5**	**0.6**		**4**					**0.07**	**1**		**0.3**

Pink shading indicates exceedance of one of the screening levels

Yellow shaded watere level values were collected on dates different than the sample colleciton date.

Reported metals are dissolved.

[2]WAC 173-200 metals criteria are for total metals.

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued												
		Bromoform	Bromomethane	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene (DCE)	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MW-1	3/1/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.28 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/7/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/25/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/8/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.28 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/23/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/29/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	3/1/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/24/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/21/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	6/3/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/8/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/11/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 GU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/13/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/9/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/2/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-2	3/31/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 T
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 T
	8/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.25 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/2/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.53	0.2 U	0.2 U	0.2 U	0.2 U	0.26 T
	2/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/27/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 T
	11/30/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/23/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/22/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/29/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/15/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/14/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/18/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/14/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	9/23/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/3/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/19/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/12/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/6/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.34 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/25/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 GU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued												
		Bromoform	Bromomethane	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene (DCE)	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MW-3	2/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.23 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/16/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/1/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/17/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/25/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/19/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/21/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/28/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/14/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/23/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	6/10/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/16/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/5/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/13/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/21/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/20/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/6/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-6A	2/26/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/12/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/17/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/17/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/12/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/29/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/27/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/26/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/22/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	6/11/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/6/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/10/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 GU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/11/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/18/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 GU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued												
		Bromoform	Bromomethane	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene (DCE)	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MW-9	2/25/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.24 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3 T
	11/2/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.482	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/18/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/27/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/16/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/24/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/6/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/21/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	6/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/14/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/18/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/7/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/18/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 GU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/25/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 GU	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
MW-10	2/26/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/17/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/28/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/27/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/26/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/25/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	6/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/15/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	11/8/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	2/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/3/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	8/4/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
WAC 246-290-310		**80**			**5**	**100**		**80**		**70**		**80**		
WAC 173-200[1]		**5**			**0.3**			**7**				**0.5**		

Pink shading indicates exceedance of one of the screening levels
Yellow shaded watere level values were collected on dates different than the sample colleciton date.
Reported metals are dissolved.
[2]WAC 173-200 metals criteria are for total metals.

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued												
		Ethylbenzene ug/l	Methylene Chloride ug/l	Methyliodide ug/l	Styrene ug/l	o-Xylene ug/l	Tetrachloroethene (PCE) ug/l	Toluene ug/l	trans-1,2-Dichloroethene ug/l	trans-1,3-Dichloropropene ug/l	Trichloroethene (TCE) ug/l	Trichlorofluoromethane ug/l	Vinyl Acetate ug/l	Vinyl Chloride ug/l
MW-1	3/1/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.0232
	5/7/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/25/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/8/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/23/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/29/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	3/1/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/24/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/21/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	6/3/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/8/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/11/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 GU	0.02 U
	5/13/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/9/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/2/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.0399
MW-2	3/31/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/2/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/27/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/30/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/23/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/22/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/29/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/15/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/14/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/18/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/14/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	9/23/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/3/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/19/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/12/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/6/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/25/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 GU

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued												
		Ethylbenzene	Methylene Chloride	Methyliodide	Styrene	o-Xylene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene (TCE)	Trichlorofluoromethane	Vinyl Acetate	Vinyl Chloride
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MW-3	2/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/16/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/1/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/17/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/25/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/19/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/21/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/28/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/14/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/23/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	6/10/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/16/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/5/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/13/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/21/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/20/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/6/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
MW-6A	2/26/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/12/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/17/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/17/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/12/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/29/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/27/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/26/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/22/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	6/11/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/6/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/10/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/11/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/18/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U

Appendix B - Groundwater Analytical Data, 2010-2015

Project No. 090057-530.4.1, Enumclaw Landfill, King County, WA

Well ID	Date	VOCs continued												
		Ethylbenzene	Methylene Chloride	Methyliodide	Styrene	o-Xylene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene (TCE)	Trichlorofluoromethane	Vinyl Acetate	Vinyl Chloride
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MW-9	2/25/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/24/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/2/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/18/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/27/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/16/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/15/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/24/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/6/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/21/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	6/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/13/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/14/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/18/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/7/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/1/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/18/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/25/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 GU
MW-10	2/26/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/6/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/17/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/4/2010	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/24/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/26/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/22/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/28/2011	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/17/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/16/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/27/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/26/2012	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/25/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	6/4/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/15/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	11/8/2013	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	2/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/19/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/12/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/3/2014	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	3/3/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	5/11/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	8/4/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	12/1/2015	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.02 U
	WAC 246-290-310	**700**	**5**		**100**		**5**	**1000**	**100**		**5**			**2**
	WAC 173-200[1]		**5**				**0.8**				**3**			**0.02**

Pink shading indicates exceedance of one of the screening levels
Yellow shaded watere level values were collected on dates different than the sample colleciton date.
Reported metals are dissolved.
[2]WAC 173-200 metals criteria are for total metals.

APPENDIX C

Groundwater Quality Statistical Data Outputs (raw data on CD)

C. Statistical Analyses Methods and ProUCL Outputs

Based on Groundwater Monitoring Requirements (WAC 173-304-490), Post-Closure Termination Requirements (Ecology 2011, 2013), and a request by Ecology in their 2010 opinion letter, a statistical procedure was used to determine whether a statistically significant change in groundwater quality compared to background conditions has occurred. The statistical analyses performed on the groundwater quality data includes: Normality and Goodness-of-fit, Dixon's Outlier, Time-Series Plots, Thiel-Sen's Slope Estimator Plots, Mann-Kendall Tests, and Mann-Whitney Tests.

As discussed in Section 3.3 (main report), groundwater flow in the aquifer in the vicinity of the landfill is towards the west-southwest at the eastern edge of the landfill and toward the northwest at the western edge of the landfill. Therefore, MW-3 is evaluated as the upgradient (background) monitoring well. Monitoring wells MW-2, MW-9, and MW-10 are considered downgradient, and MW-1 and MW-6a are cross-gradient monitoring wells. For the statistical analyses, all were treated as downgradient wells from the landfill.

Statistical analyses of the groundwater quality data were performed using the software program ProUCL version 5.0.00 (EPA, 2013) and WQStat Plus™ v.9.0.34 (Sanitas Technologies, 2010). Normality testing and Dixon's Outlier, Thiel-Sen's Slope Estimator, and Mann-Kendall tests were performed in ProUCL, while analysis of variance (ANOVA) tests were performed in WQStat Plus™.

C.1 Goodness-of-Fit

The data was evaluated for goodness-of-fit using Q-Q plots for normal, lognormal, and gamma distribution. Nondetects were not included in this evaluation. The resulting Q-Q plots, including goodness-of-fit test statistics are included in this appendix. The majority of the datasets are neither normally nor log-normally distributed. Therefore, nonparametric methods were used to perform the statistical analyses.

C.2 Dixon's Outlier

Dixon's Outlier test was used to determine if there were any results that were potentially statistically distinct from the population represented by the remainder of the dataset. Each combination of analyte and well was evaluated for outliers. Several statistically significant outliers were identified in the dataset. Box plots (Figure 17 of the main text) were also generated to visually evaluate outliers.

C.3 Time-Series Plots

Time-series plots were generated for the entire 2010–2015 dataset. Time-series plots for the last eight sample events are provided on Figure 18 of the main text for select analyzed general chemistry, dissolved metals, and vinyl chloride constituents for all of the landfill monitoring wells. Non-detect values were plotted as one-half of the laboratory reporting limit.

C.4 Thiel-Sen's Slope Estimator Plots and Mann-Kendall Tests

Sen's Slope Estimator computes a linear trend, if present, by calculating the median slope between all the pairwise combinations of results. The slope is evaluated to determine if the trend of a particular water quality constituent concentration is increasing, decreasing, or zero (no change) over time. This method of estimating the slope is not greatly affected by gross data errors or outliers and can be computed when data is missing. The Mann-Kendall Test is an additional test used to determine whether or not a trend is statistically significant (at a specific confidence level—herein, that confidence level is 95 percent, as stated on the ProUCL data sheets).

The Thiel-Sen's Slope and Mann-Kendall test results are summarized in Table 5 of the main text.

In order to evaluate the trends as potential indicators of landfill impacts, the trends must be compared to the upgradient (background) monitoring well (MW-3).

If similar trends and slopes are observed in both the upgradient and the downgradient wells, then the observed trends are likely a result of general climatic or environmental conditions. However, if contrasting trends or statistically significantly different slopes are observed between the upgradient and downgradient wells, then the observed trends may indicate groundwater quality impacts from the landfill.

Two-Sample Tests

Two-sample tests were used to compare upgradient and downgradient groundwater quality and to determine if statistically significant differences exist (WAC 173-304-490). A one-sided, nonparametric ANOVA test was used to compare the median values between two sample groups in order to determine if there is a statistically significant difference between the groups (i.e., upgradient well MW-3 compared to grouped downgradient monitoring wells).

The test results are interpreted by comparing the contrast table to identify individual wells that may statistically exceed the background water quality. A five-percent significance level was used to determine statistically significant differences between the upgradient (background) well and the grouped downgradient wells. Table 6 in the main text presents the results of the ANOVA.

References

Washington State Department of Ecology (Ecology), 2010, Letter Re.: Comments and recommendations related to post-closure monitoring changes at the Enumclaw Landfill.

Washington State Department of Ecology (Ecology), 2011, Preparing for Termination of Post-Closure Activities at Landfill Closed Under WAC Chapter 173-304.

Washington State Department of Ecology (Ecology), 2013, Addendum to "Preparing for Termination of Post-Closure Activities at Landfills Closer Under WAC Chapter 173-304, January 2013.

Sanitas Technologies, 2010, WQStat Plus™ v.9.0.34.

U.S. Environmental Protection Agency (EPA), 2013, ProUCL version 5.0, September 2013.

APPENDIX D

Select Regional Well Information:

- Boise Spring and Watercress Springs -- Groundwater Quality Data Summary 2009-Present (on CD)
- Select Boring Logs

Ecology Well Log ID: 95552

20/07-18 M

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) **OWNER:** Name Mike Stanley Address 32135-32nd SW Federal Way, Wa. 98023

(2) **LOCATION OF WELL:** County King — NW ¼ SW ¼ Sec. 18 T. 20 N., R. 7E W.M.

Bearing and distance from section or subdivision corner

(3) **PROPOSED USE:** Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) **TYPE OF WORK:** Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 6 inches.
Drilled 79 ft. Depth of completed well 79 ft.

(6) **CONSTRUCTION DETAILS:**

Casing installed: 6 " Diam. from 0 ft. to 79 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) **PUMP:** Manufacturer's Name
Type: H.P.

(8) **WATER LEVELS:** Land-surface elevation above mean sea level .... ft.
Static level 27 ft. below top of well Date 9-11-84
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Baller test 20 gal./min. with 2 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date 9-11-84
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) **WELL LOG:**

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Surface soil	0	2
Brown clay some gravel	2	9
Silty grey sand some grey clay & gravels	9	67
Brown sand & gravel	67	79

Work started 9-11, 19 84 Completed 9-11, 19 84

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson Well Drilling Co.
(Person, firm, or corporation) (Type or print)

Address P.O. Box 44427 Tacoma, Wa. 98444

[Signed] JAN 11 1985
(Well Driller)

License No. 0419 Date 11-12, 19 84

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Ecology Well Log ID: 190727

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original with Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

ENTERED

Notice of Intent No. W108041
UNIQUE Well I.D.# AFA-736
Water Right Permit No. 20-7E-18L 9302

(1) OWNER: Name Olson Farms Address 42827 282nd Ave SE, Enumclaw

(2) LOCATION OF WELL: County King NE 1/4 SW 1/4 Sec 18 T 20 N.R. 7E WM

(2a) STREET ADDRESS OF WELL: (or nearest address) 28213 SE 424th, Enumclaw

TAX PARCEL NO.: 182007-9009

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☒ Irrigation ☐ Test Well ☐ Other ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) ____
☒ New Well Method: ☐ Dug ☐ Bored ☐ Deepened ☐ Cable ☐ Driven ☐ Reconditioned ☒ Rotary ☐ Jetted ☐ Decommission

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 120 feet. Depth of completed well 105 ft.

(6) CONSTRUCTION DETAILS
Casing Installed:
☒ Welded 6" Diam. from 0 ft. to 105 ft.
☐ Liner installed " Diam. from ft. to ft.
☐ Threaded " Diam. from ft. to ft.

Perforations: ☐ Yes ☒ No
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.

Screens: ☐ Yes ☒ No ☐ K-Pac Location
Manufacturer's Name
Type Model No.
Diam. Slot Size from ft. to ft.
Diam. Slot Size from ft. to ft.

Gravel/Filter packed: ☐ Yes ☒ No ☐ Size of gravel/sand
Material placed from ft. to ft.

Surface seal: ☒ Yes ☐ No To what depth? 18 ft.
Material used in seal bentonite
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 70 ft. below top of well Date 6-24-99
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest 7 gal./min. with 25 ft. drawdown after 2 1/2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered.

MATERIAL	FROM	TO
Surface	0	3
Brown gravel - loam	3	8
Brown hardpan	8	23
Tan hardpan	23	75
Gray sand - gravel - water	75	105
Basalt	105	110
Gray hardpan gravel	110	120

RECEIVED
JUL 2 1999
DEPT OF ECOLOGY

Work Started 6-17-99 Completed 6-24-99

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Brad Johnson License No. 0233
(Licensed Driller/Engineer)

Trainee Name License No.
Drilling Company Johnson Drilling Co, Inc
(Signed) License No. 0233 9805
(Licensed Driller/Engineer)
Address 19415 108th Ave SE, Renton, WA
Contractor's Registration No JOHNSDC207QM Date 6-24-99

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6600. The TDD number is (360) 407-6006.

ECY 050-1-20 (11/98)

PC Johnson Well 2

Ecology Well Log ID: 89443

20/07/18L

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. ....

Permit No. ....

(1) OWNER: Name CITY OF ENUMCLAW Address 1339 GRIFFIN ENUMCLAW WA. 98022

(2) LOCATION OF WELL: County KING NE ¼ SW ¼ Sec 18 T 20 N., R 7E W.M.

Bearing and distance from section or subdivision corner APPROX 2500'E AND 2500'N OF SW COR SEC 18

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) PC JOHNSON WELL 2
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 16 inches.
Drilled 229 ft. Depth of completed well 227.2 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 16 " Diam. from +2.3 ft. to 203.2 ft.
Threaded ☐ ." Diam. from ft. to ft.
Welded ☒ ." Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name JOHNSON
Type S.S. WATERMARK Model No.
Diam. 14 P.S Slot size .125 from 203.6 ft. to 224 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 50 ft.
Material used in seal NEAT CEMENT
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name N.A.
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level APPROX 745' ft.
Static level 42.65 ft. below top of well Date 4/11/86
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level ROBINSON & NOBLE
Was a pump test made? Yes ☒ No ☐ If yes, by whom?
Yield: 1500 gal./min. with 95.05 ft. drawdown after 24 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
0	95.05	12	58.2	1533	44.23
1.2 MIN	68.45	30.5	56.1	1738	43.95
5	61.35	180	50.3		

Date of test 4/11-12/86
Baller test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 49 Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
ALTERNATE LAYERS OF GRAY & BROWN CLAY WITH GRAVEL, WATER AT 23, 37, AND 45'.	0	58
BROWN AND GRAY CLAY WITH ANGULAR GRAVEL.	58	83
GRAY VOLCANIC ASH, BROWN & GRAY CLAY WITH GRAVEL.	83	105
BROWN SAND, GRAVEL, WITH LAYERS OF BROWN CLAY.	105	116
GREEN, GRAY AND BROWN CLAY WITH ANGULAR GRAVEL.	116	140
BROWN SAND AND GRAVEL, W.B.	140	156
GREEN SILTY CLAY AND GRAVEL.	156	163
GREEN, GRAY, AND BROWN SAND AND GRAVEL.	163	170
GREEN SILTY CLAY BOUND GRAVEL.	170	193
BROWN SAND AND GRAVEL, W.B.	193	198
GREEN SILTY CLAY BOUND GRAVEL	198	205
BROWN SAND AND GRAVEL, W.B.	205	210
GREEN SAND AND GRAVEL, W.B.	210	213
BROWN SAND AND GRAVEL, W.B.	213	228
YELLOW, GRAY AND BROWN CLAY WITH GRAVEL AND BOULDERS.	228	229

RECEIVED
MAY 21 1986

PREPARED BY: DEPARTMENT OF ECOLOGY
NORTHWEST REGION
ROBINSON & NOBLE, INC.

MBS

Work started FEB 24, 1986 Completed APRIL 17, 1986

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HOLT DRILLING
(Person, firm, or corporation) (Type or print)

Address 1215 32nd Street East

[Signed] Randy Holt
(Well Driller)

License No. 1099 Date 5-19, 1986

ORIGINAL SIGNED BY DRILLER

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

PC Johnson Well 3

Ecology Well Log ID: 190239

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

ENTERED

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. W072125

UNIQUE WELL I.D. # ACS 963

Water Right Permit No. 20-7E-18L

(1) OWNER: Name City of Enumclaw Address 1309 Myrtle Ave

(2) LOCATION OF WELL: County King NE 1/4 SW 1/4 Sec 18 T. 20 N.R. 7 E. W.M.

(2a) STREET ADDRESS OF WELL (or nearest address) PC Johnson Well 424 ft & 284 ft

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☒ ☐ Irrigation ☐ Test Well ☐ Other ☐ ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (If more than one) PC Johnson #1

Abandoned ☐ New well ☒ Method: Dug ☐ Bored ☐ Deepened ☐ Cable ☒ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 16" inches. Drilled 230 feet. Depth of completed well 229 ft.

(6) CONSTRUCTION DETAILS:

Casing Installed: 16" Diam. from +2 ft. to 196 ft.
Welded ☒ Liner installed ☐ Threaded ☐ " Diam. from ft. to ft.
" Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type 304 Stainless Model No.
Diam. 14 Slot size 125 from 225 ft. to 195 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 55 ft.
Material used in seal Cement Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 42 ft. below top of well Date
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? Holt
Yield: 820 gal./min. with 121 ft. drawdown after 24 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
Brown silty gravels	0	15
Gray silty gravels	15	24
Brown silty gravels	24	32
Brown silty gravels and sand weeping water	32	73
Brown silty gravel cobbles	73	174
Gray gravelly silty clay	174	181
Brown sand & gravel Cobbles Some silt water	181	230

RECEIVED
JUN 14 1999
DEPT OF ECOLOGY

AUG 13 1997

Work Started 4-29-97 19. Completed 7-10 19 97

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Holt Drilling Inc (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 10621 Todd Rd E

(Signed) (WELL DRILLER) License No. 1099

Contractor's Registration No. HOLDI*136CG Date 8-6-97 19

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (206) 407-6600. The TDD number is (206) 407-6006.

ECY 050-1-20 (9/93)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

PC Johnson Well 1

Ecology Well Log ID: 98526

20/07-18 M

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Town of Enumclaw Address c/o Hart-Crowser

(2) LOCATION OF WELL: County KING — NW ¼ SW ¼ Sec 18 T 20N N., R 7E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 12" to 8" inches.
Drilled 230'6" ft. Depth of completed well 230'6" ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12" Diam. from 0 ft. to 104'8"
Threaded ☐ 8" Diam. from 104'8" ft. to 230'6"
Welded ☒ ..." Diam. from ... ft. to ... ft.

Perforations: Yes ☐ No ☒
Type of perforator used ....
SIZE of perforations ... in. by ... in.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.

Screens: Yes ☒ No ☐ Johnson
Manufacturer's Name ....
Type stainless steel Model No. ....
20'of Diam. 8" Slot size 150 from 171' ft. to 230' ft.
& extens) Diam. ... Slot size ... from ... ft. to ... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ....
Gravel placed from ... ft. to ... ft.

