

# **Stratigraphic analysis of the southwestern quadrant of the Cedar Hills Regional Landfill:**

Incorporating recent borehole explorations and radiometric dating with  
previous investigations.

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|         |     |
|---------|-----|
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| MW-59   | 55  |
| MW-70   | 60  |
| MW-72   | 72  |
| MW-82   | 92  |
| A5B-2a  | 100 |
| A5B-3   | 104 |
| A5B-6   | 108 |
| A5B-8a  | 112 |
| A5B-10  | 133 |
| A6BH-2a | 148 |
| A7B-1   | 165 |
| A7B-3   | 182 |
| A8B-1   | 187 |
| A8B-2   | 202 |
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## I. Executive Summary

This report presents the results of my stratigraphic analysis of the southwestern quadrant of the Cedar Hills Regional Landfill (CHRLF). This analysis is a product of my internship work with Anne Udaloy of Udaloy Environmental Consulting (UEC), which lasted from June to November, 2014. During my time with UEC I acted as a field and office assistant, performed a Hydrologic Evaluation of Landfill Potential (HELP3), and conducted this stratigraphic analysis. My report was intended to incorporate the recent Area 8 borehole data into the pre-existing analyses. This analysis was conducted during the preparation of the Area 8 Hydrogeologic Report, but is my independent investigation and does not represent the opinion of UEC or their associates.

The CHRLF, in Maple Valley, WA, south of Squak Mountain, is a municipal solid waste landfill that has been in operation since the 1960s. A network of borings, the product of previous investigations, exists for my study area. I utilized the compiled boring logs, previous investigations, and the recently acquired data to produce a series of interpretative cross-sections for my study area.

I recognized 9 distinct stratigraphic units, including fill, within my study area. My interpreted stratigraphic units are similar to those identified in previous investigations such as the Area 7 Hydrogeologic investigation (HDR Engineering and Associates, 2008). These units include pre-Olympia aged non-glacial alluvium, glacial alluvium, and glacial till. Additionally, younger, Vashon-aged deposits of glacial till, recessional outwash, recessional lacustrine, and ice-contact were observed. An isolated "till-like" deposit was observed below the Vashon till. This could possibly represent an older till as mapped by Sweet Edwards (1985) and Booth (1995).

I cite the continuity of the lower contact of the Vashon till (Unit 5, Table 2) and the upper contact pre-Vashon non-glacial fluvial deposits (Unit 9, Table 2) as evidence that faults or other structural features do not offset the deposits in my study area. This conclusion supports the findings of the pre-existing body of work within the landfill property (Sweet Edwards and Associates, 1985; R.W. Beck and Associates, 1983 and 1984; EMCON, 1995; CH2M HILL and UES, 2004; and HDR and Associates, 2008) and the nearby Queen City Farms property (Landau and Associates, 1990, 1991a, 1991b, and 1992, and Golder, 1997).

## II. Abbreviations and Acronyms

|         |   |
|---------|---|
| CERCLA  | Comprehensive Emergency Response, Compensation, and Liability Act of 1980 |
| CHRLF   | Cedar Hills Regional Landfill   |
| ESS     | Earth and Space Sciences  |
| HELP    | Hydrologic Evaluation of Landfill Potential                               |
| KCSWD   | King County Solid Waste Division  |
| LiDAR   | Light Detection and Ranging   |
| MESSAGE | Master's in Earth and Space Sciences: Applied Geosciences                 |
| NPL     | National Priorities List  |
| PSLC    | Puget Sound LiDAR Consortium  |
| QCF     | Queen City Farms  |
| SFZ     | Seattle Fault Zone  |
| SWHR    | Site-Wide Hydrogeologic Report  |
| UEC     | Udaloy Environmental Consulting   |
| UES     | Udaloy Environmental Services   |
| VOCs    | Volatile Organic Compounds  |
| WAC     | Washington Administrative Code  |

## **1. Introduction**

### *1.1 Purpose*

This report presents the results of my internship work with Anne Udaloy, LHG, of Udaloy Environmental Consulting (UEC) and has been performed as a partial requirement for the degree of Master of Science: Applied Geosciences through the University of Washington's department of Earth and Space Sciences (ESS). My research focuses on the Cedar Hills Regional Landfill (CHRLF) in Maple Valley Washington. During my time with UEC I served as a field and office assistant, generated a HELP model (Hydrologic of Landfill Potential), and conducted the following stratigraphic analysis of the CHRLF, which utilizes data made available in the investigation of the proposed Area 8 lateral expansion.

### *1.2 Objective*

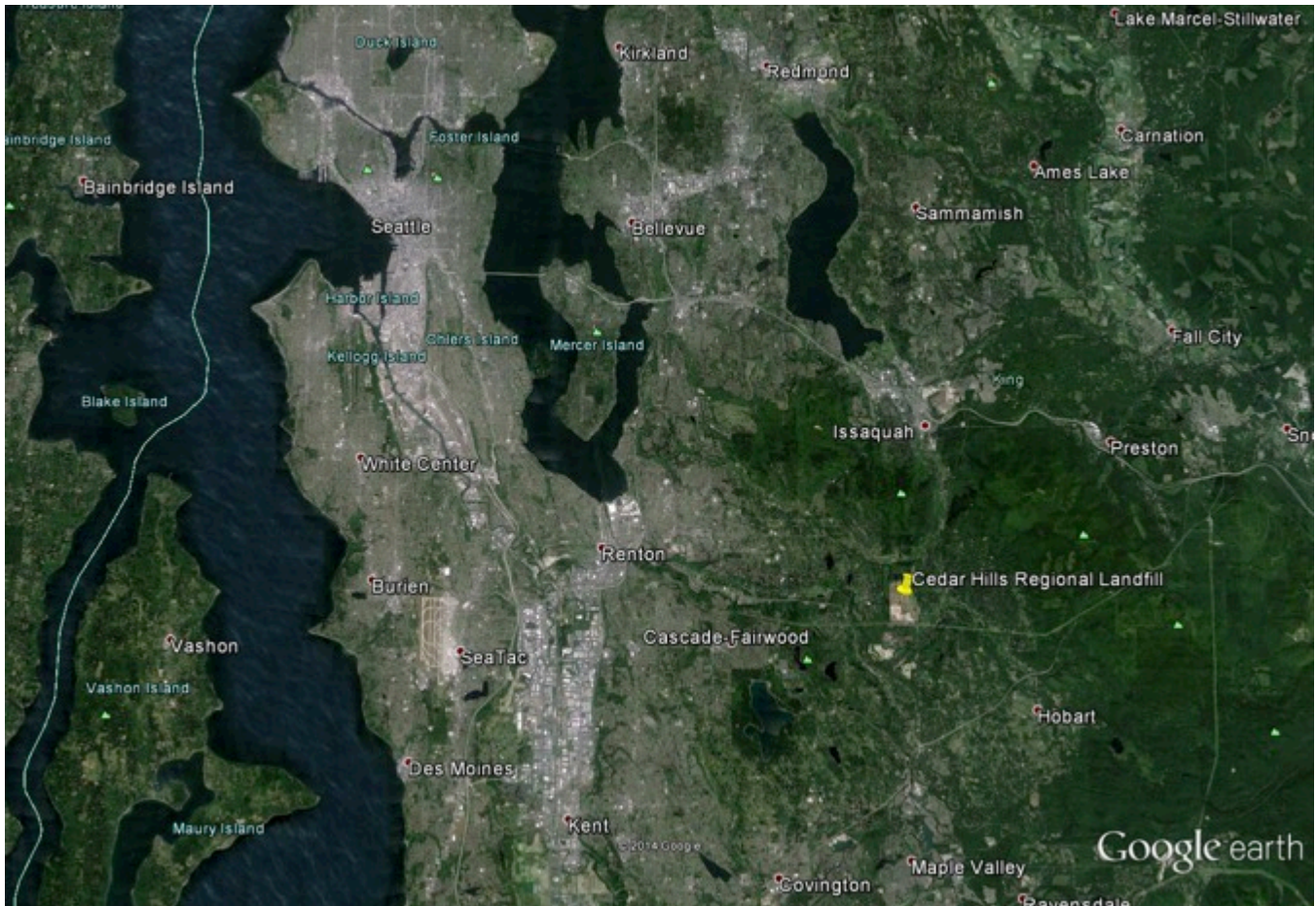
The goals for this project were to analyze the stratigraphy of the southwestern quadrant of the CHRLF, produce a series of interpretative transects, and determine whether or not faults, or other structural features, are present in my study area. In addition to the pre-existing body of research, I utilized subsurface data collected for the proposed Area 8 lateral expansion of the CHRLF.

### *1.3 Scope of Work*

This project was intended as an opportunity for me to incorporate the most recent borehole and radiometric data into the interpretation of the CHRLF's subsurface under the tutelage of a professional geologist with more than 20 years of experience at the site. The scope of work necessary to complete my work included: (1) a review of the geologic setting, (2) a review of the geomorphic setting, (3) a stratigraphic analysis of the subsurface via cross-sections, and (4) the preparation of this report. My deliverables include my interpretive cross-sections and this report.

#### 1.4 Site Description and Available Data

The CHRLF, located in Maple Valley, Washington (Fig. 1), is a solid waste disposal site run by the King County Solid Waste Division (KCSWD). The landfill was opened for municipal waste disposal in the 1960s and has undergone several lateral expansions. Most recently, Area 8, along the southwestern border of the property, has been selected for development (Fig. 2).



*Figure 1.  
Location map of the Cedar Hills Regional Landfill with relation to the city of Seattle*

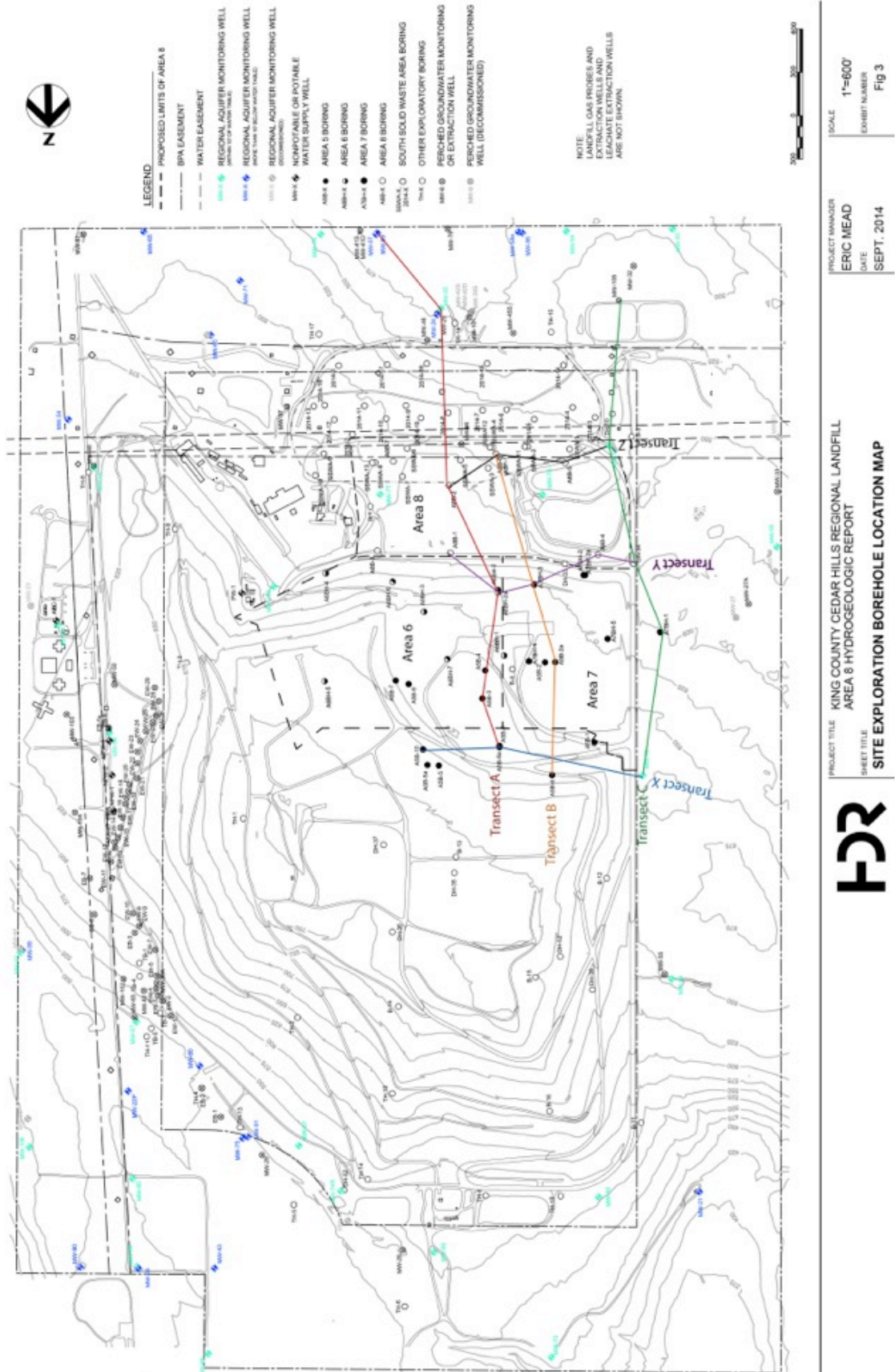


Figure 2. Area map of the CHRLF, borehole data, and my chosen cross-sectional transects. Modified from (CH2M-HILL and UES, 2004)

A significant set of subsurface data exists for the Cedar Hills area. The geology of the area has been characterized in state and federal studies, and on behalf of private developments or assessments. These studies, along with those conducted for the Areas 5, 6, 7, and 8 expansions, have generated a grid of boreholes throughout the property. The borehole logs were consolidated, and interpreted, in the Site-Wide Hydrogeologic Report (SWHR)(CH2M HILL and UES, 2004), and in the Area 8 Hydrogeologic Report (HDR et al., 2014). The analysis presented in this report was conducted at the same time as the Area 8 investigation, but stands independent. I have utilized the boring logs and radiometric dates, collected for the Area 8 investigation, but do not reference the Area 8 Hydrogeologic Report's interpretations.

### *1.5 Geographic Setting*

The CHRLF property is in northern Maple Valley, WA, south of Squak Mountain. The CHRLF is located on a plateau, between the Cedar River to the west and Issaquah Creek to the east (Fig. 3). The town of Mirrormont is to the east across Issaquah Creek.



# CHRLF LiDAR (PSLC)

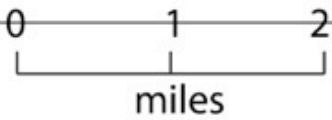
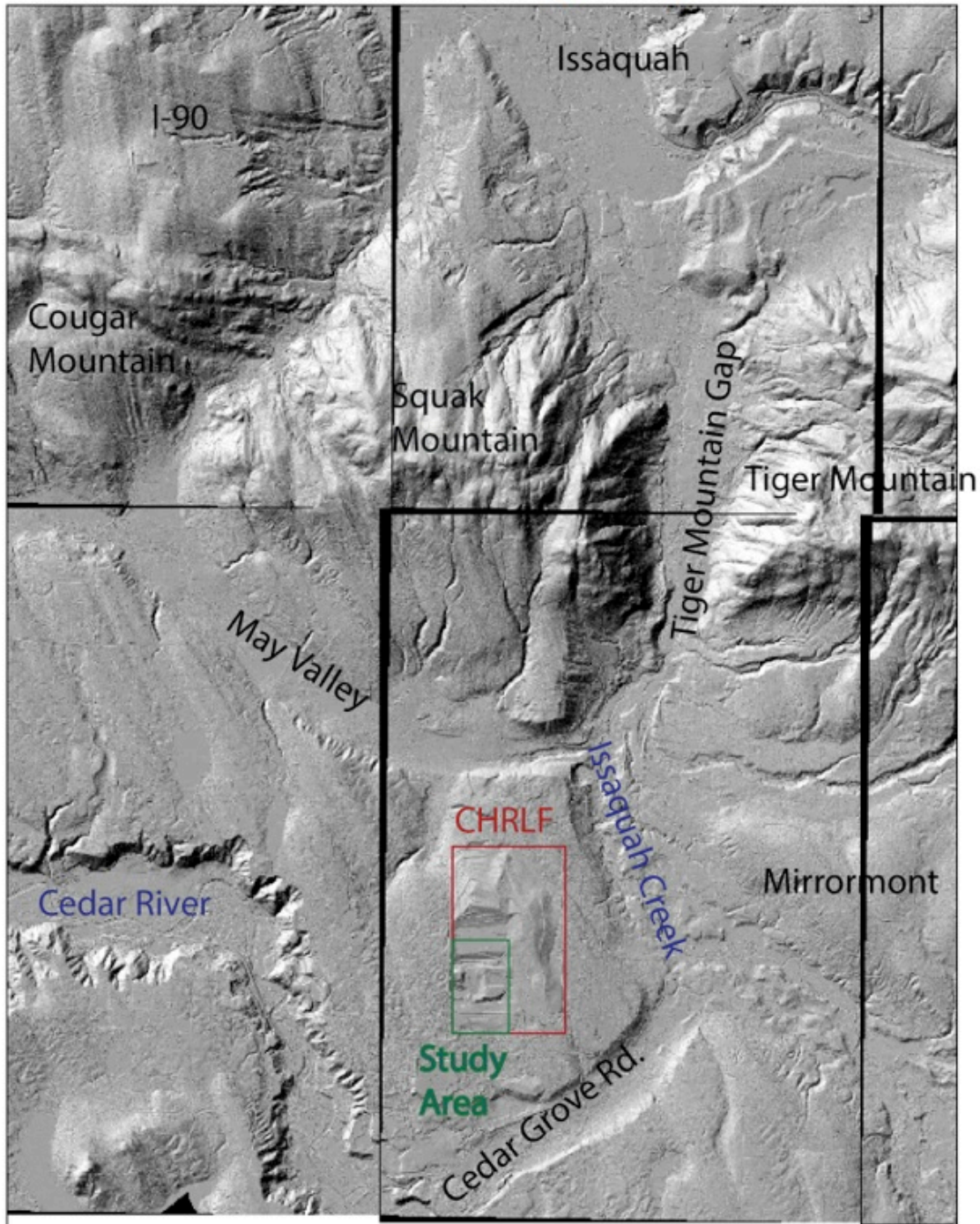


Figure 3.  
PSLC LiDAR imagery of the CHRLF and surrounding landmarks.



## 1.6 *Geomorphic Setting*

The CHRLF sits atop a plateau surrounded by outwash channels to the east, south, and west, and mountains to the north. Light detection and ranging (LiDAR) imagery, from the Puget Sound LiDAR Consortium (PSLC), shows a NW-SE trending glacial fabric, above the river valleys (Fig. 3). Vine (1962), mapped prior to development of the CHRLF, notes three drumlins on the property that is now the CHRLF. These features were labeled “Qgm: drumlinized ground moraine, chiefly till, in the lowlands”.

The nearby lakes, Lake McDonald, Lake Kathleen, Queen City Lake, Webster Lake, and Francis Lake are likely kettle features, formed by isolated blocks of melting glacial ice, which remained after the last glaciation receded. Features such as these could exist in the stratigraphy below the CHRLF.

Development of the CHRLF has significantly altered the morphology of the site. The land at the peak of the hill has been graded, deforested, and the percentage of impermeable surfaces, i.e., roads and facilities, has increased. These changes may have altered the hydrogeology of the area, which could influence the rate of weathering of deposits over the life of the landfill.

## **2. Background**

### 2.1 *Surrounding Land Use*

The land surrounding the CHRLF is used for several purposes (Fig. 4). The area to the north, east, and west is primarily residential. The former King County Alcoholism Treatment center is located on the southeast border of the property. Cedar Grove Composting, the Stoneway Concrete gravel mining operations, and the Queen City Farms property (QCF) are to the south.

QCF is currently listed on the National Priorities List (NPL) for groundwater contamination and was the catalyst for many of the detailed geoscience investigations in the area. QCF contained a pig farm, rendering plant, and small gravel mines. From 1952-1970 QCF also operated a disposal facility for farm, industrial, and commercial waste. On September 8, 1983 the QCF property was

proposed to the NPL under the Comprehensive Emergency Response, Compensation, and Liability Act of 1980 (CERCLA). This recommendation was made based on water quality tests from the site, which showed elevated levels of heavy metals and Volatile Organic Compounds (VOCs). QCF was officially accepted onto the NPL on August 16, 1988. The final remedy was selected on December 31, 1992 and construction of the remedial methods, which included removal of contaminated material, an upgradient groundwater diversion system, and monitoring well installation, was completed on September 9, 1997. At present the QCF property is still listed on the NPL, due to groundwater contamination. The area is currently the home of the 4-Tek solvent repackaging facility.

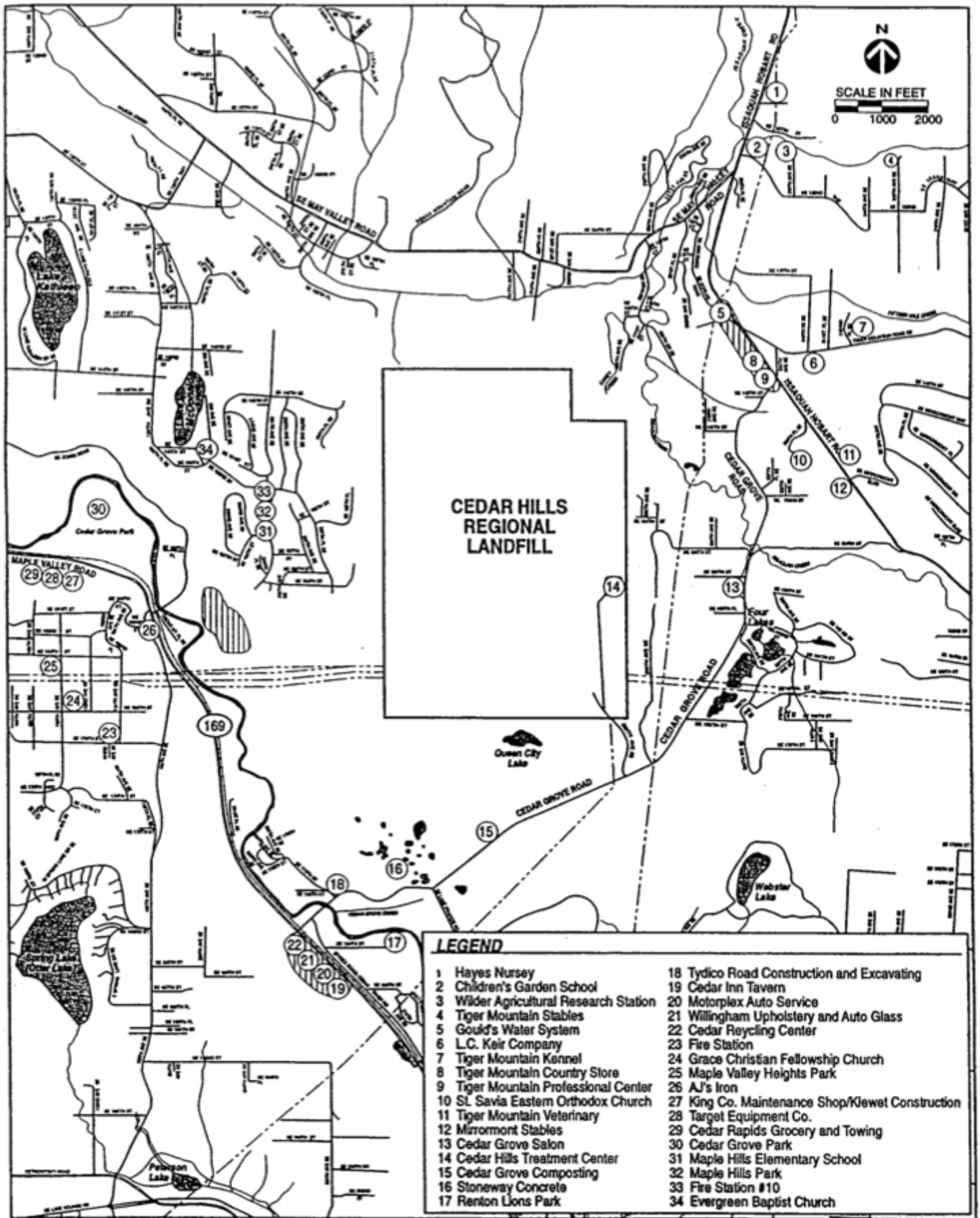


Figure 4. Nonresidential land uses of the area immediately surrounding the CHRLF (CH2M HILL and UES, 2004,

## 2.2 *Area Structural Geology*

The CHRLF is set in the Seattle Uplift, i.e., the upthrown southern block of the Seattle Fault Zone (SFZ), east of lake Washington. This region is characterized by Quaternary deposits over sedimentary and volcanic, tertiary bedrock. Depth to bedrock at the CHRLF is estimated from Booth (1995) to be roughly 500 feet or more.

North-south tectonic shortening and consequential faulting and folding have affected the area to the east of Lake Washington, where the CHRLF is located. Booth and Minard, 1992, estimate that the CHRLF lies roughly 7-8 miles south of the Seattle Fault Zone (SFZ). The SFZ is a >70-km-long, 5-7-km-wide, east-west trending, thrust or reverse fault that defines the southern extent of the Seattle basin and the northern edge of the Seattle uplift (Liberty and Pratt, 2008). Aeromagnetic imagery from Blakely et al. (2002) suggests that the SFZ extends through Sammamish, north of the Newcastle Hills, and that a second fault zone, the Newcastle Hills Anticline, trends NW-SE just one mile north of the CHRLF (Fig. 8).

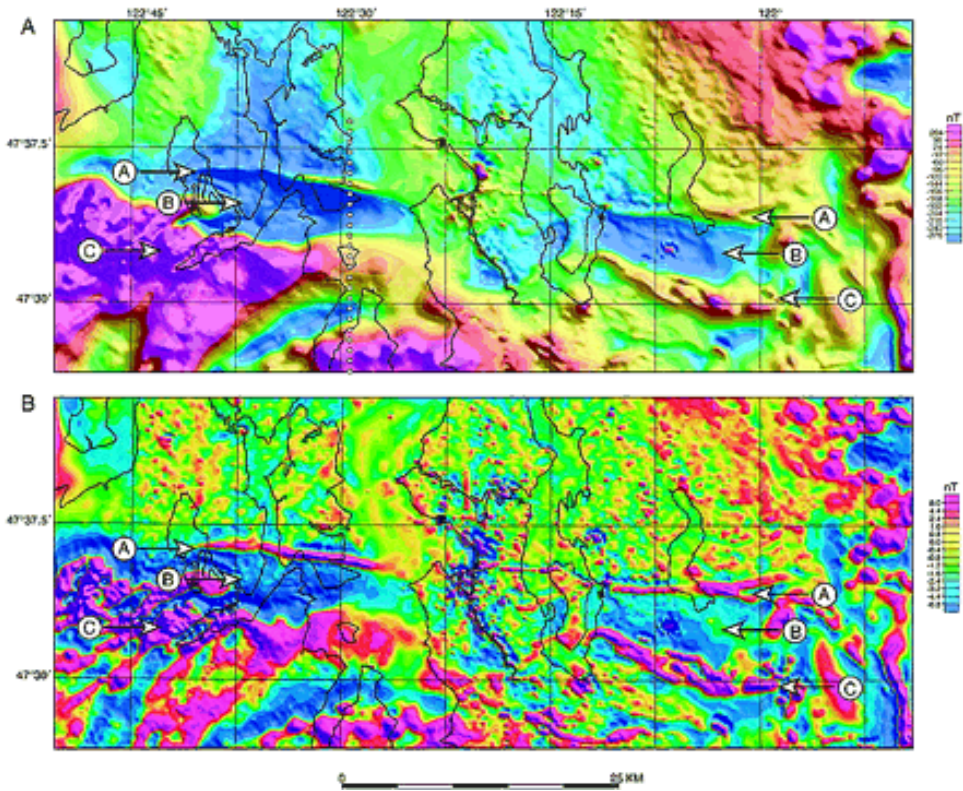


Figure 5. Aeromagnetic imagery of the Olympic Peninsula, Puget Sound, Seattle, and the area east of Lake Washington (Blakely et al., 2002). A, B, and C correspond to aeromagnetic anomalies, which were used to establish the bounds of the SFZ.