Surface seal: Yes ☒ No ☐ To what depth? 18' ft.
Material used in seal Bentonite 500 lbs.
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ... Depth of strata ....
Method of sealing strata off ....

(7) PUMP: Manufacturer's Name ....
Type: ... H.P. ....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 42'6" ft. below top of well Date ....
Artesian pressure ... lbs. per square inch Date ....
Artesian water is controlled by ... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? H.P.D. co.
Yield: ... gal./min. with ... ft. drawdown after ... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ....
Bailer test 60 gal./min. with -0- ft. drawdown after 1½ hrs.
Artesian flow ... g.p.m. Date ....
Temperature of water ... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Brown & gray silty gravely-sand	0	72
Color changing to silty gray	72	77
Less muddy here, still hard	77	83
Gray clay binder, gravel	83	88'6"
Brown color here, hard grvl.	88'6"	103
Boulders, stopped at 104'8"	103'	104'8"
*NW DRILLING CO. ROTERY RIG		
NW drilled through 30" boulder, then into material approx. the same as above material to 230'7" then hit bed rock. Drilled to 234' and quit. Harbor Pump installed screen and developed well, filled well up to 230'6".		
		230'6"

Work started June 12, 19 80 Completed July 30, 19 80

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HARBOR PUMP & DRILLING CO., INC.
(Person, firm, or corporation) (Type or print)

Address 11302 Burnham Dr. NW Gig Harbor, WA

[Signed] Jim N Miller By: P. Mille
(Well Driller)

License No. 223-01-8455 #0311 Date Jan. 12, 19 81

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Ecology Well Log ID: 427209

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

FILE: ORIG. & FIRST COPY - DEPT. OF ECOLOGY
SECOND COPY - OWNER; THIRD COPY - DRILLER

WATER WELL REPORT
STATE OF WASHINGTON

START CARD NO. **W183666**
UNIQUE WELL ID **AKP699**
WATER RIGHT PERMIT NO.

1865 78

(1) OWNER NAME: **DEL EATON** ADDRESS: **42724 238TH AVE. S. ENUMCLAW WA. 98022**

(2) LOCATION OF WELL : County **KING** **NW** 1/4 **SE** 1/4 SEC **18** TWP **20N** R **7E**

(2a) STREET ADDRESS OF WELL (or nearest address): **42718 284TH AVE. S.E. ENUMCLAW WA.**

(3) PROPOSED USE: **DOMESTIC**
(4) TYPE OF WORK: **NEW WELL**
METHOD: **ROTARY**

(5) DIMENSIONS: Diameter of well **6** inches.
Drilled **128'-6"** feet. Depth of completed well **127'-6"** ft.

(6) CONSTRUCTION DETAILS
Casing instld: **6** " Diam. From **+1** ft. to **127'-6"** ft.
Welded ☑ " Diam. From ft. to ft.
Liner ☐ " Diam. From ft. to ft.
Threaded ☐

Perforations: Yes ☐ No ☑
Type of perforator used
Size of perforations in. by in.
perforations from ft. to in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes ☐ No ☑
Manufacturer's Name:
Type Model No.
Diam Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed Yes ☐ No ☑ Size of gravel?
Gravel packed from ft. to ft.

Surface seal: Yes ☑ No ☐ To what depth? **18** ft.
Material used in seal **BENTONITE CHIPS**
Did any strata contain unusable water? Yes ☐ No ☑
Type of water? Depth of Strata ft.
Method of sealling strata off

(7) PUMP: Manufacturer's Name
Type H. P.

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level **32'-5"** below top of well Date **11/18/04**
Artesian pressure lbs Per sq. in. Date
Artesian pressure is controlled by

(9) WELL TESTS: Pump test made? By Whom
Yield gal./min with ft. drawdown after hrs.
Yield gal./min with ft. drawdown after hrs.
Yield gal /min with ft. drawdown after hrs.
Recovery data:
Time Wtr Lvl. Time Wtr Lvl. Time Wtr Lvl.

Date of test:
Bailer test **10** gal./min with ft. drawdown after hrs.
Airtest **6-8** gal/min stem set at **125** ft for **1** hrs.
Artesion flow gal/min Date
Temperature of water Was chemical analysis made? **NO**

(10) WELL LOG OR DECOMMISSIONING PROCEDURE DESCRIPTION

MATERIAL	FROM	TO
BROWN SILTY CLAY W/GRAVELS	0	6
BROWN SILTY SAND, GRAVELS	6	67
GREY SILTY SAND, GRAVELS	67	106
BROWN SILTY SAND, GRAVELS, WATER	106	128

RECEIVED
DEC 14 2005
Washington State
Department of Ecology

Work Started 11/15/04 Completed: 11/18/04

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Name: **RICHARDSON WELL DRILLING COMPANY INC.**
Address: **P. O. BOX 44427 TACOMA, WA 98444**

(Signed) _____ Lic No. **2688T**
(Well Driller)
Contractor's Registration No. **RICHAW*3210B** DATE **11/26/04**

Ecology Well Log ID: 377606

20-7E-19D

WATER WELL REPORT

ECOLOGY Original & 1st copy Ecology, 2nd copy owner, 3rd copy driller

Construction/Decommission (x in circle) 147503
- (X) Construction
- ( ) Decommission *ORIGINAL CONSTRUCTION Notice of Intent Number* _____

CURRENT Notice of Intent No W159519

Unique Ecology Well ID Tag No AKW 127

Water Right Permit No N/A

Property Owner Name DAVID MOULDEN

Well Street Address 43525-278TH AVE S.

City ENUMCLAW County KING

Location NW 1/4- 1/4 NW 1/4 Sec 19 Twn 20N R 7E EWM or WWM (circle one)

Lat/Long (s,t,r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No 192007-9034

PROPOSED USE (X) Domestic ( ) Industrial ( ) Municipal ( ) DeWater ( ) Irrigation ( ) Test Well ( ) Other _____

TYPE OF WORK Owner's number of well (if more than one) _____
(X) New Well ( ) Reconditioned *Method* ( ) Dug ( ) Bored ( ) Driven ( ) Deepened ( ) Cable (X) Rotary ( ) Jetted

DIMENSIONS Diameter of well 6 inches, drilled 58 ft
Depth of completed well 57 ft

CONSTRUCTION DETAILS
Casing Installed (X) Welded 6" Diam from +3 ft to 0 ft
( ) Liner installed _____" Diam from 0 ft to 37 ft
( ) Threaded _____" Diam from _____ ft to _____ ft

Perforations ( ) Yes (X) No
Type of perforator used _____
SIZE of perfs _____ in by _____ in and no of perfs _____ from _____ ft to _____ ft

Screens ( ) Yes (X) No ( ) K Pac Location _____
Manufacturer's Name _____
Type _____ Model No _____
Diam _____ Slot Size _____ from _____ ft to _____ ft
Diam _____ Slot Size _____ from _____ ft to _____ ft

Gravel/Filter packed ( ) Yes (X) No ( ) Size of gravel/sand _____
Materials placed from _____ ft to _____ ft

Surface Seal (X) Yes ( ) No To what depth? 19 ft
Materials used in seal Bentonite
Did any strata contain unusable water? ( ) Yes (X) No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP Manufacturer's Name _____
Type _____ H P _____

WATER LEVELS Land surface elevation above mean sea level _____ ft
Static level 25 ft below top of well Date 10-11-03
Artesian pressure _____ lbs per square inch Date _____
Artesian water is controlled by _____ (cap valve etc)

WELL TESTS Drawdown is amount water level is lowered below static level
Was a pump test made? ( ) Yes ( ) No If yes by whom? _____
Yield _____ gal/min with _____ ft drawdown after _____ hrs
Yield _____ gal/min with _____ ft drawdown after _____ hrs
Yield _____ gal/min with _____ ft drawdown after _____ hrs
Recovery data (time taken as zero when pump turned off)(water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal/min with _____ ft drawdown after _____ hrs
Airtest 15+ gal/min with stem set at 55 ft for 1 hrs
Artesian flow _____ g p m Date _____
Temperature of water _____ Was a chemical analysis made? ( ) Yes ( ) No

CONSTRUCTION OR DECOMMISSION PROCEDURE
Formation Describe by color character size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information Indicate all water encountered (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
dk brn silty topsoil	0	2
dk grey silty gravel	2	40
dk grey clay	40	52
dk grey silty small gravels wet	52	55
med brn sand gravel water Bearing	55	58

RECEIVED
APR 16 2004
DEPT OF ECOLOGY

Start Date 10-11-03 Completed Date 10-11-03

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

(X) Driller ( ) Engineer ( ) Trainee Name (Print) Thomas Crane

Driller/Engineer/Trainee Signature Thomas M. Crane

Driller or Trainee License No 2404

Drilling Company HOLT Drilling

Address 10621 Todd Rd E

City, State, Zip Puyallup WA 98372

Contractor's Registration No HOLTDI*136 OG Date 10-14-03

If trainee, licensed driller's Signature and License no _____

Ecology is an Equal Opportunity Employer ECY 050 1-20 (Rev 4/01)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Watercress Springs Well Ecology Well Log ID: 490768

20-7E 19D

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)* 269087

☒ Construction

○ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

CURRENT
Notice of Intent No. W 238924

Unique Ecology Well ID Tag No. ALK 139

Water Right Permit No. G1-9339C/6894-A

Property Owner Name City of Enumclaw

Well Street Address 28014 SE 440th St

City Enumclaw County King

Location NW 1/4-1/4 NW 1/4 Sec 19 Twn 20 R 7E EWM or WWM (circle one)

Lat/Long (s, t, r Still **REQUIRED**) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 1920079028

PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 24 inches, drilled 52 ft. Depth of completed well 50' ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 20" Diam. from +2 ft. to 20 ft. ☐ Liner installed _____" Diam. from _____ ft. to _____ ft. ☐ Threaded _____" Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ☒ Yes ☐ No ☒ K-Pac Location _____

Manufacturer's Name _____

Type Johnson Model No. _____

Diam. 20 Slot size 100 from 40' ft. to 20' ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☒ Yes ☐ No ☒ Size of gravel/sand 3/8

Materials placed from 40 ft. to 20 ft.

Surface Seal: ☒ Yes ☐ No To what depth? _____ ft.

Material used in seal Bentonite Chips

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 2' ft. below top of well Date _____

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? _____

Yield: 4300 gal./min. with 14' ft. drawdown after 24 hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Gray Coarse Gravel & sand Silty	0	30
Brown Sand & Gravel water Bearing	20	40
Gray Till	40	52

RECEIVED
JUL 18 2007
DEPT. OF ECOLOGY

Start Date 3-29-07 Completed Date 5-7-07

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☐ Trainee Name (Print) Wade Iverson

Driller/Engineer/Trainee Signature Wade Iverson

Driller or trainee License No. 0597

Drilling Company BOART ~~LONGYEAR~~ Longyear

Address PO Box 1890

City, State, Zip Milton WA 98354

Contractor's Registration No. BOARTLO55PZ Date 5-7-07

If TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

Ecology is an Equal Opportunity Employer.

ECY 050-1-20 (Rev 3/05)

The Department of Ecology does NOT warranty the Data and/or Information on this Well Report.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Ecology Well Log ID: 90266

20/7E/19 -B

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. 073397
Permit No. ....

(1) OWNER: Name David Wenke Well Address 290xx SE 234th, Enumclaw

(2) LOCATION OF WELL: County King NW¼ NE¼ Sec. 19 T. 20 N., R. 7 W.M.
Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 92 ft. Depth of completed well 92 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6" Diam. from 0 ft. to 92 ft.
Threaded ☐ ." Diam. from ft. to ft.
Welded ☒ ." Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 16 ft.
Material used in seal puddling clay
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 70 ft. below top of well Date 9-8-90
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" 30+ gpm stem set at 86' 2 1/2 hrs
" " " airjet

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Baller test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown sand gravel-rocks	0	16
Tan gravel-clay-hardpan	16	77
Gray sand-gravel-clay	77	89
Gray water sand-gravel	89	92

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SEP 17 1990
DEPT. OF ECOLOGY

Work started 9-7, 19 90 Completed 9-8, 19 90

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Johnson Drilling Co., Inc.
(Person, firm, or corporation) (Type or print)
Address 19415 108th Ave SE Renton 98055
[Signed] (Well Driller)
License No. 0233 Date 9-8, 19 90

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Ecology Well Log ID: 89612

20/7-19/P

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Clifford Overhill Address 43515 278th Ave SE Enumclaw 98022

(2) LOCATION OF WELL: County King SW ¼ S1/2 SE ¼ SW ¼ Sec. 19 T. 20 N., R. 7E W.M.

Bearing and distance from section or subdivision corner S 1/4 Cor 19

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 69 ft. Depth of completed well 69 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 69 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal puddling clay
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 3 ft. below top of well Date 4/15/83
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" AIR JET " "
" 100 " 27 " 2 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Surface	0	4
Brown clay	4	16
Gray clay	16	57
Brown water gravel with clay	57	69

Work started 4/14, 19 83. Completed 4/15, 19 83

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Johnson Drilling Co., Inc.
(Person, firm, or corporation) (Type or print)

Address 19415 108th Ave SE Renton 98055

[Signed] Brad Johnson
(Well Driller)

License No. 0233 Date 4/15, 19 83

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Ecology Well Log ID: 348646

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT

WELL LOG No Appl. 2838 Cer. 2514-A

Date Sept. 11, 1953

Record by Ralph R. Charlton

Source driller's record

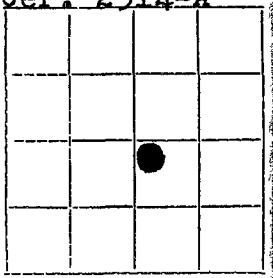

Diagram of Section

Location State of WASHINGTON

County King

Area

Map

NW ¼ SE ¼ sec. 30 T 20 N, R 7 E

Drilling Co Ralph R. Charlton

Address 3126 River Rd., Tacoma, Wash.

Method of Drilling Date Sept. 11, 1953

Owner Paul W. Moore

Address Enumclaw, Wash.

Land surface, datum ft above / below

20N/7E-30K

File number

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses If material water-bearing, so state and record static level if reported Give depths in feet below land-surface datum unless otherwise indicated Correlate with stratigraphic column, if feasible Following log of materials, list all casings, perforations, screens etc)		
	Hardpan	42	42
	Gravel & sand	56	98
	PUMP TEST:		
	Dim. 98'x10"		
	SWL: 8 ft.		
	DD: 7 ft.		
	Yield: 120 g.p.m.		
	CASING: 10" diam. from 0 to 98 ft.		
	Shoe at 98		
	PERFORATIONS: 12-¼ holes per ft.		
	57 to 98 ft.		

Turn up Sheet of sheets

Ecology does NOT Warranty the Data and/or the Information on this Well Report.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Golf Course Well

Ecology Well Log ID: 505351

20-7E-30K

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)*

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number ____

CURRENT

Notice of Intent No. WE06717

Unique Ecology Well ID Tag No. AFT 336

Water Right Permit No. 20890C

Property Owner Name City of Enumclaw

Well Street Address 45224 284th Avenue S

City Enumclaw County King

Location NW1/4-1/4 SE1/4 Sec 30 Twn 20 R 7E EWM ☒ Or WWM ☐

Lat/Long (s, t, r Still REQUIRED) Lat Deg N/A Min N/A Sec N/A Long Deg N/A Min N/A Sec N/A

Tax Parcel No. 3020079006

PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other ____

TYPE OF WORK: Owner's number of well (if more than one) GCPW

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☒ Cable ☐ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 20 inches, drilled 136 ft. Depth of completed well ____ ft.

CONSTRUCTION DETAILS

Casing Installed: ☒ Welded 20" Diam. from +1 ft. to 81 ft. ☐ Liner installed 16" Diam. from +2 ft. to 80 ft. ☐ Threaded ____" Diam. From ____ ft. to ____ ft.

Perforations: ☐ Yes ☒ No

Type of perforator used ____

SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☒ Yes ☐ No ☐ K-Pac Location ____

Manufacturer's Name Johnson

Type steel Model No. ____

Diam. 16 Slot size 0.040 from 80 ft. to 131 ft.

Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel/Filter packed: ☒ Yes ☐ No Size of gravel/sand 8x12

Materials placed from 60 ft. to 136 ft.

Surface Seal: ☒ Yes ☐ No To what depth? 25 ft.

Material used in seal bentonite

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? ____ Depth of strata ____

Method of sealing strata off ____

PUMP: Manufacturer's Name N/A

Type: N/A H.P. N/A

WATER LEVELS: Land-surface elevation above mean sea level 780 ft.

Static level 39.61 ft. below top of well Date 10/23/07

Artesian pressure ____ lbs. per square inch Date ____

Artesian water is controlled by ____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? Hokkaido

Yield: 776 gal./min. with 3.74 ft. drawdown after 1 hrs.

Yield: 776 gal./min. with 3.99 ft. drawdown after 10 hrs.

Yield: 776 gal./min. with 4.15 ft. drawdown after 24 hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
0	40.14	30	40.05	240	39.81
5	40.10	60	40.03	440	39.84
10	40.08	120	39.98	1440	39.72

Date of test Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.

Airtest ____ gal./min. with stem set at ____ ft. for ____ hrs.

Artesian flow ____ g.p.m. Date ____

Temperature of water 48 Was a chemical analysis made? ☒ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Dry Brown Silty Sand and Gravel with Cobbles	0	8
Dry Gray Silty Gravel	8	16
Dry Gray Silty Gravel w/ Cobbles and Wood	16	21
Dry Gray-Brown Silty Gravel w/ Cobbles, tight, some bound	21	45
Water Bearing Brown Medium Sand w/ some F-C Sand and Gravel	45	59
Water Bearing Brown Gravel with Med. Sand, some F-C	59	84
Water Bearing Brown Fine to Medium Sand w/ occ. Gravel and wood organics	84	108
Water Bearing Dark Brown Coarse to Medium Sand and Gravel w/ wood organics	108	131
Gray Moist Clay-Bound Sand and Gravel	131	136.5

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Start Date 5/29/07 Completed Date 10/25/07

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Driller or trainee License No. 1239

Name (Print Last, First) ROBERT B. CARPER

Driller/Engineer/Trainee Signature Robert B Carper

IF TRAINEE: Driller's License No: ____

Driller's Signature: ____

Drilling Company HOKKAIDO DRILLING, INC.

Address P.O. BOX 100

City, State, Zip GRAHAM, WA 98338

Contractor's Registration No. HOKKADI017M8 Date NOVEMBER 1, 2007

Ecology is an Equal Opportunity Employer

Ecology Well Log ID: 89679

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W 054780
Water Right Permit No.

(1) OWNER: Name CORLISS SAND/GRAVEL Address PO BOX 487 SUMNER, WA 98390- 20/7E/29 O

(2) LOCATION OF WELL: County KING - NW 1/4 NW 1/4 Sec 29 T 20 N., R 7E WM
(2a) STREET ADDRESS OF WELL (or nearest address) 29410 HWY 410 E ENUMCLAW

(3) PROPOSED USE: INDUSTRIAL

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: AIR ROTARY

(5) DIMENSIONS: Diameter of well 08 inches
Drilled 140 ft. Depth of completed well 108 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 08 * Dia. from 0 ft. to 91.3 ft.
WELDED * Dia. from ft. to ft.
* Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: YES
Manufacturer's Name HOUSTON
Type Model No.
Diam. 08 slot size 100 from 92 ft. to 102 ft.
Diam. 08 slot size 50 from 102 ft. to 107 ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 38 ft. below top of well Date 01/16/95
Artesian Pressure lbs. per square inch Date / /
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? YES If yes, by whom? JONES
Yield: 60 gal./min with 78 ft. drawdown after 4 hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal/min. ft. drawdown after hrs.
Air test gal/min. w/ stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
COBBLES SAND	0	3
SAND SILT CLAY & GRAVEL	3	25
CLAY & SAND SOME GRAVEL	25	30
SAND & GRAVEL CLAY BINDER ALITTLE WATER	30	40
CLAY & SAND	40	45
CLAY & SAND	45	47
SAND & GRAVEL GREY CLAY BINDER	47	60
SAND & GRAVEL BROWN CLAY	60	70
COBBLES GRAVEL SAND	70	72
SAND & GRAVEL BROWN CLAY BINDER	72	78
SAND & GRAVEL GREY CLAY BINDER	78	85
SAND & GRAVEL GREEN CLAY BINDER	85	89
GRAVEL SAND WATER	89	93
SAND & GRAVEL CLAY WATER	93	100
SAND & GRAVEL CLAY WATER	100	105
SAND & GRAVEL CLAY WATER	105	110
SAND & GRAVEL CLAY	110	115
RED ROCK	115	118
BLACK RED ROCK	118	122
ROCK	122	140

Work started 01/09/95 Completed 01/16/95

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME RICHARDSON WELL DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS PO BOX 44427 TAC WA 98444

[SIGNED] Ronald E Jones License No. 1547

Contractor's
Registration No. RICHAW*3210B Date 03/02/95

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Ecology Well Log ID: 95100

20/19/30 H

B

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. 073809
Water Right Permit No.