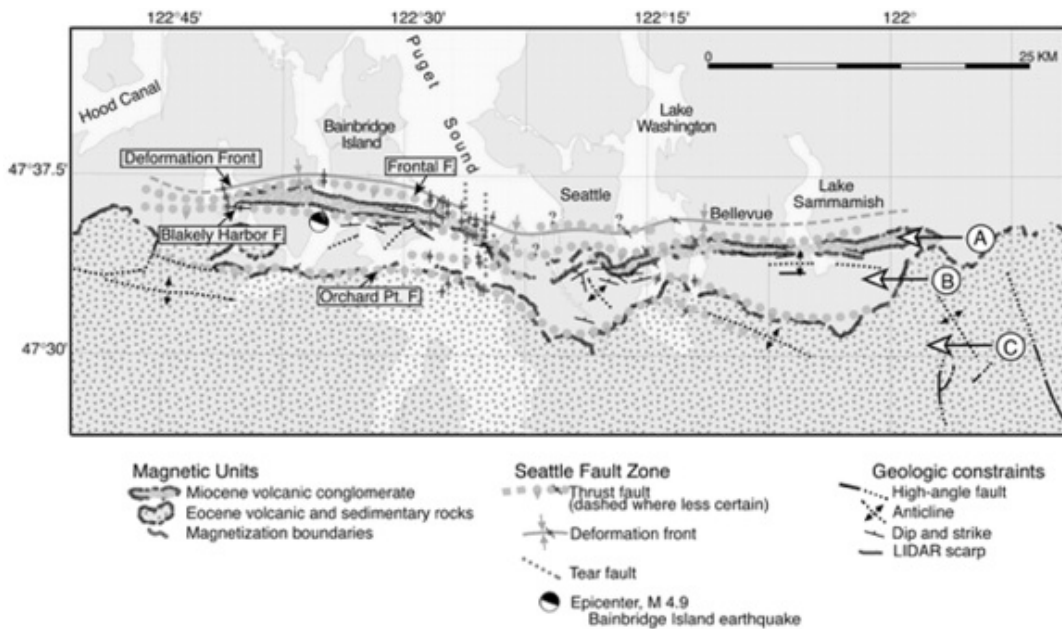


Figure 6. Generalized geology of the area discussed in Figure 5. A, B, and C correspond to aeromagnetic anomalies discussed in Blakely et al. (2002). The CHRLF is located south of the SFZ, east of Lake Sammamish.

The following figure (Fig. 7), modified from Troost and Booth (2008), illustrates the location of the CHRLF with relation to important structural and depositional features of the Puget Lowland. Of note is the proximity of the SFZ to the north of the CHRLF, just at the border of the Issaquah Alps. In addition, the study area discussed in this report falls well within the footprint of the Cordilleran Ice Sheet of the Vashon Glaciation. Therefore, I would expect to find glacial deposits in my cross-sections. The blue dotted line estimates the extent of the recessional lake, Lake Russell. Although the CHRLF is not clearly within those bounds it would not be unreasonable to assume that recessional lacustrine deposits could exist on site.



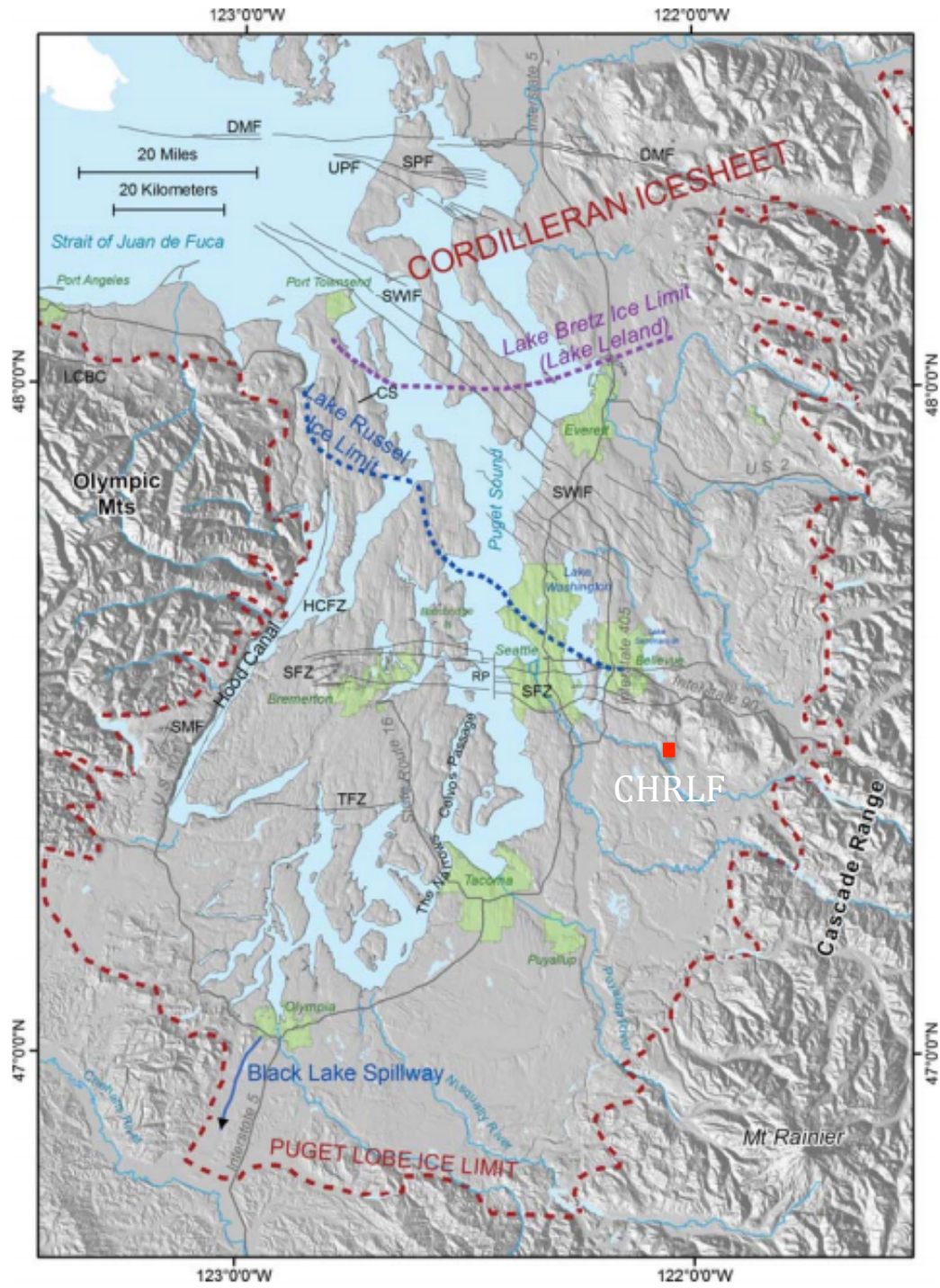


Figure 7. Summary of major structural and glacial features of the Puget Lowlands relative to the CHRLF. Modified from Troost and Booth (2008).

Regional mapping efforts have identified faults in the region surrounding the CHRLF. Vine, 1962 mapped the Hobart, Sherwood, and Tiger Mountain faults 1-2 miles east of the CHRLF property as well as several unnamed faults in the Cedar River Valley walls ½-1 mile east (Fig. 8). Walsh (1984), proposed that a normal fault could occur within the bedrock ½-1 mile below the landfill. Based on the general NE-SW/E-W trends of the faulting observed to both east and west of the CHRLF it is possible that similar features could trend below my study area (Fig. 8).



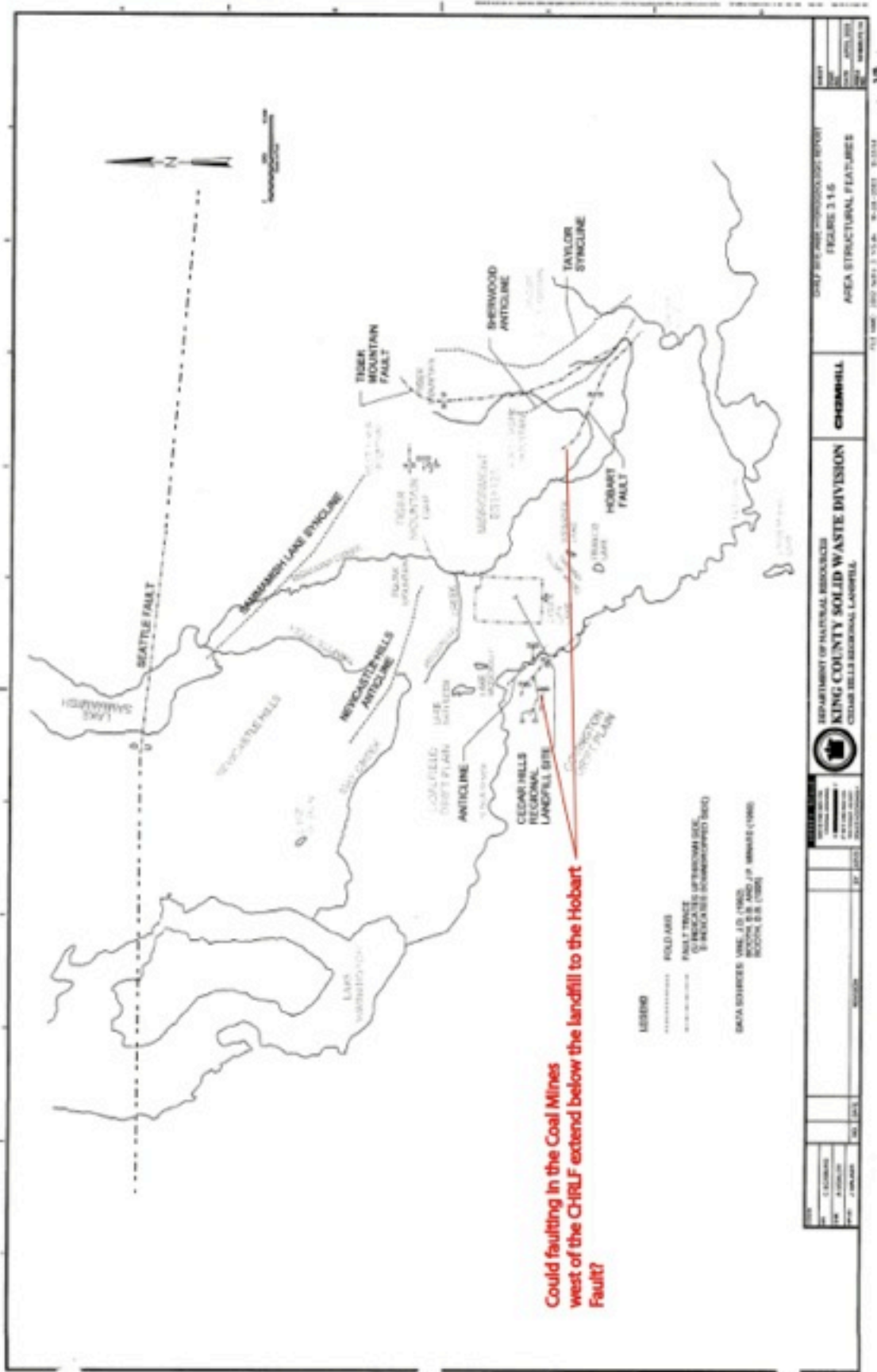


Figure 8. Generalized map of the structural features surrounding the CHRLF, from the SWHR, 2004. The faulting to the east and west trend towards the CHRLF and may extend below.

Investigations have been conducted to determine whether Holocene faulting has occurred within the bounds of the CHRLF property (Sweet Edwards and Associates, 1985; R.W. Beck and Associates, 1983 and 1984; EMCON, 1995; CH2M HILL and UES, 2004; and HDR and Associates, 2008). A stratigraphic analysis was performed during the preparation of the Site-Wide Hydrogeologic Report (CH2M HILL and UES, 2004). This report identified several laterally continuous “marker” beds below Area 5 that were also observable in some portions of Area 6. A marker bed of continuous silt at 520 feet in elevation was cited as evidence against the presence of Holocene faulting within the bounds of the study. In 2008, HDR and Golder released their geomorphic assessment of the Area 7 expansion. This evaluation concluded that there are no significant fault-related geomorphic features within a 5-mile-radius of Area 7 in the CHRLF. Additionally, it was determined that the faults to the west of area 7, mapped by Walsh in 1984, do not displace the surficial Vashon deposits and therefore, have not been active in the Holocene.

The hydrogeologic reports for areas 5, 6, and 7 did not find evidence of offset in the pre-Vashon sediments of the CHRLF. In addition to the 520-foot silt marker bed, the Area 5 and 6 reports, referenced laterally continuous units within pre-Vashon deposits as evidence that pre-Vashon deposits had not been offset in their study area (HDR and Associates, 2008, p. 2-3). These units included “laterally extensive silts within Unit D” (My units 6 and 8 from Table 3), and channel surfaces within unit E soils (My unit 9 from Table 3). The Area 7 report stated that “surfaces created by discrete depositional processes (e.g., gravels deposited in channels) that extend laterally beneath adjacent areas of the site also extend beneath Area 7 (HDR and Associates, 2008, Sec. 2 p. 4)” and that the surface of their Unit F gravels (Gravel packages within my unit 9 from Table 3) is “remarkably consistent beneath Area 7 and adjacent areas (HDR and Associates, 2008, Sec. 2 p. 4)”.

## 2.3 *Area Stratigraphy*

### 2.3.1 *Surficial Geology of Vine, 1962*

In 1962, Vine mapped the surficial geology of the Maple Valley quadrangle, where the CHRLF is found. Vine’s map is the earliest attempt to map the surficial

geology of this region. The top of the plateau is mapped as “Qg” (Quaternary glacial drift, primarily till) with isolated “Qp” deposits (Quaternary peat) and three NW-SE trending drumlins labeled “Qgm” (Quaternary ground moraine). The outwash channels nearby, through which Issaquah Creek and the Cedar River now flow, contain “Qs” (Unconsolidated Quaternary silt and sand), “Qt” (Terrace gravel and stratified drift), and “Qal” (Quaternary alluvium). The tertiary bedrock of the Renton formation, assigned the symbol “Tr”, was observed in the eastern Cedar River valley wall. This bedrock was upthrown in the hanging wall of a fault observed in coal mines.

### *2.3.2 Surficial Geology of Sweet Edwards and Associates, 1985*

In 1985, Sweet Edwards and Associates performed an analysis of the surficial geology of the CHRLF (Fig. 9). In this analysis, five geologic units, other than the existing landfill, were mapped. These units include, from youngest to oldest; Vashon recessional outwash, Vashon till, interbedded silt/sand within the Vashon till, pre-Vashon outwash and till, and Vashon and pre-Vashon outwash. The general interpretation of this analysis, which has influenced following analyses, is that two till units, separated by a sequence of outwash sands comprise the geology of the site. According to Sweet Edwards (1985) (Fig. 9), I would expect to find Vashon Till and Vashon recessional outwash at the surface of my study area. Additionally, if the mapped outwash sands and till units are laterally continuous they would extend below my study area at depth.



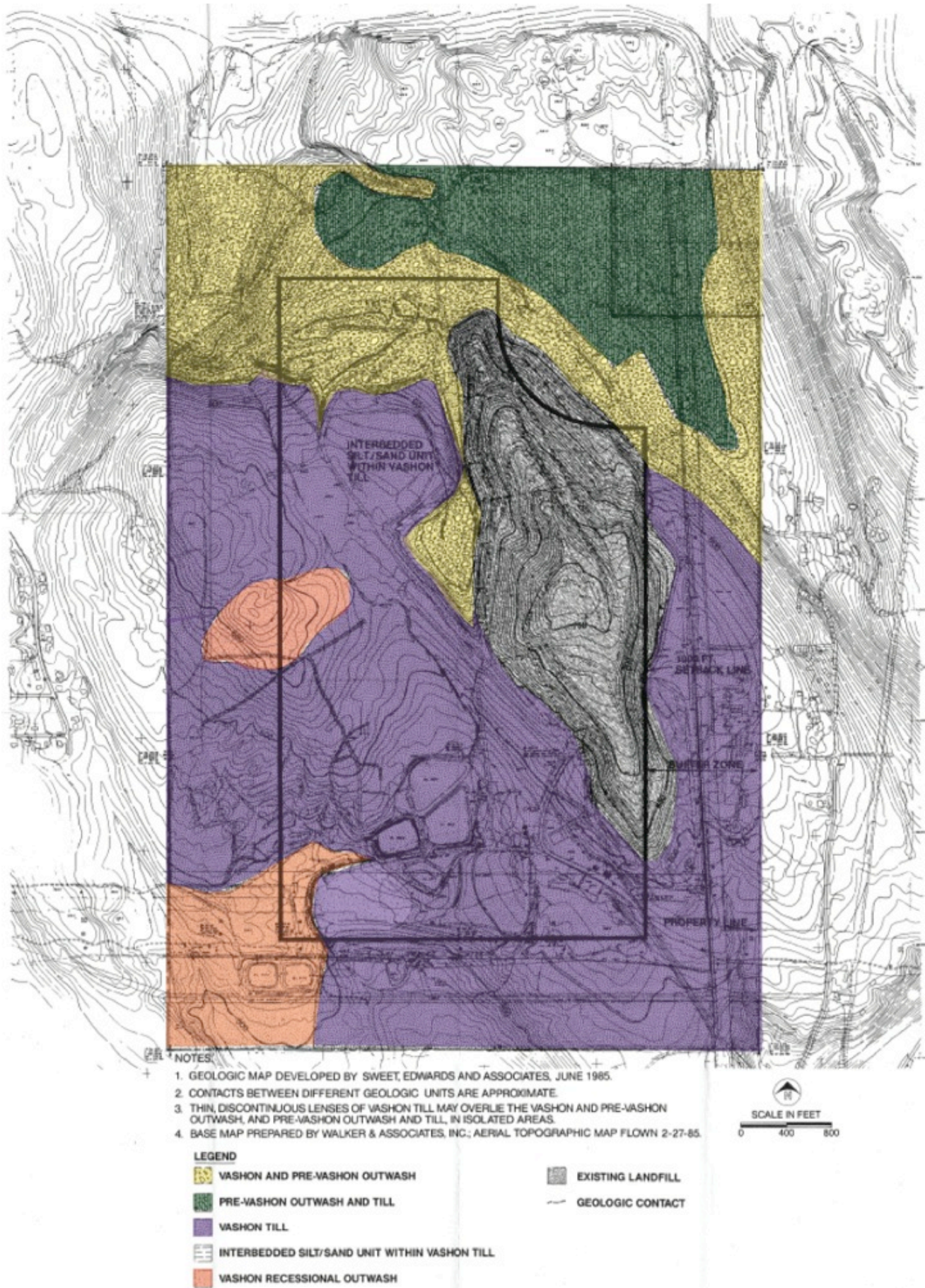


Figure 9.  
Surficial geologic map of the CHRLF, edited from Sweet Edwards (1985).

### *2.3.3 Surficial Geology of Booth, 1995*

Booth, the author of the 1985 Sweet Edwards map, revisited the surficial geology of the Maple Valley Quadrangle in 1995. This map contains additional details of the geology of the valley walls near the CHRLF (Fig. 10). The drumlins at the surface of the Cedar Hills plateau, mapped by Vine, are visible as topographical features but are not distinguished from the surrounding “Qvt” (Quaternary Vashon till) or the “Qm” (Quaternary modified land) representing the CHRLF. Below the Qvt of the plateau surface, in the recessional valley walls, Booth mapped a unit of “Qva” (Quaternary Vashon advance outwash sands).

Along the north and eastern border of the Cedar Hills Plateau this Qva meets the “Qvr” (Quaternary Vashon recessional outwash) of the recessional channels. These recessional deposits are further classified into “Qvr1”, “Qvr2”, and “Qvr3” by age, where Qvr1 is the oldest and Qvr3 is the youngest. These recessional deposits are of a similar age with “Qvi” (Quaternary Vashon ice-contact deposits).

In the eastern wall of the Cedar River Valley, Booth mapped a sequence of pre-Fraser deposits below his Vashon advance outwash. This includes a discontinuous, pre-Fraser till at a relatively consistent elevation near 450 feet. The sedimentary deposits below the mapped pre-Fraser till are labeled as “Qpf” (Quaternary pre-Fraser deposits).



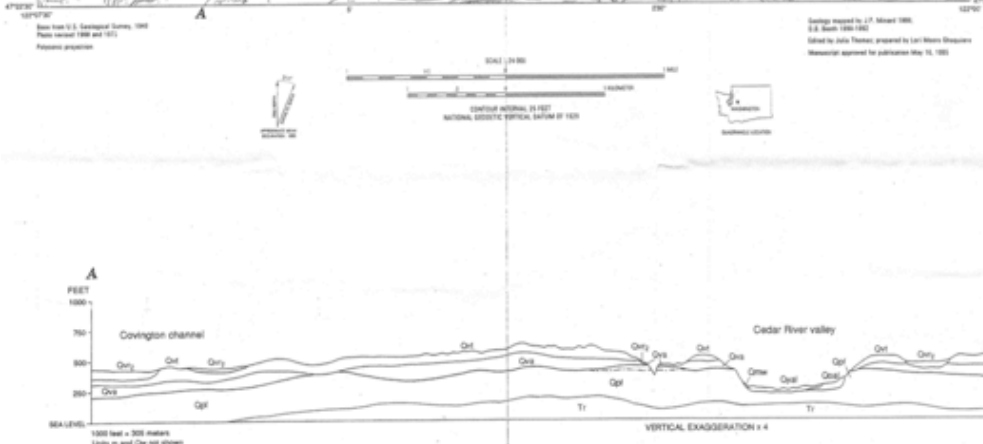
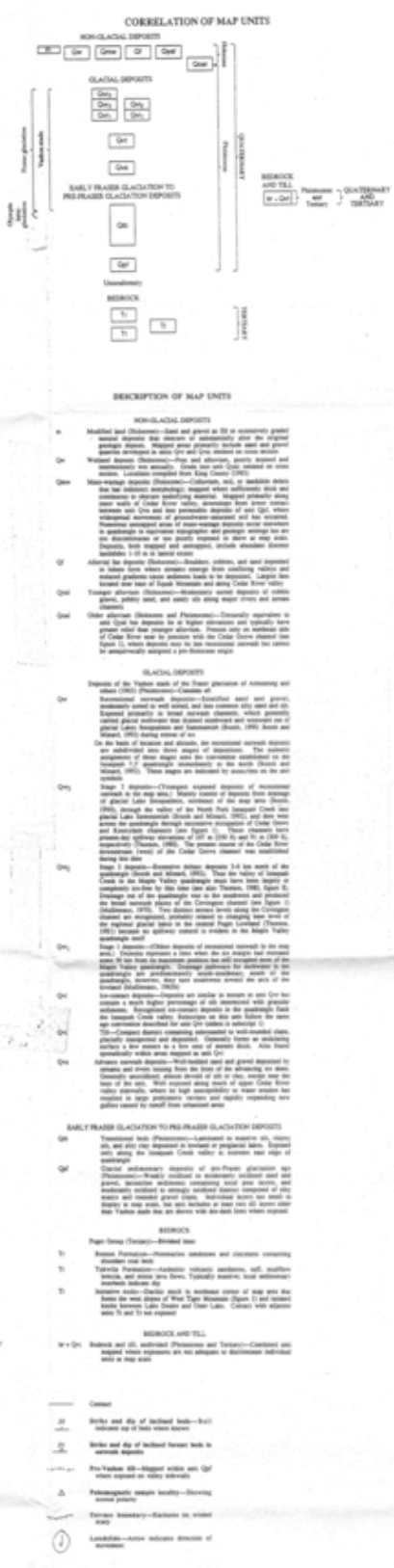
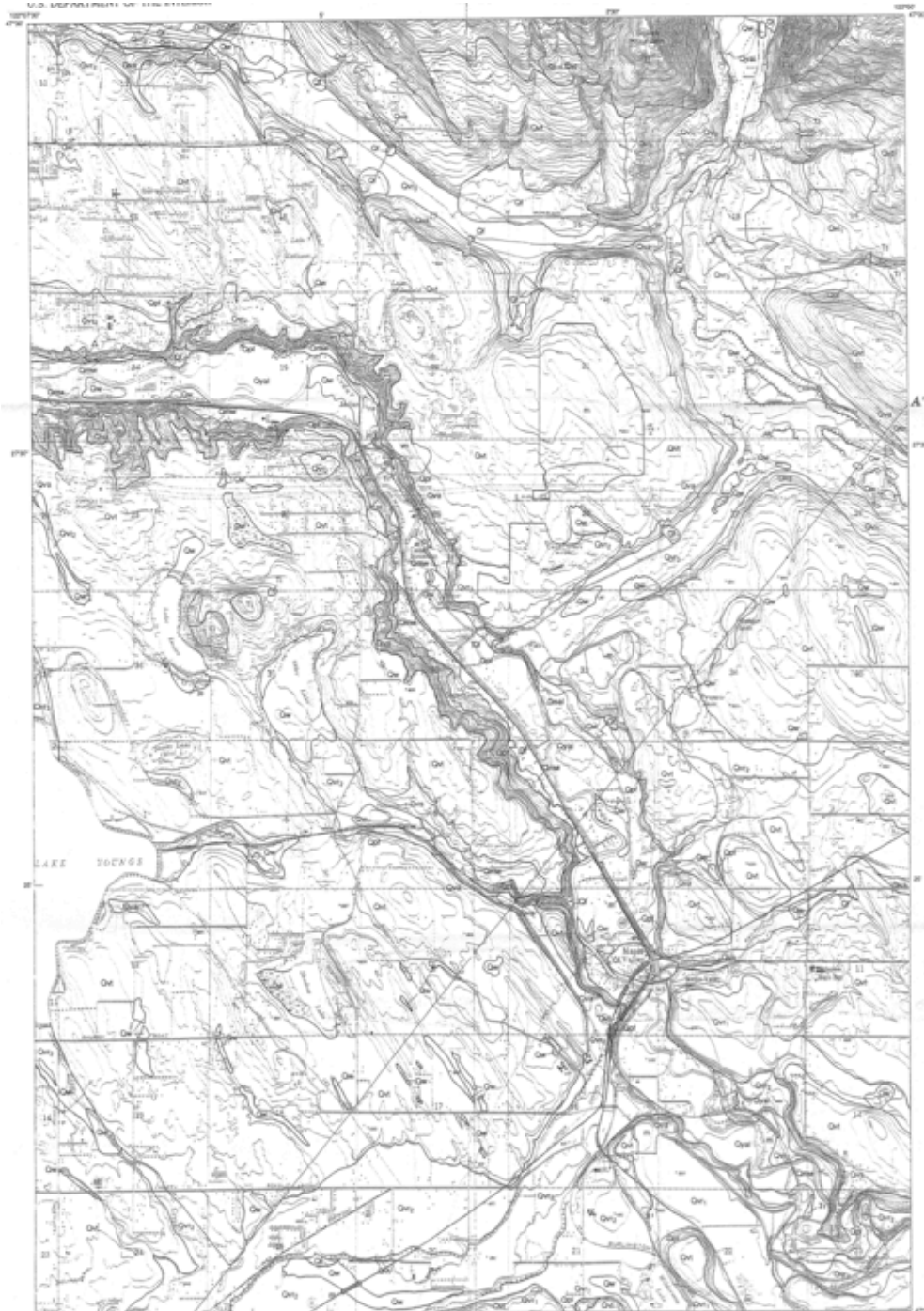


Figure 10. Surficial geology map of the Maple Valley Quadrangle (Booth, 1995) Tinklepaugh, 2014

#### *2.3.4 Area 7 Hydrogeologic Report Stratigraphy*

The most recent Hydrogeological report for the CHRLF, prepared for the Area 7 lateral expansion, by HDR and Associates (2008) interpreted 8 stratigraphic units below the CHRLF (Table 1). This interpretation says that the subsurface of the CHRLF contains sedimentary bedrock overlain by pre-Vashon fluvial, lacustrine, and alluvial deposits with possible pre-Vashon till. These pre-Vashon deposits are overlain by Vashon-aged ice contact and till deposits, capped by Vashon Recessional outwash and young alluvium. Contacts between units are interpreted as erosional unconformities, which may be angular, especially in the case of channelized erosional unconformities.

| Table 3.2-1<br>Summary of CHRLF Site Stratigraphic Units        |  |  |   |
|---|--|--|---|
| Formation   | Depositional Facies  | Sediment Type  | Approximate Elevations and Locations Beneath CHRLF  |
| Unit A: Recent alluvium   | Stream channels, swales, enclosed depressions                                  | Peat (in enclosed depressions); fine sands and silt with abundant organic material.  | Occurs as thin (less than 10-foot-thick) surficial deposits overlying glacial soils.  |
| Unconformity  |  |  |   |
| Unit B: Vashon recessional outwash                              | Aeolian  | Yellow-brown and brown and brown silt, sandy silt, and silty sand.   | Occurs as a thin (less than 10-foot thick) surficial deposit at elevations of about 510 to 540 feet in the northeastern corner of CHRLF.  |
| Unit B: Vashon recessional outwash                              | River channel and deltas   | Brown and orange-brown gravels and sands.  | Occurs as a surficial deposit at elevations of about 419 to 550 feet in the southwestern corner of CHRLF; also occurs as a thin (less than 10-foot-thick) surficial deposit on and near the topographic high west of Area 5 and Area 6.   |
| Unconformity  |  |  |   |
| Unit C: Vashon till (ablation till)                             | Meltwater of receding glacier  | Gray silt with varying proportions of gravel and sand, less dense than lodgement till. May include glaciolacustrine deposits.  | Occurs as surficial deposits, inconsistently differentiated from lodgement till and ice contact deposits, likely present in most portions of the CHRLF and QCF sites.   |
| Unit C: Vashon till (lodgement till)                            | Beneath continental glacier  | Dense to very dense gray silt with varying proportions of gravel and sand.   | Generally occurs below surficial deposits; a relatively (15-foot) thick section occurs at elevations of about 405 to 440 south of the SSWA.   |
| Unit C: Vashon ice contact (stratified drift) deposits          | Glaciolacustrine and glaciofluvial, transitional with till                     | Glaciolacustrine deposits are gray fine sand and silt occasionally varved; glaciofluvial deposits are silty gravels and silty sandy gravels with sandier and siltier interbeds; includes clean sandy gravels as channel deposits. Less dense than lodgement till.  | Occurs as surficial deposits (where it may include ablation till) and beneath lodgement till at elevations above about 500 feet. Identified beneath the Main Hill and subsequent developed areas and above lodgement till at the QCF site. Absent from the north and northeastern periphery of CHRLF. |
| Unconformity  |  |  |   |
| Unit D: pre-Vashon deposits: alluvial gravels and possible till | Alluvial fan, braided river channel, and braidplain; may include glacial till. | Silty to slightly silty with interbedded clean gravels and sands; typically contain trace to little yellow brown and brown fines; silt content generally increases upwards, dated as Olympia interglacial deposits (HDR Engineering and Aspect Consulting 2003). Uppermost silty gravel mapped as till by Minard (see Figure 3.1-4). | Occurs at elevations of 410 to about 600 feet beneath the all portions of the CHRLF site north of the SSWA and east of the western Perimeter Road.  |