(1) OWNER: Name MALL, MARVIN Address 18833 NE 183 WOODINVILLE, WA 98072-

(2) LOCATION OF WELL: County KING - SE 1/4 NE 1/4 Sec 30 T 20 N., R 7 WM
(2a) STREET ADDRESS OF WELL (or nearest address) 289XX NE 124

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches
Drilled 180 ft. Depth of completed well 180 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Dia. from 0 ft. to 180 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: YES
Type of perforator used ROTARY STAR
SIZE of perforations 3-16 in. by 1 in.
320 perforations from 137 ft. to 145 ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: NO
Manufacturer's Name
Type Model No.
Diam. slot size from ft. to ft.
Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off N/A

(7) PUMP: Manufacturer's Name
Type N/A H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 110 ft. below top of well Date 08/02/90
Artesian Pressure lbs. per square inch Date
Artesian water controlled by N/A

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? NO If yes, by whom?
Yield: gal./min with ft. drawdown after hrs.

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 7 gal/min. w/ stem set at 140 ft. for 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
TOPSOIL	0	2
LOG	2	3
BROWN CLAY	3	16
BLUE CLAY	16	110
BLUE CLAY W/OCC GRAVEL	110	137
WATER BEARING SAND W/OCC GRAVEL	137	145
BLUE SILTY SAND	145	180

Work started 08/01/90 Completed 08/02/90

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME NORTHWEST PUMP & DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS 3245 AUBURN WAY SOUTH

[SIGNED] R. B. DeLamarter License No. 0097

Contractor's
Registration No. NORTHPD137PQ Date 08/08/90

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

APPENDIX E

Historical Leachate Data and Aerial Photographs

NOTICE: IF THE DOCUMENT IS FILMED AT A REDUCTION RATIO GREATER THAN 15:1, IT IS DUE TO THE QUALITY OF THE DOCUMENT.

CERTIFICATE OF AUTHENTICITY

I, the undersigned, an employee of ALPHA Information Management, do certify that the documents described on the guidesheet target are being microfilmed in accordance with the Washington State Standards for the production and use of microfilm. I also certify that the records contained on this roll of microfilm are true and correct copies of the originals. However, no judgement is made at the time of microfilming as to the validity, accuracy or legality of any document.

FILMED THIS 16th DAY OF FEB,

1999.

SIGNATURE: Ding Lam

PRINTED NAME: DING LAM

ALPHA INFORMATION MANAGEMENT, INC.

GUIDESHEET TARGET

CAMERA OPERATOR: Jung
CAMERA REDUCTION: 25X / ROLL #: 1
DATE 02/16/99 FILM TYPE: KODAK

MICROFILM INDEX

START ENUMCLAW LEACHATE DATE REPORTED FROM 5/1/86 — 3/31/89

END

JOB IDENTIFICATION

MICROFILMED FOR: KING CO. SOLID WASTE

MICROFILMED AT: ALPHA

REMARKS

FRAME COUNT:

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

START

OF

ROLL

NO ----------1----------

5907 4TH AVE. SC. P.O. BOX 24468 SEATTLE, WA 98124 206-763-2220

LEACHATE

DATA REPORTED FROM:
5/1/86-3/31/89

King County
Solid Waste Division
Department of Public Works
Yesler Building
400 Yesler Way, Room 600
Seattle, WA 98104-2637
(206) 296-6542

ENGINEERING SERVICES SECTION

FAX TRANSMITTAL COVER SHEET

FAX NO. 296-8431

DATE: 4-30-93 TIME: 2:45 A.M. (P.M.) NO. OF PAGES INCLUDING COVER 10

TO: JIM KELLEY
HEALTH RISK ASSOC., INC. FAX # 329-8439

FM: SENDY JIMENEZ / JEFF BUXTEL TEL.NO.: 296-4364

RE: ENVIROLAB ~~BCK~~ LEACHATE DATA (NORTH POND)

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

Non-Metals --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Alkalinity (HCO3) (mg/L)	Alkalinity Total (CaCO3) (mg/L)	Ammonia -N (mg/L)	Chloride (mg/L)	Cyanide (mg/L)	Fluoride (mg/L)	Nitrate -N (mg/L)	Nitrite -N (mg/L)
LS-POND	LEP-86514	05/14/86			22.6	436.2		< 0.05		
LS-POND	LEP-86D16	12/16/86					< 0.01			
LS-POND	LEP-89310	03/10/89			7.2	20	< 0.005	< 0.2	1.5	0.016

E000 0000 0000 0

Non-Metals --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Erumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Phosphate, Ortho (mg/L)	Phosphate, Total (mg/L)	Sulfate (SO4) (mg/L)	Sulfide, Total (mg/L)	Sulfur, Total (mg/L)	Sulfide, Soluble (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen
LS-POND	LEP-86514	05/14/86		8.1	36				37.8	
LS-POND	LEP-89310	03/10/89	< 0.005	0.054	40		17			

Indicator Parameters --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	pH (Lab) std units	Conductance (Lab) umhos/cm	Total Solids (TS) (mg/L)	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (mg/L)	Chemical Oxygen Demand (COD) (mg/L)	Total Organic Carbon (TOC) (mg/L)	Total Organic Halogens (TOX) (mg/L)	Biological Oxygen Demand (BOD) (mg/L)	Oxygen, Dissolved (mg/L)
LS-POND	LEP-86514	05/14/86	7.7	1644	1342	1341	0.3	714				
LS-POND	LEP-86N05	11/05/86	6.3				370	1300				
LS-POND	LEP-89310	03/10/89	7.1	490	300		23	28	9	0.05	6	

IT IS DUE TO ... QUALITY OF THE DOCUMENT.

Indicator Parameters --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sandy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Coliform, Total MPN/ 100 mLs	Coliforms Total CFU/ 100 mLs	Coliform, Fecal MPN/ 100 mLs	Hardness (mg/L)	Turbidity NTU	Polar Fats, Oils, & Grease (mg/L)	Non-Polar Fats, Oils, & Grease (mg/L)	Total Fats, Oils, & Grease (mg/L)
LS-POND	LEP-86514	05/14/86				490				
LS-POND	LEP-86D16	12/16/86	180							
LS-POND	LEP-87505	05/05/87	1600							
LS-POND	LEP-89310	03/10/89	1600		2					

Total Metals --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sandy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)
LS-POND	LEP-86514	05/14/86		0.122	< 0.004	< 0.02	< 0.02	45.2	0.04	4.05
LS-POND	LEP-86N05	11/05/86			< 0.002	0.022	0.03	46	0.02	
LS-POND	LEP-86D16	12/16/86	0.005		< 0.01	< 0.01	0.02	129	< 0.005	7.4
LS-POND	LEP-87505	05/05/87	< 0.002	0.46	< 0.01	< 0.02		256	< 0.002	19.3
LS-POND	LEP-89310	03/10/89	< 0.005	0.06	< 0.002	< 0.005	0.014	3	< 0.01	1

NOTICE: IF THE DOCUMENT IN THIS FRAME IS LESS CLEAR THAN THIS NOTICE
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Total Metals --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sandy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Mercury (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)
LS-POND	LEP-86514	05/14/86	0.0003	< 0.02		< 0.004	1.181
LS-POND	LEP-86N05	11/05/86		0.02			0.16
LS-POND	LEP-86D16	12/16/86	< 0.0005	< 0.04	< 0.005	< 0.005	0.02
LS-POND	LEP-87505	05/05/87	< 0.0002		< 0.002	< 0.01	0.02
LS-POND	LEP-89310	03/10/89	< 0.001	0.02	< 0.005	< 0.002	0.02

NOTICE: IF THE DOCUMENT IN THIS FRAME IS LESS CLEAR THAN THIS NOTICE
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Herbicides, Pesticides, and Radioactivity

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Ensmclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	2,4-D (ug/L)	2,4,5-TP (Silvex) (ug/L)	Endrin (ug/L)	Lindane (ug/L)	Methoxy-chlor (ug/L)	Toxa-phene (ug/L)	Gross Alpha Activity pCi/L	Gross Beta pCi/L	Radium 226 pCi/L	Radium 228 pCi/L
LS-POND	LEP-86D16	12/16/86			< 0.10	< 0.05	< 0.50	< 1.0				
LS-POND	LEP-87S05	05/05/87	< 1		< 1	< 1	< 1	< 4				
LS-POND	LEP-89310	03/10/89	< 0.50	< 0.50	< 0.10	< 0.05	< 0.50	< 1.00	< 2		< 0.6	< 1

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Volatiles --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Acetone (ug/L)	Benzene (ug/L)	Bromo-dichloro-methane (ug/L)	Bromoform (ug/L)	Bromo-methane (ug/L)	2-Butanone (ug/L)	Carbon Disulfide (ug/L)	Carbon Tetra-chloride (ug/L)	Chloro-benzene (ug/L)	Chloro-ethane (ug/L)
LS-POND	LEP-86016	12/16/86	6200	< 2	< 1	< 2	< 4	4400	< 2	< 2	< 1	15
LS-POND	LEP-87505	05/05/87	5050	24	< 1.3	< 1.9	< 4.2	4560	< 2.0	< 1.7	< 1.3	16
LS-POND	LEP-89310	03/10/89	12	< 1	< 1	< 1	< 1	< 3	< 1	< 1	< 3	< 3

Volatiles --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Chloroform (ug/L)	Dibromo-chloro-methane (ug/L)	p-Dichloro benzene (ug/L)	1,1-Dichlo ethane (ug/L)	1,2-Dichlo ethane (ug/L)	1,2-Dichlo ethene, total (ug/L)	1,1-Dichlo ethene (ug/L)	1,2-Dichlo propane (ug/L)	cis-1,3-Dichloro-propene (ug/L)	trans-1,3-Dichloro-propene (ug/L)
LS-POND	LEP-86016	12/16/86	< 3	< 2		19	< 2	50	< 5	< 2	< 2	< 2
LS-POND	LEP-87505	05/05/87	< 2.5	< 1.6		62	< 2.3	90	< 4.5	< 1.6	< 1.7	< 1.7
LS-POND	LEP-89310	03/10/89	< 1	< 3	< 1	< 1	< 1	< 1	< 1	< 1	< 3	< 3

Volatiles --- Part 3

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Ersamclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Ethyl Benzene (ug/L)	2-Hexanone (ug/L)	Methylene Chloride (ug/L)	4-Methyl-2-Pentanon (ug/L)	Styrene (ug/L)	1,1,2,2-Tetra-chloro-ethane (ug/L)	Tetra-chlor-ethylene (ug/L)	Toluene (ug/L)	1,1,1-Tri-chloro-ethane (ug/L)	1,1,2-Tri-chloro-ethane (ug/L)
LS-POND	LEP-86016	12/16/86	38	118	208	309	< 3	< 2	< 1	534	< 1	< 2
LS-POND	LEP-87505	05/05/87	35	13	77	140	< 2.7	< 2.1	< 1.2	1100	< 1.6	< 1.6
LS-POND	LEP-89310	03/10/89	< 1	< 3	< 1	< 3	< 1	< 3	< 1	< 1	< 1	< 1

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Volatiles --- Part 4

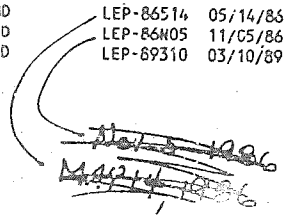
DATA REPORTED FROM MAY 1, 1985 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Trichloro-ethene (ug/L)	Vinyl Acetate (ug/L)	Vinyl Chloride (ug/L)	Total Xylenes (ug/L)	Chloro-methane (ug/L)
LS-POND	LEP-86D16	12/16/86	2	< 6	11	129	< 3
LS-POND	LEP-87505	05/05/87	2.2	< 5.8	14	105	< 3.2
LS-POND	LEP-89310	03/10/89	< 1	< 1	< 1	2	< 1

Indicator Parameters --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sandy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	pH (Lab) std units	Conductance (Lab) umhos/cm	Total Solids (TS) (mg/L)	Total Dissolved Solids (TDS) (mg/L)	Total Suspended Solids (mg/L)	Chemical Oxygen Demand (COD) (mg/L)	Total Organic Carbon (TOC) (mg/L)	Total Organic Halogens (TOX) (mg/L)	Biological Oxygen Demand (BOD) (mg/L)	Oxygen, Dissolved (mg/L)
LS-POND	LEP-86514	05/14/86	7.7	1644	1342	1341	0.3	714				
LS-POND	LEP-86N05	11/05/86	6.3				370	1500				
LS-POND	LEP-89310	03/10/89	7.1	490	300		23	28	9	0.05	6	



Indicator Parameters --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Coliform, Total MPN/ 100 mLs	Coliforms Total CFU/ 100 mLs	Coliform, Fecal MPN/ 100 mLs	Hardness (mg/L)	Turbidity NTU	Polar Fats, Oils, & Grease (mg/L)	Non-Polar Fats, Oils, & Grease (mg/L)	Total Fats, Oils, & Grease (mg/L)
LS-POND	LEP-86514	05/14/86				490				
LS-POND	LEP-86016	12/16/86	180							
LS-POND	LEP-87505	05/05/87	1600							
LS-POND	LEP-89310	03/10/89	1600		2					

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Non-Metals --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Alkalinity (HCO3) (mg/L)	Alkalinity Total (CaCO3) (mg/L)	Ammonia -N (mg/L)	Chloride (mg/L)	Cyanide (mg/L)	Fluoride (mg/L)	Nitrate -N (mg/L)	Nitrite -N (mg/L)
LS-POND	LEP-86514	05/14/86			22.6	436.2		< 0.05		
LS-POND	LEP-86D16	12/16/86			7.2	20	< 0.01	< 0.2	1.5	0.016
LS-POND	LEP-89310	03/10/89					< 0.005			

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Non-Metals --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sandy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Phosphate, Ortho (mg/L)	Phosphate, Total (mg/L)	Sulfate (SO4) (mg/L)	Sulfide, Total (mg/L)	Sulfur, Total (mg/L)	Sulfide, Soluble (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen
LS-POND	LEP-86514	05/14/86		8.1	36				37.8	
LS-POND	LEP-89310	03/10/89	< 0.005	0.054	40		17			

Total Metals --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Manganese (mg/L)
LS-POND	LEP-86514	05/14/86		0.122	< 0.004	< 0.02	< 0.02	45.2	0.04	4.05
LS-POND	LEP-86N05	11/05/86			< 0.002	0.022	0.03	46	0.02	
LS-POND	LEP-86D16	12/16/86	0.005		< 0.01	< 0.01	0.02	129	< 0.005	7.4
LS-POND	LEP-87505	05/05/87	< 0.002	0.46	< 0.01	< 0.02		286	< 0.002	19.3
LS-POND	LEP-89310	03/10/89	< 0.005	0.06	< 0.002	< 0.005	0.014	3	< 0.01	1

Total Metals --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sandy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Mercury (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)
LS-POND	LEP-86514	05/14/86	0.0033	< 0.02		< 0.004	1.181
LS-POND	LEP-86N05	11/05/86		0.02			0.16
LS-POND	LEP-86016	12/16/86	< 0.0005	< 0.04	< 0.005	< 0.005	0.02
LS-POND	LEP-87505	05/05/87	< 0.0002		< 0.002	< 0.01	0.02
LS-POND	LEP-89310	03/10/89	< 0.001	0.02	< 0.005	< 0.002	0.02

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Herbicides, Pesticides, and Radioactivity

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	2,4-D (ug/L)	2,4,5-TP (Silvex) (ug/L)	Endrin (ug/L)	Lindane (ug/L)	Methoxy-chlor (ug/L)	Toxa-phene (ug/L)	Gross Alpha Activity pCi/L	Gross Beta pCi/L	Radium 226 pCi/L	Radium 228 pCi/L
LS-POND	LEP-86D16	12/16/86			< 0.10	< 0.05	< 0.50	< 1.0				
LS-POND	LEP-87505	05/05/87	< 1		< 1	< 1	< 1	< 4				
LS-POND	LEP-89310	03/10/89	< 0.50	< 0.50	< 0.10	< 0.05	< 0.50	< 1.00	< 2		< 0.6	< 1

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Volatiles --- Part 1

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296- 411

SITE ID	SAMPLE ID	SAMPLE DATE	Acetone (ug/L)	Benzene (ug/L)	Bromo-dichloro-methane (ug/L)	Bromoform (ug/L)	Bromo-methane (ug/L)	2-Butanone (ug/L)	Carbon Disulfide (ug/L)	Carbon Tetra-chloride (ug/L)	Chloro-benzene (ug/L)	Chloro-ethane (ug/L)
LS-POND	LEP-86D16	12/16/86	6200	< 2	< 1	< 2	< 4	4400	< 2	< 2	< 1	15
LS-POND	LEP-87505	05/05/87	5050	24	< 1.3	< 1.9	< 4.2	4560	< 2.0	< 1.7	< 1.3	16
LS-POND	LEP-89310	03/10/89	12	< 1	< 1	< 1	< 1	< 3	< 1	< 1	< 3	< 3

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Volatiles --- Part 2

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Chloroform (ug/L)	Dibromo-chloro-methane (ug/L)	p-Dichloro benzene (ug/L)	1,1-Dichlo ethane (ug/L)	1,2-Dichlo ethane (ug/L)	1,2-Dichlo ethene, total (ug/L)	1,1-Dichlo ethene (ug/L)	1,2-Dichlo propane (ug/L)	cis-1,3-Dichloro-propene (ug/L)	trans-1,3-Dichloro-propene (ug/L)
LS-POND	LEP-86D16	12/16/86	< 3	< 2		19	< 2	50	< 5	< 2	< 2	< 2
LS-POND	LEP-87505	05/05/87	2.5	< 1.6		62	< 2.3	90	< 4.5	< 1.6	< 1.7	< 1.7
LS-POND	LEP-89310	03/10/89	< 1	< 3	< 1	< 1	< 1	< 1	< 1	< 1	< 3	< 3

Volatiles --- Part 3

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sendy Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Ethyl Benzene (ug/L)	2-Hexanone (ug/L)	Methylene Chloride (ug/L)	4-Methyl-2-Pentanon (ug/L)	Styrene (ug/L)	1,1,2,2-Tetra-chloro-ethane (ug/L)	Tetra-chlor-ethylene (ug/L)	Toluene (ug/L)	1,1,1-Tri-chloro-ethane (ug/L)	1,1,2-Tri-chloro-ethane (ug/L)
LS-POND	LEP-86016	12/16/86	38	118	208	309	< 3	< 2	< 1	534	< 1	< 2
LS-POND	LEP-87505	05/05/87	35	13	77	140	< 2.7	< 2.1	< 1.2	1100	< 1.6	< 1.6
LS-POND	LEP-89310	03/10/89	< 1	< 3	< 1	< 3	< 1	< 3	< 1	< 1	< 1	< 1