Table 1.  
Stratigraphic units identified in the Area 7 Hydrogeologic Report (HDR and Associates, 2008)



| Table 3.2-1<br>Summary of CHRLF Site Stratigraphic Units           |   |  |   |
|--|---|--|---|
| Formation  | Depositional Facies   | Sediment Type  | Approximate Elevations and Locations Beneath CHRLF  |
| Unit D: pre-Vashon deposits: alluvial gravels                      | Braided river channel and braidplain.   | Slightly silty to clean gravels with interbedded sands; typically contain trace to few yellow brown and brown fines; grades upwards into brown and yellow brown silty gravel with interbedded silty sand, dated as Olympia interglacial deposits or older (HDR Engineering and Aspect Consulting, 2003).                                       | Occurs at elevations of about 400 to about 500 feet beneath the all portions of the CHRLF site north of the SSWA and east of the western Perimeter Road.  |
| Possible unconformity  |   |  |   |
| Unit E: pre-Vashon deposits: lacustrine or fluvial sands and silts | Sequence of meandering fluvial deposits or possibly lacustrine turbidites   | Repeated sequences of fine sand with few to no fines and trace to some gravel; gravels are dispersed in matrix when present; sequences are typically capped by laminated silts, dated as Olympia interglacial deposits or older (HDR Engineering and Aspect Consulting, 2003). Includes laterally-equivalent clean gravels and gravelly sands. | Occurs at elevations of 320 to about 400 feet beneath the all portions of the CHRLF site north of the SSWA and east of the western Perimeter Road.  |
| Unconformity   |   |  |   |
| Unit F: pre-Vashon deposits: fluvial gravels                       | Channel deposits within meandering or anastomosed fluvial deposits, consists of gravel channels deposits incised into underlying fine-grained soils; includes associated floodplain deposits. | Sandy gravel and gravelly sand channel deposits with lateral deposits of gravelly sand, gravelly silts, silty gravels, sand, silty sands, sandy silts, and silts; occurs above and below soils, dated as Olympia interglacial deposits or older (HDR Engineering and Aspect Consulting, 2003).   | Occurs at elevations of 250 to 320 feet beneath all portions of CHRLF north of the SSWA and east of the western Perimeter Road.   |
| Unit F: pre-Vashon deposits: fluvial sands and silts               | Meandering or anastomosed fluvial deposits, includes minor sandy gravel channels deposits and minor eolian deposits   | Gray fine sand, coarse silt, silt, occasional thin (less than 10-foot-thick) layers of varved silts and clayey silts, includes occasional thin (less than 10-foot-thick) sandy gravels or gravelly sands, dated as Olympia interglacial deposits or older (HDR Engineering and Aspect Consulting, 2003).                                       | Occurs at elevations below about 250 feet beneath all portions of CHRLF north of the SSWA and east of the western Perimeter Road. Occurs at elevations below about 360 feet beneath all portions of CHRLF south of the SSWA and at elevations below about 400 feet beneath the CHRLF site buffer zone west of the western Perimeter Road. |

Table 1 Continued (Pg. 2/3).

| Table 3.2-1<br>Summary of CHRLF Site Stratigraphic Units                                 |                        |  |  |
|--|------------------------|--|--|
| Formation  | Depositional Facies    | Sediment Type  | Approximate Elevations and Locations Beneath CHRLF   |
| Possible unconformity<br>Unit G: pre-Vashon deposits: massive clayey lacustrine deposits | Lacustrine             | 10- to 40-foot-thick deposit of blue to gray silt, clay, silty clay, or clayey silt, with possible gravel interbed. Typically very dense, varved, with obvious slickensides. | Identified only in southeast portion of CHRLF: well MW-54 at 284 to 296 and 302 to 312 feet (also identified beneath eastern boundary of QCF site: well K(2) at elevation 299 to 341 feet, well G(3) at elevation 235 to 245 and 269 to 294 feet, and well P(2) at elevation 315 to 334 feet). |
| Unconformity<br>Unit H: Bedrock  | Siltstone or sandstone | Quartzose silt and fine sand with minor calcareous cement.   | Potentially identified in ATC-1 at elevations of 90 to 170 feet.   |

Table 1 Continued (Pg. 3/3).

### 2.3.5 Summary of Stratigraphy

Based on earlier efforts by Vine, Walsh, Booth, HDR, and others, I expect to find primarily glacial sediments within the bounds of my study area. Figure 11, modified from Troost and Booth (1999), illustrates the general stratigraphic units of glacial and interglacial units in the Puget Lowlands. Based on the discussed interpretations from the previously listed authors, I expect that the sediments at the CHRLF will be born of the Fraser glaciation, the Olympia interglacial period, and possibly pre-Olympia periods such as the Possession drift, Whidbey formation, or Double-Bluff drift. However, I cannot rule out the possibility that deposits from the Puyallup Valley section are not present due to major unconformities in the subsurface.

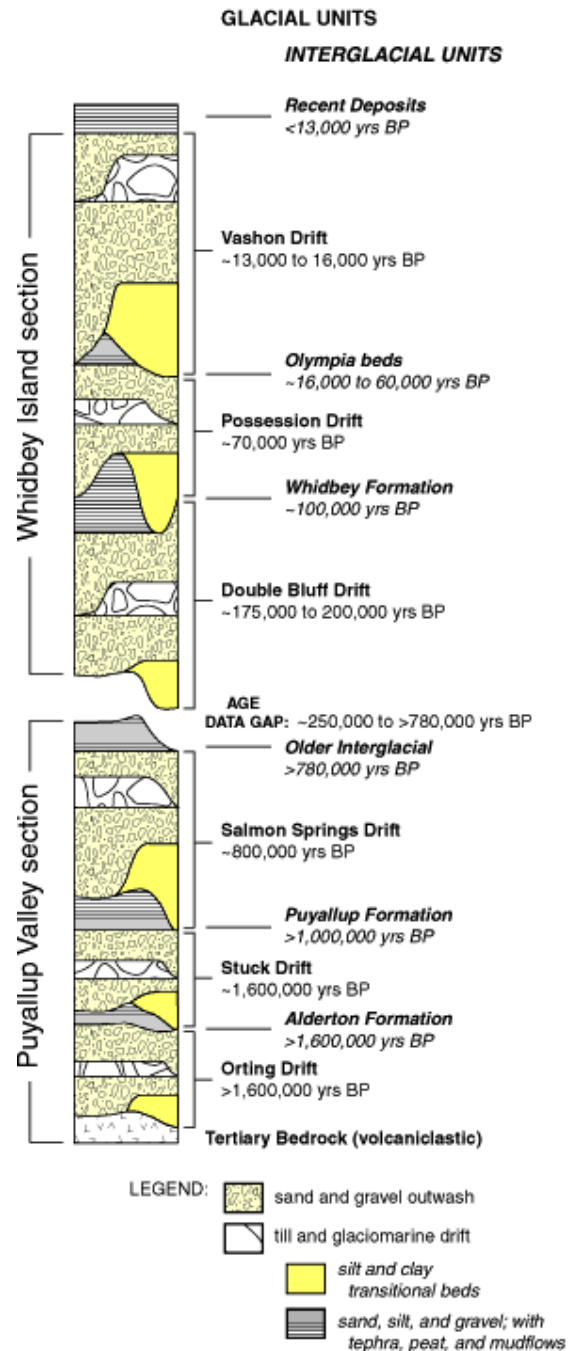


Figure 11. Generalized stratigraphic column of glacial and interglacial deposits observed in the Puget Lowlands. Modified from Troost and Booth (1999).

## 2.4 *Groundwater*

Groundwater is a primary source of weathering in subsurface deposits and has affected the sediments in my study area. Beneath the CHRLF are a series of saturated zones, suspended on clay and silt lenses, above a deeper regional aquifer. The regional aquifer is recharged by precipitation and discharges to the northeast towards the Tiger Mountain Gap (Fig. 3). The primary recharge area for the CHRLF is located to the south, within the QCF property, just north of Main Gravel Pit Lake. The general trend of groundwater flow is radial from the recharge zone in the QCF property and trends to the northeast below the CHRLF (HDR and Aspect, 2003).

## **3. Methods**

The findings I present in this report are drawn from my stratigraphic analysis and were informed by my literature review of previous CHRLF hydrogeologic reports. The field component of my work was minimal limited to the drilling and logging of A8B-8 and A8B-9.

In order to place the CHRLF within a regional geologic framework, I reviewed papers by Liberty, Pratt, Troost, Blakely, and others alongside the regional maps produced by Booth, Minard, and Walsh. The Site-Wide Hydrogeologic Report, along with the Area 7 Hydrogeologic Report informed my interpretation of the geologic contacts in the subsurface of my study area.

My stratigraphic analysis utilized boring logs that had been compiled in the SWHR (2004) (Area 5, Area 6, MW, and DH wells), the 2008 Area 7 Hydrogeologic Report (Area 7 wells), and those passed on to me by my mentor (Area 8 wells). I chose to plot six cross-sections, three trending north to south, labeled A, B, and C, and three trending east to west, labeled X, Y, and Z (Fig. 3). I then performed a stratigraphic analysis, based on the borehole data now plotted (Appendix 1), and produced corresponding interpretative cross-sections (Discussion, Section 5, Fig. 13-18).

#### 4. Analysis

##### 4.1 Radiometric Dates

Radiometric dating of organic material in the CHRLF was incorporated into my analysis. Six samples, four from A6BH-2a, one from A8B-2, and one from A8B-5 were utilized in my analysis. These samples are summarized in Table 2. The samples taken at 540.6 and 512.6 feet in elevation in A6BH-2a fell within my interpreted Vashon till unit (Unit 5). There is a significant margin of errors inherent to the date independent of the testing errors. Glacial environments are very high in energy and will rework material in their path. Therefore, radiometric dates taken from glacial deposits may be dating material older than their bearing unit.

Dates of samples taken within the high-energy fluvial deposits below the till (Unit 6 from Table 3) suggest an age consistent with the Olympia interglacial period (Troost, 2008). Assuming these materials are in-situ and representative of the age of the surrounding material I would classify these deposits as Qob (Quaternary Olympia Beds). However, it is unusual to not observe advance outwash deposits where more than one till exists (Personal Communications with Kathy Troost, November 2014). I would expect deposits of both within this unit, but they may be indistinguishable from one another. For this reason I have labeled unit 6 as Qob/Qva (Quaternary Olympia Beds or Quaternary Vashon Outwash) (Table 3, unit 6).

| Borehole | Transect | Sample Depth (ft.) | Sample Elevation (ft.) | Radiometric Age (ybp) | Bearing Unit (Table 3) |
|----------|----------|--------------------|------------------------|-----------------------|------------------------|
| A6BH-2a  | A and Y  | 48.0 - 49.0        | 539.6 - 540.6          | 35,500 ± 830          | 5                      |
|          |          | 76.0 - 77.0        | 511.6 - 512.6          | > 45,810              | 5                      |
|          |          | 209                | 379.6                  | > 46,600              | 9                      |
|          |          | 328.0 - 328.5      | 260.1 - 260.6          | > 46,880              | 9                      |
| A8B-2    | A and Z  | 130                | 456                    | 32,030 ± 190          | 6                      |
| A8B-5    | Z        | 88                 | 442.6                  | 31,210 ± 170          | 6/8                    |

*Table 2.  
Radiometric dates utilized in this analysis (HDR and Aspect, 2003, Table A-1 and HDR et al., 2014)*

## 4.2 *Stratigraphic Units*

Sand, gravel, silt, clay, cobbles, boulders, and peat comprise the subsurface of my study area. I identified patterns of deposition consistent with fluvial, lacustrine, and till deposits. My interpretative cross-sections of the borehole data are presented in section 4.3.

I interpreted nine major stratigraphic units within my study area (Table 3 and Figure 12). The deepest boreholes encountered a unit of fluvial deposits, below 412 feet in elevation, which continued beyond the base of the boreholes. This unit contained distinct black and white sand, a relatively high occurrence of organic material, and possible ash layers, below. This unit gives way to a higher-energy, channelized, fluvial unit wherein the black and white sand is absent and organics appear much less frequently. In A6BH-2a, of cross-sections A and Y, a deposit of intact till-like clasts, within a well-graded gravel, was logged between 444.05 and 430.5 feet in elevation. This could correspond to the older till described by Booth (1985 and 1995) (Fig. 9 and 10). Assuming that unit 7 is indeed a distinct till unit, by the law of superposition, I separated the high-energy fluvial deposits above this unit from those below.

A unit of sand and gravel with a silty matrix, and some cobbles and boulders appears near or at the surface of each borehole. This unit was typically difficult to drill compared to the sediments below. This description is consistent with a lodgement till. Given the shallow position of this unit in the stratigraphic column and radiometric ages from its basal contact (Table 2) I interpret this to be the Vashon till.

Unit 5, my proposed Vashon till, is visible at the surface of the majority my study area, except where it is overlain by artificial fill or possible recessional deposits. Units 1, 2, 3, and 4 in Table 2, all overlay my interpreted Vashon till, but have differing properties. Based on superposition, topography, and my interpretation of the described material properties of the unit, I expect that unit 4 is the oldest of a sequence of recessional deposits. Booth (1985) (Fig. 9) mapped a

recessional deposit at the southwestern border of the CHRLF property. It stands to reason that my unit 4, observed in the southern-most two boreholes of transect A (Fig. 32), is the same recessional outwash observed by Booth, and that his surficial map of the CHRLF underestimated the lateral extent of the deposit (Fig. 9).

Unit 3 is observed above the Vashon Till in cross-sections A, B, C, and X (Fig. 13, 14, 15, and 16) to the north. This deposit of interbedded silt and clay with some gravel and trace organics may be the result of a recessional lake due to ice damming of outwash channels.

Unit 2 lies above unit 3 and was recognized in cross-sections A, C, and X (Fig. 13, 15, and 16). This deposit is significantly harder and dryer than unit 3 and was logged as “weathered till” in borehole MW-72. I do not think it’s likely that this is actually a younger till than unit 5, but is more plausibly a Vashon recessional ice contact deposit. A block of ice, left behind after the glacier receded could have left such a deposit. The nearby kettle lakes, discussed in section 1.4, may have been formed in a similar manner and lend weight to the theory of isolated ice blocks remaining during the recession of the Vashon glacier.

| Unit Relative Age (Young to Old) | Unit Description  | Interpretation  | Apparent Locations  | Label   |
|----------------------------------|---|---|---|---------|
| 1                                | Modified land, fill   | Fill  | Transect Z: Above 500 ft.<br>Transect Y: Above 538 ft.  | Qm      |
| <b>Unconformity</b>              |   |   |   |         |
| 2                                | Gray, sometimes brown, SILT and SAND with some gravel, trace organics, and trace orange mottling.   | Vashon Recessional Ice-Contact Deposit  | Transect A: Above 600 ft.<br>Transect B: Above 600 ft.<br>Transect C: Above 655 ft.                                   | Qvric   |
| 3                                | Gray, dark gray, brown, dark brown, and black, SILT and CLAY with some gravel and trace organics.   | Vashon Recessional Lacustrine   | Transects C and X: Above 598 ft.  | Qvrl    |
| 4                                | Gray, gray-brown, brown, and yellow-brown, GRAVEL, SAND, and SILT with some clay, a few cobbles, and trace organics.  | Vashon Recessional Outwash  | Northern end of transects A, B, and C above 510 ft.<br>Transect X: Above 510 ft.                                      | Qvr     |
| 5                                | Gray, brown, or yellow-brown, GRAVEL and SAND with some silt and a few cobbles and boulders, trace orange mottling, hard and dry.   | Vashon Till   | Found in all transects at the surface where not overlain by recessional deposits or modified land.                    | Qvt     |
| <b>Unconformity</b>              |   |   |   |         |
| 6                                | Yellow-brown, brown, orange-brown, yellow-gray, and gray SAND, SILT, and GRAVEL with trace mottling, organics absent.   | Pre-Vashon fluvial deposits, possibly Olympia Beds (Based on radiometric dating) and Vashon Advance Outwash | Found in all transects below the Vashon Till.   | Qob/Qva |
| 7                                | Gray, well-graded GRAVEL and silty SAND with gravel, trace orange mottles, hard.  | Pre-Olympia Glacial Till  | Most apparent in Transects A and Z between 405 and 442 ft. Is likely present elsewhere but in a very weathered state. | Qpogt   |
| 8                                | Yellow-brown, brown, orange-brown, yellow-gray, and gray SAND, SILT, and GRAVEL with trace mottling, organics absent.   | Pre-Olympia Coarse-grained Deposits   | Indistinguishable from unit 7, but likely present below unit 8.   | Qpoc    |
| <b>Unconformity</b>              |   |   |   |         |
| 9                                | Gray, dark gray, brown, dark brown, and black SILT, SAND, and GRAVEL, lack and white sand, some organics, a few peat layers, and apparent fining-upward sequences with silt caps. | Pre-Olympia Non-glacial Deposits  | Basal unit present in all transects below 412 ft.   | Qpon    |

*Table 3.  
Stratigraphic units delineated in my analysis.*



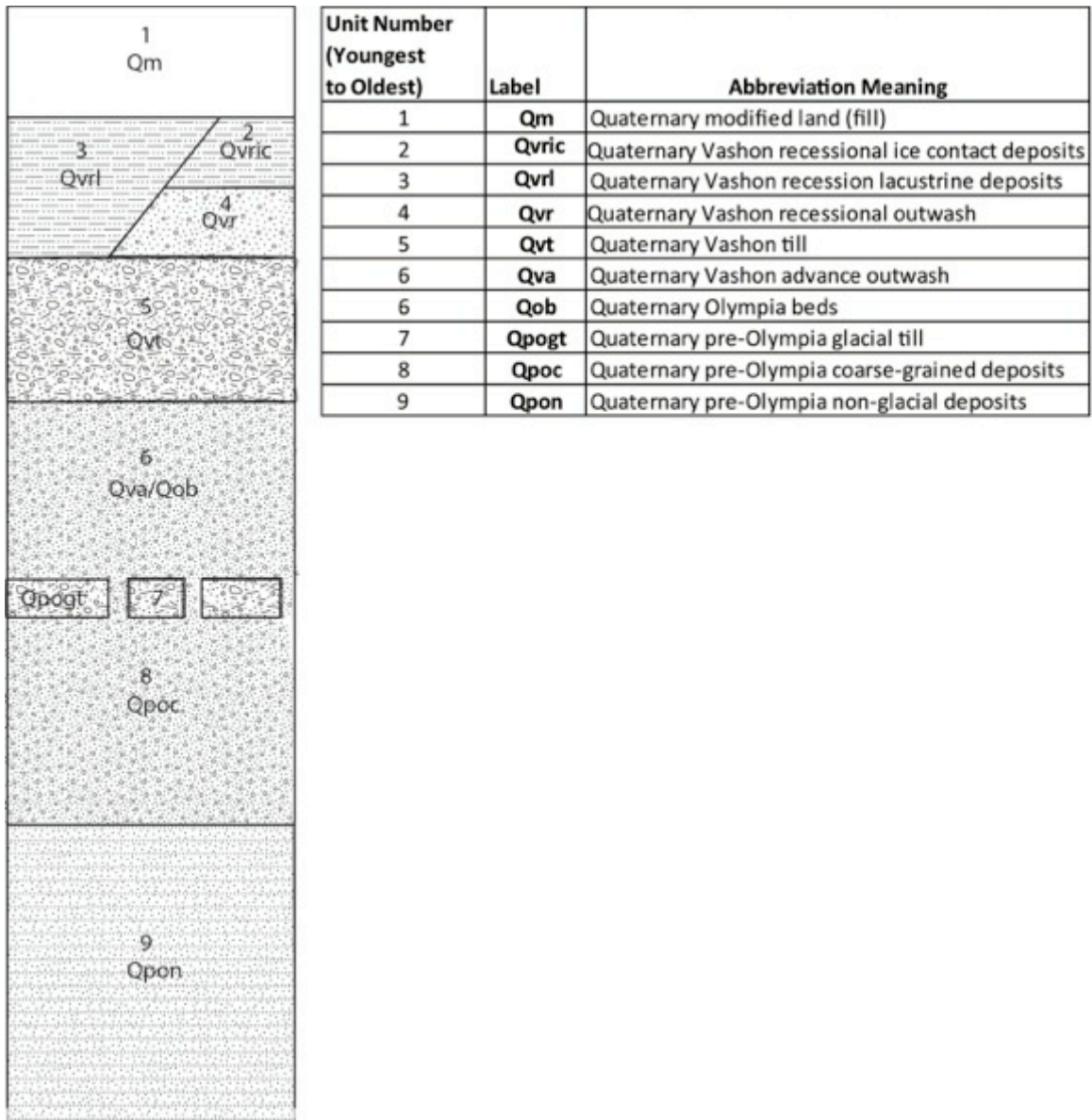


Figure 12.  
Generalized stratigraphic column of the units delineated in my stratigraphic analysis.

### 4.3 *Interpretative Cross-Sections*

In this section I present my interpretative stratigraphic cross-sections of the southwestern quadrant of the CHRLF. Transects A, B, and C trend north-south with east into the page. Transects X, Y, and Z trend east-west with north into the page. The location of the transects are illustrated in the CHRLF borehole map (Fig. 13) and the color of each transect in corresponds to the title-color at the top of each cross-section.

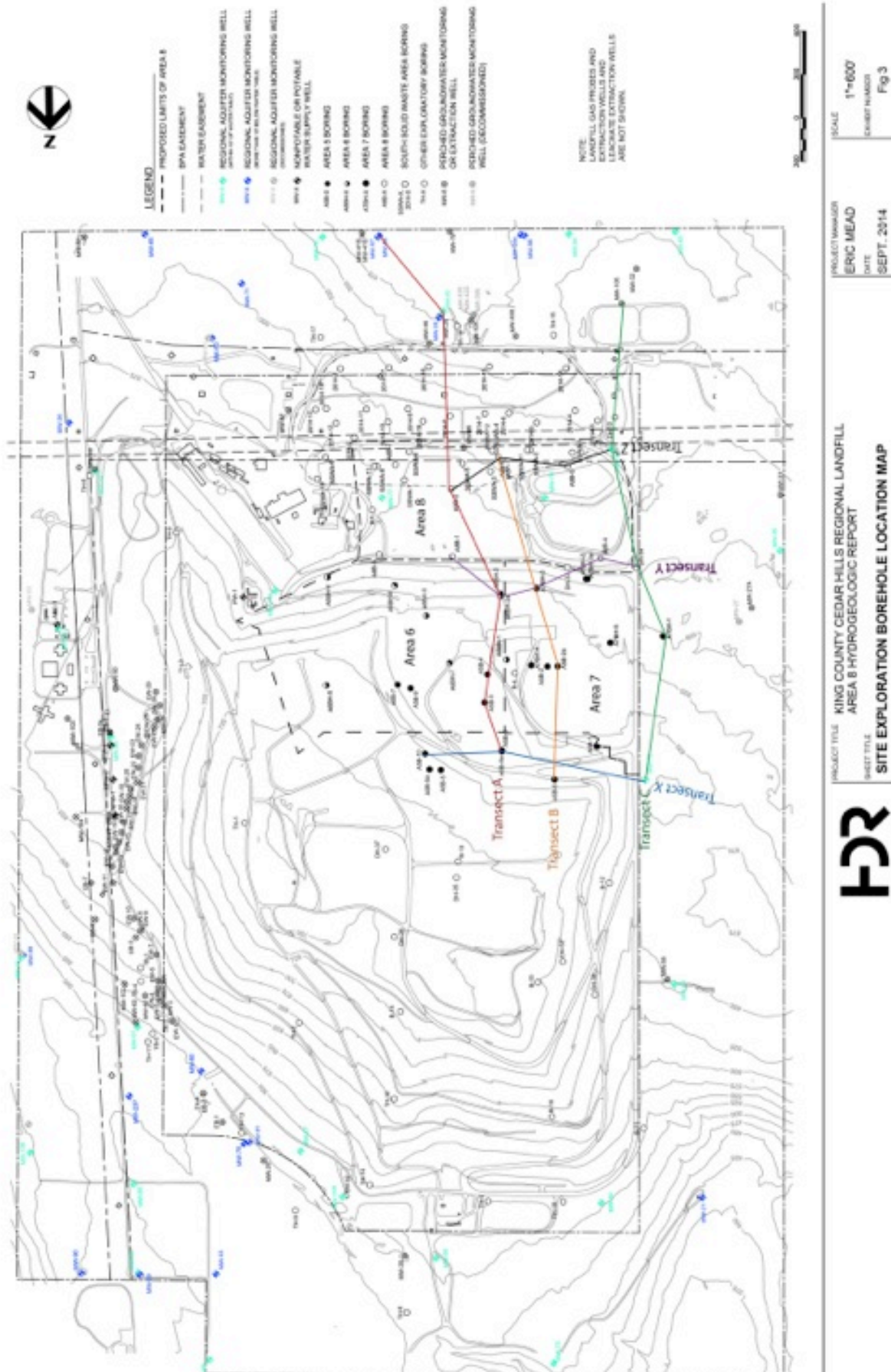


Figure 13. Area map of the CHRLF, borehole data, and my chosen cross-sectional transects. Modified from (CH2M-HILL and UES, 2004)