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Volatiles --- Part A

DATA REPORTED FROM MAY 1, 1986 TO MARCH 31, 1989
Enumclaw Landfill --- LEACHATE
CONTACT PERSON: Sergio Jimenez, (206) 296-4411

SITE ID	SAMPLE ID	SAMPLE DATE	Trichloro-ethene (ug/L)	Vinyl Acetate (ug/L)	Vinyl Chloride (ug/L)	Total Xylenes (ug/L)	Chloro-methane (ug/L)
LS-POND	LEP-[illegible]016	12/16/86	2	< 6	11	129	< 3
LS-POND	LEP-[illegible]505	05/05/87	3.2	< 5.8	14	105	< 5.2
LS-POND	LEP-[illegible]310	03/10/89	< 1	< 1	< 1	2	< 1

Site Number	Zone	Onsite	Sitename	GSE	TOC	Depth	X	Y
S-POND		Y	LEACHATE POND NORTH	0.00	0.00	0.00	0.000	0.000

ENUMCLAW LEACHATE POND (NORTH) DATA

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

Site : LS-POND ID : LEP-86514

Constituent Name	Units	Results	Limit	Qual
Barium, total	mg/L	0.122	0	
Cadmium, total	mg/L	< 0.004	0.004	
Chloride	mg/L	436.2	0	
Chromium, total	mg/L	< 0.02	0.02	
Copper, total	mg/L	< 0.02	0.02	
Fluoride	mg/L	< 0.05	0.05	
Iron, total	mg/L	45.2	0	
Lead, total	mg/L	0.04	0	
Manganese, total	mg/L	4.050	0	
Mercury, total	mg/L	0.0003	0	
Nickel, total	mg/L	< 0.02	0.02	
Potassium	mg/L	43.2	0	
Silver, total	mg/L	< 0.004	0.004	
Zinc, total	mg/L	1.181	0	
Ammonia, (NH3)	mg/L	22.6	0	
Phosphate, total	mg/L	8.10	0	
Sulfate (SO4)	mg/L	36	0	
Chemical Oxygen Demand	mg/L	714	0	
Conductance	mg/L	1644	0	
Suspended Solids	mg/L	0.3	0	
Total Dissolved Solids	mg/L	1341	0	
Hardness	mg/L	490	0	
Total Kjeldahl N	mg/L	37.8	0	
Total Solids	mg/L	1342	0	
pH	std. units	7.70	0	
Biological Oxygen Demand	mg/L	184	0	
Volatile Suspended Solids	mg/L	327	0	
	mg/L	572	0	

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Site : LS-POND ID : LEP-86N05

Constituent Name	Units	Results	Limit	Qual
Cadmium, total	mg/L	< 0.002	0.002	
Chromium, total	mg/L	0.022	0	
Copper, total	mg/L	0.030	0	
Iron, total	mg/L	46	0	
Lead, total	mg/L	0.02	0	
Nickel, total	mg/L	0.02	0	
Zinc, total	mg/L	0.16	0	
Chemical Oxygen Demand	mg/L	1300	0	
Suspended Solids	mg/L	370	0	
pH	std units	6.3	0	
Biological Oxygen Demand	mg/L	840	0	

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Site : LS-POND ID : LEP-36016

Constituent Name	Units		Results	Limit	Qual
Antimony, total	mg/L	<	0.005	0.005	
Arsenic, total	mg/L		0.005	0	
Beryllium, total	mg/L	<	0.005	0.005	
Cadmium, total	mg/L	<	0.01	0.01	
Chromium, total	mg/L	<	0.01	0.01	
Copper, total	mg/L		0.02	0	
Cyanide	mg/L	<	0.01	0.01	
Iron, total	mg/L		129	0	
Lead, total	mg/L	<	0.005	0.005	
Manganese, total	mg/L		7.4	0	
Mercury, total	mg/L	<	0.0005	0.0005	
Nickel, total	mg/L	<	0.04	0.04	
Selenium, total	mg/L	<	0.005	0.005	
Silver, total	mg/L	<	0.005	0.005	
Thallium, total	mg/L	<	0.002	0.002	
Zinc, total	mg/L		0.02	0	
Coliform, total	MPN/100 mL		180	0	
Aldrin	ug/L	<	0.05	0.05	
Aroclor 1016	ug/L	<	0.50	0.50	
Aroclor 1221	ug/L	<	0.50	0.50	
Aroclor 1232	ug/L	<	0.50	0.50	
Aroclor 1242	ug/L	<	0.50	0.50	
Aroclor 1248	ug/L	<	0.50	0.50	
Aroclor 1254	ug/L	<	0.50	0.50	
Aroclor 1260	ug/L	<	1.0	1.0	
Chlordane	ug/L	<	0.50	0.50	
Dieldrin	ug/L	<	0.10	0.10	
Endosulfan Sulfate	ug/L	<	0.10	0.10	
Endrin	ug/L	<	0.10	0.10	
Endrin Ketone	ug/L	<	0.10	0.10	
Heptachlor Epoxide	ug/L	<	0.05	0.05	
Heptachlor	ug/L	<	0.05	0.05	
Methoxychlor	ug/L	<	0.50	0.50	
4,4' DDD	ug/L	<	0.10	0.10	
4,4' DDE	ug/L	<	0.10	0.10	
4,4' DDT	ug/L	<	0.10	0.10	
Toxaphene	ug/L	<	1.0	1.0	
Alpha BHC	ug/L	<	0.05	0.05	
Beta BHC	ug/L	<	0.05	0.05	
Delta BHC	ug/L	<	0.05	0.05	
Endosulfan	ug/L	<	0.05	0.05	

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

Site : LS-POND ID : LEP-86016

Constituent Name	Units	Results	Limit	Qual
Endosulfan II	ug/L	< 0.10	0.10	
Lindane	ug/L	< 0.05	0.05	
1,1,1-Trichloroethane	ug/L	< 1	1	
1,1,2,2-Tetrachloroethane	ug/L	< 2	2	
1,1,2-Trichloroethane	ug/L	< 2	2	
1,1-Dichloroethene	ug/L	19	0	
1,1-Dichloroethene	ug/L	< 5	5	
1,2-Dichloroethane	ug/L	< 2	2	
1,2-Dichloropropane	ug/L	< 2	2	
2-Butanone	ug/L	4400	0	
4-Methyl-2-Pentanone	ug/L	309	0	
Benzene	ug/L	< 2	2	
Bromodichloromethane	ug/L	< 1	1	
Bromoform	ug/L	< 2	2	
Bromomethane	ug/L	< 4	4	
Carbon Disulfide	ug/L	< 2	2	
Carbon Tetrachloride	ug/L	< 2	2	
Chlorobenzene	ug/L	< 1	1	
Chloroethane	ug/L	15	0	
Chloroform	ug/L	< 3	3	
Chloromethane	ug/L	< 3	3	
cis-1,3-Dichloropropene	ug/L	< 2	2	
Dibromochloromethane	ug/L	< 2	2	
Ethylbenzene	ug/L	38	0	
Methylene Chloride	ug/L	208	0	
Styrene	ug/L	< 3	3	
Tetrachloroethylene	ug/L	< 1	1	
Toluene	ug/L	534	0	
trans-1,3-Dichloropropene	ug/L	< 2	2	
Trichloroethene	ug/L	2	0	
Vinyl Acetate	ug/L	< 6	6	
Vinyl Chloride	ug/L	11	0	
Total Xylenes	ug/L	129	0	
1,2-Dichloroethene, total	ug/L	50	0	
2-Chloroethylvinylether	ug/L	< 3	3	
2-Hexanone	ug/L	112	0	
2-Methylphenol	ug/L	100	0	
4-Methylphenol	ug/L	3700	0	
Dimethyl Phthalate	ug/L	130	0	
Phenol	ug/L	53	0	
Acetone	ug/L	6200	0	

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

Site : LS-POND ID : LEP-87505

Constituent Name	Units	Results	Limit	Qual
Arsenic, total	mg/L	< 0.002	0.002	
Barium, total	mg/L	0.46	0	
Cadmium, total	mg/L	< 0.01	0.01	
Chromium, total	mg/L	< 0.02	0.02	
Iron, total	mg/L	286	0	
Lead, total	mg/L	< 0.002	0.002	
Manganese, total	mg/L	19.3	0	
Mercury, total	mg/L	< 0.0002	0.0002	
Selenium, total	mg/L	< 0.002	0.002	
Silver, total	mg/L	< 0.01	0.01	
Zinc, total	mg/L	0.02	0	
Coliform, total	MPN/100 mL	1600	0	
2,4,5-T Methyl Ester	ug/L	< 1	1	
2,4-D	ug/L	< 1	1	
Endrin	ug/L	< 1	1	
Methoxychlor	ug/L	< 1	1	
Toxaphene	ug/L	< 4	4	
Lindane	ug/L	< 1	1	
1,1,1-Trichloroethane	ug/L	< 1.6	1.6	
1,1,2,2-Tetrachloroethane	ug/L	< 2.1	2.1	
1,1,2-Trichloroethane	ug/L	< 1.6	1.6	
1,1-Dichloroethane	ug/L	62	0	
1,1-Dichloroethene	ug/L	< 4.5	4.5	
1,2-Dichloroethane	ug/L	< 2.3	2.3	
1,2-Dichloropropane	ug/L	< 1.6	1.6	
2-Butanone	ug/L	4560	0	
4-Methyl-2-Pentanone	ug/L	140	0	
Benzene	ug/L	24	0	
Bromodichloromethane	ug/L	< 1.3	1.3	
Bromoform	ug/L	< 1.9	1.9	
Bromomethane	ug/L	< 4.2	4.2	
Carbon Disulfide	ug/L	< 2.0	2.0	
Carbon Tetrachloride	ug/L	< 1.7	1.7	
Chlorobenzene	ug/L	< 1.3	1.3	
Chloroethane	ug/L	16	0	
Chloroform	ug/L	< 2.5	2.5	
Chloromethane	ug/L	< 3.2	3.2	
cis-1,3-Dichloropropene	ug/L	< 1.7	1.7	
Dibromochloromethane	ug/L	< 1.6	1.6	
Ethylbenzene	ug/L	35	0	
Methylene Chloride	ug/L	77	0	

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

Site : LS-POMU ID : LEP-87505

Constituent Name	Units	Results	Limit	Qual
Styrene	ug/L	< 2.7	2.7	
Tetrachloroethylene	ug/L	< 1.2	1.2	
Toluene	ug/L	1100	0	
trans-1,3-Dichloropropene	ug/L	< 1.7	1.7	
Trichloroethene	ug/L	2.2	0	
Vinyl Acetate	ug/L	< 5.8	5.8	
Vinyl Chloride	ug/L	14	0	
Total Xylenes	ug/L	105	0	
1,2-Dichloroethene, total	ug/L	90	0	
2-Chloroethylvinylether	ug/L	< 2.6	2.6	
2-Hexanone	ug/L	13	0	
Acetone	ug/L	5050	0	

E00 0000 0003

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

Site : LS-POND ID : LEP-89310

Constituent Name	Units		Results	Limit	Qual
Arsenic, total	mg/L	<	0.005	0.005	
Barium, total	mg/L		0.06	0	
Cadmium, total	mg/L	<	0.002	0.002	
Chloride	mg/L		20	0	
Chromium, total	mg/L	<	0.005	0.005	
Copper, total	mg/L		0.014	0	
Cyanide	mg/L	<	0.005	0.005	
Fluoride	mg/L	<	0.2	0.2	
Iron, total	mg/L		3.0	0	
Lead, total	mg/L	<	0.01	0.01	
Manganese, total	mg/L		1.0	0	
Mercury, total	mg/L	<	0.001	0.001	
Nickel, total	mg/L		0.02	0	
Selenium, total	mg/L	<	0.005	0.005	
Silver, total	mg/L	<	0.002	0.002	
Sulfide	mg/L	<	0.1	0.1	
Zinc, total	mg/L		0.020	0	
Ammonia, (NH3)	mg/L		7.2	0	
Nitrate, (NO3)	mg/L		1.5	0	
Nitrite, (NO2)	mg/L		0.016	0	
Phosphate, ortho	mg/L	<	0.005	0.005	
Phosphate, total	mg/L		0.054	0	
Sulfate (SO4)	mg/L		40	0	
Sulfur, total	mg/L		17	0	
Sulfate (S)	mg/L		13	0	
Chemical Oxygen Demand	mg/L		28	0	
Coliform, total	MPN/100 mL	>	1600	0	
Coliform, fecal	MPN/100 mL		2	0	
Conductance	umhos/cm		420	0	
Suspended Solids	mg/L		23	0	
Total Organic Carbon	mg/L		9.0	0	
Total Solids	mg/L		300	0	
Total Organic Halogens	mg/L		0.05	0	
pH	std. units		7.1	0	
Radium 228	pCi/L	<	1	1	
Radium 226	pCi/L	<	0.6	0.6	
Gross Alpha Activity	pCi/L	<	2	2	
Biological Oxygen Demand - 5 day	mg/L		6	0	
2,4,5-TC Methyl Ester	ug/L	<	0.50	0.50	
2,4-D	ug/L	<	0.50	0.50	
Endrin	ug/L	<	0.10	0.10	

IT IS DUE TO THE QUALITY OF THE DOCUMENT.

Site : LS-POND ID : LEP-89310

Constituent Name	Units	Results	Limit	Qual
Methoxychlor	ug/L	< 0.50	0.50	
Toxaphene	ug/L	< 1.00	1.00	
.indane	ug/L	< 0.05	0.05	
1,1,1-Trichloroethane	ug/L	< 1	1	
1,1,2,2-Tetrachloroethane	ug/L	< 3	3	
1,1,2-Trichloroethane	ug/L	< 1	1	
1,1-Dichloroethane	ug/L	< 1	1	
1,1-Dichloroethene	ug/L	< 1	1	
1,2-Dichloroethane	ug/L	< 1	1	
1,2-Dichloropropane	ug/L	< 1	1	
o-Dichlorobenzene	ug/L	< 1	1	
2-Butanone	ug/L	< 3	3	
4-Methyl-2-Pentanone	ug/L	< 3	3	
Benzene	ug/L	< 1	1	
Bromodichloromethane	ug/L	< 1	1	
Bromoform	ug/L	< 1	1	
Bromomethane	ug/L	< 1	1	
Carbon Disulfide	ug/L	< 1	1	
Carbon Tetrachloride	ug/L	< 1	1	
Chlorobenzene	ug/L	< 3	3	
Chloroethane	ug/L	< 3	3	
Chloroform	ug/L	< 1	1	
Chloromethane	ug/L	< 1	1	
cis-1,3-Dichloropropene	ug/L	< 3	3	
Dibromochloromethane	ug/L	< 3	3	
Ethylbenzene	ug/L	< 1	1	
Methylene Chloride	ug/L	< 1	1	
Styrene	ug/L	< 1	1	
Tetrachloroethene	ug/L	< 1	1	
Toluene	ug/L	< 1	1	
trans-1,2-Dichloroethene	ug/L	< 1	1	
trans-1,3-Dichloropropene	ug/L	< 3	3	
Trichloroethene	ug/L	< 1	1	
Vinyl Acetate	ug/L	< 1	1	
Vinyl Chloride	ug/L	< 1	1	
Total Xylenes	ug/L	2	0	
cis-1,2-Dichloroethene	ug/L	< 1	1	
1,2-Dichloroethene, total	ug/L	< 1	1	
2-Hexanone	ug/L	< 3	3	
Acetone	ug/L	12	0	

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DATE 02/16/99 FILM TYPE: KODAK

MICROFILM INDEX

START ENUMCLAW LEACHATE DATE REPORTED FROM 5/1/86 — 3/31/89

END 5/1/86 — 3/31/89

JOB IDENTIFICATION

MICROFILMED FOR: KING CO. SOLID WASTE

MICROFILMED AT: ALPHA

REMARKS

FRAME COUNT: 43

END

OF

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ALPHA INFORMATION MANAGEMENT, INC.

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CAMERA OPERATOR: DEBORAH L. MILLER
CAMERA REDUCTION: 25X ROLL #: 1
DATE 01-28-00 FILM TYPE: KODAK

MICROFILM INDEX

START ENUMCLAW — LEACHATE
05-14-86

END ENUMCLAW — LEACHATE
11-05-86

JOB IDENTIFICATION

MICROFILMED FOR: KING CO. SOLID WASTE

MICROFILMED AT: ALPHA

REMARKS

FRAME COUNT: 20

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PRINTED NAME: DEBORAH L. MILLER

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940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063
Chemistry Microbiology and Technical Services

RECEIVED
AUG 28 1990
K.C. PUBLIC WORKS
Solid Waste Division
ENGINEERING SECTION

FAX TRANSMISSION COVER SHEET

To the attention of: Anne Holmes

From: Vera Groom

Date: 8-28-90

RE: Your File

Our File 9913

Please regard this information as _____ preliminary.

_____ final.

For the transmission to be complete, you should have received 3 pages, including this cover page.

If you wish to respond by FAX, our number is 1-206-767-5063. Thank You.

Amazing but true, I found it!

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Entered

Laucks Testing Laboratories, Inc.

940 South Harney St., Seattle, Washington 98108 (206)767-5060

Chemistry, Microbiology and Technical Services

Certificate

CLIENT: King County Division of Solid Waste
419 Occidental Ave. South
601 F.X. McRory Building
Seattle, WA 98104
ATTN: Barbara Zaroff

LABORATORY NO. 99713

DATE: Dec. 11, 1986

PO #B22769B

REPORT ON: WATER

SAMPLE IDENTIFICATION: Submitted 11/5/86 and identified as shown:

E. Leachate Enumclaw Pond (from Trailer) D. Nyblom
11-5-86 2:00 pm G. Anabele

TESTS PERFORMED AND RESULTS:

pH, glass electrode @ 25 degrees C	6.3

	parts per million (mg/L)
Total Cadmium	L/0.002
Total Chromium	0.022
Total Copper	0.030
Total Lead	0.02
Total Iron	46.
Total Zinc	0.16
Total Nickel	0.02
Chemical Oxygen Demand	1300.
5-day Biochemical Oxygen Demand	840.
Total Suspended Solids	370.

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Laucks
Testing Laboratories, Inc.
940 South Harney St. Seattle Washington 98108 (206)767-5060

Certificate

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Total Cadmium	L/0.002
Total Chromium	0.022
Total Copper	0.030
Total Lead	0.02
Total Iron	46.
Total Zinc	0.15
Total Nickel	0.02
Chemical Oxygen Demand	1300.
5-day Biochemical Oxygen Demand	840.
Total Suspended Solids	220.

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Chemistry, Microbiology and Technical Services

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LABORATORY NO. 99713

King County Division of Solid Waste

Key

L/ = less than

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J. M. Owens

JMO:vsg

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LABORATORY NO. 99713

Key

L/ = less than

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Laucks Testing Laboratories, Inc.

J. M. Owens

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ENUMCLAW

LEACHATE

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Duvall
Enumclaw
Cedar Falls
Hobart

Project B

684-2300

KING COUNTY SOLID WASTE

Entered

ANALYTICAL DATA Heavy Metals Month May Year 86

Sample Date	5/12	5/13	5/13	5/14	5/14	5/19	5/20
Sample Location	DMW#2	EMW#1	EMW#3	HMW#2	Leachate	CFMW#3	STA CHS-E
Ag dissolved?	<.004	<.004	<.004	<.004	<.004	<.004	<.004
As							
Ba	.021	.051	.011	<.005	.122	.009	.009
Cd	<.004	<.004	<.004	<.004	<.004	<.004	<.004
Cr	.03	<.02	<.02	<.02	<.02	.003	<.001
Cu	<.02	<.02	<.02	<.02	<.02	<.01	<.01
Fe	<.02	18.0	<.02	.16	45.2	<.02	.11
Hg	.0003	<.0002	.0002	.0004	.0003	.0002	.0002
Mn	<.005	48.40	.023	1.350	4.050	<.005	<.005
Ni	<.02	<.02	<.02	<.02	<.02	.03	<.02
Pb	<.02	.05	<.02	<.02	.04	<.001	<.001
Se							
Zn	<.010	.012	<.010	.013	1.181	<.006	<.005
K	.55	4.72	.70	.35	43.2	.30	.29

DF/PAN / Bail

Note: All parameters are expressed as mg/l.

1340-1 (7/84)

REF:hh 6/84

Ray Dull 684-2323

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METRO

KING COUNTY SOLID WASTE

ANALYTICAL DATA Conventional Perameters Month May Year 86

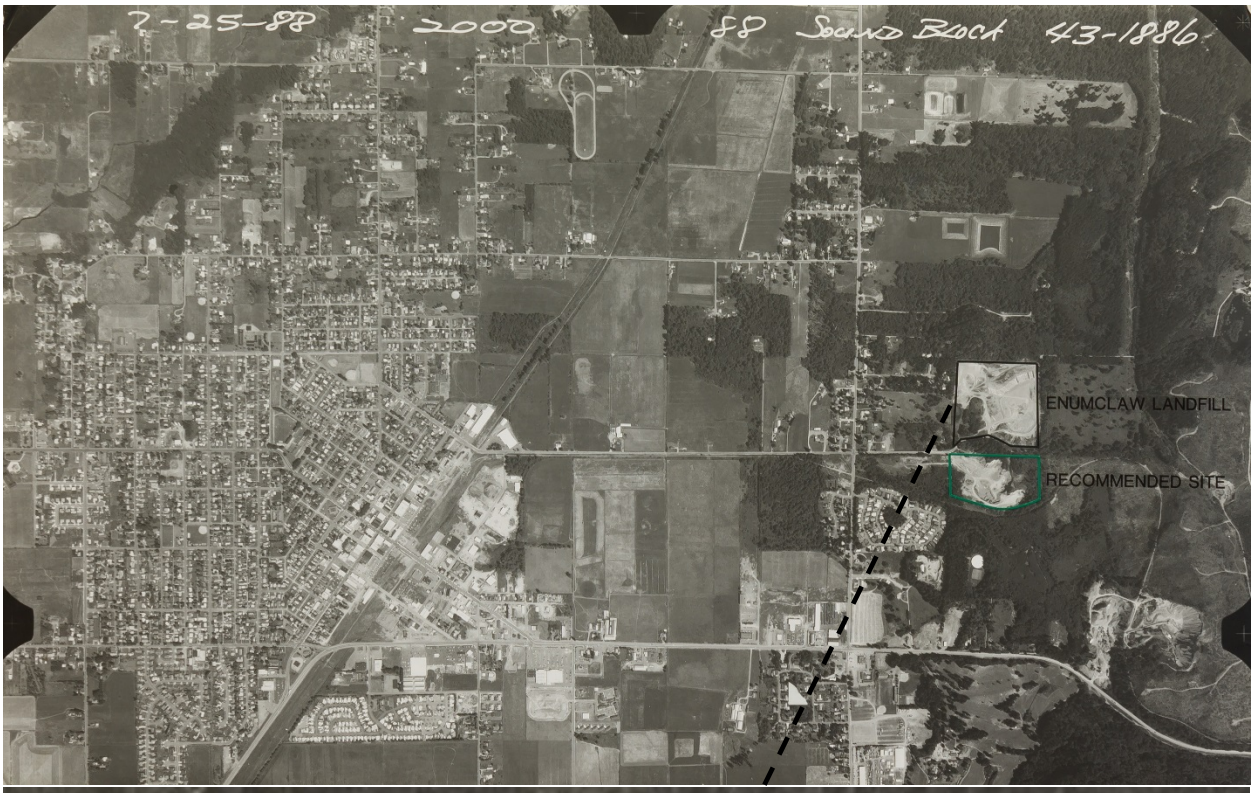
Sample Date	5/12	5/13	5/13	5/14	5/14	5/19	5/20
Sample Location	DMW#2	EMW#1	EMW#3	HMW#2	Leachate	CFMW#3	STA CHS-E
pH	7.40	6.97	6.72	6.02	7.70	7.69	6.85
COD	12	740	14	12	714	9	11
BOD_5	<.1	560	2.9	<.1	184	<.1	2.2
S.S.	<.1	20.5	1.7	.3	.3	0.9	.09
V.S.S.	<.1	9.7	1.7	498	327	0.2	.09
T.S.	90	1920	68	55.8	1342	91	100
T.V.S.	26	1199	36	18.7	572	26	32
Total Dissolved Solids	90	1900	66	56	1341	90	100
Total Kjeldehl Nitrogen	.33	.97	.40	.42	37.8	<.20	.31
Total PO_4-P	.18	.11	.04	.03	8.10	.02	.02
SO_4	<5	<5	<5	<5	36	<5	11
($CaCO_3$) T. Hardness	spilled lost	1390	39	26.5	490	52	32
Specific Conduct.	spilled	2541	113	89	1644	151	112
NH_3-N	.19	.07	.19	.06	22.6	.02	.23
Fluoride	<.05	<.05	<.05	<.05	<.05	<.05	<.05
Chloride	1.8	161.5	4.8	4.6	436.2	4.9	6.9

DF/PAJ / Bank.

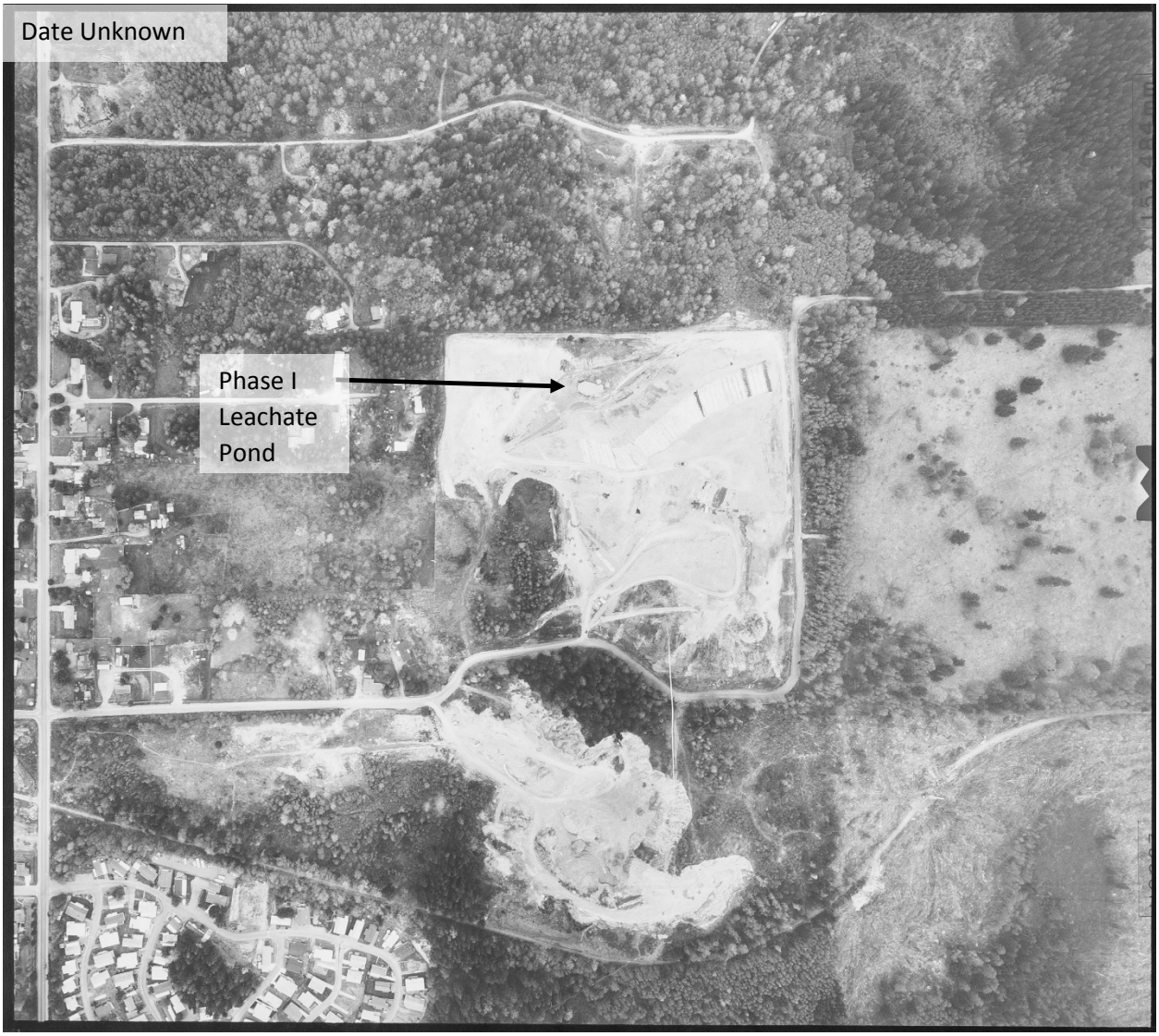
Note: All parameters are expressed as mg/l except for pH which is unitless.

1340 (7/84) REF:hh 6/84

June 1980


7-25-88 2000 88 Sound Block 43-1886
ENUMCLAW LANDFILL
RECOMMENDED SITE

7-25-88
Phase I
Leachate
Pond
ENUMC


Date Unknown
Phase I
Leachate
Pond

APPENDIX F

Summary of Reviewed Historical Documents

King County Solid Waste Division
Enumclaw Closed Landfill
Appendix F
Historical Document Review

Document Title	Date Published	Author/Creator	Summary of Relevant Content/Other Notes
1978 Aerial Photographs	1/23/1978	Walker and Associates	No relevant information
Groundwater Geology-Investigations for Rural Landfills in KC	3/26/1984	RW Beck	Summary of GW sampling in this period (no relevance to leachate pond, superceded by subsequent reports)
1986 Rural Landfill Monitoring Wells	1986	KCSWD	No relevant information
Geotech Report 9-19-87	9/19/1987	Sweet, Edwards and associates	Groundwater information in GW wells (no specific leachate analysis)
Phase I Plan - Site Map	1988	RW Beck	Phase I Closure Drawings
1989 Leachate Pond Sections/Details	1989	Unk	Details for geomembrane lined leachate ponds and surface water infiltration basin
1989 Phase II Operations Cell Sequence Plan and Sections	1989	Unk	No relevant information
1989 Phase II Ops Plan Final Grading Plan	1989	Unk	No relevant information
1989 Final Design Report	Jun-89	RW Beck	Contains information regarding the "inert fill" to the west of the main fill areas, leachate management design, and flow rates/capacity of aquifer below ELF. Calls for cover to control leachate and no collection or storage facilities to be installed.
Phase I Procedure Manual	Jun-89	RW Beck	Phase I Closure CQA Manual
Phase II Operations Plan	Jun-89	RW Beck	Operations plan for Phase II filling (covers filling, leachate management, LFG Management, daily cover, etc…
Enumclaw Landfill June 1989 Surveying and Mapping	6/30/1989	RW Beck	Provides survey topography of the leachate pond (no geomembrane liner) prior to removal
1988 Groundwater Quality - Off-Site	1/14/1990	KCSWD	Groundwater sample forms (not relevant)
1990 Final Design Report Add. NO. 1	Mar-90	RW Beck	Includes calculations for sizing the leachate pond (lined) and infiltration basin
1990 Final Design Report Revised Add. No. 1 v2	May-90	RW Beck	Updated calcs for infiltration basin
1984-1990 Environmental Data Base Ground-Surface Water Leachate	8/31/1990	HLA	Contains WQ Data from period before closure
1989 Groundwater Quarterly Well Wizard	9/7/1990	KCSWD	Groundwater sample forms (not relevant)
1989 Groundwater Quarterly Well Wizard 2	9/8/1990	KCSWD	Groundwater sample forms (not relevant)
1990 Groundwater Quarterly Well Wizard 3	9/9/1990	KCSWD	Groundwater sample forms (not relevant)
1991 Groundwater Quarterly Well Wizard 4	9/10/1990	KCSWD	Groundwater sample forms (not relevant)
1992 Groundwater Quarterly Well Wizard 5	9/11/1990	KCSWD	Groundwater sample forms (not relevant)
Final Geotechnical Soils Investigation April 1991	4/26/1991	HWA	Related only to transfer station development
Request for Variance Extension	Jul-92	KCSWD/RW Beck	Provides backup documentation for continued filling in Phase II.
1984 - 1990 Groundwater Report	7/30/1992	Emcon Northwest, Inc	Indicates some leachate impacts to GW Quality in downstream MWs during active filling and closure implementation period of the landfill

King County Solid Waste Division
Enumclaw Closed Landfill
Appendix F
Historical Document Review

Document Title	Date Published	Author/Creator	Summary of Relevant Content/Other Notes
Phase II Design Report	Dec-92	RW Beck	Phase II Closure Design Report (post removal of non-geomembrane lined leachate pond)
Phase II Construction Phase Manual	Apr-93	RW Beck	Phase II Closure CQA Manual
Phase II Plan - Site Map	4/26/1993	RW Beck/EMCON	Phase II Closure Construction Drawings
2002 Enumclaw and Houghton Lanfill GW Quality Reports	9/17/2002	KCSWD	Houghton GW Quality Plots (not relevant)
2003 Enumclw Site Inspection	6/12/2003	KCSWD	No relevant information
2002 Annual Groundwater Report	Jan-04	KCSWD	Evaluation of GW data from 1986 - 2002. Includes site history and update to GW quality trends. General improvement or steady trends for contaminants observed.
2004 Annual Groundwater Report	Mar-05	KCSWD	Evaluation of GW data from 1986 - 2004. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
2005 Annual Groundwater Report	Mar-06	KCSWD	Evaluation of GW data from 1986 - 2005. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
2006 Annual Groundwater Report	Mar-07	KCSWD	Evaluation of GW data from 1986 - 2006. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
2007 Annual Groundwater Report	Mar-08	KCSWD	Evaluation of GW data from 1986 - 2007. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
2008 Annual Groundwater Report	Dec-08	KCSWD	Evaluation of GW data from 1986 - 2008. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
1986 - 1999 Groundwater Report	Sep-09	KCSWD	Results of groundwater samples contained "low" concentrations of leachate indicating constituents and no significant trends were observed.
2009 Annual Groundwater Report	Jan-10	KCSWD	Evaluation of GW data from 1986 - 2009. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.

King County Solid Waste Division
Enumclaw Closed Landfill
Appendix F
Historical Document Review

Document Title	Date Published	Author/Creator	Summary of Relevant Content/Other Notes
Ecology Letter	12/14/2010	K. Kowalik/ Ecology	Identifies potential contaminated soils in the SW infiltration basin and potential gap in cover system near MW-10 (reference to 2009 annual report)
2010 Annual Groundwater Report	Dec-10	KCSWD	Evaluation of GW data from 1986 - 2010. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
2011 Annual Groundwater Report	Dec-11	KCSWD	Evaluation of GW data from 1986 - 2011. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
2012 Annual Groundwater Report	Dec-12	KCSWD	Evaluation of GW data from 1986 - 2012. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples.
2013 Annual Groundwater Report	Dec-13	KCSWD	Evaluation of GW data from 1986 - 2013. Includes site history and update to GW quality trends. Indicates continued improvement in GW quality based on well samples. Each annual GW report shows stable or decreasing trends for leachate indicating parameters. It was noted in recommendations of report that the site is demonstrating stabilization and that is may be appropriate to move towards custodial care (terminate post-closure care).
1986 Off-Site Wells	Fall 1986	Unk	No relevant information
Fig. 1 Cover Repair & Leachate Pond	Unk	Unk	Refers to Leachate Pond 3 only (Shows location of existing leachate ponds 1 and 2
Fig. 2 Sections and Details	Unk	Unk	Sections and details for Pond 3 and leachate collection
Enumclaw Landfill Aerial Photographs	Various	KCSWD	Observe changing site conditions. No specific relevance to leachate pond.

APPENDIX G

Select Phase I Construction Drawings

ENUMCLAW LANDFILL

CLOSURE PROJECT

PHASE I

PREPARED FOR:

KING COUNTY, WASHINGTON

PREPARED BY:

R. W. BECK AND ASSOCIATES

SWEET-EDWARDS/EMCON INC.

DON SHIMONO ASSOCIATES

LOCATION MAP

VICINITY MAP

DRAWING INDEX

	COVER SHEET
838-C-1	SITE PLAN
838-C-2	LANDFILL GRADING AND DRAINAGE PLAN
838-C-3	FINAL COVER PLAN
838-C-4	INFILTRATION BASIN GRADING
838-C-5	TYPICAL GRADING SECTIONS
838-C-6	TYPICAL GRADING SECTIONS
838-C-7	COVER DETAILS
838-C-8	DRAINAGE AND MISCELLANEOUS DETAILS
838-C-9	MISCELLANEOUS DETAILS
838-C-10	TANK PLANS AND MISCELLANEOUS DETAILS
838-C-11	LANDFILL GAS COLLECTION SYSTEM
838-C-12	GAS EXTRACTION WELL AND DETAILS
838-C-13	LFG EQUIPMENT COMPLEX SITE PLAN, SECTIONS AND DETAILS
838-C-14	LFG EQUIPMENT COMPLEX MECHANICAL PLAN AND SECTION
838-C-15	LFG EQUIPMENT COMPLEX FOUNDATION PLAN AND DETAILS
838-C-16	CONDENSATE SYSTEM
838-C-17	MISCELLANEOUS DETAILS
838-L-1	PLANTING PLAN
838-L-2	PLANTING PLAN
838-L-3	DETAIL SHEET/PLANTING PLAN
838-E-1	BLOWER/FLARE - ELECTRICAL PLAN AND DETAILS
838-E-2	CONTROL AND WIRING DIAGRAMS

NOTES:

1. NEW CONTOURS SHOWN ON THIS SHEET REPRESENT TOP OF FINISH SUBGRADE. 3' COVER SYSTEM WILL BE PLACED ON TOP. SEE FINAL COVER PLAN DWG. C-3.
2. REFUSE WILL BE ENCOUNTERED IN ALL AREAS OF EXCAVATION.
3. EMBANKMENT LIMITS SHOWN ARE APPROXIMATIONS ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION STAKING. SEE TYPICAL GRADING DETAILS DWGS. C-5 AND C-6.
4. drain pipe on HDPE

NORTH DITCH

STATION	ELEVATION	DITCH SLOPE
N 0+00	856.50	30' TRANSITION
N 0+30	853.80	85' @ 0.9%
N 1+15	854.55	494.5' @ 1.6%
N 6+09.5	846.65	197.5' @ 14%
N 8+07	819.00	513' @ 6.38%
N 13+20	786.30	10' @ 3%
N 13+30	786.00	10' @ 0%
N 13+40	786.00	120' @ 5%
N 14+60	786.60	15' TRANSITION
N 14+75	788.68	270' @ 0.5%
N 17+45	790.00	

WEST DITCH

STATION	ELEVATION	DITCH SLOPE
W 0+00	795.84	
W 0+10	796.00	10' @ 1.6%
W 4+00	825.25	390' @ 7.5%
W 5+95	827.20	195' @ 1%
W 6+25	829.50±	30' TRANSITION

STATION	BEARING	DISTANCE
N 0+00		
N 1+50	N 1°37'16"E	150'
P.I. N 6+25.57 AHD	N 0°30'33"W	475.57'
P.I. N 9+27.03 AHD	N 88°08'39"W	320.94'
P.I. N 11+39.96 AHD	S 56°12'23"W	216.59'
P.I. N 16+07.94 AHD	S 72°22'26"W	468.32'
N 17+45	S 28°19'51"W	138.67
W 0+00		
P.I. W 0+37.71 AHD	S 17°37'34"E	37.71'
P.I. W 3+34.92 AHD	S 56°30'46"W	306.98
W 5+95	S 10°53'48"E	275.83