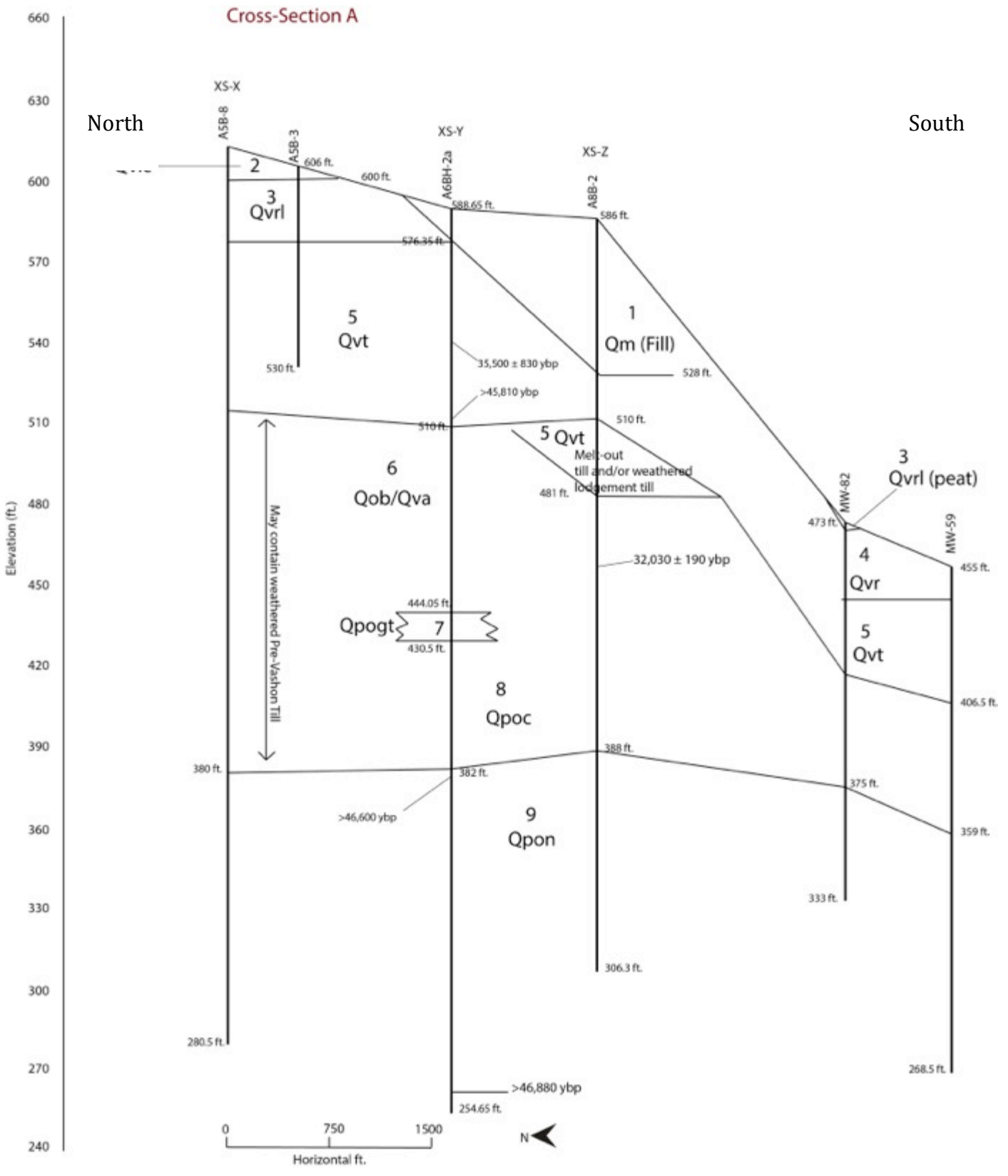


Figure 14.  
Interpretative cross-section A. VE=20X

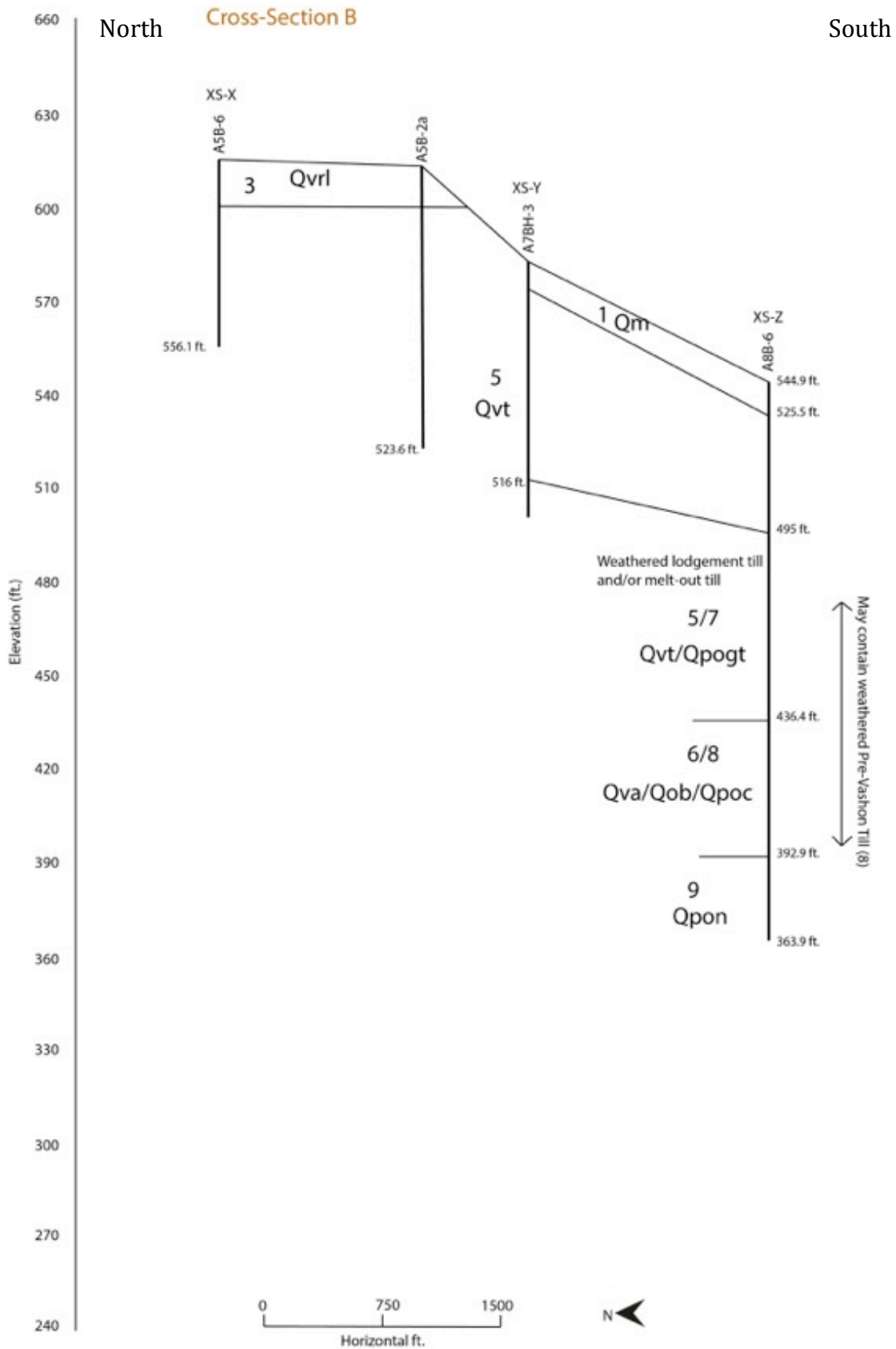


Figure 15.  
 Interpretative cross-section B. VE=20X

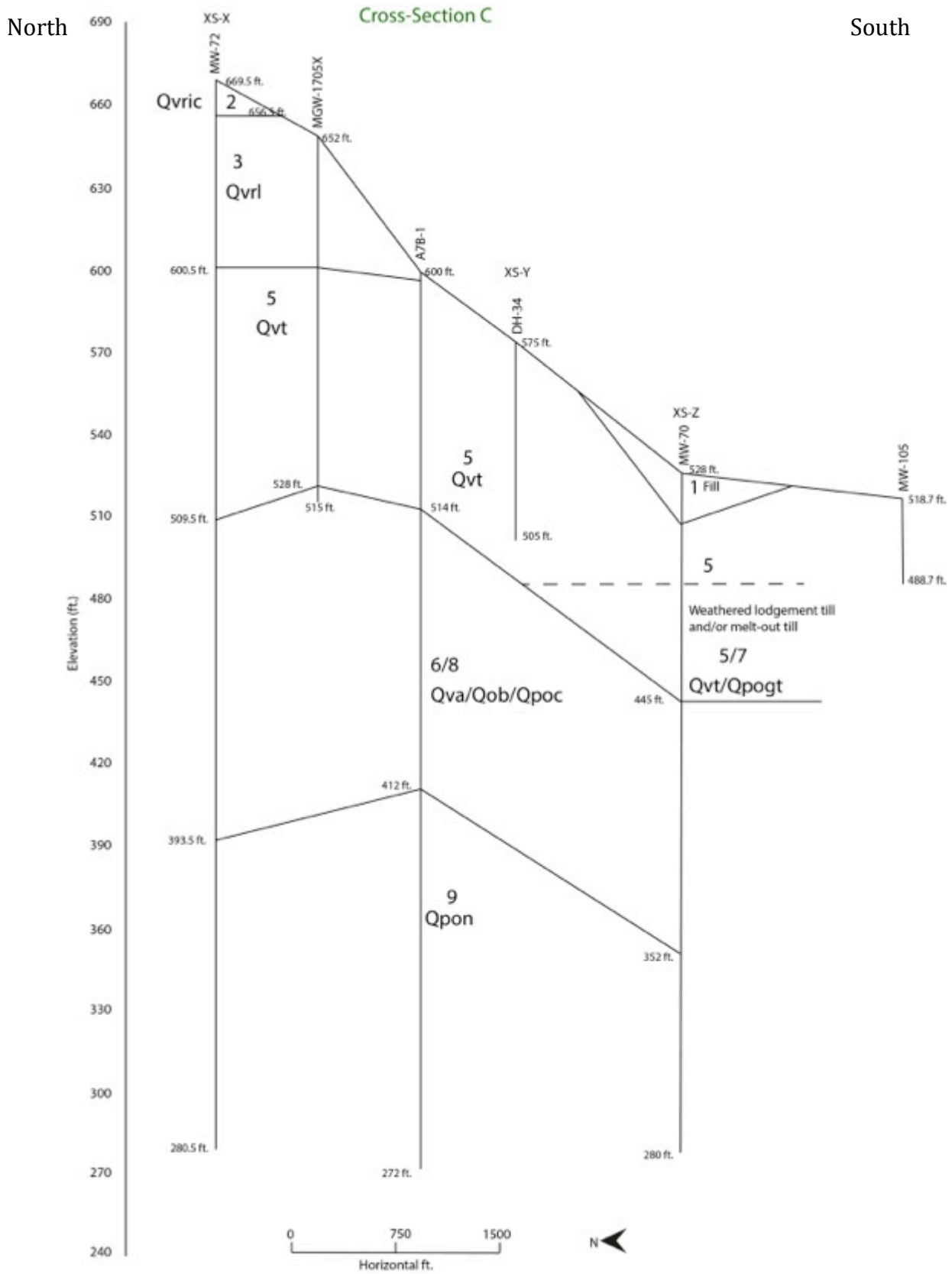


Figure 16.  
Interpretative cross-section C. VE=20X

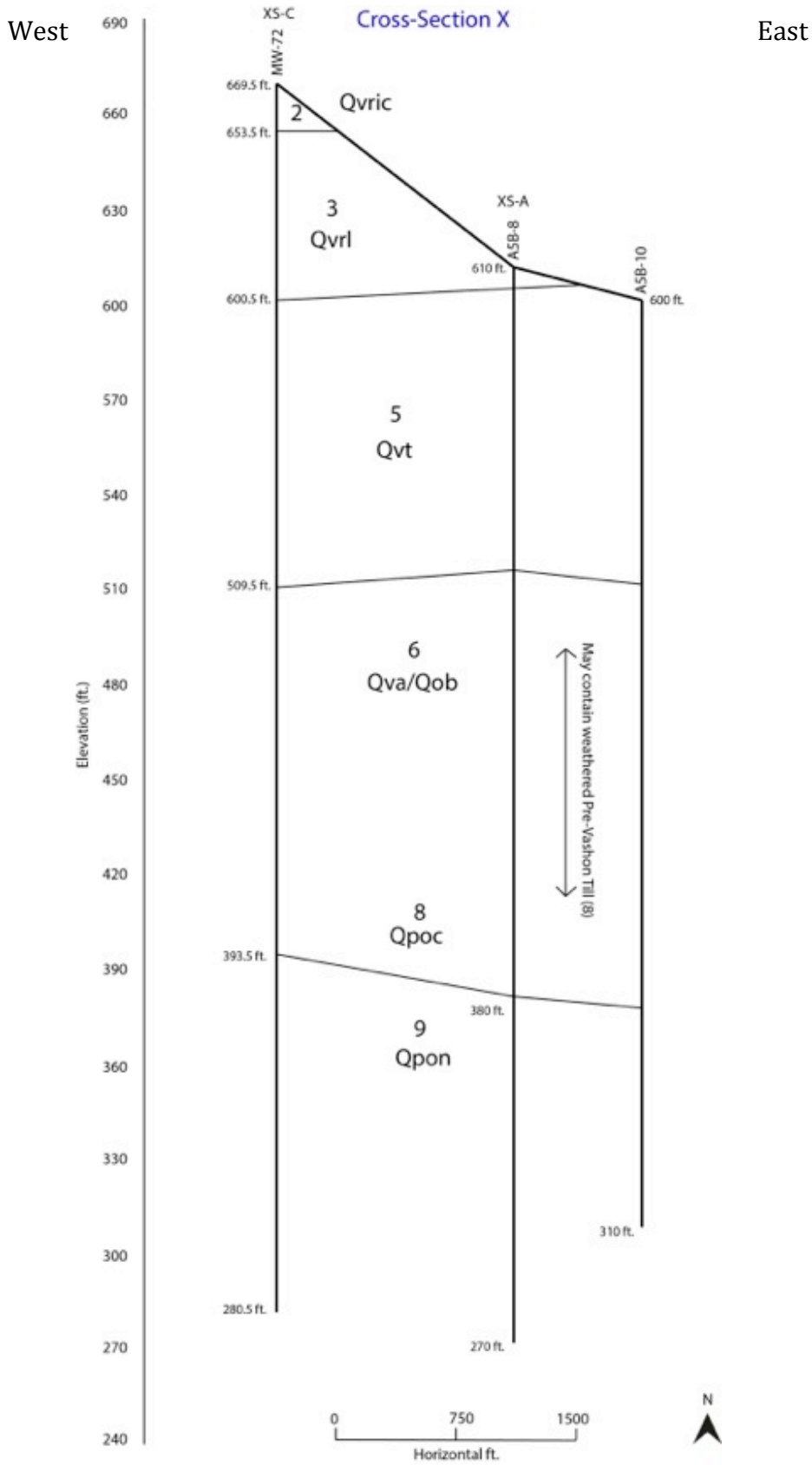


Figure 17.  
Interpretative cross-section X. VE=20X

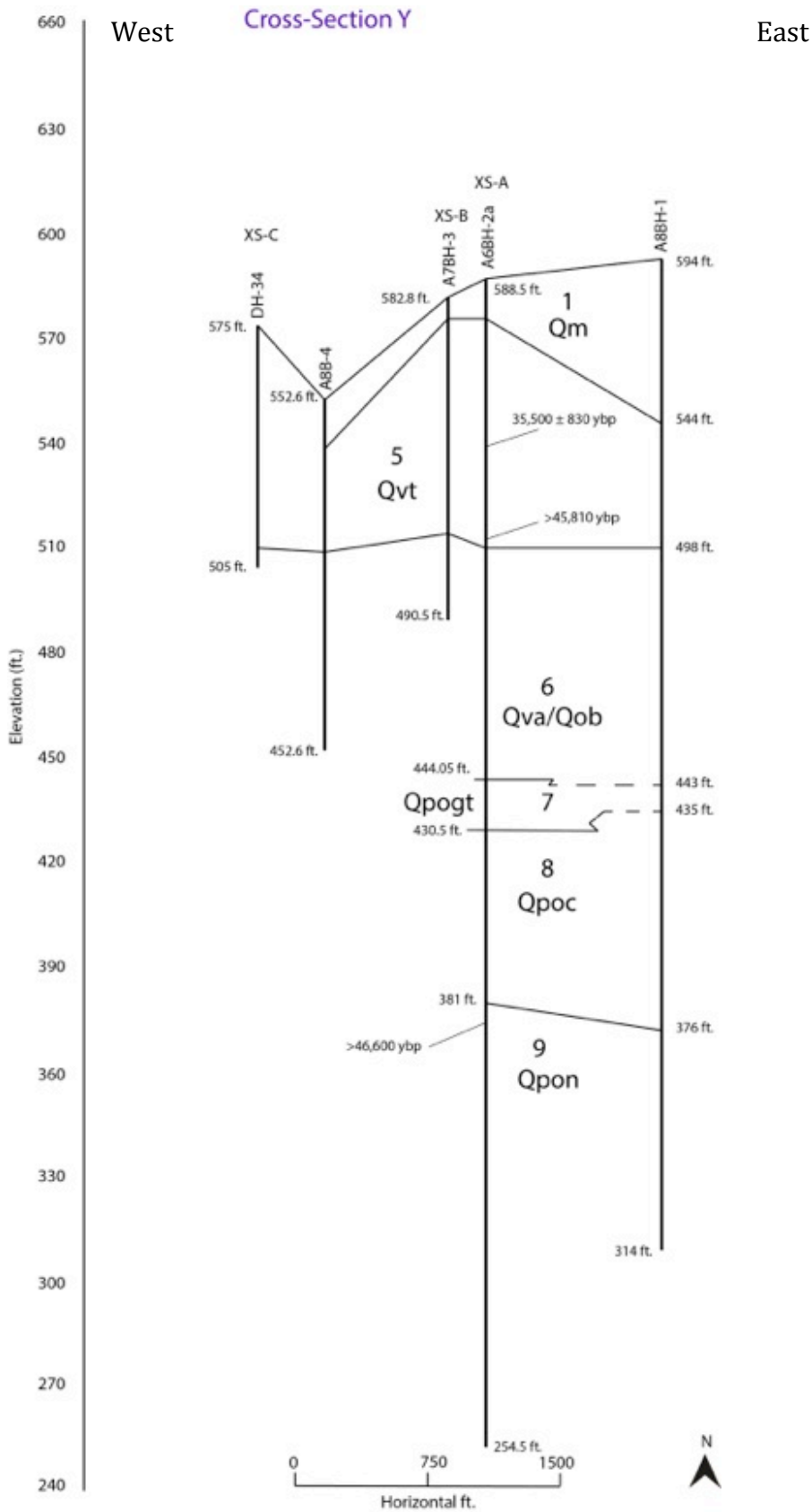


Figure 18.  
Interpretative cross-section Y. VE=20X



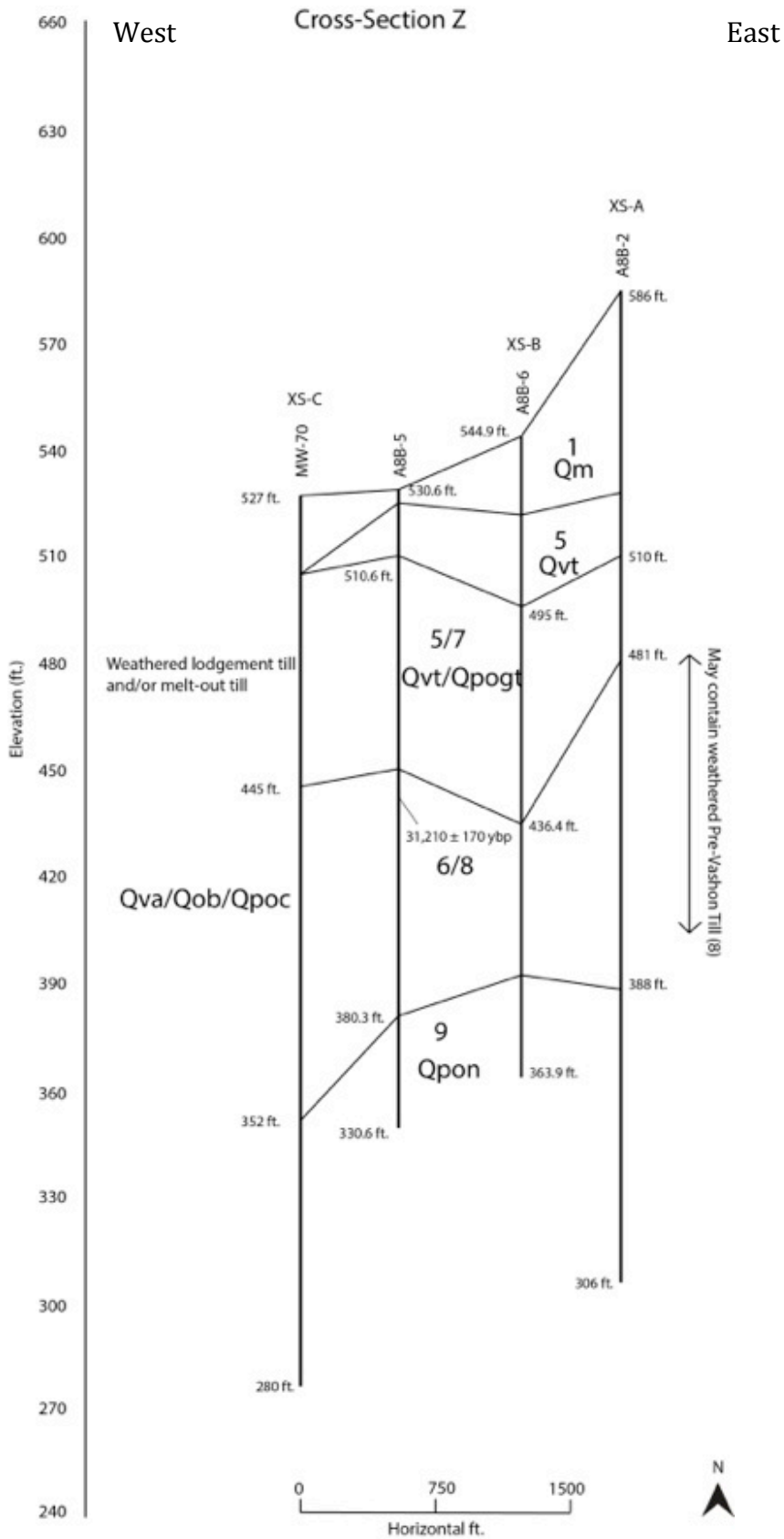


Figure 19.  
Interpretative cross-section Z. VE=20X

## 5. Discussion

### 5.1 Conceptual Models

My stratigraphic analysis of the southwestern quadrant of the CHRLF suggests a geologic history of at least one glacial advance over non-glacial fluvial deposits. I interpret nine primary stratigraphic units, including fill, within my study area (Table 3).

The presence of a second till unit could not be confirmed or disproved in this study. Therefore I hypothesize two potential conceptual models for the stratigraphy at the CHRLF. The first hypothesis, which I refer to as the “Single-Till Hypothesis”, assumes that only one sequence of glacial deposits is recorded in the subsurface (Fig. 19).

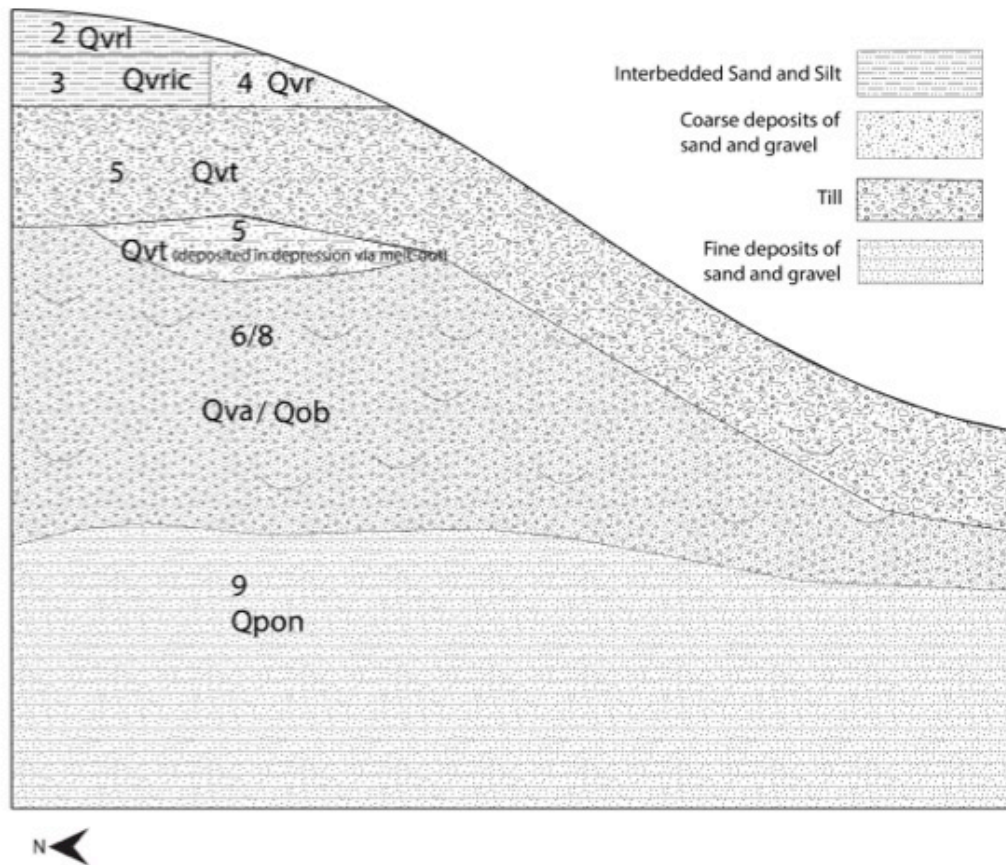


Figure 20.  
“Single-Till Hypothesis”  
Conceptual model of the shallow subsurface of the CHRLF, assuming only one glaciation is recorded in the stratigraphy.

The alternative to the Single-Till Hypothesis is that at least two sequences of glacial deposits are present in the subsurface of the CHRLF. This alternative model, which I refer to as the “Layered-Till Hypothesis” is presented below (Fig. 20). In the maps by Booth (Sweet Edwards, 1985) (Fig. 5) and (Booth, 1995) (Fig. 6), the proposed second, deeper till unit was not visible at the surface of the CHRLF, yet the Vashon till is at the surface everywhere it is not overlain by recessional deposits. In the Layered-Till Hypothesis I propose that the Vashon Till may crosscut the proposed deeper till along an erosional unconformity.

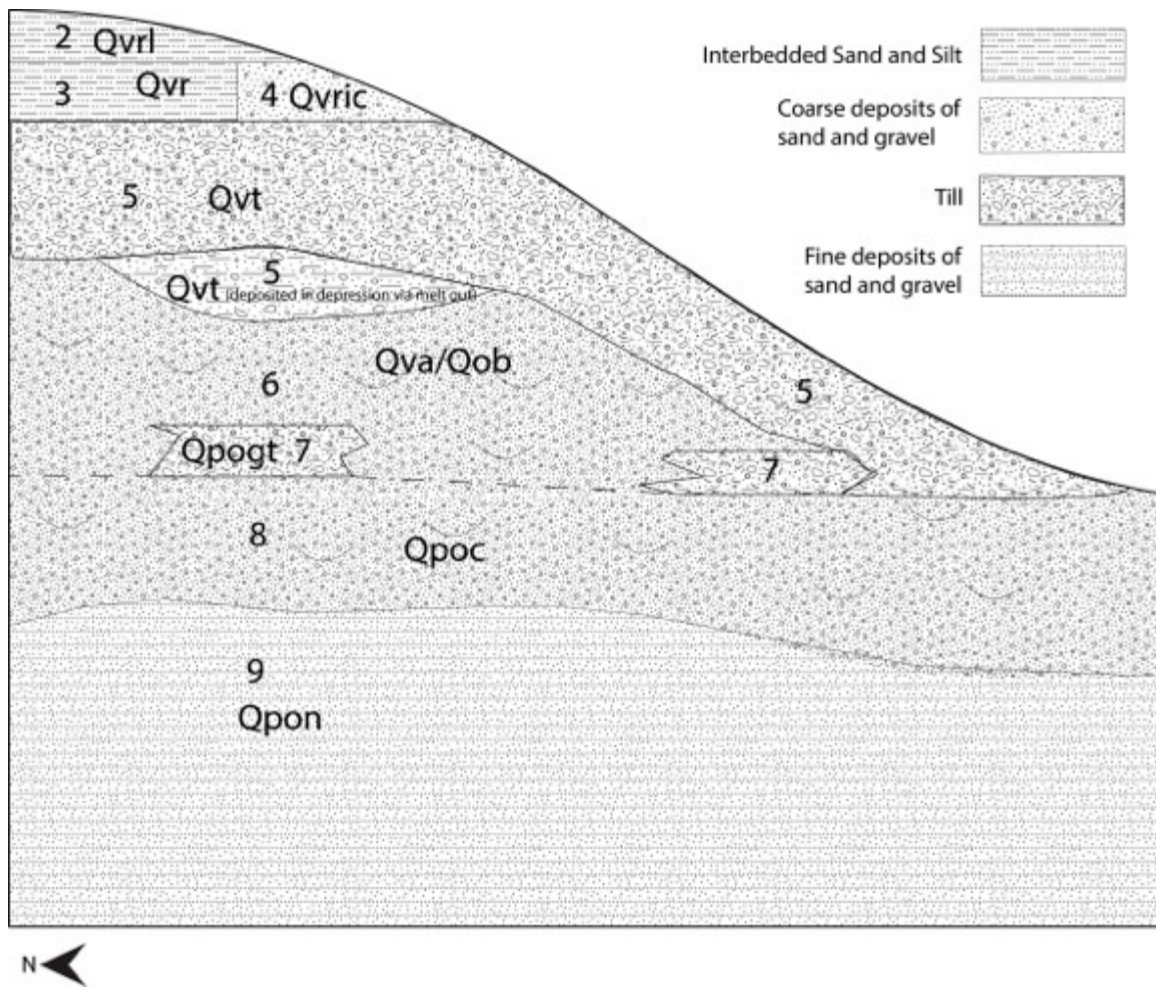


Figure 21.  
 “Layered-Till Hypothesis”  
 Conceptual model of the shallow subsurface of the CHRLF, assuming that at least two glacial sequences are recorded in the stratigraphy.

## 5.2 *Unconformities*

Stratigraphic contacts at the CHRLF are most likely the result of erosional unconformities. The transitions between non-glacial fluvial deposits (Unit 9, Table 2), fluvial/ glaciofluvial deposits (Units 6 and 8, Table 2), and glacial deposits (Units 5, 4, 3, and 2, Table 2) would have been accompanied by changes in energy and climate, which could create erosional surfaces.

Individual depositional layers may not be laterally extensive within units 6,7,8, and 9 (Table 2), but I do not expect that faulting has truncated these features. These units were deposited in fluvial environments, which would leave uneven records of channels aggrading, avulsing, and eroding. I would also expect to find amorphous mass wasting deposits in these channels. Therefore, it is unlikely that they were deposited in laterally extensive units. And those that were deposited over large areas, such as flood plain deposits, were likely incised into at later times by migrating channels

During my investigation of the southwestern quadrant of the CHRLF I did not find evidence of faulting. The irregular basal elevation of the Vashon till roughly conforms to topography and does not truncate at any point other than where it was removed and replaced with artificial fill. Therefore, I conclude that neither faults nor other forms of structural deformation have offset Vashon and Holocene deposits. Pre-Vashon deposits also do not exhibit offset. I cite the contact between the non-glacial unit 9 (Table 2) and the younger fluvial deposits, which is very consistent across my study area.

Walsh proposed that faulting to the west could extend below the CHRLF at a depth of ½-1 mile below the surface. I cannot prove or disprove their existence because my data did not extend to these depths.

## **6. Conclusion**

### 6.1 *Findings*

Based on my analysis of borehole data from the investigation of the Area 8 lateral expansion of the CHRLF in Maple Valley, Washington, and previous

investigations, I conclude that the subsurface of the southwestern quadrant of the landfill contains non-glacial, fluvial deposits overlain by fluvial, lacustrine, and at least one sequence of glacial deposits. I expect more than one till unit is present in the subsurface of the CHRLF. I cannot prove or disprove the existence of a pre-Vashon till with my current data set. However, both Sweet Edwards (1985) and Booth (1995) observed and mapped a second till unit below the Vashon till at separated by a sand and gravel unit. An isolated “till-like” deposit, logged in A6BH-2a, could correspond to the deeper till described previously.

Faulting or other structural deformation, to the depths that I have analyzed, has not offset the deposits in my study area. In this conclusion I cite the basal contact of the Vashon till (Unit 5, Table 3) and the upper contact of the pre-Olympia non-glacial unit (Unit 9, Table 3), which were both continuous across my study area. The elevation of the basal Vashon till contact does vary, but this is likely a result of the deposition of the lodgement till over paleotopography, not offset.

## 6.2 *Assumptions and Sources of Error*

In drawing the contacts of my stratigraphic analysis of the southwestern quadrant of the CHRLF I made several assumptions. (1) Faults do not offset the deposits within my study area. (2) The materials sampled during the logging of the boreholes is representative of the material in the subsurface. (3) Bedrock is at depth below the base of boreholes in my analysis.

This report relies on data collected by scientists, other than myself, over a roughly 30-year period. Drilling methods, weather conditions, objectives, and experience levels all varied during the course of their investigations. Therefore, the boring logs utilized in my analysis are not free from bias.

The CHRLF property has been altered from its natural state. I expect that the rate of weathering in the subsurface has been affected by grading, installation of impermeable surfaces (roads, facilities, liners), and by the removal of material. This could affect the appearance of the same unit between studies.

### 6.3 *Suggestions for Further Investigations*

There are several investigations that could be undertaken in the future to improve my analysis. With regards to the question of the number of till units below the CHRLF, expanding the study area and improving the network of boreholes, especially to the west where Booth originally mapped the pre-Vashon till, could offer more insight.

Although I trust in the skills of the geologists who have worked in the area before my time, we now have a greater wealth of data for this site. I would like to revisit the surficial geology of the Cedar River Valley in particular, and compare observations of the potential pre-Vashon till of the CHRLF to the unit mapped by Booth in 1995.

Additional radiometric dates and an analysis of the validity of the dates would be very useful. Currently, if we assume that the dates utilized in my analysis are representative of their bearing units, we must conclude that the fluvial deposits below the shallow till are of pre-Vashon age. This means that Vashon Advance Outwash is not present in this study area, which is unusual in the Puget Lowlands.

A detailed provenance study of the sediments below the proposed Vashon till could better constrain transitions from non-glacial to glacial deposits.

I also expect that a detailed analysis of the perched saturated zones and other hydrogeologic features could greatly inform the interpretation of this study area. This is an analysis that I hoped to perform, but did not due to time constraints.

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## Appendix 1: Working Cross-Sections

During the early stages of my investigation, my transects were labeled to correspond to those used by my mentor, Anne Udaloy, of UEC. They were then relabeled for this report. Following is a key to the labeling scheme:

| <b>Initial label</b> | <b>Adjusted label for this report</b> |
|----------------------|---------------------------------------|
| D                    | A                                     |
| D-E                  | B                                     |
| E                    | C                                     |
| J                    | X                                     |
| K                    | Y                                     |
| L                    | Z                                     |



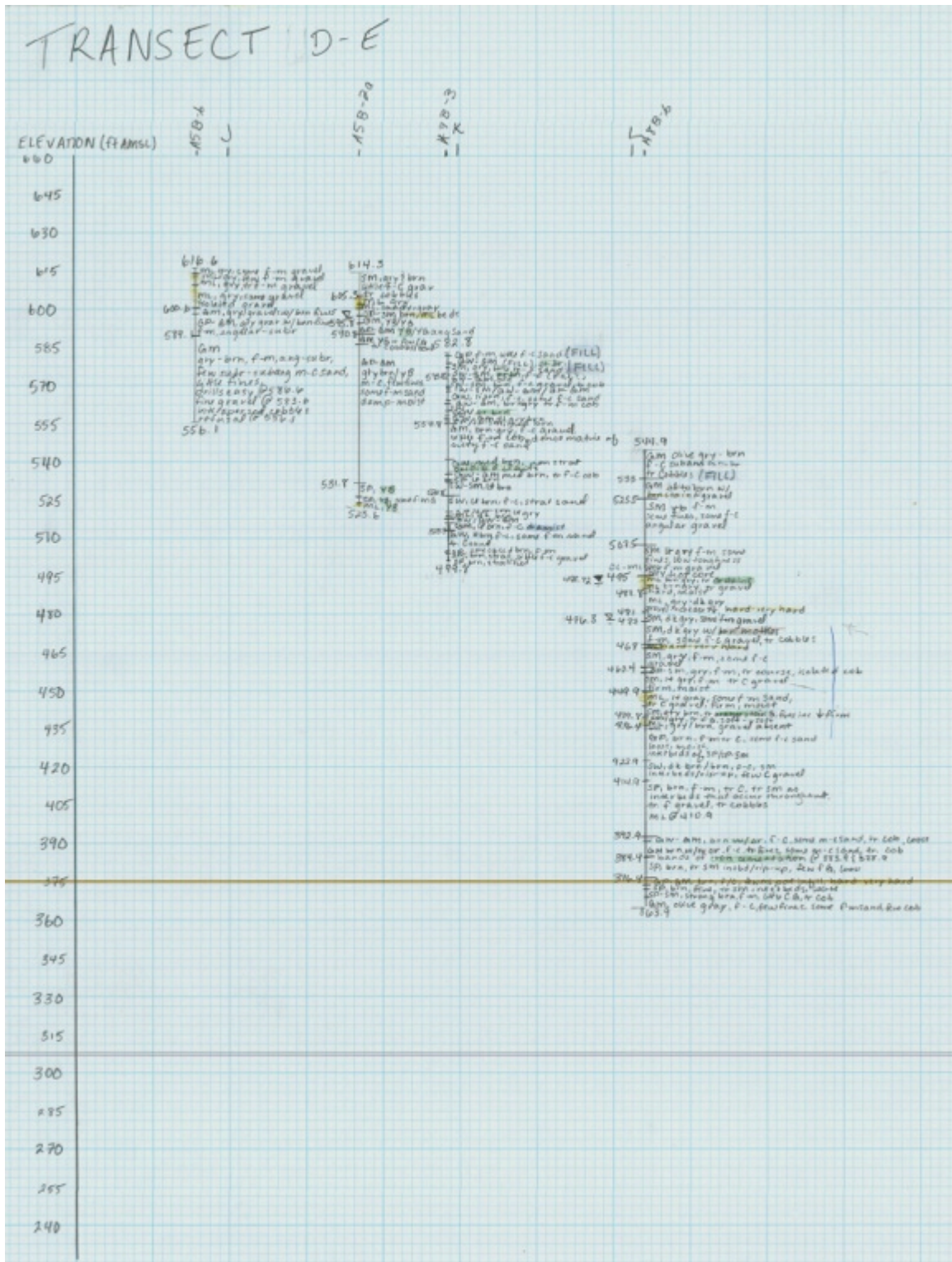


Figure 23.  
My working cross-section for Transect B.



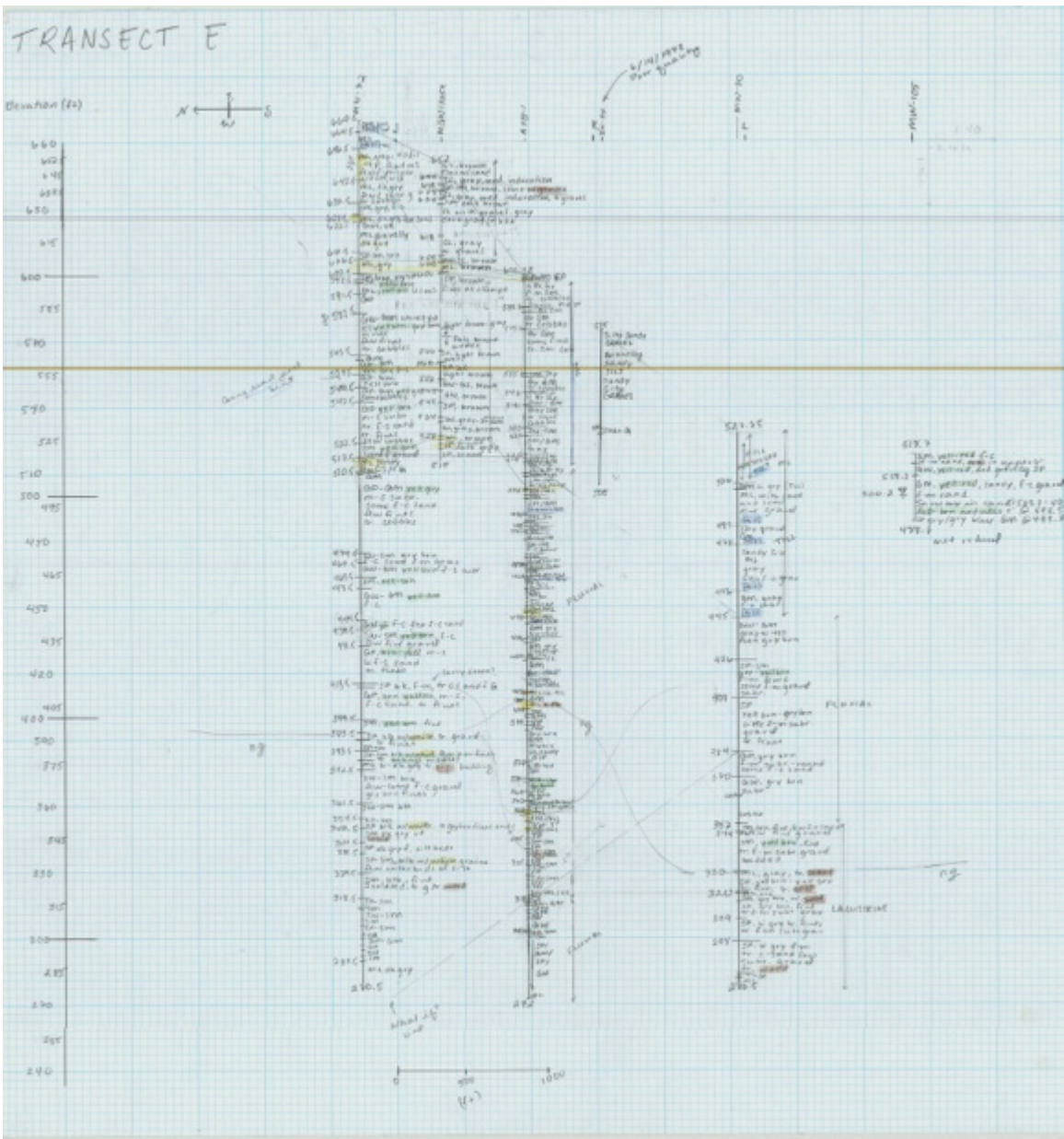


Figure 24.  
My working cross-section for Transect C.

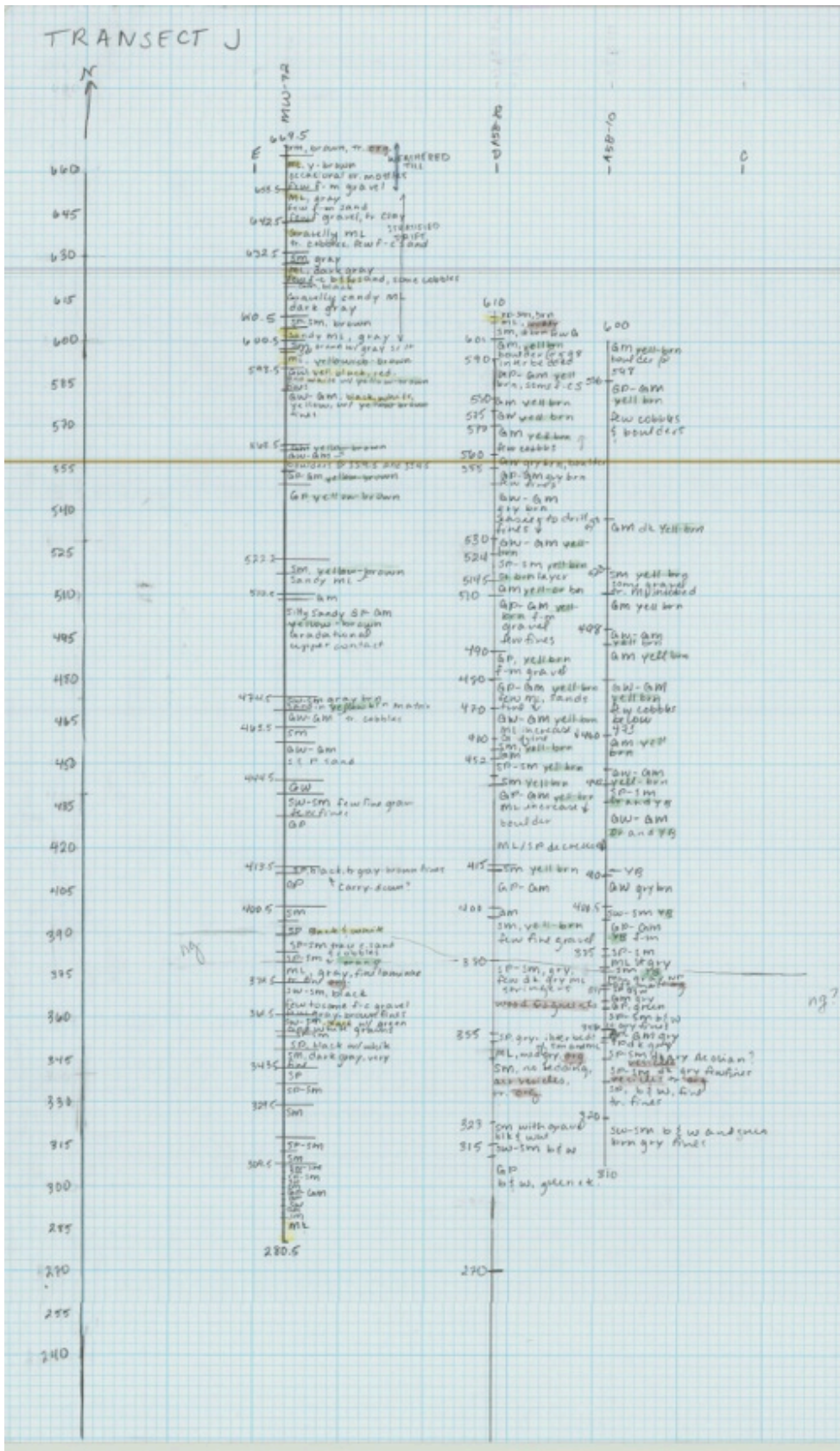


Figure 25.  
My working cross-section for Transect X.



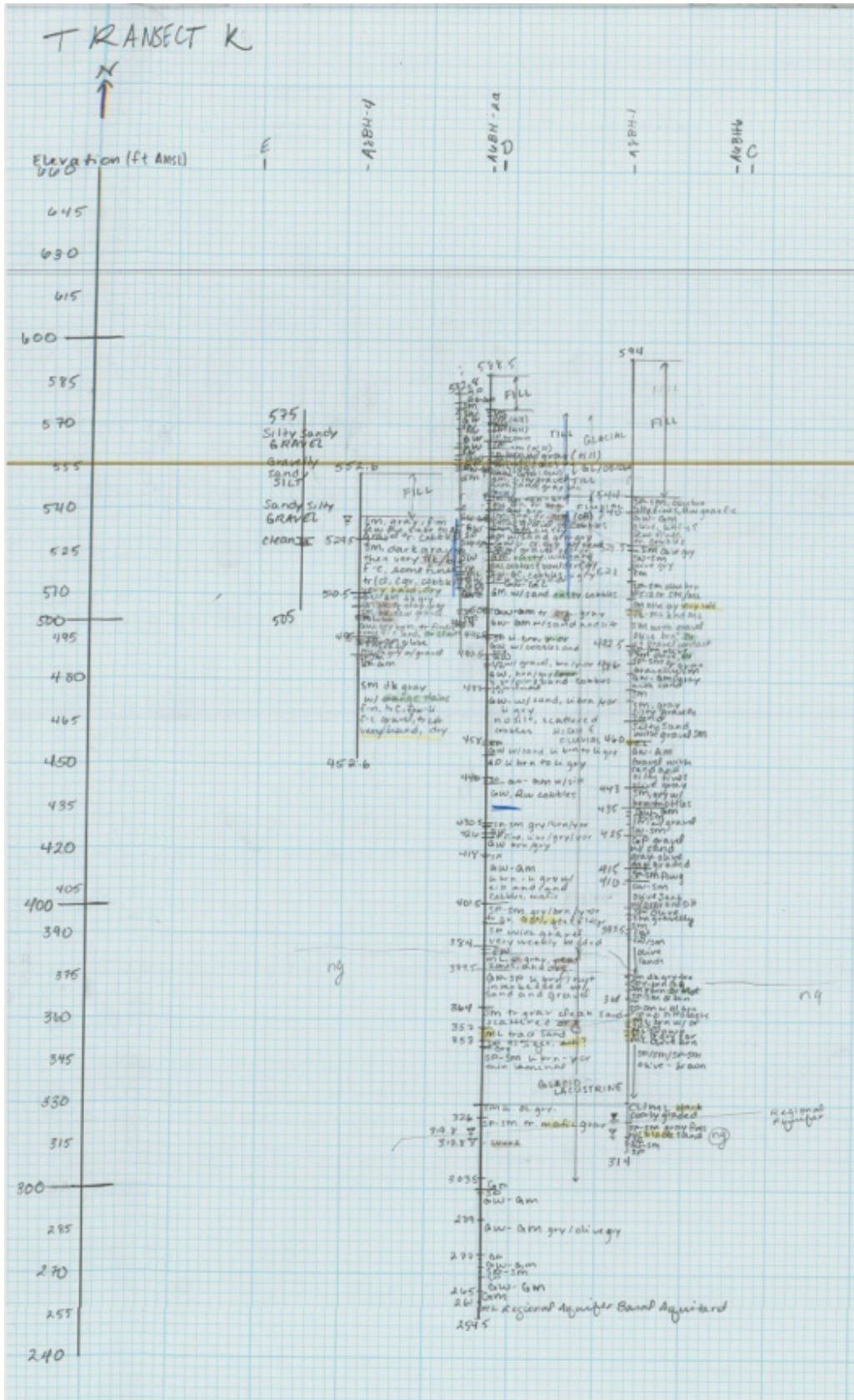


Figure 26.  
My working cross-section for Transect Y.

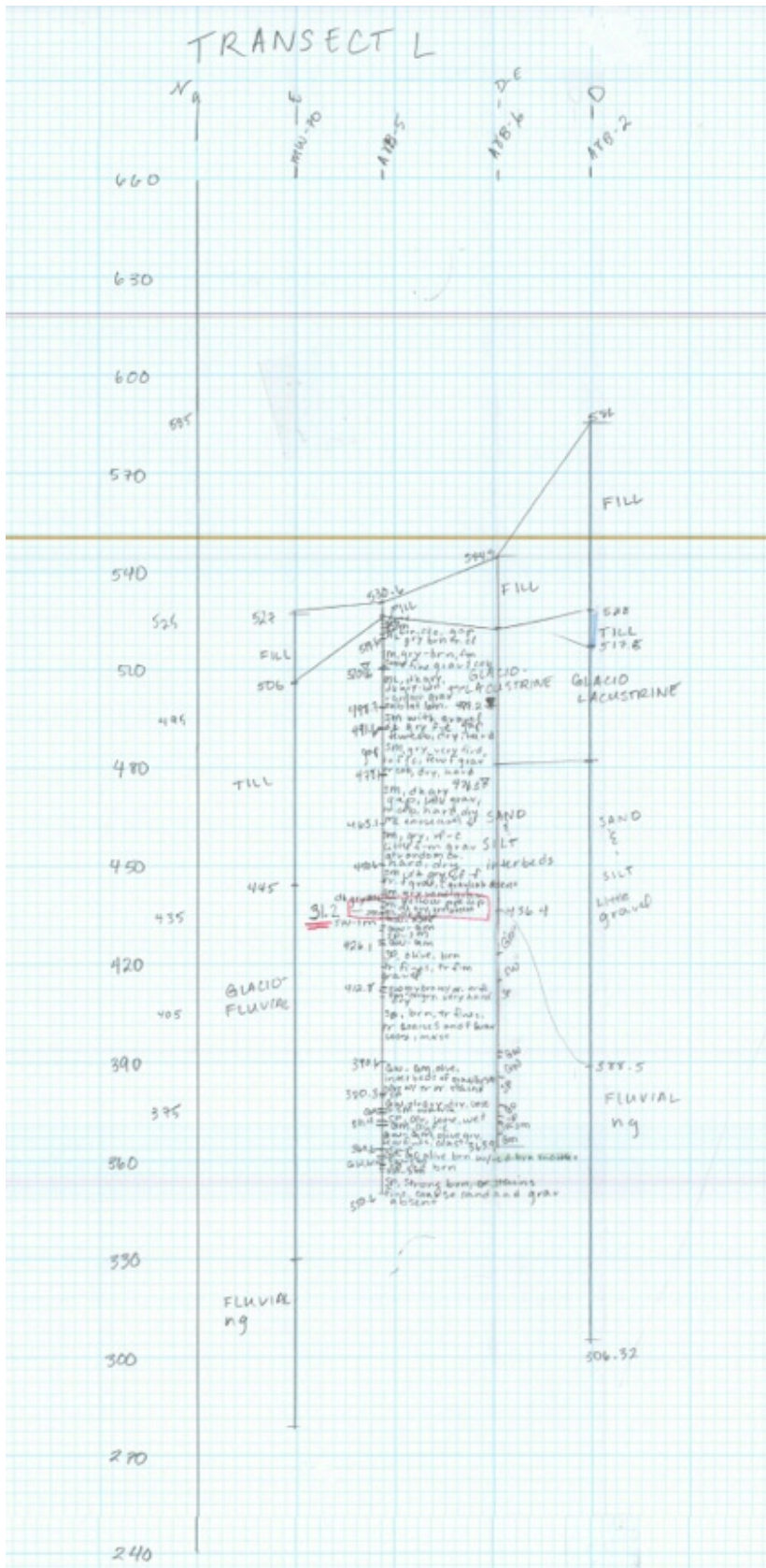


Figure 27.  
My working cross-section for Transect Z.



## Appendix 2: Boring Logs

|         |     |
|---------|-----|
| DH-34   | 54  |
| MW-59   | 55  |
| MW-70   | 60  |
| MW-72   | 72  |
| MW-82   | 92  |
| A5B-2a  | 100 |
| A5B-3   | 104 |
| A5B-6   | 108 |
| A5B-8a  | 112 |
| A5B-10  | 133 |
| A6BH-2a | 148 |
| A7B-1   | 165 |
| A7B-3   | 182 |
| A8B-1   | 187 |
| A8B-2   | 202 |
| A8B-4   | 217 |
| A8B-5   | 223 |
| A8B-6   | 232 |



Sweet, Edwards & Associates, Inc.

# BORING LOG

PROJECT Cedar Hills Ground Water Study Page 1 of 1

Location S.W. borrow area Boring No. DH-34  
 Surface Elevation approx. 575 ft. Drilling Method Air Rotary  
 Total Depth 70 ft. Drilled By Unitas Enterprises  
 Date Completed 6/14/83 Logged By D.A.Cordell

| WELL DETAILS                                   | PENETRATION TIME/RATE | DEPTH (FEET) | SAMPLE |      | PERMEABILITY TESTING   | SYMBOL | LITHOLOGIC DESCRIPTION   | WATER QUALITY |
|--|-----------------------|--------------|--------|------|--|--------|--|---------------|
|  |                       |              | NO.    | TYPE |  |        |  |               |
| NO WELL INSTALLED<br>BACKFILLED WITH BENTONITE |                       | 0            |        |      |  |        |  |               |
|  |                       | 5            | 1      | Bag  | <b>a</b>   |        | 0.0'-70.0' <u>SILTY SANDY GRAVEL, GRAVELLY SANDY SILT, SANDY SILTY GRAVEL</u> (till)- tan to grey, variable ratio of silt, sand and gravel with occasional cobble or boulder, dry to moist, gravel is typically 0.25" to 0.75" diameter. |               |
|  |                       | 10           | 2      | "    |  |        |  |               |
|  |                       | 12           | 3      | "    |  |        |  |               |
|  |                       | 20           | 4      | "    | <b>b</b>   |        |  |               |
|  |                       | 25           | 5      | "    |  |        |  |               |
|  |                       | 30           | 6      | "    | <b>c</b>   |        |  |               |
|  |                       | 35           | 7      | "    |  |        |  |               |
|  |                       | 40           | 8      | "    |  |        |  |               |
|  |                       | 45           | 9      | "    | 45.0'-48.0' <u>CLEAN GRAVEL ZONE</u>                         |        |  |               |
|  |                       | 50           | 10     | "    |  |        |  |               |
|  |                       | 55           | 11     | "    |  |        |  |               |
|  |                       | 60           | 12     | "    |  |        |  |               |
|  |                       | 65           | 13     | "    |  |        |  |               |
|  | 70                    | 14           | "      |      | Hole abandon 6/15/83 by backfilling with a bentonite slurry. |        |  |               |

SEA-300-02a

## LOG OF EXPLORATORY BORING

|              |  |                 |         |
|--------------|--|-----------------|---------|
| PROJECT NAME | CEDAR HILLS LANDFILL - South Property Line | BORING NO.      | MW-59   |
| LOCATION     | See Figure 2                               | PAGE            | 1 OF 5  |
| DRILLED BY   | Tacoma Pump & Drill.                       | REFERENCE ELEV. | 455.00' |
| DRILL METHOD | Cable Tool                                 | TOTAL DEPTH     | 185.50' |
| LOGGED BY    | John Cooper                                | DATE COMPLETED  | 8/16/88 |

| TIP READINGS | SPECIFIC COND. | (SAMPLE) BLOW COUNT          | GROUND WATER LEVELS | DEPTH IN FT. | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|--------------|----------------|------------------------------|---------------------|--------------|---------|--------------|--------------------|--|
| 00.5         | 111.2          | (S-1)<br>26-35-41            |                     | 5            |         |              |                    | 0-10.5 feet: GRAVELLY FINE SAND (ALLUVIUM), some silt to silty, brown with minor tan mottling to yellow brown with rusty brown mottling, 25-30% silt, 40-50% fine sand, dry, dense. (SM) |
| 00.2         | 132.3          | (S-2)<br>30-50/3-25-50/2     |                     | 10           |         |              |                    | @ 10.0 feet: becomes olive brown sandy gravel, damp to wet.  |
| 00.0         |                | (S-4)<br>Cuttings            |                     | 15           |         |              |                    | 10.5-31.5 feet: SILTY SANDY GRAVEL to GRAVELLY SANDY SILT (WEATHERED TILL), gray brown to yellow brown, 25-40% fine to coarse sand, very dense, dry to wet. (GM)                         |
| -00.1        |                | (S-5)<br>00/4-NR<br>Cuttings |                     | 20           |         |              |                    |  |
|              |                | (S-6)<br>00/4-NR<br>Cuttings |                     | 25           |         |              |                    |  |
|              | 82.8           | (S-7)<br>100/5               |                     | 30           |         |              |                    |  |
| 00.2         | 79.2           | (S-8)<br>100/3               |                     | 35           |         |              |                    | 31.5-38.5 feet: FINE SANDY SILT (TILL), gray to blue gray, 20-30% fine sand, 10-20% gravel and boulders, <5% coarse sand, dry, dense. (GM)   |
|              |                |                              |                     | 40           |         |              |                    | 38.5-48.5 feet: see page 2 for description.  |

**REMARKS**

Tip values represent difference between ambient/headspace readings. \*=top of casing value.  
 \*\*S-16 sunlight exposed, tip value questionable. Sp.Cond. readings from drill slurry. Sample taken with 3" dia. sampler. NR=no return.



SWEET-EDWARDS/EMCON

S2102.07.CEDAR.CJF.12/05/88

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CEDAR HILLS LANDFILL - South Property Line  
**LOCATION** See Figure 2  
**DRILLED BY** Tacoma Pump & Drill.  
**DRILL METHOD** Cable Tool  
**LOGGED BY** John Cooper

**BORING NO.** MW-59  
**PAGE** 2 OF 5  
**REFERENCE ELEV.** 455.00'  
**TOTAL DEPTH** 185.50'  
**DATE COMPLETED** 8/16/88

| TIP READINGS | SPECIFIC COND. | (SAMPLE) BLOW COUNT         | GROUND WATER LEVELS | DEPTH IN FT. | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|--------------|----------------|-----------------------------|---------------------|--------------|---------|--------------|--------------------|--|
| 00.2         | 86.6           | (S-9)<br>100/2              |                     |              |         |              |                    | 38.5-48.5 feet: GRAVELLY FINE TO MEDIUM SAND (TILL), gray to slightly gray brown, 20-30% silt, 10-20% fine gravel, <5% clay, damp to wet, dense. (SM/GM)   |
| 00.0*        |                | (S-10)<br>100/7             |                     | 45           |         |              |                    |  |
| 00.0*        | 139.9          | (S-11)<br>100/6             |                     | 50           |         |              |                    | 48.5-54.0 feet: GRAVELLY MEDIUM TO COARSE SAND (ADVANCE OUTWASH), gray brown with occasional orange brown mottling, 5-10% silt, wet, dense. (SP/GP)  |
| -00.1*       | 146.9          | (S-12)<br>100/3             |                     | 55           |         |              |                    | 54.0-56.5 feet: GRAVELLY FINE TO COARSE SAND (ADVANCE OUTWASH), gray brown with minor pinkish brown mottling, 15-20% silt, damp, very dense. (SM)  |
| 3.4          | 90.3           | (S-13)<br>100/2.5-NR-Cutti- |                     | 60           |         |              |                    | 56.5-62.0 feet: SANDY GRAVEL (ADVANCE OUTWASH), gray brown to light brown, 15-30% sand, 10-15% silt, dense. (GM)<br>62.0-64.0 feet: GRAVEL and MEDIUM TO COARSE SAND (ADVANCE OUTWASH), gray brown to light brown, <5% silt, dry, dense. (SP/GP) |
| 00.4         | 107.4          | (S-14)<br>100/4             |                     | 65           |         |              |                    | 64.0-68.0 feet: GRAVELLY FINE TO COARSE SAND (ADVANCE OUTWASH), light brown to light gray brown, 5-10% silt, wet, dense. (SW/GW)   |
| 4.9          | 152.3          | (S-15)<br>100/3             |                     | 70           |         |              |                    | 68.0-73.0 feet: GRAVELLY MEDIUM TO COARSE SAND (ADVANCE OUTWASH), gray brown to light gray brown, 5-10% silt, wet, dense. (SP/GP)  |
| 41.9**       | 144.1          | (S-16)<br>100/3.5           |                     | 75           |         |              |                    | 73.0-78.0 feet: SANDY GRAVEL (ADVANCE OUTWASH), light brown to light gray brown, 10% silt, wet, dense. (GW-SW)   |
|              |                |                             |                     | 80           |         |              |                    |  |

### REMARKS

Tip values represent difference between ambient/headspace readings. \* = top of casing value.  
 \*\*S-16 sunlight exposed, tip value questionable. Sp.Cond. readings from drill slurry. Sample taken with 3" dia. sampler. NR=no return.