CONTROL POINTS	NORTHING	EASTING
STA. N 1+50	10,750	12,555
PP 13A	11,257.28	12,550.32
PP 50 (SEE DWG. C-1)	11,207.69	11,452.52

CURVE DATA

① PC STA. N 5+77.59
PT STA N 6+54.07
Δ = 87°38'06"
R = 50'
L = 76.48'
T = 47.98'

② PC STA N 8+70.76
PT STA N 9+79.64
Δ = 35°38'57"
R = 175'
L = 108.88'
T = 56.27'

③ PC STA. N 11+15.10
PT STA. N 11+64.48
Δ = 16°10'02"
R = 175'
L = 49.38'
T = 24.86'

④ PC STA. W 0+03.71
PT STA. W 0+61.94
Δ = 74°08'21"
R = 45'
L = 58.23'
T = 34'

⑤ PC STA. W 2+68.22
PT STA. W 3+85.87
Δ = 67°24'35"
R = 100'
L = 117.65'
T = 66.7'

GRAPHIC SCALE:
50 0 50 100
1" = 50'

LEGEND
- LIMIT OF FINAL COVER
- 6" PERFORATED CORRUGATED DRAIN PIPE
- 6" CORRUGATED DRAIN PIPE

Approximate location of former Phase I Leachate Lagoon

DRAIN PIPE TO DAYLIGHT IN DITCH ON TOP OF FINAL COVER, TYP.
EXISTING FENCE TO REMAIN. CONTRACTOR TO REPLACE ANY PORTION DAMAGED DURING CONSTRUCTION.
GRADE TO DRAIN
SEE DRAINAGE DITCH TRANSITION DETAIL DWG. C-8
EXISTING WELLS TO BE PROTECTED DURING CONSTRUCTION
EMBANKMENT IN THIS AREA TO BE REFUSE
EMBANKMENT IN THIS AREA TO BE SELECT NATIVE MAT'L
SEE SUMP GRADING DETAIL, DWG. C-
EMBANKMENT IN THIS AREA TO BE SELECT NATIVE MATERIAL
EMBANKMENT THIS AREA TO BE REFUSE
CONSTRUCT BERM 0' TO 2' HIGH, SEE TYP GRADING SECTION DWG. C-6
SEE DRAINAGE DITCH TRANSITION DETAIL DWG. C-8
INFILTRATION BASIN SEE DRAWING C-4
LIMIT OF FINAL COVER
DENSE TREES
7' Cycl. & Barb Gnt
Tel Box
Gate
R.R Spike in PP EL. 837.50

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DATE	DWN BY	CHKD	APPR

REVISIONS

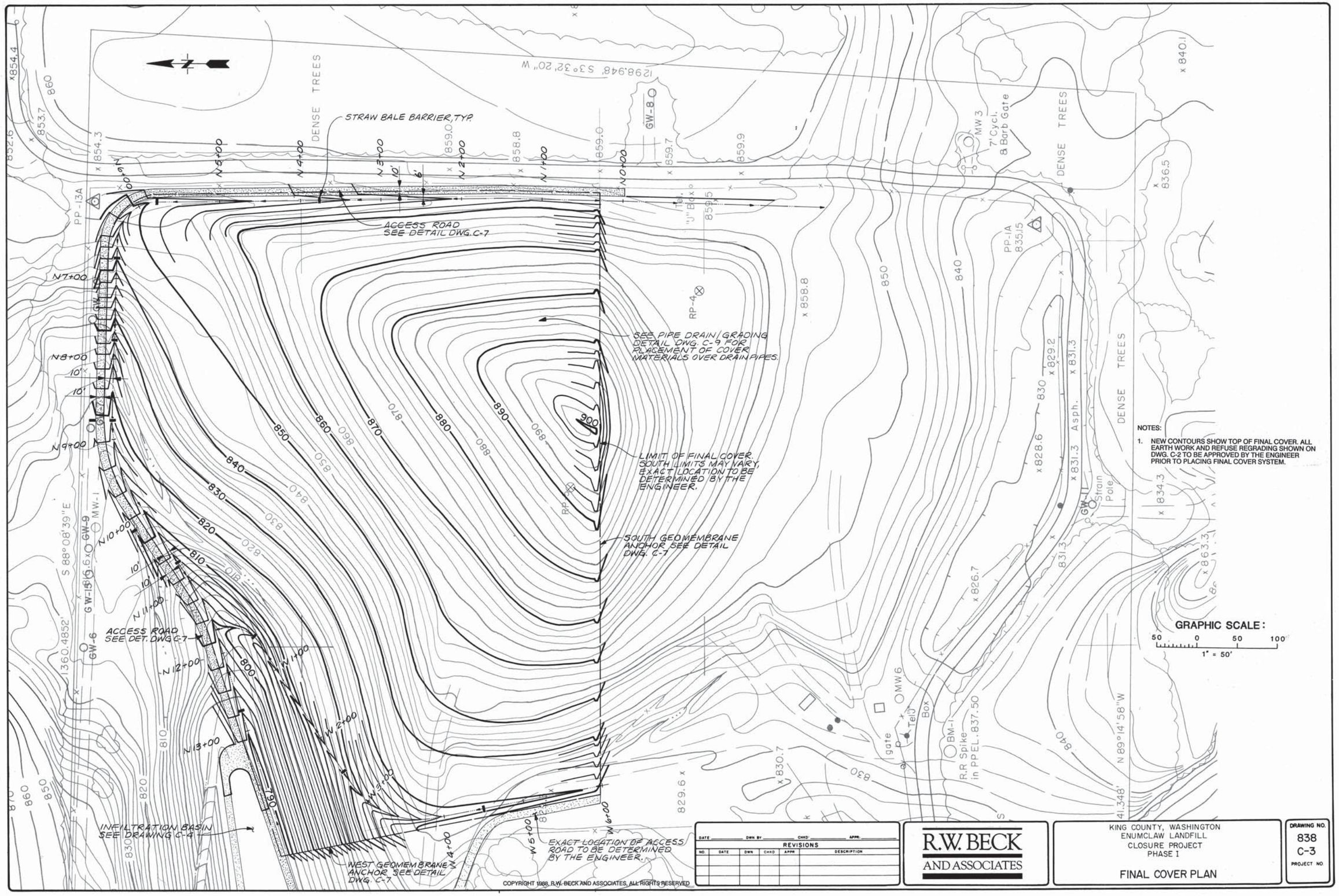
NO.	DATE	DWN	CHKD	APPR	DESCRIPTION

R.W. BECK AND ASSOCIATES

KING COUNTY, WASHINGTON
ENUMCLAW LANDFILL
CLOSURE PROJECT
PHASE I

LANDFILL GRADING AND DRAINAGE PLAN

DRAWING NO. 838 C-2
PROJECT NO.



NOTES:

1. NEW CONTOURS SHOW TOP OF FINAL COVER. ALL EARTH WORK AND REFUSE REGRADING SHOWN ON DWG. C-2 TO BE APPROVED BY THE ENGINEER PRIOR TO PLACING FINAL COVER SYSTEM.

GRAPHIC SCALE:
50 0 50 100
1" = 50'

DATE	DWN BY	CHKD	APPR

REVISIONS

NO.	DATE	DWN	CHKD	APPR	DESCRIPTION

R.W. BECK AND ASSOCIATES

KING COUNTY, WASHINGTON
ENUMCLAW LANDFILL
CLOSURE PROJECT
PHASE I

FINAL COVER PLAN

DRAWING NO. 838 C-3
PROJECT NO.

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N 11,067
E 11,573

N 11,086
E 11,658

N 11,105
E 11,843

ROCK OUTFALL, TYP.
SEE DETAIL DWG C-

25 L.F. 24"
@ 4.0%

23 L.F. 12"
@ 2.17%

I.E. 788

30 L.F. 12"
@ 3.33%

GRADE
TO DRAIN

TOP ELEV. 790

N12+00

POND BOTTOM
EL. 786

I.E. 786

I.E. 788.5

N13+00

How's this paid for?

SEE ROCK OVERFLOW
DETAIL DWG C-

I.E. 787

30 L.F. 8" HDPE
@ 0%

? Need some slope
esp in small pipe

POND BOTTOM
EL. 786

N14+00

I.E. 788

120' V.C.

28 L.F. 24"
@ 3.57%

CB #1, TYPE II, 54"
STA. N13+40, 29' RT
TOP 791.7
I.E. NE 787.5
I.E. S.W. 787.0

N 11,600

N15+00

STA. N14+85

STA. N14+40

STA. N14+60

LIMIT OF
FINAL COVER,
SEE NOTE

E 11,800

TOP ELEV. 790

N16+00

ACCESS ROAD,
SEE DETAIL
DWG. C-7

SEE DRAINAGE
DITCH TRANSITION

Whose?

E 12,000

N17+00

N 10,860
E 11,514
EL. 790

N 10,850.00
E 11,536.99
EL. 790

25 L.F. 12"
MAINTAIN 1' COVER OVER
TOP OF PIPE AND 1%
MINIMUM SLOPE. EXACT
LOCATION TO BE DETER-
MINED BY THE ENGINEER.

GRADE
TO DRAIN

EXACT LOCATION OF
ACCESS ROAD TO
BE DETERMINED
BY THE ENGINEER

MW-2

℄ ACCESS ROAD

HORIZONTAL		VERTICAL	
STA.	*OFFSET	STA.	ELEV.
N12+00	15' RT		120' VC
N12+80	15' RT	PVC N12+80	793.83
N13+40	11' RT	PVI N13+40	790.00
N14+00	8.4' RT	PVT N14+00	790.00
N17+45	5' RT		

* FROM DITCH ℄ TO EDGE OF ROAD

CURVE DATA
PC STA. N15+91.76
PT STA. N16+22.51
Δ = 44°02'34"
R = 40'
L = 30.75'
T = 16.18'

NOTE:
1. PROPOSED CONTOURS THIS DWG REPRESENT FINAL GRADES. IN AREAS WHERE COVER SYSTEM IS TO BE CONSTRUCTED CONTOURS SHOW TOP OF FINAL COVER, SEE DWG. C-2 FOR SUBGRADE PLAN.

GRAPHIC SCALE:
20 0 20 40
1" = 20'

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DATE ____ DWN BY ENG CHK'D ____ APPR. ____

REVISIONS

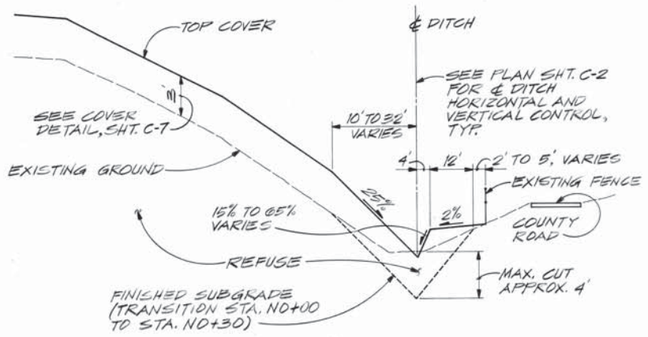
NO.	DATE	DWN	CHK'D	APPR	DESCRIPTION

R.W. BECK AND ASSOCIATES

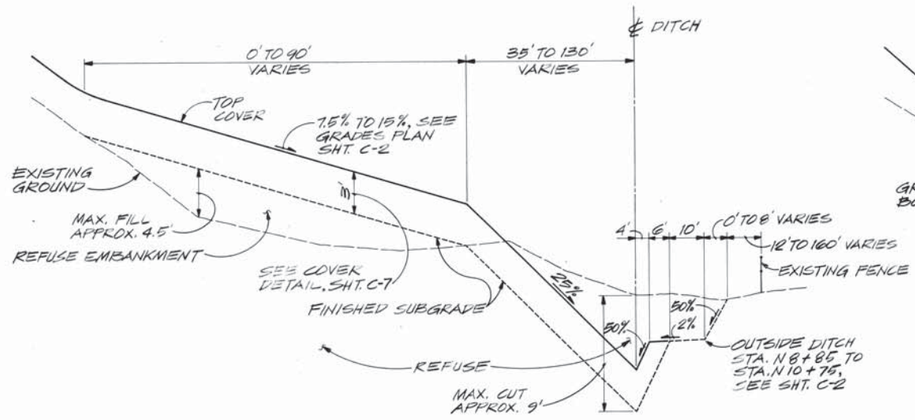
KING COUNTY, WASHINGTON
ENUMCLAW LANDFILL
CLOSURE PROJECT
PHASE I

INFILTRATION BASIN GRADING PLAN

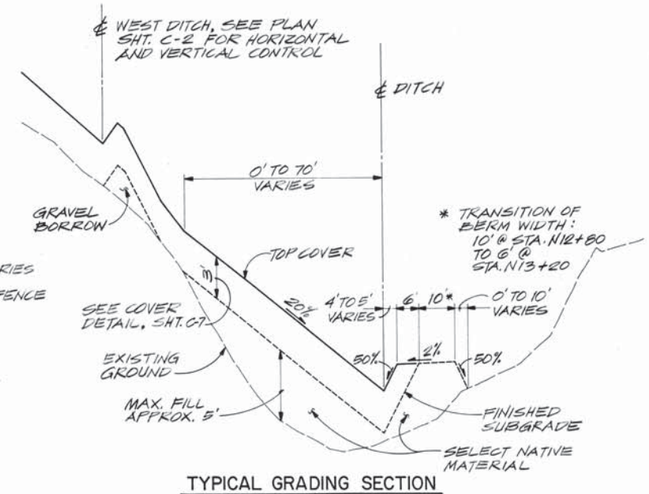
DRAWING NO. 838 C-4
PROJECT NO.



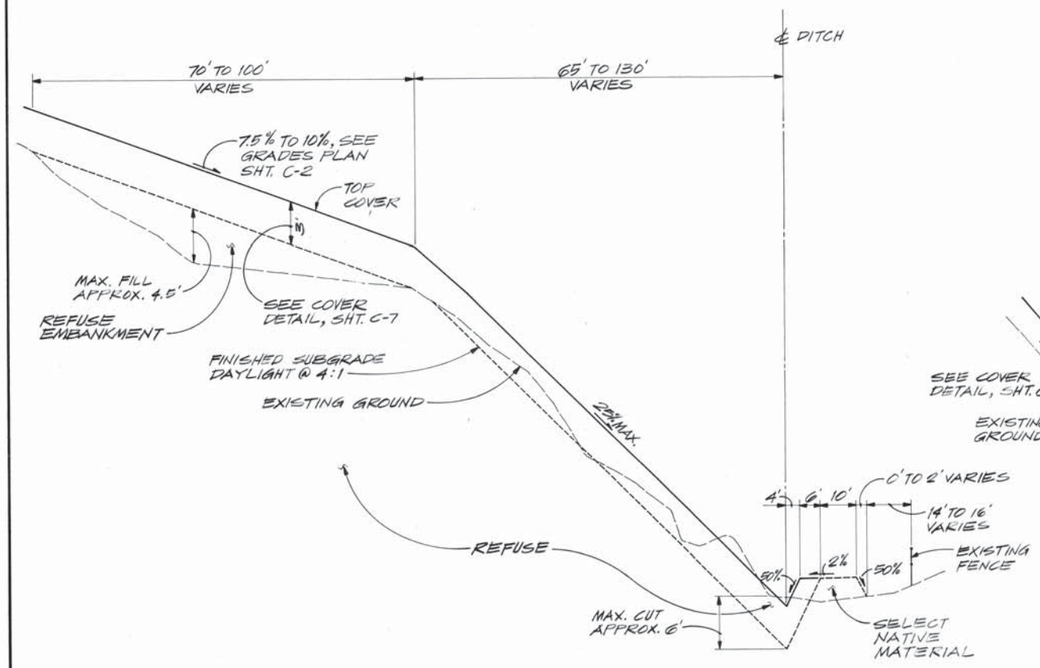
TYPICAL GRADING SECTION
STA. N 0+30 TO N 5+00
(TRANSITION STA. N 5+00 TO N 6+50)



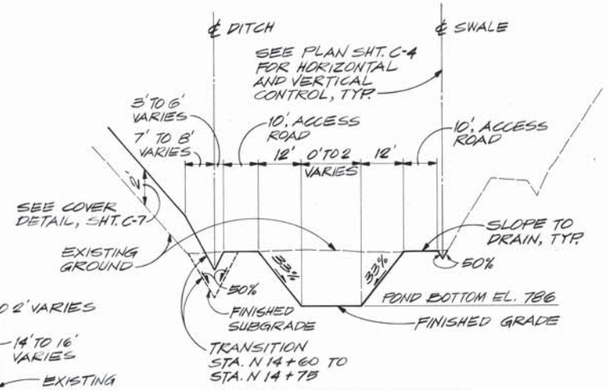
TYPICAL GRADING SECTION
STA. N 6+50 TO N 7+40
STA. N 8+85 TO N 10+75
(TRANSITION STA. N 10+75 TO N 11+20)



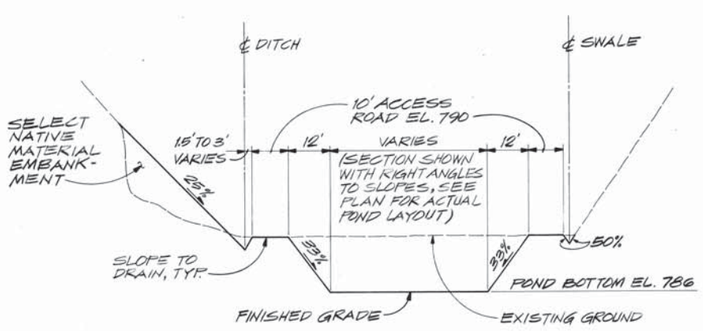
TYPICAL GRADING SECTION
STA. N 11+20 TO N 13+20
(TRANSITION STA. N 13+20 TO N 13+50)



TYPICAL GRADING SECTION
STA. N 7+40 TO N 8+85



TYPICAL GRADING SECTION
STA. N 13+50 TO N 14+60
EXCAVATED MATERIAL THIS AREA TO BE USED AS SELECT NATIVE MATERIAL, BEDDING AND COVER SOIL.



TYPICAL GRADING SECTION
STA. N 14+75 TO N 16+00
EXCAVATED MATERIAL THIS AREA TO BE USED AS SELECT NATIVE MATERIAL, BEDDING AND COVER SOIL.

DATE	DWN BY EMG	CHKD	APPR

REVISIONS

NO.	DATE	DWN	CHKD	APPR	DESCRIPTION

R.W. BECK AND ASSOCIATES

KING COUNTY, WASHINGTON
ENUMCLAW LANDFILL
CLOSURE PROJECT
PHASE I

TYPICAL GRADING SECTIONS

DRAWING NO. 838 C-5
PROJECT NO.

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KAA15003

KING COUNTY
DEPARTMENT OF PUBLIC WORKS
SOLID WASTE DIVISION

ENUMCLAW LANDFILL CLOSURE PROJECT
PHASE II
CONTRACT NO. C10388C

KING COUNTY OFFICIALS

KING CO. EXECUTIVE:	Tim Hill
COUNCIL MEMBERS:	Audrey Gruger Cynthia Sullivan Brian Derdowski Larry Phillips Ron Sims Bruce Laing Paul Barden Greg Nickels Kent Pullen
DIRECTOR OF PUBLIC WORKS:	Paul Tanaka
SOLID WASTE DIVISION MANAGER:	Rodney Hansen
ENGINEERING SERVICES SECTION MANAGER:	Kevin Kiernan
KING CO. PROJECT MANAGER:	Jeff Bunnell

DON SHIMONO ASSOCIATES
LANDSCAPE ARCHITECTS ENVIRONMENTAL PLANNERS RECREATION PLANNERS
375 118TH AVENUE SE SUITE 100 BELLEVUE, WASH. 98005 (206) 454-1500

EMCON Northwest, Inc.