SWEET-EDWARDS/EMCON

S2102.07.CEDAR.CJF.12/05/88

## LOG OF EXPLORATORY BORING

|              |  |                 |         |
|--------------|--|-----------------|---------|
| PROJECT NAME | CEDAR HILLS LANDFILL - South Property Line | BORING NO.      | MW-59   |
| LOCATION     | See Figure 2                               | PAGE            | 3 OF 5  |
| DRILLED BY   | Tacoma Pump & Drill                        | REFERENCE ELEV. | 455.00' |
| DRILL METHOD | Cable Tool                                 | TOTAL DEPTH     | 185.50' |
| LOGGED BY    | John Cooper                                | DATE COMPLETED  | 8/16/88 |

| TIP READINGS | SPECIFIC COND. | (SAMPLE) BLOW COUNT     | GROUND WATER LEVELS | DEPTH IN FT. | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|--------------|----------------|-------------------------|---------------------|--------------|--------------|--------------------|--|
| 4.0          | 307.0          | (S-17)<br>100/9         |                     |              |              |                    | Continued from previous page.<br>@ 76.5 - 78.0 feet: increased silt to 15-20%.   |
|              | 178.6          |                         |                     |              |              |                    |  |
| 2.4          | 166.4          | (S-18)<br>100/2         |                     | 85           |              |                    | 78.0-87.0 feet: GRAVEL AND SAND (ADVANCE OUTWASH), light gray brown, 5-10% silt, dense. (GW-SW)  |
|              | 137.4          |                         |                     |              |              |                    |  |
| 1.4          | 221.0          | (S-19)<br>100/3         |                     | 90           |              |                    | 87.0-96.0 feet: GRAVEL AND SAND (PREVASHON), gray brown with light gray, orangish brown and chocolate brown mottling, 15-30% silt, dense. (GM)                     |
|              | 188.1          |                         |                     |              |              |                    |  |
| 00.0-00.2    | 174.5          | (S-10)<br>100/4.5<br>NR |                     | 95           |              |                    | 96.0-102.0 feet: SAND and SILT TO SAND with some SILT (PREVASHON), gray brown with black, orange, brown, and light gray mottling, 10-20% gravel, damp, dense. (SM) |
|              |                |                         |                     |              |              |                    |  |
| 2.8          | 196.0          | (S-21)<br>100/4         |                     | 100          |              |                    | 102.0-110.0 feet: GRAVELLY SAND (PREVASHON), gray brown to dark rusty brown, 10-20% silt, gravel, have iron stains, damp, dense. (GM/ML)                           |
|              | 214.0          |                         |                     |              |              |                    | @ 105.0-110.0 feet: increasing silt content to 20-30%. (GM/ML)   |
| 1.3          | 221.0          | (S-22)<br>100/3         |                     | 105          |              |                    |  |
|              | 140.2          |                         |                     |              |              |                    |  |
| 00.7         | 138.3          | (S-23)<br>100/3         |                     | 110          |              |                    | 110.0-114.0 feet: FINE SAND (PREVASHON), rusty brown to yellow brown, 10-15% silt, 5% fine gravel and gray fine sand, dry, dense. (SP)                             |
|              |                |                         |                     |              |              |                    |  |
| 1.0          |                | (S-24)<br>100/5         |                     | 115          |              |                    | 114.0-141.0 feet: FINE TO VERY FINE SAND (PREVASHON), dark gray to gray, 0-10% silt, damp to wet, dense. (SP)  |
|              |                |                         |                     |              |              |                    | Continued on following page.   |
|              |                |                         |                     | 120          |              |                    |  |

**REMARKS**

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 \*\*S-16 sunlight exposed, tip value questionable. Sp.Cond. readings from drill slurry. Sample taken with 3" dia. sampler. NR=no return.



SWEET-EDWARDS/EMCON

S2102.07.CEDAR.CJF.12/05/88

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CEDAR HILLS LANDFILL - South Property Line  
**LOCATION** See Figure 2  
**DRILLED BY** Tacoma Pump & Drill  
**DRILL METHOD** Cable Tool  
**LOGGED BY** John Cooper

**BORING NO.** MW-59  
**PAGE** 4 OF 5  
**REFERENCE ELEV.** 455.00'  
**TOTAL DEPTH** 185.50'  
**DATE COMPLETED** 8/16/88

| TIP READINGS | SPECIFIC COND. | (SAMPLE) BLOW COUNT        | GROUND WATER LEVELS | DEPTH IN FT. | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|--------------|----------------|----------------------------|---------------------|--------------|---------|--------------|--------------------|--|
| 00.8         | 124.0          | (S-25)<br>100/7            |                     |              |         |              |                    | @ 120.0 feet: 5% medium sand and gravel, wet.  |
| 4.3          | 106.4          | (S-26)<br>80/17            |                     | 125          |         |              |                    | @ 125.0 feet: gray to gray brown, minor bedding, trace wood fragments, soft.   |
| 1.7          | 174.6          | (S-27)<br>100/8            |                     | 128.27*      |         |              |                    | @ 130.0 feet: micaceous.   |
| 4.2          | 178.6          | (S-28)<br>50/12            |                     | 135          |         |              |                    |  |
| 1.0          | 204.0          | (S-29)<br>50/18            |                     | 140          |         |              |                    |  |
| 00.0         | 188.1          | (S-30)<br>100/6            |                     | 145          |         |              |                    | 141.0-145.0 feet: INTERBEDDED VERY FINE SANDY SILT and FINE TO MEDIUM SAND (PREVASHON), gray, trace of wood fragments, wet, dense. (ML/SP)   |
|              |                |                            |                     |              |         |              |                    | 145.0-146.0 feet: CLAYEY SILT (PREVASHON), gray, dry, dense. (ML)  |
| 0.9          | 185.1<br>125.4 | (S-31)<br>2/18 NR<br>40/18 |                     | 150          |         |              |                    | 146.0-152.0 feet: FINE SAND (PREVASHON), dark gray, 5% medium sand, 5% silt and clay, minor wood fragments, wet, dense. (SP)   |
|              |                |                            |                     |              |         |              |                    | 152.0-153.0 feet: CLAYEY SILT (PREVASHON), gray brown, dense. (ML)   |
| 00.6         |                | (S-32)<br>100/5            |                     | 155          |         |              |                    | 153.0-171.5 feet: FINE TO MEDIUM SAND (PREVASHON), dark gray, occasionally gray brown, 0-10% silt, <5% gravel and coarse sand, minor wood fragments, isolated interbeds of light gray silty fine sand, dense. (SP) |
|              |                |                            |                     | 160          |         |              |                    |  |

**REMARKS**

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 \*\*S-16 sunlight exposed, tip value questionable. Sp.Cond. readings from drill slurry. Sample taken with 3" dia. sampler. NR=no return.



SWEET-EDWARDS/EMCON

S2102.07.CEDAR.CJF.12/05/88

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CEDAR HILLS LANDFILL - South Property Line  
**LOCATION** See Figure 2  
**DRILLED BY** Tacoma Pump & Drill.  
**DRILL METHOD** Cable Tool  
**LOGGED BY** John Cooper

**BORING NO.** MW-59  
**PAGE** 5 OF 5  
**REFERENCE ELEV.** 455.00'  
**TOTAL DEPTH** 185.50'  
**DATE COMPLETED** 8/16/88

| TIP READINGS | SPECIFIC COND. | (SAMPLE) BLOW COUNT | GROUND WATER LEVELS | DEPTH IN FT. | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|--------------|----------------|---------------------|---------------------|--------------|---------|--------------|--------------------|---|
| 00.1         |                | (S-33)<br>100/12    |                     |              |         |              |                    | Continued from previous page.   |
| 00.0         |                | (S-34)<br>50/12     |                     | 165          |         |              |                    | @162.0 feet: increasing interbeds of light gray silty fine sand and sandy silt, wet.  |
| 00.9         |                | (S-35)<br>50/12     |                     | 170          |         |              |                    | @170.0 feet: becomes dark gray to black, <5% silt gravel and coarse sand, abundant wood fragments.  |
| 00.0         | 143.0          | (S-36)<br>50/17     |                     | 175          |         |              |                    | 171.5-180.5 feet: MEDIUM and COARSE SAND (PREVASHON), dark gray, 15-20% gravel, 5-10% fine sand, 0-10% silt, wood fragments, wet, dense. (SW) |
| 00.0         | 149.3          | (S-37)<br>50/17     |                     | 180          |         |              |                    | 180.5-185.5 feet: CLAYEY SILT (PREVASHON), gray to blue gray, dense. (ML)   |
| 00.0*        |                | (S-38)<br>100/12    |                     | 185          |         |              |                    | @185.0 feet: abundant wood fragments.   |
| 00.0         |                | (S-39)              |                     | 185          |         |              |                    | Bottom of borehole @ 185.5 feet.  |
|              |                |                     |                     | 190          |         |              |                    |   |
|              |                |                     |                     | 195          |         |              |                    |   |
|              |                |                     |                     | 200          |         |              |                    |   |

**REMARKS**

Tip values represent difference between ambient/headspace readings. \*=top of casing value.  
 \*\*S-16 sunlight exposed, tip value questionable. Sp.Cond. readings from drill slurry. Sample taken with 3" dia. sampler. NR=no return.



SWEET-EDWARDS/EMCON

S2102.07.CEDAR.CJF.12/05/88



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 1 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|--|
|               |               |                    |                     | 0             |         |                   |              | 0 to 2.0 feet: COBBLES AND GRAVEL (FILL)   |
|               |               |                    |                     | 5             |         |                   |              | 2.0 to 5.0 feet: SANDY SILT (ML), dark brown, little to some fine to coarse sand, few fine to medium gravel, moist. (TOPSOIL)          |
| G             | 1             |                    |                     | 5             |         |                   |              | 5.0 to 17.0 feet: SANDY SILT (ML), yellow brown, some fine to coarse sand, few fine to coarse subrounded gravel. (WEATHERED TILL/FILL) |
|               |               |                    |                     | 10            |         |                   |              |  |
| G             | 2             |                    |                     | 10            |         |                   |              |  |
|               |               |                    |                     | 15            |         |                   |              | @ 15.0 feet: wet.  |
| G             | 3             |                    |                     | 15            |         |                   |              |  |
|               |               |                    |                     | 20            |         |                   |              | 17.0 to 20.0 feet: SILTY GRAVEL (GM), light gray, some fine to coarse sand, some fines. (TILL)   |

**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.



FMCON Northwest, Inc.

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 2 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|--|
| G             | 4             |                    |                     |               |         |                   |              | 20.0 to 36.0 feet: SANDY SILT (ML), gray, little to some fine to coarse sand, little to some fine to coarse subrounded gravel, moist. (TILL) |
| G             | 5             |                    |                     | 25            |         |                   |              |  |
| G             | 6             |                    |                     | 30            |         |                   |              |  |
| G             | 7             |                    |                     | 35            |         |                   |              |  |
|               |               |                    |                     | 40            |         |                   |              | 36.0 to 45.0 feet: SILTY GRAVEL (GM), gray, fine to coarse, subrounded, little to some fine to coarse sand, some fines. (TILL)               |



### REMARKS

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 6 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION  |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|---|
| G             | 20            |                    |                     |               | ■       |                   |              | 97.0 to 115.0 feet: SILTY SAND (SP-SM), gray brown to yellow brown, fine to medium, few coarse sand, some fine to medium subrounded gravel, trace to few fines. (ADVANCE OUTWASH) |
| G             | 21            |                    |                     | 105           | ■       |                   |              |   |
| G             | 22            |                    |                     | 110           | ■       |                   |              |   |
| G             | 23            |                    |                     | 115           | ■       |                   |              |   |
|               |               |                    |                     | 120           |         |                   |              | 115.0 to 139.0 feet: SAND (SP), yellow brown to gray brown, little fine to medium subrounded gravel, trace fines. (ADVANCE OUTWASH)   |



**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 7 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION  |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|---|
| G             | 24            |                    |                     |               |         |                   |              | 115.0 to 139.0 feet: SAND (SP), yellow brown to gray brown, little fine to medium subrounded gravel, trace fines. (ADVANCE OUTWASH) |
| G             | 25            |                    |                     | 125           |         |                   |              |   |
| G             | 26            |                    |                     | 130           |         |                   |              |   |
| G             | 27            |                    |                     | 135           |         |                   |              |   |
|               |               |                    |                     | 140           |         |                   |              | 139.0 to 153.0 feet: See description on Page 8.   |



**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.

EMCON Northwest, Inc.

0232-024.05.CHRL.L49/...:4.11/06/93...CHRL-M

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 8 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|--|
| G             | 28            |                    |                     |               |         |                   |              | 139.0 to 153.0 feet: GRAVEL (GP), gray brown, fine to medium, subrounded to rounded, some fine to coarse sand, trace to few fines. (ADVANCE OUTWASH) |
| G             | 29            |                    |                     | 145           |         |                   |              |  |
| G             | 30            |                    |                     | 150           |         |                   |              |  |
| G             | 31            |                    |                     | 155           |         |                   |              | 153.0 to 171.0 feet: GRAVEL (GW), gray brown, subrounded, little to some fine to coarse sand, trace fines. (ADVANCE OUTWASH)                         |
|               |               |                    |                     | 160           |         |                   |              | @ 158.5 feet: cobble.  |



**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 9 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|--|
| G             | 32            |                    |                     |               |         | 153.0             |              | 153.0 to 171.0 feet: GRAVEL (GW), gray brown, subrounded, little to some fine to coarse sand, trace fines. (ADVANCE OUTWASH) |
|               |               |                    |                     |               |         | 165               |              | @ 162.5 to 168.0 feet: cobbles.  |
| G             | 33            |                    |                     |               |         |                   |              |  |
|               |               |                    |                     |               |         | 170               |              |  |
| G             | 34            |                    |                     |               |         |                   |              | 171.0 to 179.0 feet: SILTY SAND (SM), brown, fine, few fine to coarse sand, little fines, few fine gravel. (ADVANCE OUTWASH) |
|               |               |                    |                     |               |         | 175               |              |  |
| G             | 35            |                    |                     |               |         |                   |              | 179.0 to 179.5 feet: SILT (ML), brown. (ADVANCE OUTWASH)   |
|               |               |                    |                     |               |         | 180               |              |  |



**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.

EMCON Northwest, Inc.

0232-024.05.CHRL.L49/:::4.11/05/93...CHRL-M



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 10 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION  |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|---|
| SB            | 36            | 50                 |                     |               |         |                   |              | 179.5 to 193.0 feet: SILTY SAND (SM), yellow brown, fine, little fines, trace fine to medium subrounded gravel, moist. Bedded. (ADVANCE OUTWASH)<br><br>@ 185.0 feet: spherical voids.<br><br>193.0 to 194.0 feet: SILT (ML), gray, few fine sand, trace wood fragments: (PRE-VASHON DEPOSITS)<br>194.0 to 203.0 feet: SAND (SP), gray brown to yellow brown, fine, trace fines, trace coal, moist. (PRE-VASHON DEPOSITS) |
| SB            | 37            | 50                 |                     |               |         |                   |              |   |
| SB            | 38            | 50                 |                     | 185           |         |                   |              |   |
| SB            | 39            | 50                 |                     | 190           |         |                   |              |   |
| SB            | 40            | 50-50              |                     | 195           |         |                   |              |   |
| SB            | 41            | 50-50              |                     |               |         |                   |              |   |
|               |               |                    |                     | 200           |         |                   |              |   |

**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.



EMCON Northwest, Inc.

0232-024.05.CHRL.L43/44:4.11/06/93...CHRL-M

## LOG OF EXPLORATORY BORING

PROJECT NAME CHRL Expanded Aquifer Characterization  
 LOCATION Cedar Hills Landfill  
 DRILLED BY Ramlo Well Drilling  
 DRILL METHOD Air Rotary  
 LOGGED BY P. Brooks/S. Burkett

BORING NO. MW-70  
 PAGE 11 OF 14  
 GROUND ELEV. 527.85'  
 TOTAL DEPTH 246.50'  
 DATE COMPLETED 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|--|
| G             | 42            |                    |                     |               |         |                   |              | 194.0 to 203.0 feet: SAND (SP), gray brown to yellow brown, fine, trace fines, trace coal, moist. (PRE-VASHON DEPOSITS)  |
| G             | 43            |                    |                     |               |         |                   |              | 203.0 to 204.0 feet: SILT (ML), brown, trace fine sand. (PRE-VASHON DEPOSITS)  |
| SB            | 44            | 50                 |                     | 205           |         |                   |              | 204.0 to 207.0 feet: SILTY SAND (SM), gray brown, fine, trace coal, trace discrete light brown silt interbeds, moist. (PRE-VASHON DEPOSITS)                      |
| SB            | 45            | 50                 |                     |               |         |                   |              | 207.0 to 214.0 feet: SAND (SP), gray brown, fine, trace fines, trace fine to medium subrounded gravel, trace medium to coarse sand, moist. (PRE-VASHON DEPOSITS) |
| SB            | 46            | 50                 |                     | 210           |         |                   |              | @ 212.5 to 214.0 feet: trace wood fragments.   |
| SB            | 47            | 25-45-50/3"        |                     |               |         |                   |              | 214.0 to 225.0 feet: SAND (SP), light gray, trace fines, trace fine to medium subrounded gravel, wet. (PRE-VASHON DEPOSITS)                                      |
| SB            | 48            | 25-38-50           |                     | 215           |         |                   |              | @ 217.0 feet: abundant wood fragments.   |
| SB            | 49            | 19-38-50           |                     |               |         |                   |              |  |

### REMARKS

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.



EMCON Northwest, Inc.

0232-024.05.CHRL.L49/ae:4.11/05/93...CHRL-M

## LOG OF EXPLORATORY BORING

PROJECT NAME CHRL Expanded Aquifer Characterization  
 LOCATION Cedar Hills Landfill  
 DRILLED BY Ramlo Well Drilling  
 DRILL METHOD Air Rotary  
 LOGGED BY P. Brooks/S. Burkett

BORING NO. MW-70  
 PAGE 12 OF 14  
 GROUND ELEV. 527.85'  
 TOTAL DEPTH 246.50'  
 DATE COMPLETED 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION  |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|---|
| SB            | 50            | 39-50              |                     |               |         |                   |              | 214.0 to 225.0 feet: SAND (SP), light gray, trace fines, trace fine to medium subrounded gravel, wet. (PRE-VASHON DEPOSITS)   |
| SB            | 51            | 50                 |                     |               |         |                   |              |   |
| G             | 52            |                    |                     | 225           |         |                   |              | 225.0 to 242.5 feet: SAND (SP), light gray, fine to medium, trace coarse sand, few to little fine to medium subrounded gravel, trace wood fragments, wet. (PRE-VASHON DEPOSITS) |
| G             | 53            |                    |                     | 230           |         |                   |              |   |
| G             | 54            |                    |                     | 235           |         |                   |              | @ 239.0 to 240.0 feet: abundant wood fragments.   |
|               |               |                    |                     | 240           |         |                   |              |   |



**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.67 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 13 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION  |
|---------------|---------------|--------------------|---------------------|---------------|---------------------------|--------------|---|
| G             | 55            |                    |                     |               | 225.0                     |              | 225.0 to 242.5 feet: SAND (SP), light gray, fine to medium, trace coarse sand, few to little fine to medium subrounded gravel, trace wood fragments, wet. (PRE-VASHON DEPOSITS) |
| SB            | 56            | 25-38-50           |                     |               | 242.5                     |              | 242.5 to 243.0 feet: SILT (ML), light gray, stiff, trace medium subrounded gravel, moist. (PRE-VASHON DEPOSITS)   |
|               |               |                    |                     |               | 243.0                     |              | 243.0 to 243.7 feet: SAND (SP), light gray, fine, trace fines, moist. (PRE-VASHON DEPOSITS)   |
| SB            | 57            | 29-37-50           |                     | 245           | 243.7                     |              | 243.7 to 246.5 feet: SILT (ML), light gray, finely laminated, trace wood chips, trace coal, moist. (PRE-VASHON DEPOSITS)  |
|               |               |                    |                     |               |                           |              | Total depth drilled = 245.0 feet.<br>Total depth sampled = 246.5 feet.  |
|               |               |                    |                     |               |                           |              | 250   |
|               |               |                    |                     |               |                           |              | 255   |
|               |               |                    |                     |               |                           |              | 260   |

See Page 14 for Well Completion Details.



**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.

EMCON Northwest, Inc.

0232-074 05 CHRI 149L-4 11/05/93 CHRI-M

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Expanded Aquifer Characterization  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Ramlo Well Drilling  
**DRILL METHOD** Air Rotary  
**LOGGED BY** P. Brooks/S. Burkett

**BORING NO.** MW-70  
**PAGE** 14 OF 14  
**GROUND ELEV.** 527.85'  
**TOTAL DEPTH** 246.50'  
**DATE COMPLETED** 05/11/93

| SAMPLE METHOD | SAMPLE NUMBER | BLOWS PER 6-INCHES | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | LITHOLOGIC COLUMN | WELL DETAILS | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------------|---------------------|---------------|---------|-------------------|--------------|--|
|               |               |                    |                     | 265           |         |                   |              | <p><b>WELL COMPLETION DETAILS:</b></p> <p>+ 2.7 to 205.1 feet: Nominal 2.5-inch O.D., flush-threaded, schedule 80 PVC blank riser pipe.</p> <p>204.4 to 205.1 feet: Stainless steel centralizer.</p> <p>205.1 to 209.1 feet: Nominal 2.5-inch O.D., flush-threaded, schedule 80 PVC well screen with 0.020-inch machined slots.</p> <p>209.1 to 209.9 feet: Nominal 2.5-inch O.D., flush-threaded, schedule 80 PVC blank riser pipe.</p> <p>209.9 to 218.8 feet: Nominal 2.5-inch O.D., flush-threaded, schedule 80 PVC well screen with 0.020-inch machined slots.</p> <p>218.8 to 219.7 feet: Nominal 2.5-inch O.D., flush-threaded, schedule 80 PVC end cap with stainless steel centralizer.</p> <p>0 to 3.0 feet: Concrete.</p> <p>3.0 to 202.1 feet: Pure Gold medium bentonite chips hydrated with potable water.</p> <p>202.1 to 224.3 feet: 20 - 40 Colorado Silica Sand.</p> <p>224.3 to 234.8 feet: Pure Gold medium bentonite chips.</p> <p>234.8.0 to 246.5 feet: Slough.</p> |
|               |               |                    |                     | 270           |         |                   |              |  |
|               |               |                    |                     | 275           |         |                   |              |  |
|               |               |                    |                     | 280           |         |                   |              |  |

**REMARKS**

(1) See general remarks. (2) Blow counts do not represent SPT results. (3) Reference elevation = ground surface. (4) Top of casing elevation = 530.57 feet. (5) Static water level = 209.20 feet below top of casing at 14:05 on June 7, 1993. (6) Water added during drilling below 30 feet.



EMCON Northwest, Inc.

0232-024.05.CHRL.L49#4;4,11/05/93...CHRL-M

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 1 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-0       | G           |                               |                     |               |         |              |                   | 0 to 5.0 feet: <b>SILTY SAND (SM)</b> , brown to dark brown, fine to coarse, some fines, trace fine subangular gravel, trace organic, roots to 5 cm long and 2 cm diameter, moist. (WEATHERED TILL) |
| MW-72-5       | G           |                               |                     | 5             |         |              |                   | 5.0 to 13.0 feet: <b>SANDY SILT (ML)</b> , yellow brown, firm to stiff, some fine to coarse sand, few fine to medium gravels, moist. Occasional orange mottles in silts. (WEATHERED TILL)           |
| MW-72-10      | G           |                               |                     | 10            |         |              |                   |   |
| MW-72-15      | G           |                               |                     | 15            |         |              |                   | 13.0 to 27.0 feet: <b>SANDY SILT (ML)</b> , gray, no dilatency, no plasticity, soft, few to little fine to medium sand, few fine subrounded gravel, trace clay. (STRATIFIED DRIFT)                  |
|               |             |                               |                     | 20            |         |              |                   | @ 19.0 feet: boulder.   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** MW-72  
**PAGE** 2 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| MW-72-20      | G           |                               |                     |               |         |              |                   | 13.0 to 27.0 feet: <b>SANDY SILT (ML)</b> , as above.  |
| MW-72-25      | G           |                               |                     | 25            |         |              |                   | @ 27.0 feet: cobbles or boulders.  |
| MW-72-27      | G           |                               |                     |               |         |              |                   | 27.0 to 37.0 feet: <b>GRAVELLY SILT (ML)</b> , dark gray, few coarse subrounded gravel, few fine to coarse sand, trace cobbles. (STRATIFIED DRIFT)     |
| MW-72-30      | G           |                               |                     | 30            |         |              |                   | @ 33.0 to 37.0 feet: little gravel and sand as interbeds of brown gravelly silt and gray silt with sand and gravel.                                    |
| MW-72-35      | G           |                               |                     | 35            |         |              |                   | 37.0 to 42.0 feet: <b>SILTY SAND (SM)</b> , gray, fine to coarse, little fine to coarse subrounded gravel, some fines (trace clay). (STRATIFIED DRIFT) |
|               |             |                               |                     | 40            |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 3 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| MW-72-40      | G           |                               |                     |               |         |              |                   | 37.0 to 42.0 feet: SILTY SAND (SM), as above.  |
| MW-72-42      | G           |                               |                     |               |         |              |                   | 42.0 to 47.0 feet: SANDY SILT (ML), dark gray, no dilatency, moderate plasticity, trace to few clay, few fine to coarse white and black sand. (STRATIFIED DRIFT)<br>@ 43.0 feet: cobble. |
| MW-72-45      | G           |                               |                     | 45            |         |              |                   | @ 45.0 to 47.0 feet: trace fractured coarse gravel.<br><br>@ 47.0 feet: cobble.  |
| MW-72-47      | G           |                               |                     |               |         |              |                   | 47.0 to 48.0 feet: SILTY GRAVEL (GM), black, fine to coarse gravel with dark gray fines, little to some fine to coarse sand, little fines. (STRATIFIED DRIFT)                            |
| MW-72-50      | G           |                               |                     | 50            |         |              |                   | 48.0 to 59.0 feet: GRAVELLY SANDY SILT (ML), dark gray, little fine to coarse black subrounded gravels, little fine to coarse sand. (STRATIFIED DRIFT)                                   |
| MW-72-55      | G           |                               |                     | 55            |         |              |                   | @ 55.5 feet: cobbles.  |
|               |             |                               |                     | 60            |         |              |                   | 59.0 to 63.0 feet: SILTY SAND (SP-SM), brown to 59.5 feet, gray below 59.5 feet, fine to   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRL



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 4 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| MW-72-60      | G           |                               |                     |               |         |              |                   | medium, few fines. (STRATIFIED DRIFT)  |
| MW-72-65      | G           |                               |                     | 65            |         |              |                   | 63.0 to 69.0 feet: <b>SANDY SILT (ML)</b> , gray, few to little fine sand. (STRATIFIED DRIFT)<br><br>@ 67.0 feet: few fine to coarse subangular gravel.  |
| MW-72-72      | G           |                               |                     | 70            |         |              |                   | 69.0 to 72.0 feet: <b>SILTY SAND (SM)</b> , brown with little gray silt, silt content decreases downhole. (ADVANCE OUTWASH)  |
| MW-72-73      | G           |                               |                     | 75            |         |              |                   | 72.0 to 73.0 feet: <b>SAND (SP)</b> , yellowish brown, fine to medium, trace fines. (ADVANCE OUTWASH)<br>73.0 to 78.0 feet: <b>SANDY SILT (ML)</b> , yellowish brown, nonplastic, moderate dilatency, little fine to medium sand, moist. (ADVANCE OUTWASH) |
| MW-72-75      | G           |                               |                     | 80            |         |              |                   | 78.0 to 87.0 feet: <b>SANDY GRAVEL (GW)</b> , yellow, black, red and white with yellowish brown fines, fine to coarse, subrounded to subangular, few medium to coarse sand, trace fines, trace   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.