R.W. BECK AND ASSOCIATES

REC KAA15003 11-25-92 @ 13:43

KAA15016

GEOMEMBRANE LIMITS		
POINT	NORTHING	EASTING
1	10623 (1)	11811 (1)
2	10666 (1)	12055 (1)
3	10729 (1)	12363 (1)
4	10727 (1)	12561 (1)
5	10596	12548
6	10485	12553
7	10365	12557
8	10167	12535
9	10105	12481
10	10096	12340
11	10105	12236
12	10140	12122
13	10175	12038
14	10217	11989
15	10284	11950
16	10447	11872

NOTES:

(1) APPROXIMATE LOCATION OF COVER CONNECTION OF PHASE II GEOMEMBRANE TO EXISTING PHASE I GEOMEMBRANE. ACTUAL LOCATION TO BE VERIFIED AFTER EXCAVATION OF PHASE I ANCHOR BERM. SEE SECTIONS E AND F, DWG C-9.

(2) ALL OTHER GEOMEMBRANE LIMITS TO BE LOCATED ±2 FEET FROM POINT OF NORTHINGS AND EASTINGS.

N: 10780
E: 11754

AREA FOR DISPOSAL OF EXCESS MATERIAL (CLEAR, GRUB, AND REMOVE TREES)

PHASE I AREA

PHASE II AREA

EXISTING 6" REC LEACHATE PIPE

TYPE 1 FILTER FABRIC FENCE

N: 10480
E: 11595

TIE NEW 6"ø PEC INTO EXISTING 6"ø LEACHATE COLLECTION PIPE

REMOVE AND RELOCATE EXISTING LEACHATE COLLECTION SUMP AND PUMP

17"ø PEC CONNECT TO EXISTING LEACHATE COLLECTION LINE

RELOCATED LEACHATE COLLECTION SUMP AND PUMP

REUSE EXISTING CONDUCTOR OR INSTALL TYPE USE NO.12 CONDUCTORS, DIRECT BURY WITH LEACHATE SUMP DISCHARGE

REMOVE EXISTING 12" PEC PIPE

REMOVE EXISTING FENCE

TYPE 1 FILTER FABRIC FENCE (TYP)

EXISTING POWER POLE TO REMAIN

EXISTING STUB POLE W/METER, SERVICE DISCONNECT AND LOAD CENTER TO BE RELOCATED APPROXIMATELY 100' TO THE SOUTHWEST

RELOCATED STUB POLE W/METER, SERVICE DISCONNECT AND LOAD CENTER

EXISTING TELEPHONE BOX COORDINATE RELOCATION WITH US WEST

TIE NEW 6"ø PEC INTO EXISTING 6"ø LEACHATE COLLECTION PIPES

PROPERTY BOUNDARY

ROAD A

REMOVE EXISTING CONCRETE ASPHALT ROAD. PULVERIZE AND REUSE ASPHALT WHEN REGRADING AND RESURFACING EXISTING LANDFILL PERIMETER ROAD

INFILTRATION POND NO 2

EXISTING POWER POLE TO REMAIN

SEE NOTE 5

1"ø HDPE LEACHATE PUMP DISCHARGE

SEE NOTE 6

CONSTRUCT 8' WIDE GRAVEL SHOULDER

ROW

NEAT LINE CUT ASPHALT

SEDIMENTATION POND NO 2

MAXIMUM SLOPE FOR SEDIMENTATION AN INFILTRATION PONDS SHALL BE 3:1

EXISTING LEACHATE COLLECTION PIPE

TYPE 1 FILTER FABRIC FENCE

10' WIDE ROAD

RELOCATED LEACHATE COLLECTION SUMP AND PUMP

REMOVE AND RELOCATE EXISTING LEACHATE COLLECTION SUMP AND PUMP

SE 440TH STREET

E 11,500 E 11,750 E 12,000 E 12,250 E 12,500 E 12,750

N 10,750 N 10,500 N 10,250 N 10,000

GAS FLARE FACILITY EXISTING

SIMILAR

PROPERTY BOUNDARY

20-MIL HDPE COVER WITH SANDBAGS: REMOVE AND DISPOSE OF IN OWNER PROVIDED TRAILER. SANDBAGS MAY BE DISPOSED OF ON SITE IN LEACHATE POND NO. 2

FILL LEACHATE POND #2 WITH LANDFILL MATERIAL, SANDBAGS OR NATIVE SOIL. GEOMEMBRANE LINER MAY BE LEFT IN PLACE.

NOTES:

1. CONTOURS ARE FOR LANDFILL SUBGRADE, AND ROAD A, ROAD B, AND ROAD C SUBGRADE, AND FOR ACCESS ROAD AND PERIMETER ROAD SUBGRADE.
2. MAXIMUM TYPICAL LANDFILL COVER SLOPE 25% ±3%, MINIMUM TYPICAL COVER SLOPE 5%
3. MATERIAL GRADED WITHIN LANDFILL AREA MUST BE PLACED WITHIN GEO-MEMBRANE LIMITS.
4. SEE DWG C-4 FOR LAYOUT OF DRAIN PIPING ON LANDFILL. TRENCH EXCAVATION NOT SHOWN ON THIS DWG.
5. SEE SKE-1 FOR RELOCATED LEACHATE SUMP ELECTRICAL ARRANGEMENT AND DETAILS.

GRAPHIC SCALE:

50 0 50 100

1" = 50'

Susan A. Boggs 4-26-93
EXPIRES 8-25-93

REV.	DATE	BY	CK'D	APPROVALS	DESCRIPTION
2	4-26-93	MLI	KRH	SAB	ADDED ADD. NO.4 AND ISSUED FOR CONSTRUCTION
1	2-11-93	MLI	KRH	SAB	ADDED ADDENDUM NO. 1
0	2-4-93	MLI	KRH	SAB	ISSUED FOR BIDS

DRAWING REVISION RECORD

DESIGN	MLI
DRAWN	CAD
CHECKED	KRH
APPROVED	SAB

KING COUNTY DEPARTMENT OF PUBLIC WORKS
Paul Tanaka, Director
SOLID WASTE DIVISION

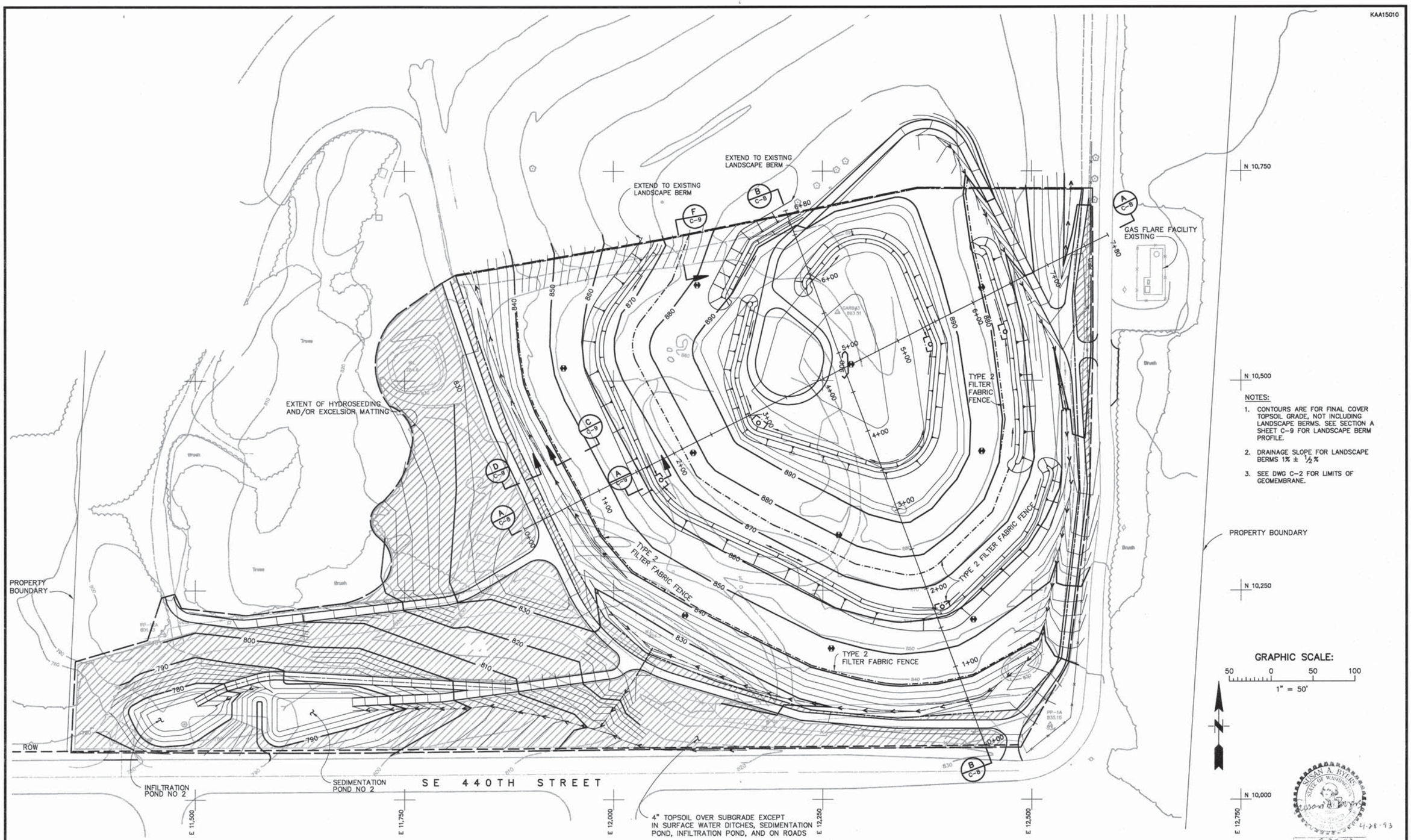
ENUMCLAW LANDFILL CLOSURE PROJECT
PHASE II

GRADING PLAN

SCALE	DRAWING NUMBER	REV
1" = 50'	C-2	2

SCS N:\KAA15016 2-12-93 @ 11:10

KAA15010



NOTES:

1. CONTOURS ARE FOR FINAL COVER TOPSOIL GRADE, NOT INCLUDING LANDSCAPE BERMS. SEE SECTION A SHEET C-9 FOR LANDSCAPE BERM PROFILE.
2. DRAINAGE SLOPE FOR LANDSCAPE BERMS 1% ± ½%
3. SEE DWG C-2 FOR LIMITS OF GEOMEMBRANE.

GRAPHIC SCALE:

50 0 50 100

1" = 50'

SUSAN A. BYERS STATE OF WASHINGTON 4-28-93

8-25-93

E.M. I:\KAA15010 1-29-93 @ 15:40

REV.	DATE	BY	CK'D	APPROVALS	DESCRIPTION
1	4-26-93	MLI	KRH	SAB	ISSUED FOR CONSTRUCTION
0	2-04-93	MLI	KRH	SAB	ISSUED FOR BIDS

DRAWING REVISION RECORD

REV.	DATE	BY	CK'D	APPROVALS	DESCRIPTION

DRAWING REVISION RECORD

DESIGN	MLI
DRAWN	CAD
CHECKED	KRH
APPROVED	SAB

KING COUNTY DEPARTMENT OF PUBLIC WORKS
Paul Tanaka, Director
SOLID WASTE DIVISION

ENUMCLAW LANDFILL CLOSURE PROJECT
PHASE II

FINAL COVER PLAN

SCALE	DRAWING NUMBER	REV
1" = 50'	C-3	1

KAA15001

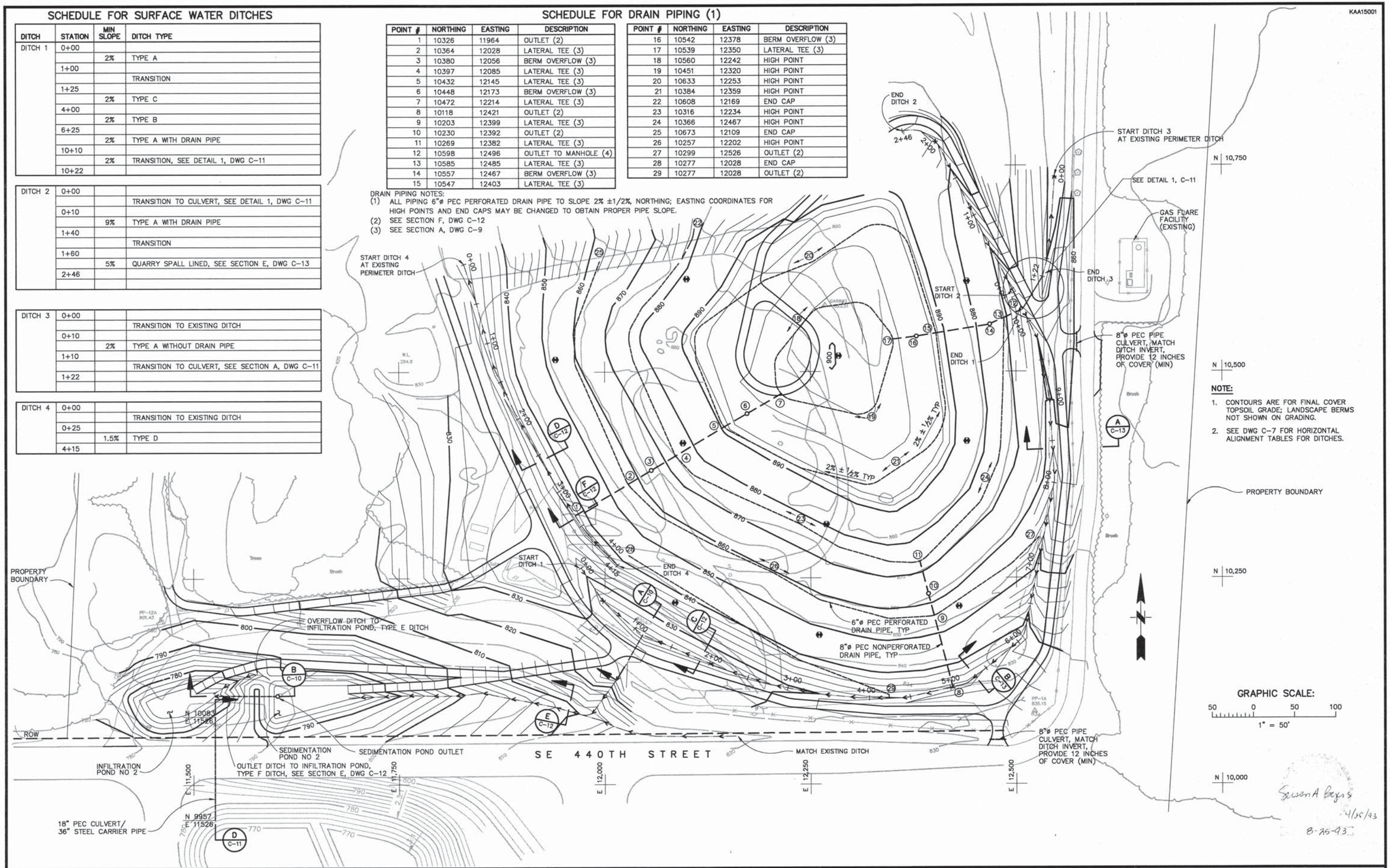
SCHEDULE FOR SURFACE WATER DITCHES

DITCH	STATION	MIN SLOPE	DITCH TYPE
DITCH 1	0+00		
		2%	TYPE A
	1+00		
			TRANSITION
	1+25		
		2%	TYPE C
	4+00		
		2%	TYPE B
	6+25		
		2%	TYPE A WITH DRAIN PIPE
	10+10		
		2%	TRANSITION, SEE DETAIL 1, DWG C-11
	10+22		
DITCH 2	0+00		
			TRANSITION TO CULVERT, SEE DETAIL 1, DWG C-11
	0+10		
		9%	TYPE A WITH DRAIN PIPE
	1+40		
			TRANSITION
	1+60		
		5%	QUARRY SPALL LINED, SEE SECTION E, DWG C-13
	2+46		
DITCH 3	0+00		
			TRANSITION TO EXISTING DITCH
	0+10		
		2%	TYPE A WITHOUT DRAIN PIPE
	1+10		
			TRANSITION TO CULVERT, SEE SECTION A, DWG C-11
	1+22		
DITCH 4	0+00		
			TRANSITION TO EXISTING DITCH
	0+25		
		1.5%	TYPE D
	4+15		

SCHEDULE FOR DRAIN PIPING (1)

POINT #	NORTHING	EASTING	DESCRIPTION
1	10326	11964	OUTLET (2)
2	10364	12028	LATERAL TEE (3)
3	10380	12056	BERM OVERFLOW (3)
4	10397	12085	LATERAL TEE (3)
5	10432	12145	LATERAL TEE (3)
6	10448	12173	BERM OVERFLOW (3)
7	10472	12214	LATERAL TEE (3)
8	10118	12421	OUTLET (2)
9	10203	12399	LATERAL TEE (3)
10	10230	12392	OUTLET (2)
11	10269	12382	LATERAL TEE (3)
12	10598	12496	OUTLET TO MANHOLE (4)
13	10585	12485	LATERAL TEE (3)
14	10557	12467	BERM OVERFLOW (3)
15	10547	12403	LATERAL TEE (3)
16	10542	12378	BERM OVERFLOW (3)
17	10539	12350	LATERAL TEE (3)
18	10560	12242	HIGH POINT
19	10451	12320	HIGH POINT
20	10633	12253	HIGH POINT
21	10384	12359	HIGH POINT
22	10608	12169	END CAP
23	10316	12234	HIGH POINT
24	10366	12467	HIGH POINT
25	10673	12109	END CAP
26	10257	12202	HIGH POINT
27	10299	12526	OUTLET (2)
28	10277	12028	END CAP
29	10277	12028	OUTLET (2)

DRAIN PIPING NOTES:
(1) ALL PIPING 6"ø PEC PERFORATED DRAIN PIPE TO SLOPE 2% ±1/2%, NORTHING; EASTING COORDINATES FOR HIGH POINTS AND END CAPS MAY BE CHANGED TO OBTAIN PROPER PIPE SLOPE.
(2) SEE SECTION F, DWG C-12
(3) SEE SECTION A, DWG C-9



Susan A Boyd 4/15/93
8-26-93

REV.	DATE	BY	CK'D	APPROVALS	DESCRIPTION
1	4-26-93	MLJ	KRH	SAB	ISSUED FOR CONSTRUCTION
0	2-04-93	MLJ	KRH	SAB	ISSUED FOR BIDS

DRAWING REVISION RECORD

DESIGN	MLJ
DRAWN	CAD
CHECKED	KRH
APPROVED	SAB

KING COUNTY DEPARTMENT OF PUBLIC WORKS
Paul Tanaka, Director
SOLID WASTE DIVISION

ENUMCLAW LANDFILL CLOSURE PROJECT
PHASE II

SURFACE WATER DRAINAGE PLAN

SCALE	DRAWING NUMBER	REV
1" = 50'	C-4	1

E.M. D:\KAA15001 1-04-93 @ 10:43

KAA15011

ROAD	STATION	ROAD SECTION	NOTES
PERIMETER	0+00	STANDARD ROAD SECTION, SEE SECTION A, DWG C-13	TRANSITION TO EXISTING ROAD
	3+35		BEGIN ROAD A
	4+25		START 2' CURVE WIDENING
	5+10		BEGIN ROAD B
	5+50		END 2' CURVE WIDENING
	7+00		START 2' CURVE WIDENING
	7+50		END 2' CURVE WIDENING
	9+50		START WIDENING ROAD FOR ENTRY GATE
	10+00	APPROXIMATE START OF TRANSITION TO ROAD SECTION WITH ANCHOR TRENCH, SEE SECTION B, DWG C-13	END WIDENING ROAD FOR ENTRY GATE
	10+50		START 2' CURVE WIDENING
	11+00		END 2' CURVE WIDENING
	12+50		START 2' CURVE WIDENING
	13+00		END 2' CURVE WIDENING
	14+20		START ROAD WIDENING FOR ENTRY GATE AND ACCESS ROAD
	15+25		END ROAD WIDENING FOR ENTRY GATE AND ACCESS ROAD
	16+43		TRANSITION TO EXISTING ROAD
ACCESS	0+00	ROAD SECTION WITH ANCHOR TRENCH, SEE SECTION B, DWG C-13	BEGIN ACCESS ROAD
	0+10	ACCESS ROAD WITH DITCH, SEE SECTION C, DWG C-13	
	2+30	APPROXIMATE START OF SECTION TRANSITION TO ACCESS ROAD WITH DITCH OVER PHASE I, SEE SECTION E, DWG C-13	
	2+40	APPROXIMATE END OF SECTION TRANSITION	
	2+85		START 2' CURVE WIDENING
	3+80	APPROXIMATE START OF SECTION TRANSITION TO ACCESS ROAD OVER PHASE I, SEE SECTION F, DWG C-13	END 2' CURVE WIDENING
	5+00	APPROXIMATE START OF SECTION TRANSITION TO ACCESS ROAD OVER PHASE II, SEE SECTION C, DWG C-13	
	5+20	APPROXIMATE END OF SECTION TRANSITION	
	7+00		START 2' CURVE WIDENING
	9+00		END 2' CURVE WIDENING
	9+80		END ACCESS ROAD
ROAD A	0+00	STANDARD ROAD SECTION, SEE SECTION A, DWG C-13,	BEGIN ROAD
			15% MAXIMUM SLOPE TO STA 2+50
	1+00		START 2' CURVE WIDENING
1	1+50		END 2' CURVE WIDENING
	2+75		START 2' CURVE WIDENING
	4+87	TRANSITION TO EXISTING ROAD	END 2' CURVE WIDENING
ROAD B	0+00	STANDARD ROAD SECTION, SEE SECTION A, DWG C-13,	BEGIN ROAD
			14% MAXIMUM SLOPE TO STA 3+42
	3+42		END AT BASE OF SEDIMENTATION POND
ROAD C	0+00	STANDARD ROAD SECTION, SEE SECTION A, DWG C-13,	BEGIN AT ROAD B 5TH STA 1+54
			14% MAXIMUM SLOPE
	3+83		END AT BASE OF INFILTRATION POND

NOTE:

1. SEE DWG C-6 FOR PERIMETER ROAD AND ACCESS ROAD PROFILES.
2. SEE DWG C-7 FOR HORIZONTAL ALIGNMENT TABLES FOR PERIMETER ROAD, ACCESS ROAD, ROAD A, ROAD B AND ROAD C.

SUSAN A. BYERS — STATE OF WASHINGTON — 20093 — REGISTERED PROFESSIONAL ENGINEER
4-28-93
EXPIRES: 8-25-93

REV.	DATE	BY	CK'D	APPROVALS	DESCRIPTION
2	4-26-93	MLI	KRH	SAB	ADDED ADD. NO.4 AND ISSUED FOR CONSTRUCTION
1	2-11-93	MLI	KRH	SAB	ADDED ADDENDUM NO. 1
0	2-04-93	MLI	KRH	SAB	ISSUED FOR BIDS

DRAWING REVISION RECORD

REV.	DATE	BY	CK'D	APPROVALS	DESCRIPTION

DRAWING REVISION RECORD

DESIGN	MLI
DRAWN	CAD
CHECKED	KRH
APPROVED	SAB

KING COUNTY DEPARTMENT OF PUBLIC WORKS
Paul Tanaka, Director
SOLID WASTE DIVISION

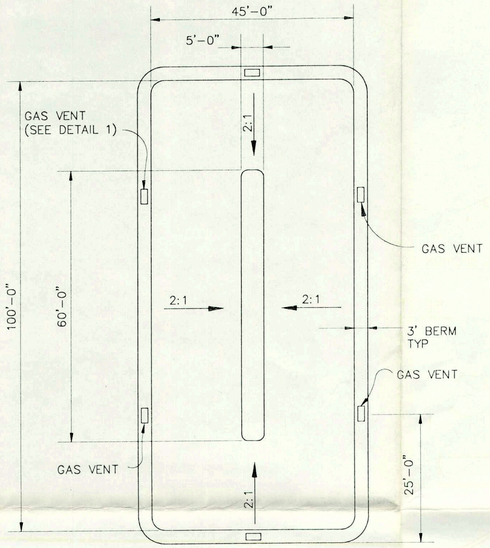
ENUMCLAW LANDFILL CLOSURE PROJECT
PHASE II

ROAD PLAN

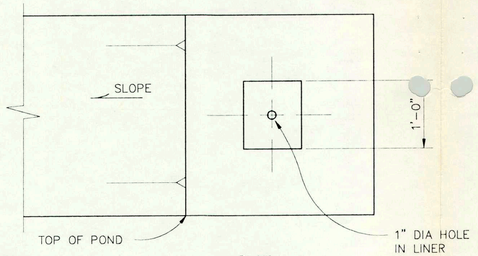
SCALE	DRAWING NUMBER	REV
1" = 50'	C-5	2

SCS I:\KAA15011 2-12-93 @ 10:35

KAA14000



PLAN



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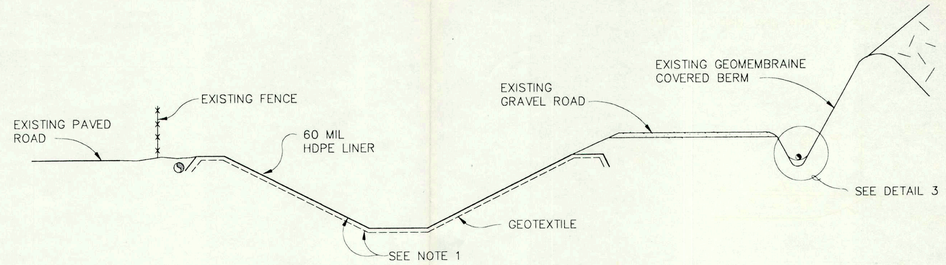
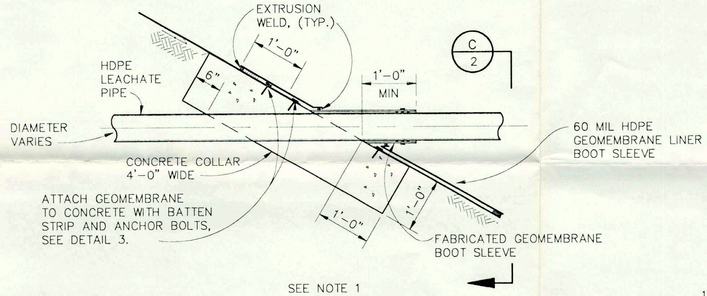


CROSS SECTION FOR LEACHATE POND 3

SECTION A/1

NO SCALE



SEE NOTE 1

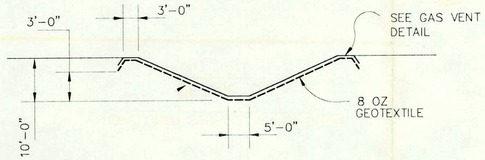
TYPICAL LINER PENETRATION

DETAIL 2

NO SCALE

NOTE

1. WORK INCLUDED UNDER CONTRACT FOR ENUMCLAW LANDFILL LEACHATE POND #3 AND TEMPORARY COVER REPAIR. GRADING FOR LEACHATE POND TO BE PERFORMED BY OWNER.
2. WORK TO BE PERFORMED BY OWNER.

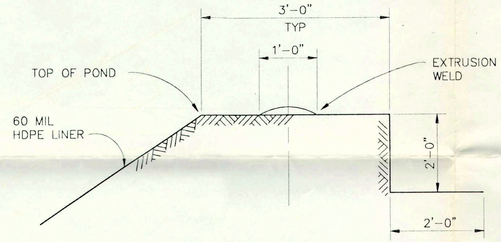


SEE NOTE 1

PROFILE

LEACHATE POND #3

NO SCALE

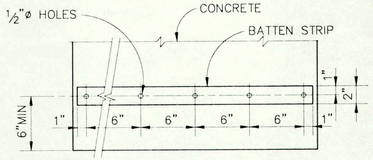


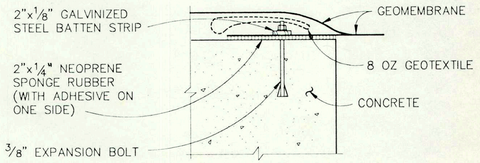
SEE NOTE 1

LEACHATE POND – GAS VENT DETAIL

DETAIL 1

NO SCALE



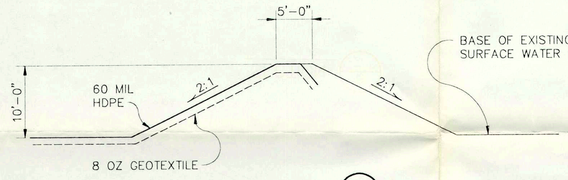


SEE NOTE 1

BATTEN STRIP AND ANCHOR BOLT

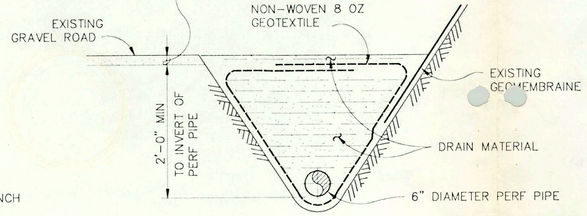
DETAIL 4

NO SCALE



SECTION B/1

NO SCALE

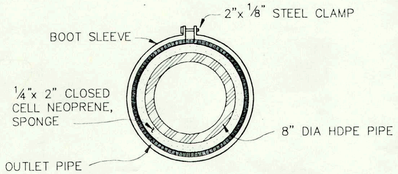


SEE NOTE 2

TYPICAL LEACHATE COLLECTION TRENCH

DETAIL 3

NO SCALE



SECTION C/2

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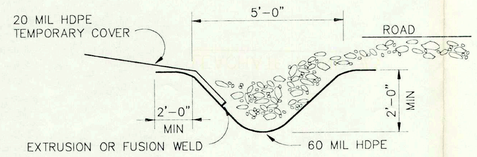
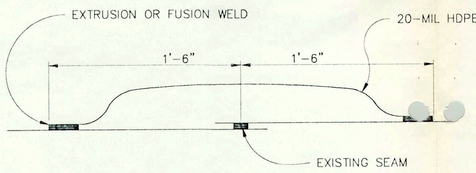


SEE NOTE 1

HDPE LINED SURFACE WATER DITCH

DETAIL 5

NO SCALE



SEE NOTE 1

SEAM REPAIR – CAP STRIP

DETAIL 6

NO SCALE

DATE	BY	CK'D	APPROVALS	DESCRIPTION

DRAWING REVISION RECORD

REV.	DATE	BY	CK'D	APPROVALS	DESCRIPTION

DRAWING REVISION RECORD

DESIGN	XXX	
DRAWN	C.D.D.	
CHECKED		
APPROVED		

KING COUNTY DEPARTMENT OF PUBLIC WORKS
Paul Tanaka, Director
SOLID WASTE DIVISION
ENUMCLAW LANDFILL COVER REPAIR
AND LEACHATE POND

SECTIONS AND DETAILS

SCALE	DRAWING NUMBER	REV.
AS SHOWN	FIGURE 2	

APPENDIX H

Settlement Survey Data

King County Solid Waste Division
Enumclaw Closed Landfill
Appendix H
Settlement Survey Data

MARKER	NORTHING (USF)	EASTING (USF)	BASE ELEV (USF)	ELEVATION CHANGE (USF)[1]		SETTLEMENT (FT)	SETTLEMENT (INCHES)
				11/19/2015	5/18/2016		
68	77592.746	1362029.978	850.099	0.00	-0.02	0.02	0.24
69	77727.557	1362053.438	862.871	0.00	0.00	0.00	0.00
70	77865.147	1362044.429	868.686	0.00	0.00	0.00	0.00
71	78003.095	1362052.701	869.236	0.00	0.00	0.00	0.00
72	78142.993	1362066.943	861.157	0.00	0.00	0.00	0.00
73	78281.525	1362066.173	859.321	0.00	-0.01	0.01	0.12
74	78420.039	1362061.553	858.225	0.00	-0.01	0.01	0.12
75	78554.674	1362030.208	847.610	0.00	0.00	0.00	0.00
76	78566.902	1361939.021	837.166	0.00	-0.02	0.02	0.24
77	78569.589	1361796.235	826.695	0.00	-0.01	0.01	0.12
78	78517.386	1361670.304	818.847	0.00	-0.01	0.01	0.12
79	78452.039	1361560.658	811.039	0.00	0.00	0.00	0.00
80	78349.201	1361457.870	820.178	0.00	0.00	0.00	0.00
81	78248.661	1361350.024	829.886	0.00	-0.01	0.01	0.12
82	78141.726	1361341.874	836.005	0.00	0.00	0.00	0.00
83	78004.179	1361371.197	837.221	0.00	0.00	0.00	0.00
84	77866.455	1361378.554	840.411	0.00	0.00	0.00	0.00
85	77732.411	1361415.991	838.474	0.00	-0.02	0.02	0.24
86	77616.606	1361486.726	838.834	0.00	-0.01	0.01	0.12
87	77557.075	1361611.920	837.523	0.00	-0.01	0.01	0.12
88	77489.133	1361799.320	841.934	0.00	0.00	0.00	0.00
89	77493.878	1361937.878	843.842	0.00	-0.01	0.01	0.12
90	77579.292	1361902.528	868.076	0.00	-0.01	0.01	0.12

King County Solid Waste Division
Enumclaw Closed Landfill
Appendix H
Settlement Survey Data

MARKER	NORTHING (USF)	EASTING (USF)	BASE ELEV (USF)	ELEVATION CHANGE (USF)[1]		SETTLEMENT (FT)	SETTLEMENT (INCHES)
				11/19/2015	5/18/2016		
91	77660.646	1361986.510	870.908	0.00	-0.01	0.01	0.12
92	77730.442	1361983.044	884.414	0.00	-0.01	0.01	0.12
93	77968.527	1361985.154	878.437	0.00	0.00	0.00	0.00
94	78092.353	1361934.124	883.308	0.00	0.00	0.00	0.00
95	78234.188	1361930.532	879.035	0.00	0.00	0.00	0.00
96	78374.228	1361928.022	863.471	0.00	0.00	0.00	0.00
97	78484.558	1361991.319	853.475	0.00	0.00	0.00	0.00
98	78493.120	1361878.108	844.998	0.00	0.01	-0.01	0.00
99	78431.648	1361751.817	841.025	0.00	0.00	0.00	0.00
100	78364.976	1361793.897	856.853	0.00	0.01	-0.01	0.00
101	78338.564	1361647.587	844.962	0.00	0.01	-0.01	0.00
102	78247.589	1361540.869	850.298	0.00	0.00	0.00	0.00
103	78147.485	1361451.694	856.245	0.00	0.00	0.00	0.00
104	78009.384	1361462.111	853.070	0.00	0.00	0.00	0.00
105	77872.842	1361489.469	863.580	0.00	-0.02	0.02	0.24
106	77740.205	1361531.685	857.776	0.00	-0.01	0.01	0.12
107	77668.610	1361646.870	867.130	0.00	-0.02	0.02	0.24
108	77608.632	1361771.539	868.360	0.00	-0.02	0.02	0.24
109	77680.830	1361869.619	889.181	0.00	0.01	-0.01	0.00
110	77780.865	1361846.295	898.083	0.00	-0.01	0.01	0.12
111	77917.595	1361877.792	897.476	0.00	-0.01	0.01	0.12
113	78174.619	1361834.754	883.643	0.00	-0.02	0.02	0.24
114	78277.811	1361843.705	873.274	0.00	0.00	0.00	0.00

King County Solid Waste Division
Enumclaw Closed Landfill
Appendix H
Settlement Survey Data

MARKER	NORTHING (USF)	EASTING (USF)	BASE ELEV (USF)	ELEVATION CHANGE (USF)[1]		SETTLEMENT (FT)	SETTLEMENT (INCHES)
				11/19/2015	5/18/2016		
115	78192.825	1361729.564	873.817	0.00	-0.02	0.02	0.24
116	78117.111	1361611.867	872.811	0.00	0.00	0.00	0.00
117	77988.528	1361603.590	880.964	0.00	0.00	0.00	0.00
118	77878.656	1361672.504	890.811	0.00	-0.03	0.03	0.36
119	77868.670	1361588.963	885.292	0.00	0.04	-0.04	0.00
120	77775.312	1361748.266	894.575	0.00	-0.01	0.01	0.12
121	77884.641	1361792.687	896.291	0.00	0.00	0.00	0.00
122	78014.536	1361822.019	894.465	0.00	-0.02	0.02	0.24
123	78073.415	1361710.604	883.206	0.00	0.00	0.00	0.00
126	78195.967	1361403.400	844.324	0.00	0.02	-0.02	0.00
127	78114.980	1361528.712	866.468	0.00	-0.01	0.01	0.12
129	77560.703	1361720.849	851.812	0.00	-0.01	0.01	0.12
130	77770.441	1361658.516	888.559	0.00	-0.03	0.03	0.36
						Minimum	**0.00**
						Maximum	**0.36**
						Mean	**0.08**
						Median	**0.00**
						Standard Deviation	**0.10**

(1) Change in elevation was limited to 0.01 feet (0.12 inches) level of precision based on KC Roads "Monitoring Survey Narrative."
(2) Negative settlement values (indicating increase in elevation) were not included in the settlement statistics.

APPENDIX I

Interview Questions

King County Solid Waste Division
Enumclaw Closed Landfill
Interview Questions for Leachate System Historical Review
Interviewees: Neil Fujii, and Kevin Kiernan

Personal Experience

1. What was your role at Enumclaw Landfill (ELF), what period were you involved, and what elements (operations, development, closures) were you involved with?

Historical Knowledge Relating to Leachate Management

2. How were leachate impacted surface water flows and leachate seeps/breakouts managed?
3. Do you recall the methods used to collect, convey, store, and discharge leachate at ELF?
4. Was leachate actively collected at ELF?
    a. And if so, how was leachate actively collected?
    b. Were volumes of leachate estimated and if so, is that data recorded somewhere?
5. What was the total number of leachate ponds utilized at ELF?
    a. Where were these ponds located?
    [NOTE: point out suspected leachate pond locations on a map, including the 3rd "planned" pond in Phase II]

Pond Construction & Operation

6. How were the leachate ponds constructed?
    a. Did construction vary between the different ponds?
    b. If so, why?
7. Do you recall if any of the identified leachate ponds (lagoons) at ELF were lined?
    a. And if so, what type of liner (low permeability soil or geomembrane)?
8. Was the leachate in the ponds ever sampled for laboratory analysis?
9. Where would the contents of the leachate ponds go after being impounded (infiltration, pump away for treatment, etc.)
10. Were liquid levels monitored in the leachate ponds?
11. Were the leachate sumps and pumps indicated on Phase II Closure Project drawings utilized during operation of the landfill?
12. Were the ponds maintained during the period of operation? (e.g. sediments removed and disposed of…)
13. Do you recall if any of the leachate ponds were utilized for any other use than leachate storage?

Pond Decommissioning & Closure Activities

14. Did the leachate collection system continue to operate post closure?
    a. If so, for how long?
    b. If not, why did leachate collection stop after the closure and how was leachate managed post-closure?
15. How were the leachate facilities decommissioned (ponds, conveyance, extraction, collection, etc…)?
    a. Was the pond over excavated?
    b. Was soil testing completed as part of the decommissioning process? (e.g. were samples of the liner [if earthen], sediment within the pond, or the "clean" soil below the liner tested?)

16. Did the installation of the Phase I infiltration basin installed at the location of leachate pond #1 include removal of soils/lining system from the leachate pond?
    c. If so, where was that soil placed and was it tested?

Miscellaneous

17. Can you tell us about any other elements of the leachate collection, storage, and discharge systems at ELF not covered in the previous questions?
18. Can you point us to any documentation for any of the above questions?