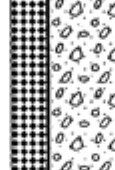
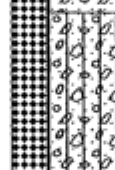
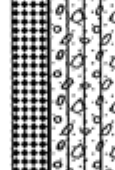
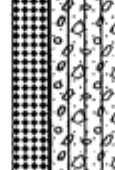
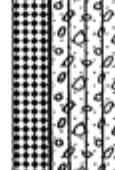
**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sp:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** MW-72  
**PAGE** 5 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS  | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN   | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|----------------------|---------------|---------|--------------|---|--|
| MW-72-80      | G           |                               |                      |               |         |              |    | cobbles and boulders. (ADVANCE OUTWASH)  |
| MW-72-85      | G           |                               |                      | 85            |         |              |    | @ 84.0 to 85.5 feet: boulder.  |
| MW-72-87      | G           |                               | ∇<br>6/12/98<br>1000 |               |         |              |   | 87.0 to 106.0 feet: SILTY GRAVEL (GW-GM), black, white and yellow with yellowish brown to grayish brown fines, fine to coarse, subrounded to subangular, little fine to coarse sand, few fines, trace to few cobbles, wet. (ADVANCE OUTWASH) |
| MW-72-90      | G           |                               |                      | 90            |         |              |  |  |
| MW-72-95      | G           |                               |                      | 95            |         |              |  |  |
|               |             |                               |                      | 100           |         |              |  |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 6 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-100     | G           |                               |                     |               |         |              |                   | 87.0 to 106.0 feet: SILTY GRAVEL (GW-GM), as above.   |
| MW-72-105     | G           |                               |                     | 105           |         |              |                   | 106.0 to 108.0 feet: SILTY GRAVEL (GM), yellowish brown fines, fine to medium, some fines. (ADVANCE OUTWASH)  |
| MW-72-110     | G           |                               |                     | 110           |         |              |                   | 108.0 to 115.0 feet: SILTY GRAVEL (GW-GM), yellowish brown matrix, fine to coarse, subrounded, trace fine to coarse sand, few fines. (ADVANCE OUTWASH)<br>@ 110.0 to 115.0 feet: boulders.                |
| MW-72-115     | G           |                               |                     | 115           |         |              |                   | 115.0 to 120.0 feet: SILTY GRAVEL (GP-GM), yellowish brown matrix, fine to medium, subrounded, little fine to coarse sand, few fines. (ADVANCE OUTWASH)<br>@ 116.0 feet: thin bed of fine to medium sand. |
|               |             |                               |                     | 120           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHR

## LOG OF EXPLORATORY BORING

PROJECT NAME CHRL Area 5 Borehole Project  
 LOCATION Cedar Hills Regional Landfill  
 DRILLED BY Hokkaido Drilling & Development  
 DRILL METHOD Air Rotary/Cable Tool  
 LOGGED BY A. Udaloy/T. Treat

BORING NO. MW-72  
 PAGE 7 OF 20  
 GROUND ELEV. 669.50'  
 TOTAL DEPTH 389.00'  
 DATE COMPLETED 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-120     | G           |                               |                     |               |         |              |                   | 120.0 to 127.0 feet: <b>SILTY GRAVEL (GP-GM)</b> , yellowish gray, medium to coarse, few fine to coarse sand, few fines, some cobbles and boulders. (ADVANCE OUTWASH)<br>@ 122.0 to 127.0 feet: predominantly cobbles or boulders.                |
| MW-72-125     | G           |                               |                     | 125           |         |              |                   |   |
| MW-72-130     | G           |                               |                     | 130           |         |              |                   | 127.0 to 147.0 feet: <b>GRAVEL (GP)</b> , yellowish brown matrix, medium to coarse, subrounded, trace fine to coarse sand, trace fines, few to little cobbles and boulders. Sand increases and gravels fine slightly down hole. (ADVANCE OUTWASH) |
| MW-72-135     | G           |                               |                     | 135           |         |              |                   |   |
|               |             |                               |                     | 140           |         |              |                   |   |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 8 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-140     | G           |                               |                     |               |         |              |                   | 127.0 to 147.0 feet: GRAVEL (GP), as above.   |
| MW-72-145     | G           |                               |                     | 145           |         |              |                   | 147.0 to 152.0 feet: SILTY GRAVELLY SAND (SM), yellowish brown, medium to coarse, some fines, some fine gravel. (ADVANCE OUTWASH MARKER #1)                   |
| MW-72-150     | G           |                               |                     | 150           |         |              |                   | 152.0 to 159.0 feet: SANDY SILT (ML), yellowish brown, some fines and few coarse sand or fine gravel (which could be carry down). (ADVANCE OUTWASH MARKER #1) |
| MW-72-155     | G           |                               |                     | 155           |         |              |                   | 159.0 to 160.0 feet: SILTY SANDY GRAVEL (GM), yellowish gray, fine to medium, little  |
|               |             |                               |                     | 160           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and advanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.sa:5.CHRL...CHRL

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 9 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-160     | G           |                               |                     |               |         |              |                   | fines, some fine sand. (ADVANCE OUTWASH)<br><b>160.0 to 195.0 feet: SILTY SANDY GRAVEL (GP-GM)</b> , yellowish gray, medium to coarse subrounded, some fine to coarse sand, few fines, trace to few cobbles. Gradational upper contact. (ADVANCE OUTWASH) |
| MW-72-165     | G           |                               |                     | 165           |         |              |                   | @ 165.0 feet: cobble.   |
| MW-72-170     | G           |                               |                     | 170           |         |              |                   | @ 172.0 feet: casing drives freely.   |
| MW-72-175     | G           |                               |                     | 175           |         |              |                   |   |
|               |             |                               |                     | 180           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and advanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa:4.CHRL...CHRL

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 10 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-180     | G           |                               |                     |               |         |              |                   | 160.0 to 195.0 feet: <b>SILTY SANDY GRAVEL (GP-GM)</b> , as above.<br>@ 180.0 to 195.0 feet: yellowish brown.   |
| MW-72-185     | G           |                               |                     | 185           |         |              |                   | @ 185.0 to 195.0 feet: sand and silt content increase slightly.   |
| MW-72-190     | G           |                               |                     | 190           |         |              |                   |   |
| MW-72-195     | G           |                               |                     | 195           |         |              |                   | 195.0 to 200.0 feet: <b>SILTY GRAVELLY SAND (SW-SM)</b> , gray-brown sand in yellowish brown matrix, fine to coarse, some fine to medium subangular and subrounded gravel, few fines. (ADVANCE OUTWASH) |
|               |             |                               |                     | 200           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/88.12:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 11 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-200     | G           |                               |                     |               |         |              |                   | 200.0 to 206.0 feet: <b>SILTY GRAVEL (GW-GM)</b> , yellowish brown matrix, fine to coarse, subrounded, little fine to coarse sand, few fines, trace cobbles. (ADVANCE OUTWASH)                  |
| MW-72-204     | G           |                               |                     | 205           |         |              |                   | @ 205.0 feet: some fine to coarse sand.   |
| MW-72-207     | G           |                               |                     |               |         |              |                   | 206.0 to 211.0 feet: <b>SILTY SAND (SM)</b> , yellowish brown matrix, little fines. (ADVANCE OUTWASH MARKER #2)   |
| MW-72-215     | G           |                               |                     | 215           |         |              |                   | 211.0 to 225.0 feet: <b>SILTY GRAVEL (GW-GM)</b> , yellowish brown matrix, fine to coarse, subrounded, little fine to coarse black and white sands, few fines, trace cobbles. (ADVANCE OUTWASH) |
|               |             |                               |                     | 220           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except **no** water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98, ss:5,CHRL...CHRL



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** MW-72  
**PAGE** 12 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN    | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|----------------------|---|
| MW-72-220     | G           |                               |                     | 225           |         |              | 211.0 to 225.0 feet: | SILTY GRAVEL (GW-GM), as above.   |
| MW-72-225     | G           |                               |                     | 230           |         |              | 225.0 to 230.0 feet: | GRAVEL (GW), yellowish brown matrix, fine to coarse, few fine to coarse sand, trace fines. Gradational upper contact. (ADVANCE OUTWASH) |
| MW-72-231     | G           |                               |                     | 235           |         |              | 230.0 to 238.0 feet: | SILTY SAND (SW-SM), yellowish brown matrix, fine to coarse, few fine gravel, few fines. (ADVANCE OUTWASH)                               |
| MW-72-238     | G           |                               |                     | 240           |         |              | 238.0 to 256.0 feet: | GRAVEL (GP), brownish yellow matrix, medium to coarse, little fine to coarse sand, trace fines. (ADVANCE OUTWASH)                       |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.sr:5.CHRL...CHRL



### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** MW-72  
**PAGE** 14 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-260     | G           |                               |                     |               |         |              |                   | 258.0 to 270.0 feet: GRAVEL (GP), as above.   |
| MW-72-265     | G           |                               |                     | 265           |         |              |                   | @ 265.0 to 270.0 feet: trace grayish brown fines, trace fine sand, few coarse sand.   |
| MW-72-268     | G           |                               |                     | 270           |         |              |                   | 270.0 to 276.0 feet: SILTY SAND (SM), yellowish brown, fine, some gravels that are likely carry-down (currently at limit of air rotary circulation capacity). (ADVANCE OUTWASH)             |
| MW-72-275     | G           |                               |                     | 275           |         |              |                   |   |
| MW-72-276.5   | SB          | 5-8-11 (14")                  |                     |               |         |              |                   | 276.0 to 279.5 feet: SAND (SP), black with white, fine to medium, trace coarse, trace fine to medium subrounded gravel, trace yellowish brown fines. Sands fine downhole. (ADVANCE OUTWASH) |
| MW-72-278     | SB          | 9-50/4" (9")                  |                     |               |         |              |                   |   |
| MW-72-279.5   | SB          | 9-50/3" (12")                 |                     | 280           |         |              |                   | @ 279.0 feet: few fine to coarse subrounded gravel in bailer.   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALAY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.az:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** MW-72  
**PAGE** 15 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-281     | SB          | 7-50/1" (18")                 |                     |               |         |              |                   | 279.5 to 286.5 feet: <b>SILTY SAND (SP-SM)</b> , black with white, fine to medium, few light brown fines, trace fine subrounded gravel. Sands fine downhole. (ADVANCE OUTWASH)  |
| MW-72-282.5   | SB          | 14-30-50/5" (18")             |                     |               |         |              |                   |   |
| MW-72-284     | SB          | 9-50/1" (6")                  |                     | 285           |         |              |                   | @ 284.0 to 286.5 feet: trace coarse sand, trace cobbles.  |
| MW-72-285.5   | SB          | 7-50/5" (6")                  |                     |               |         |              |                   |   |
| MW-72-287     | SB          | 8-50/5" (12")                 |                     |               |         |              |                   | 286.5 to 290.5 feet: <b>SILTY SAND (SP-SM)</b> , black with white, fine to medium, few yellowish brown fines, trace coarse sand. (ADVANCE OUTWASH)  |
| MW-72-288.5   | SB          | 10-50/3" (6")                 |                     |               |         |              |                   | @ 288.5 feet: trace orange mottles.   |
| MW-72-290     | SB          | 14-22-50/1" (12")             |                     | 290           |         |              |                   |   |
| MW-72-292     | SB          | 25-40-50/3" (13")             |                     |               |         |              |                   | 290.5 to 297.0 feet: <b>SILT (ML)</b> , light to dark gray, some fine sand, little clay, fine horizontal laminae (1- to 2 mm-varves), trace fine organic material parallel with bedding, low plasticity, no dilatency, stiff, moist. (PRE-VASHON) |
| MW-72-295     | SB          | 21-50/3" (0")                 |                     | 295           |         |              |                   |   |
| MW-72-297.5   | SB          | 50 (0")                       |                     |               |         |              |                   | 297.0 to 308.0 feet: <b>SILTY GRAVELLY SAND (SW-SM)</b> , black, fine to coarse, few to some fine to coarse subrounded gravel, few grayish brown fines. Gravel content decreases and gravels fine downhole. (PRE-VASHON)                          |
| MW-72-298     | SB          | 10-50/0" (0")                 |                     |               |         |              |                   |   |
|               |             |                               |                     | 300           |         |              |                   |   |

### REMARKS

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALAY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 16 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| MW-72-300     | SB<br>G     | 26-50/4" (18")                |                     |               |         |              |                   | 297.0 to 308.0 feet: <b>SILTY GRAVELLY SAND (SW-SM)</b> , as above.<br>@ 300.0 to 302.0 feet: light gray fines.  |
| MW-72-302.5   | SB          | 14-50/4" (18")                |                     |               |         |              |                   |  |
| MW-72-305     | SB          | 50/5" (3")                    |                     | 305           |         |              |                   | @ 307.0 feet: some fine gravel, trace fines.   |
| MW-72-307     | SB<br>G     | 14-50/4" (6")                 |                     |               |         |              |                   | 308.0 to 315.0 feet: <b>SILTY SAND (SW-SM)</b> , black with green and white grains, few gray fines, little to some fine to coarse subrounded gravel, gradational upper contact. (PRE-VASHON) |
| MW-72-310     | SB          | 33-50/2" (18")                |                     | 310           |         |              |                   | @ 312.5 to 313.0 feet: greenish gray silt stringers, to 3 cm thick.  |
| MW-72-312.5   | SB<br>G     | 50 (5")                       |                     |               |         |              |                   |  |
| MW-72-315     | SB          | 50 (18")                      |                     | 315           |         |              |                   | 315.0 to 316.0 feet: <b>SILTY SAND (SP-SM)</b> , black with white grains, fine to medium, few light gray fines, few coarse sand, trace fine rounded gravel. (PRE-VASHON MARKER #1)           |
| MW-72-317     | SB          | 20-50/4" (6")                 |                     |               |         |              |                   | 316.0 to 320.0 feet: <b>SAND (SP)</b> , black with white grains, fine to medium, trace grayish brown fines, few fines, subrounded gravel. Gradational upper contact. (PRE-VASHON MARKER #1)  |
|               |             |                               |                     | 320           |         |              |                   |  |

### REMARKS

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.sa:5.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** MW-72  
**PAGE** 17 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-320     | SB G        | 18-50 (9")                    |                     |               |         |              |                   | 320.0 to 326.0 feet: <b>SILTY SAND (SM)</b> , dark gray, very fine, little dark gray silt. (PRE-VASHON MARKER #1)   |
| MW-72-322.5   | SB          | 10-50/1" (18")                |                     |               |         |              |                   | @ 322.0 feet: wood fragments to 3 cm length.  |
| MW-72-325     | SB          | 10-50/3" (3")                 |                     | 325           |         |              |                   | 326.0 to 331.0 feet: <b>SAND (SP)</b> , dark gray, fine, trace brown fines, occasional horizontal silt beds to 3 mm thick. Sand coarsens downhole. (PRE-VASHON) |
| MW-72-327.5   | SB          | 3-22-50/1" (3")               |                     |               |         |              |                   |   |
| MW-72-330     | SB          | 14-50 (14")                   |                     | 330           |         |              |                   |   |
| MW-72-332.5   | SB G        | 14-50 (9")                    |                     |               |         |              |                   | 331.0 to 340.0 feet: <b>SILTY SAND (SP-SM)</b> , black with white grains, fine to medium, few fines, few interbeds of light gray to brown silt. (PRE-VASHON)    |
| MW-72-335     | SB          | 10-50/3" (18")                |                     | 335           |         |              |                   |   |
| MW-72-337.5   | SB          | 10-50/3" (18")                |                     |               |         |              |                   |   |
|               |             |                               |                     | 340           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and advanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALAY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98, sr:5, CHRL...CHRL



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 18 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| MW-72-340     | SB          | 19-50/2" (18")                |                     |               |         |              |                   | 340.0 to 351.0 feet: <b>SILTY SAND (SM)</b> , black with white grains, fine, little to some light gray fines, silt content increases downhole. (PRE-VASHON)  |
| MW-72-342.5   | SB<br>G     | 14-50/4" (18")                |                     |               |         |              |                   | @ 344.0 to 345.0 feet: trace fine rounded gravel, trace dark gray stiff silt interbeds 3 to 4 mm thick.<br>@ 345.0 to 346.0 feet: trace fine subrounded gravel.  |
| MW-72-345     | SB          | 17-33-50/2" (18")             |                     | 345           |         |              |                   | @ 347.5 to 348.4 feet: trace fine subrounded gravel, trace wooden debris, trace silt interbeds to 3 cm thick.  |
| MW-72-347.5   | SB          | 23-50/5" (18")                |                     |               |         |              |                   |  |
| MW-72-350     | SB          | 10-50/3" (18")                |                     | 350           |         |              |                   | @ 350.0 to 350.7 feet: trace coarse sand, trace fine to coarse subrounded gravel.  |
| MW-72-352.5   | SB          | 17-50/4" (18")                |                     |               |         |              |                   | 351.0 to 356.0 feet: <b>SILTY SAND (SP-SM)</b> , black with white grains, fine, few light gray fines, few to little fine to coarse gravel. Gradational upper contact. Gravels increase and coarsen downhole. (PRE-VASHON)  |
| MW-72-355     | SB          | 8-50/4" (18")                 |                     | 355           |         |              |                   |  |
| MW-72-357.5   | SB<br>G     | 7-50 (6")                     |                     |               |         |              |                   | 356.0 to 360.0 feet: <b>SILTY SAND (SM)</b> , black with white grains, fine to coarse, little dark gray fines, trace fine subrounded gravel, wet below 360.0 feet. (PRE-VASHON)<br><br>@ 359.0 to 360.0 feet: <b>SILTY SAND (SM)</b> , black with white grains, fine to coarse, little dark gray |

### REMARKS

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sp:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 19 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| MW-72-360     | SB<br>G     | 9-50/5"<br>(0")               | 8/7/98              |               |         |              |                   | fines, trace fine subrounded gravel, wet below 360.0 feet.<br>@ 359.0 to 360.0 feet: some fine to coarse subrounded to rounded gravel.  |
| MW-72-361.5   | SB          | 15-50/4"<br>(6")              | 1312                |               |         |              |                   | 360.0 to 361.0 feet: <b>SILTY SAND (SW-SM)</b> , black with white grains, fine to coarse, some fine to coarse subrounded to rounded gravel, few light gray fines, wet. (PRE-VASHON)   |
| MW-72-363     | SB<br>G     | 25-50/3"<br>(6")              |                     |               |         |              |                   | 361.0 to 362.5 feet: <b>SILTY SAND (SM)</b> , black with white grains, fine to coarse, little dark gray fines, some fine to medium, subrounded gravel. Gradational upper contact. (PRE-VASHON)  |
| MW-72-364.5   | SB          | 7-50<br>(12")                 |                     | 365           |         |              |                   | 362.5 to 366.0 feet: <b>SILTY SAND (SP-SM)</b> , black with white grains, fine to medium, trace coarse, few fine to coarse subrounded to rounded gravel, few light gray fines, wet. Sand coarsens and gravels increase downhole. (PRE-VASHON) |
| MW-72-366     | SB<br>G     | 10-50/2"<br>(6")              |                     |               |         |              |                   | 366.0 to 367.0 feet: <b>SAND (SW)</b> , black with white grains, fine to coarse, trace fines, some fine to coarse subrounded gravel, trace cobbles to 4-inches diameter. (PRE-VASHON)   |
| MW-72-368     | SB          | 26-50/0"<br>(12")             |                     |               |         |              |                   | 367.0 to 368.0 feet: <b>SILTY SAND (SM)</b> , dark gray, fine, moist. (PRE-VASHON)  |
| MW-72-369.5   | SB          | 10-50/3"<br>(6")              |                     | 370           |         |              |                   | 368.0 to 370.0 feet: <b>SILTY GRAVEL (GP-GM)</b> , black, fine to medium subrounded to rounded, some fine to coarse sand, few fines, trace cobbles, wet. (PRE-VASHON)   |
| MW-72-371     | SB          | 15-50/5"<br>(6")              |                     |               |         |              |                   | 370.0 to 372.0 feet: <b>GRAVEL (GP)</b> , black, fine to medium subrounded to rounded, some fine to coarse sand, trace fines, trace cobbles, wet. Gradational upper contact. (PRE-VASHON)   |
| MW-72-372.5   | SB          | 35-50/0"<br>(5")              |                     |               |         |              |                   | 372.0 to 374.0 feet: <b>SAND (SW)</b> , black with white grains, fine to coarse, few fine to medium subrounded gravel, trace gray fines, wet. (PRE-VASHON)  |
| MW-72-374     | SB<br>G     | 22-40-50/5"<br>(18")          |                     | 375           |         |              |                   | 374.0 to 376.0 feet: <b>SILTY SAND (SM)</b> , gray, fine, little grayish brown fines, large (8 cm x 8 cm) wood fragment in sampler, wet. (PRE-VASHON)   |
| MW-72-375.5   | SB          | 8-50<br>(6")                  |                     |               |         |              |                   |   |
| MW-72-377     | SB          | 10-50/3"<br>(3")              |                     |               |         |              |                   |   |
| MW-72-378.5   | SB          | 8-27-50/2"<br>(18")           |                     | 380           |         |              |                   |   |

### REMARKS

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.sa:5.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** MW-72  
**PAGE** 20 OF 20  
**GROUND ELEV.** 669.50'  
**TOTAL DEPTH** 389.00'  
**DATE COMPLETED** 8/7/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | GRAB SAMPLES | SB SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|--------------|------------|--------------|-------------------|---|
| MW-72-380     | SB          | 5-28-50/3" (12")              |                     |               |              |            |              |                   | 376.0 to 378.0 feet: SILTY GRAVEL (GM), black, fine, subrounded to rounded, little light gray fines, few subrounded coarse sand, few stiff brown silt lenses, trace wood fragments, wet. (PRE-VASHON)   |
| MW-72-382.5   | SB          | 7-18-50/3" (12")              |                     |               |              |            |              |                   | 378.0 to 380.0 feet: SILTY SAND (SM), black, fine, little light gray fines, trace coarse sand, trace wood fragments, wet. (PRE-VASHON)  |
| MW-72-385     | SB          | 5-14-50 (18")                 |                     | 385           |              |            |              |                   | 380.0 to 389.0 feet: SILT (ML), dark gray, soft to firm. (PRE-VASHON)<br>@ 380.0 to 381.0 feet: brown mottles.<br>@ 382.5 feet: bailed dry, added water to drill.<br>@ 384.0 to 389.0 feet: brownish gray.  |
| MW-72-387.5   | SB          | 5-14-40 (14")                 |                     |               |              |            |              |                   | @ 387.5 to 389.0 feet: trace dark brown mottles.  |
|               |             |                               |                     | 390           |              |            |              |                   | Total depth drilled = 387.5 feet.<br>Total depth sampled = 389.0 feet.  |
|               |             |                               |                     | 395           |              |            |              |                   | <b>WELL CONSTRUCTION DETAILS:</b><br>+ 2.4 to 366.2 feet: nominal 2.5-inch I.D., flush-threaded, Schedule 80 PVC blank riser pipe.<br>366.2 to 375.8 feet: nominal 2.5-inch I.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots.<br>375.8 to 376.5 feet: nominal 2.5-inch I.D., Schedule 80 PVC blank sump.<br>366.5 to 366.0 and 375.5 to 376.5 feet: stainless steel centralizers.<br>0 to 2.0 feet: concrete.<br>2.0 to 360.9 feet: Pure Gold™ medium bentonite chips, hydrated.<br>360.9 to 376.8 feet: 20 - 40 Colorado™ silica sand.<br>376.8 to 378.0 feet: tamped pea gravel.<br>378.0 to 380.8 feet: Pure Gold™ medium bentonite chips, placed into groundwater.<br>380.8 to 386.0 feet: pea gravel.<br>386.0 to 389.0 feet: slough/native soils.<br>380.6 to 387.5 feet: casing remnant & drive shoe. |
|               |             |                               |                     | 400           |              |            |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added below 5 ft., except no water added from 37 to 77 ft. depth. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Casing lead joint severely bent at 116 ft.; casing pulled, bent section removed and readvanced. (6) Drilled using air rotary to 276 ft., cable tool below 276 ft. (7) Water level for perched groundwater encountered during drilling = 585 ft. (87.4-ft.-depth) with the borehole at 88 ft. on June 12, 1998. (8) Top of steel casing elevation = 672.37 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/88,ss:4,CHRL...CHRL22

## LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 1 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (in ppm) | GROUND WATER LEVEL      | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------|-------------------------|---------------|---------|--------------|--------------------|--|
|               |               |              |                         | 5             |         |              |                    | 0 to 0.5 foot: GRAVEL (GP), gray, medium to coarse, angular, some sand. (FILL/ROAD SUBGRADE)<br>0.5 to 6.5 feet: PEAT (PT), dark brown, few to some fine sand, some fines, moist, soft. (ALLUVIUM)                               |
| G             | 4             |              |                         | 5             |         |              |                    |  |
| G             | 5             |              |                         | 5             |         |              |                    |  |
| G             | 7             |              | ▽<br>+11/1/00<br>@ 0820 | 5             |         |              |                    | 6.5 to 10.0 feet: SILTY SANDY GRAVEL (GW-GM), yellowish-gray, fine to coarse, subrounded to subangular, few to little fine to medium sand, few fines, moist to wet. Drills easily. (STRATIFIED DRIFT)                            |
| G             | 10            |              |                         | 10            |         |              |                    | 10.0 to 14.0 feet: SANDY GRAVELLY SILT (ML), gray, little to some fine to medium sand, few to little fine to coarse subrounded to subangular gravel (possibly carrydown), wet. Drills easily. (STRATIFIED DRIFT)                 |
| G             | 15            |              |                         | 15            |         |              |                    | 14.0 to 19.0 feet: SANDY SILTY GRAVEL (GM), gray, medium to coarse, few to little fines, some sand, trace cobbles, moist to wet. Fines upward, upper portion mostly silty gravelly sand. Cobble at 14.0 feet. (STRATIFIED DRIFT) |
|               |               |              |                         | 20            |         |              |                    | 19.0 to 22.0 feet: SILTY GRAVELLY SAND (SM), grayish-yellow, fine to medium, few subangular to   |

**REMARKS**

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1.  
 (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gdx:3.3/24/01.CHRLF...A15-002.02 T11

### LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 2 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (In ppm) | GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|---------------|--------------|--------------------|---------------|---------|--------------|--------------------|---|
| G             | 20            |              |                    |               |         |              |                    | subrounded medium to coarse gravel, gravels coarsen downhole, cobbles at 22.0 feet, some fine to medium sand, few to little fines, moist. (STRATIFIED DRIFT) @ 20.0 feet: add water while drilling.             |
| G             | 23            |              |                    |               |         |              |                    | 22.0 to 24.0 feet: SILT (ML), gray, soft. (STRATIFIED DRIFT)  |
| G             | 26            |              |                    | 25            |         |              |                    | 24.0 to 29.0 feet: SILTY GRAVEL (GP-GM), yellow-brown fines, medium to coarse, subrounded to subangular, few to little fines, some fine to medium sand. Drills easily. (STRATIFIED DRIFT)                       |
| G             | 30            |              |                    | 30            |         |              |                    | 29.0 to 33.0 feet: SILTY SAND (SM), gray, fine to medium, few fines, some fine to coarse gravel. Drills easily. (STRATIFIED DRIFT)  |
| G             | 33            |              |                    | 35            |         |              |                    | 33.0 to 41.0 feet: SILTY GRAVEL (GM), gray fines, fine to coarse, subrounded to subangular, few to little fines, few to little fine to coarse sand, trace cobbles and boulders. Very difficult drilling. (TILL) |
| G             | 36            |              |                    |               |         |              |                    | @ 37.0 to 38.0 feet: easier drilling.   |
|               |               |              |                    | 40            |         |              |                    |   |

**REMARKS**

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1. (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gds:3.3/2401.CHRLF...A15-002.02 T11

## LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 3 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (In ppm) | GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------|--------------------|---------------|---------|--------------|--------------------|--|
|               |               |              |                    | 45            |         |              | 45                 | 33.0 to 41.0 feet: SILTY GRAVEL (GM), continued.<br>41.0 to 53.0 feet: SILTY GRAVEL (GP-GM), gray to brownish-gray, few fines, few fine to medium sand, trace cobbles and boulders. Drills with difficulty. (TILL) |
| G             | 42            |              |                    |               |         |              |                    |  |
| G             | 45            |              |                    |               |         |              |                    | @ 45.0 feet: gray, little fines (GM).  |
|               |               |              |                    | 50            |         |              |                    | @ 48.0 to 49.0 feet: boulder, collapsed drive shoe. Pull casing, reline borehole, resume drilling using new drill bit and drive shoe.  |
| G             | 51            |              |                    |               |         |              |                    |  |
| G             | 53            |              |                    |               |         |              |                    | 53.0 to 56.0 feet: SILTY SANDY GRAVEL (GM), gray, fine to coarse, little to some fine to medium sand, some fines, trace cobbles. Casing drives easily. (TILL)  |
| G             | 55            |              |                    |               |         |              |                    |  |
| G             | 57            |              |                    |               |         |              |                    | 56.0 to 72.0 feet: SILTY SANDY GRAVEL (GP-GM), grayish-brown to brown, fine to medium, mostly subrounded, some fine to medium sand, little fines. Drills relatively easily. (ADVANCE OUTWASH)                      |
|               |               |              |                    | 60            |         |              |                    |  |

**REMARKS**

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1. (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gds:3.324/01.CHRLF...A15-002.02 T11



### LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 4 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (in ppm) | GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |   |
|---------------|---------------|--------------|--------------------|---------------|---------|--------------|-------------------|---|---|
| G             | 65            |              | 65                 | 65            | ■       |              | ●●●●●             | 56.0 to 72.0 feet: SILTY SANDY GRAVEL (GP-GM), continued.<br>@ 60.0 to 64.0 feet: mostly medium to coarse subrounded gravel with some fine to medium sand, few fines. |   |
| G             | 69            |              | 70                 | 70            | ■       |              | ●●●●●             |   |   |
| G             | 73            |              | 75                 | 73            | ■       |              | ●●●●●             |   | 72.0 to 76.0 feet: SILTY SAND (SW-SM), yellow-brown fines, fine to coarse, trace fine to medium gravel, few fines, gradational basal contact. (ADVANCE OUTWASH) |
| G             | 77            |              | 80                 | 77            | ■       |              | ●●●●●             |   | 76.0 to 81.5 feet: SILTY SAND (SP-SM), yellow-brown fines, medium to coarse, subrounded to angular, trace fine to medium gravel. (ADVANCE OUTWASH)              |

**REMARKS**

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1. (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gds 3.3/24/01 CHRLF...A15-002.02 T11

## LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 5 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (In ppm) | GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|---------------|--------------|--------------------|---------------|---------|--------------|--------------------|---|
| G             | 83            |              | 85                 | 85            | 85      |              | 85                 | 76.0 to 81.5 feet: SILTY SAND (SP-SM), continued.<br><br>81.5 to 104.0 feet: SANDY GRAVEL (GP), brown-gray fines, medium to coarse, subrounded, some fine to coarse angular sand, trace fines. Gradational to well-graded gravel. (ADVANCE OUTWASH)<br><br>@ 84.0 feet: cobbles. Some gravels have oxidized rinds.<br><br>@ 87.0 to 90.0 feet: beds of fine to medium sand, less than 1.0-foot thick each.<br><br>@ 93.0 to 104.0 feet: cobbley, very difficult drilling. |
| G             | 90            |              |                    | 90            | 90      |              | 90                 |   |
| G             | 96            |              |                    | 95            | 95      |              | 95                 |   |
|               |               |              |                    | 100           |         |              | 100                |   |

**REMARKS**

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1. (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gds.3.3/24/01.CHRLF...A15-002.02 T11

## LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 6 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (in ppm) | GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------|--------------------|---------------|---------|--------------|--------------------|--|
| G             | 100           |              |                    |               |         |              |                    | 81.5 to 104.0 feet: SANDY GRAVEL (GP), continued.  |
| G             | 104           |              |                    | 105           |         |              |                    | 104.0 to 107.0 feet: SILTY GRAVEL (GM), orange-brown fines, medium to coarse, little to some fine to medium sand, some fines. Fines occur as layers with orange-brown staining on outer surfaces. (ADVANCE OUTWASH)                |
| G             | 105           |              |                    |               |         |              |                    | 107.0 to 111.5 feet: SILTY SAND (SM), orange-brown fines, fine to medium, some fines, may include or grade to SANDY SILT (ML). Few medium to coarse gravels may be carrydown. Drills smoothly and easily. (ADVANCE OUTWASH)        |
| G             | 109           |              |                    | 110           |         |              |                    | 111.5 to 116.0 feet: SANDY GRAVEL (GP), orange-brown fines, fine to medium, subrounded to subangular, some fine to coarse sand, few fines. Many gravels have oxidized brown coatings. Gradational basal contact. (ADVANCE OUTWASH) |
| G             | 112           |              |                    | 115           |         |              |                    | 116.0 to 121.0 feet: SANDY GRAVEL (GP), orange-brown fines, medium to coarse, subrounded to subangular, some fine to medium sand, trace gray silt (ML) as thin layers or lenses. Many red or red-coated clasts. (ADVANCE OUTWASH)  |
| G             | 118           |              |                    | 120           |         |              |                    |  |

### REMARKS

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1. (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gds:3.3/24/01.CHRLF\_A15-002.02 T11

## LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 7 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (In ppm) | GROUND WATER LEVEL     | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN                                 | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------|------------------------|---------------|---------|--------------|--|--|
| G             | 121           |              | 11/2/00<br>@ 1630<br>▼ |               |         |              | 116.0 to 121.0 feet: SANDY GRAVEL (GP), continued. |  |
| G             | 125           |              |                        | 125           |         |              | @ 125.0 feet: little fines.                        | 121.0 to 128.0 feet: SILTY SAND (SP-SM), yellow-brown fines, fine, few fines, trace coal fragments. Fines increasing downhole, basal contact is gradational with uncertain position. (ADVANCE OUTWASH) |
| G             | 130           |              |                        | 130           |         |              |  | 128.0 to 132.5 feet: SILTY SAND (SM), yellow-brown fines, fine, some fines. Basal contact is abrupt with uncertain position. (ADVANCE OUTWASH)   |
| G             | 134           |              |                        | 135           |         |              |  | 132.5 to 136.0 feet: SILTY SAND (SP-SM), yellow-brown fines, fine to medium, trace coarse, little fines, trace coal. Basal contact is gradational with uncertain position. (ADVANCE OUTWASH)           |
| G             | 138           |              |                        | 140           |         |              |  | 136.0 to 139.5 feet: SILTY SAND (SM), yellow brown fines, fine, some fines, very easy drilling. Gradational to sandy silt (ML). (ADVANCE OUTWASH)  |

**REMARKS**

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1. (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gds:3.3/2401.CHRLF...A15-002.02 T11

### LOG OF EXPLORATORY BORING

**PROJECT NAME** Area 5 Permit Compliance  
**LOCATION** Cedar Hills Landfill  
**DRILLED BY** Cascade Drilling, Inc.  
**DRILL METHOD** Air Rotary  
**LOGGED BY** Udaloy

**BORING NO.** MW-82  
**PAGE** 8 of 8  
**REFERENCE ELEV.** 472.80  
**TOTAL DEPTH** 139.5'  
**DATE COMPLETED** 11/2/00

| SAMPLE METHOD | SAMPLE NUMBER | PID (in ppm) | GROUND WATER LEVEL | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHO-LOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|---------------|--------------|--------------------|---------------|---------|--------------|--------------------|--|
|               |               |              |                    |               |         |              |                    | Bottom of cased hole = 134.0 feet.<br>Bottom of drilling = 139.5 feet.<br>Bottom depth sampled = 139.5 feet.<br><br><b>WELL COMPLETION DETAILS</b><br>+2.6 to 123.9 feet: nominal 4-inch O.D., flush-threaded, Schedule 80 PVC blank riser pipe.<br>123.9 to 133.4 feet: nominal 4-inch O.D., flush-threaded, Schedule 80 PVC screen with 0.020-inch machined slots and 0.125-inch spacers.<br>133.4 to 134.0 feet: nominal 4-inch O.D. flush-threaded Schedule 80 PVC blank riser casing with end cap.<br>123.0 to 124.0 feet: stainless steel centralizer.<br>133.0 to 134.0 feet: stainless steel centralizer.<br><br>0 to 2.0 feet: concrete.<br>2.0 to 119.0 feet: PureGold® medium bentonite chips.<br>119.0 to 135.0 feet: 20-40 Colorado™ silica sand.<br>135.0 to 139.5 feet: slough. |

**REMARKS**

(1) See General Remarks. (2) Water added during drilling below 20 feet. (3) Tri-cone drill bit, 9 5/8-inch-diameter casing. (4) N: 167725.31, E: 1699553.72. (5) Reference Elevation = Ground Surface. (6) Top of PVC Casing Elevation = 474.85 feet. (7) Boring ID = MW-1.  
 (8) Perched groundwater elevation = 465.6 feet at 08:20 November 1, 2000. (9) Regional groundwater elevation = 350.2 feet at 16:30 November 2, 2000.

**UDALOY ENVIRONMENTAL SERVICES**

CHRLF.gds:3.3/24/01.CHRLF...A15-002.02 T11

## LOG OF EXPLORATORY BORING

|                    |                                     |                      |         |
|--------------------|-------------------------------------|----------------------|---------|
| PROJECT NAME       | CH2M Hill/Area 5 Geotechnical Eval. | BORING NO.           | A5B-2A  |
| GEOLOGIST/ENGINEER | Udaloy/Treat                        | PAGE                 | 1 OF 5  |
| DRILLED BY         | Hokkaido Drilling & Development     | GROUND SURFACE ELEV. | 614.30' |
| DRILL METHOD       | Air Rotary, Downhole hammer         | TOP OF CASING ELEV.  |         |
| DATE COMPLETED     | 02/06/98                            | TOTAL DEPTH          | 90.40'  |

| SAMPLE NUMBER (SAMPLE METHOD) | SAMPLE RECOVERY (in feet) | BLOW COUNTS (per 6-inches) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|-------------------------------|---------------------------|----------------------------|---------------------|---------------|---------|--------------|-------------------|--|
|                               |                           |                            |                     | 5             |         |              |                   | 0 to 9.0 feet: SILTY SAND (SM), gray and brown, some fines, little fine to coarse gravel, trace cobbles, moist to wet. (REWORKED STRATIFIED DRIFT) |
| 5-5.5 (G)                     |                           |                            |                     | 10            |         |              |                   | 9.0 to 12.0 feet: SILT (ML), gray, few fine sand, moist. (STRATIFIED DRIFT/LACUSTRINE)   |
| 11-12 (G)                     |                           |                            |                     | 12            |         |              |                   | 12.0 to 14.0 feet: SANDY SILT (ML), gray, few fine sand, little fine to medium gravel. Gradational upper contact. (STRATIFIED DRIFT/LACUSTRINE)    |
| 12-13 (G)                     |                           |                            |                     | 14            |         |              |                   |  |
| 14-15 (G)                     |                           |                            | ▽                   | 15            |         |              |                   | 14.0 to 16.5 feet: SILTY SAND (SP-SM), brown, fine to medium, few fines, possible silt interbeds, moist to wet. (ADVANCE OUTWASH)                  |
| 17-18 (G)                     |                           |                            |                     | 18            |         |              |                   | 16.5 to 18.5 feet: SILTY GRAVEL (GM), yellow-brown to yellow-gray, medium to coarse, some fine to coarse sand, some fines, wet. (ADVANCE OUTWASH)  |
| 19-20 (G)                     |                           |                            |                     | 20            |         |              |                   | 18.5 to 23.5 feet: SILTY GRAVEL (GP-GM), yellow-brown to yellow-gray, fine to medium, some fine to coarse angular sand, few fines,                 |

**REMARKS**  
 (1) G = Grab sample. (2) SS = Nominal 2-inch O.D. split-spoon sampler. (3) SB = Nominal 3-inch O.D. split-barrel sampler. (4) No water added during drilling. (5) Boring diameter: 6-inches. (6) Northing: 170195.99, Easting: 1698842.5. (7) Water encountered at 14 feet below grade.

UDALOY ENVIRONMENTAL SERVICES

A15-003.01.CH2MH.sa:2.03/29/98...CH2MH

## LOG OF EXPLORATORY BORING

|                    |                                     |                      |         |
|--------------------|-------------------------------------|----------------------|---------|
| PROJECT NAME       | CH2M Hill/Area 5 Geotechnical Eval. | BORING NO.           | A5B-2A  |
| GEOLOGIST/ENGINEER | Udaloy/Treat                        | PAGE                 | 2 OF 5  |
| DRILLED BY         | Hokkaido Drilling & Development     | GROUND SURFACE ELEV. | 614.30' |
| DRILL METHOD       | Air Rotary, Downhole hammer         | TOP OF CASING ELEV.  |         |
| DATE COMPLETED     | 02/06/98                            | TOTAL DEPTH          | 90.40'  |

| SAMPLE NUMBER<br>(SAMPLE METHOD) | SAMPLE RECOVERY<br>(in feet) | BLOW COUNTS<br>(per 6-inches) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN  | LITHOLOGIC DESCRIPTION |
|----------------------------------|------------------------------|-------------------------------|---------------------|---------------|---------|--------------|--|------------------------|
| 21-22<br>(G)                     |                              |                               |                     |               |         |              | 18.5 to 23.5 feet: SILTY GRAVEL (GP-GM),<br>continued: moist. (ADVANCE OUTWASH)  |                        |
| 25-26<br>(G)                     |                              |                               |                     | 25            |         |              | 23.5 to 27.5 feet: SILTY GRAVEL (GM),<br>yellow-brown to yellow-gray, medium to coarse,<br>subangular to subrounded, some medium<br>angular sand, little fines, moist to wet.<br>(ADVANCE OUTWASH)                         |                        |
| 27.5-<br>28.0<br>(G)             |                              |                               |                     | 30            |         |              | 27.5 to 33.0 feet: SILTY SAND (SP-SM),<br>yellow-gray, medium, subangular, few fines,<br>few fine gravel, trace cobbles and boulders,<br>moist to wet. (ADVANCE OUTWASH)<br><br>@ 30.0 to 33.0 feet: cobbles and boulders. |                        |
| 33-34<br>(G)                     |                              |                               |                     | 35            |         |              | 33.0 to 82.5 feet: SILTY GRAVEL (GP-GM),<br>gray-brown to yellow-brown, medium to coarse,<br>few fines, some fine to medium sand, damp to<br>moist. (ADVANCE OUTWASH)<br><br>@ 33.0 to 33.5 feet: SAND (SP).               |                        |
| NS<br>(SB)                       | 0                            | 50/3"                         |                     |               |         |              |  |                        |
| 38.0-<br>38.5<br>(G)             |                              |                               |                     | 40            |         |              |  |                        |

### REMARKS

(1) G = Grab sample. (2) SS = Nominal 2-inch O.D. split-spoon sampler. (3) SB = Nominal 3-inch O.D. split-barrel sampler. (4) No water added during drilling. (5) Boring diameter: 6-inches. (6) Northing: 170195.99, Easting: 1698842.5. (7) Water encountered at 14 feet below grade.

UDALOY ENVIRONMENTAL SERVICES

A15-003.01.CH2MH.sa:2.03/29/98...CH2MH







## LOG OF EXPLORATORY BORING

|                    |                                     |                      |         |
|--------------------|-------------------------------------|----------------------|---------|
| PROJECT NAME       | CH2M Hill/Area 5 Geotechnical Eval. | BORING NO.           | A5B-3   |
| GEOLOGIST/ENGINEER | Pyle                                | PAGE                 | 1 OF 4  |
| DRILLED BY         | Hokkaido Drilling & Development     | GROUND SURFACE ELEV. | 606.12' |
| DRILL METHOD       | Air Rotary, Downhole hammer         | TOP OF CASING ELEV.  |         |
| DATE COMPLETED     | 02/19/98                            | TOTAL DEPTH          | 75.00'  |

| SAMPLE NUMBER<br>(SAMPLE METHOD) | SAMPLE RECOVERY<br>(in feet) | BLOW COUNTS<br>(per 6-inches) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|----------------------------------|------------------------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| 0-1<br>(G)                       |                              |                               |                     |               |         |              |                   | 0 to 2.5 feet: SILTY GRAVEL (GP-GM), grayish-brown, angular to subangular, little fines, moist. (REWORKED TILL/STRATIFIED DRIFT)                                   |
| 4-5<br>(G)                       |                              |                               |                     | 5             |         |              |                   | 2.5 to 5.0 feet: GRAVELLY SILT (ML), gray, little subrounded fine to medium gravel, moist. (REWORKED TILL/STRATIFIED DRIFT)  |
| 5-6<br>(G)                       |                              |                               |                     |               |         |              |                   | 5.0 to 6.3 feet: PEAT (PT), dark brown, clayey, damp to moist. (ALLUVIUM)  |
| 6-7<br>(G)                       |                              |                               |                     |               |         |              |                   | 6.3 to 7.0 feet: SILTY GRAVEL (GM), brown, angular to subangular, little fines, little organics, gradational upper contact. (ADVANCE OUTWASH)                      |
| 7-8<br>(G)                       |                              |                               |                     |               |         |              |                   | 7.0 to 8.0 feet: GRAVELLY SILT (GP-GM), light brown, little subrounded fine to medium gravel, few to little fine to medium sand, moist. (ADVANCE OUTWASH)          |
| 8-9<br>(G)                       |                              |                               |                     |               |         |              |                   | 8.0 to 11.0 feet: SILTY GRAVEL (GM), light grayish-brown, angular, little fines, damp to 9 feet, moist below 9 feet. (ADVANCE OUTWASH)                             |
| 15-16<br>(G)                     |                              |                               | ▽                   | 15            |         |              |                   | 11.0 to 19.0 feet: SILTY GRAVEL (GM), light brown, angular, little to some fine to medium sand, some fines, moist to 15 feet, wet below 15 feet. (ADVANCE OUTWASH) |
| 19-20<br>(G)                     |                              |                               |                     |               |         |              |                   | 19.0 to 25.0 feet: SILTY GRAVEL (GM), light brown, subrounded, little sand, some fines,  |

**REMARKS**

(1) G = Grab sample. (2) SS = Nominal 2-inch O.D. split-spoon sampler. (3) SB = Nominal 3-inch O.D. split-barrel sampler. (4) No water added during drilling. (5) Boring diameter: 6-inches. (6) Northing: 170419.08, Easting: 1699315.8.

UDALOY ENVIRONMENTAL SERVICES

A15-003.01.CH2MH.sa:2.03/29/98...CH2MH

### LOG OF EXPLORATORY BORING

|                    |                                     |                      |         |
|--------------------|-------------------------------------|----------------------|---------|
| PROJECT NAME       | CH2M Hill/Area 5 Geotechnical Eval. | BORING NO.           | A5B-3   |
| GEOLOGIST/ENGINEER | Pyle                                | PAGE                 | 2 OF 4  |
| DRILLED BY         | Hokkaido Drilling & Development     | GROUND SURFACE ELEV. | 606.12' |
| DRILL METHOD       | Air Rotary, Downhole hammer         | TOP OF CASING ELEV.  |         |
| DATE COMPLETED     | 02/19/98                            | TOTAL DEPTH          | 75.00'  |

| SAMPLE NUMBER<br>(SAMPLE METHOD) | SAMPLE RECOVERY<br>(in feet) | BLOW COUNTS<br>(per 6-inches) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|----------------------------------|------------------------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| 24-25 (G)                        |                              |                               |                     | 25            |         |              |                   | 19.0 to 25.0 feet: SILTY GRAVEL (GM), continued: damp to moist. (ADVANCE OUTWASH)<br><br>@ 22.0 feet: some fines, trace to few sand (GM). |
| 25-26 (G)                        |                              |                               |                     | 25            |         |              |                   | 25.0 to 28.0 feet: SILTY GRAVEL (GP-GM), reddish-brown, angular to subrounded, damp to moist. (ADVANCE OUTWASH)                           |
| 27-28 (G)                        |                              |                               |                     | 30            |         |              |                   | 28.0 to 64.0 feet: SILTY GRAVEL (GM), brownish-gray, fine to medium, subrounded to angular, some fines, damp to moist. (ADVANCE OUTWASH)  |
| 31.5-32.0 (G)                    |                              |                               |                     | 35            |         |              |                   |   |
| 36.5-37.0 (G)                    |                              |                               |                     | 40            |         |              |                   | @ 37.0 feet: cobbles, angular gravels.  |

**REMARKS**  
 (1) G = Grab sample. (2) SS = Nominal 2-inch O.D. split-spoon sampler. (3) SB = Nominal 3-inch O.D. split-barrel sampler. (4) No water added during drilling. (5) Boring diameter: 6-inches. (6) Northing: 170419.08, Easting: 1699315.8.

## LOG OF EXPLORATORY BORING

|                    |                                     |                      |         |
|--------------------|-------------------------------------|----------------------|---------|
| PROJECT NAME       | CH2M Hill/Area 5 Geotechnical Eval. | BORING NO.           | A5B-3   |
| GEOLOGIST/ENGINEER | Pyle                                | PAGE                 | 3 OF 4  |
| DRILLED BY         | Hokkaido Drilling & Development     | GROUND SURFACE ELEV. | 606.12' |
| DRILL METHOD       | Air Rotary, Downhole hammer         | TOP OF CASING ELEV.  |         |
| DATE COMPLETED     | 02/19/98                            | TOTAL DEPTH          | 75.00'  |

| SAMPLE NUMBER<br>(SAMPLE METHOD) | SAMPLE RECOVERY<br>(in feet) | BLOW COUNTS<br>(per 6-inches) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION                                      |
|----------------------------------|------------------------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| 41-42<br>(G)                     |                              |                               |                     | 45            |         |              |                   | 28.0 to 64.0 feet: SILTY GRAVEL (GM), continued.            |
| 46-47<br>(G)                     |                              |                               |                     | 50            |         |              |                   | @ 44.0 feet: cobbles.                                       |
| 50-51<br>(G)                     |                              |                               |                     | 55            |         |              |                   | @ 50.0 to 50.5 feet: trace wood.                            |
| 55-56<br>(G)                     |                              |                               |                     | 60            |         |              |                   | @ 54.0 feet: boulder.<br>@ 55.0 to 64.0 feet: little fines. |
| 59-60<br>(G)                     |                              |                               |                     |               |         |              |                   |   |

**REMARKS**

(1) G = Grab sample. (2) SS = Nominal 2-inch O.D. split-spoon sampler. (3) SB = Nominal 3-inch O.D. split-barrel sampler. (4) No water added during drilling. (5) Boring diameter: 6-inches. (6) Northing: 170419.08, Easting: 1699315.8.

**UDALOY ENVIRONMENTAL SERVICES**

A15-003.01.CH2MH.sa:2.03/29/98...CH2MH

## LOG OF EXPLORATORY BORING

|                    |                                     |                      |         |
|--------------------|-------------------------------------|----------------------|---------|
| PROJECT NAME       | CH2M Hill/Area 5 Geotechnical Eval. | BORING NO.           | A5B-3   |
| GEOLOGIST/ENGINEER | Pyle                                | PAGE                 | 4 OF 4  |
| DRILLED BY         | Hokkaido Drilling & Development     | GROUND SURFACE ELEV. | 606.12' |
| DRILL METHOD       | Air Rotary, Downhole hammer         | TOP OF CASING ELEV.  |         |
| DATE COMPLETED     | 02/19/98                            | TOTAL DEPTH          | 75.00'  |

| SAMPLE NUMBER<br>(SAMPLE METHOD) | SAMPLE RECOVERY<br>(in feet) | BLOW COUNTS<br>(per 6-inches) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES      | WELL DETAILS | LITHOLOGIC COLUMN   | LITHOLOGIC DESCRIPTION  |
|----------------------------------|------------------------------|-------------------------------|---------------------|---------------|--------------|--------------|---|---|
|                                  |                              |                               |                     | 65            | 64-65<br>(G) |              | 64.0 to 66.5 feet: SILTY SAND WITH GRAVEL (SM), brown, little fine gravel, little fines, damp to moist. (ADVANCE OUTWASH)   | 28.0 to 64.0 feet: SILTY GRAVEL (GM), continued.  |
|                                  |                              |                               |                     | 70            | 67-68<br>(G) |              | 66.5 to 69.5 feet: SILTY GRAVEL (GM), brownish-gray, fine, few fine to coarse sand, little fines, damp to moist. Gradational upper contact. (ADVANCE OUTWASH)   |   |
|                                  |                              |                               |                     | 75            | 70-71<br>(G) |              | @ 69.0 to 70.0 feet: fine to medium gravel.<br>69.5 to 72.5 feet: SILTY SAND WITH GRAVEL (SM), brown, medium, little fine gravel, little fines, damp to moist. Gradational upper contact. (ADVANCE OUTWASH) |   |
|                                  |                              |                               |                     | 80            | 74-75<br>(G) |              | Total depth drilled = 75.0 feet.<br>Total depth sampled = 75.0 feet.  |   |
|                                  |                              |                               |                     |               |              |              |   | Decommissioning Details<br>0 to 55.0 feet: Soil.<br>55.0 to 75.0 feet: Bentonite chips. |

**REMARKS**

(1) G = Grab sample. (2) SS = Nominal 2-inch O.D. split-spoon sampler. (3) SB = Nominal 3-inch O.D. split-barrel sampler. (4) No water added during drilling. (5) Boring diameter: 6-inches. (6) Northing: 170419.08, Easting: 1699315.8.

**UDALOY ENVIRONMENTAL SERVICES**

A15-003.01.CH2MH.sa:2.03/29/98...CH2MH

## LOG OF EXPLORATORY BORING

|                    |                                     |                      |         |
|--------------------|-------------------------------------|----------------------|---------|
| PROJECT NAME       | CH2M Hill/Area 5 Geotechnical Eval. | BORING NO.           | A5B-6   |
| GEOLOGIST/ENGINEER | Pyle                                | PAGE                 | 1 OF 4  |
| DRILLED BY         | Hokkaido Drilling & Development     | GROUND SURFACE ELEV. | 616.56' |
| DRILL METHOD       | Air Rotary, tri-cone bit            | TOP OF CASING ELEV.  |         |
| DATE COMPLETED     | 02/18/98                            | TOTAL DEPTH          | 60.50'  |

| SAMPLE NUMBER<br>(SAMPLE METHOD) | SAMPLE RECOVERY<br>(in feet) | BLOW COUNTS<br>(per 6-inches) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|----------------------------------|------------------------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
|                                  |                              |                               |                     | 0             |         |              |                   | 0 to 2.5 feet: GRAVELLY SILT (ML), gray, some fine to medium subrounded gravel, moist. (REWORKED TILL/STRATIFIED DRIFT)                         |
|                                  |                              |                               |                     | 2.5           |         |              |                   | 2.5 to 4.0 feet: GRAVELLY SILT (ML), gray, few fine to medium subrounded gravel, moist. (TILL/STRATIFIED DRIFT)                                 |
| 4-5<br>(G)                       |                              |                               |                     | 5             |         |              |                   | 4.0 to 7.0 feet: SILT (ML), gray, trace fine to medium subrounded gravel, moist. (STRATIFIED DRIFT)   |
|                                  |                              |                               |                     | 7.5           |         |              |                   | 7.0 to 16.0 feet: GRAVELLY SILT (ML), gray, some subrounded gravel, moist. (STRATIFIED DRIFT)   |
| 10-11<br>(G)                     |                              |                               |                     | 10            |         |              |                   | @ 12.0 feet: cobbles.   |
| 14-15<br>(G)                     |                              |                               |                     | 15            |         |              |                   | @ 14.0 to 15.0 feet: angular gravel.  |
| 16-17<br>(G)                     |                              |                               | ▽                   |               |         |              |                   | 16.0 to 18.0 feet: SILTY GRAVEL (GM), gray gravels with brown fines, angular, some fines, wet. (ADVANCE OUTWASH)                                |
| 18-19<br>(G)                     |                              |                               |                     | 20            |         |              |                   | 18.0 to 27.5 feet: SILTY GRAVEL (GP-GM), gray gravels with brown fines, fine to medium, angular to subrounded, damp to moist. (ADVANCE OUTWASH) |

### REMARKS

(1) G = Grab sample. (2) SS = Nominal 2-inch O.D. split-spoon sampler. (3) SB = Nominal 3-inch O.D. split-barrel sampler. (4) No water added during drilling. (5) Water encountered at 16.0 feet below grade. (6) Boring diameter: 6-inches. (7) Northing: 170963.22, Easting: 1698884.2.

UDALOY ENVIRONMENTAL SERVICES

A15-003.01.CH2MH.sa:2.03/29/98...CH2MH









## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 1 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-5      | G           |                               |                     | 5             |         |              |                   | 0 to 2.5 feet: <b>GRAVELLY SAND (SP-SM)</b> , brown, fine to coarse, little fine to coarse subrounded gravel, few fines, moist, trace cobbles. (REWORKED TILL)                         |
|               |             |                               |                     |               |         |              |                   | 2.5 to 4.5 feet: <b>SILT (ML)</b> , dark brown, 50 percent timber, moist.  |
|               |             |                               |                     |               |         |              |                   | 4.5 to 9.0 feet: <b>SILTY SAND (SM)</b> , light brown to yellow brown, fine to medium sand, little fines, few fine to medium subangular to subrounded gravel, moist. (ADVANCE OUTWASH) |
| A5B-8a-10     | G           |                               |                     | 10            |         |              |                   | @ 9.0 feet: boulder.   |
|               |             |                               |                     |               |         |              |                   | 9.0 to 20.0 feet: <b>SANDY GRAVEL (GM)</b> , yellow brown, fine to coarse subangular to subrounded gravels, some fines, few fine to coarse sand, dry. (ADVANCE OUTWASH)                |
|               |             |                               |                     |               |         |              |                   | @ 12.0 feet: boulder.<br>@ 12.5 feet: interbedded layers of light brown silts and fine to medium brown sand.   |
| A5B-8a-15     | G           |                               |                     | 15            |         |              |                   | @ 15.0 feet: <b>SANDY SILT (ML)</b> , light brown, little fine to medium sands, trace fine to medium gravels, dry. (ADVANCE OUTWASH)   |
|               |             |                               |                     |               |         |              |                   |  |
|               |             |                               |                     | 20            |         |              |                   |  |

**REMARKS**  
 (1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 2 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-20     | G           |                               |                     |               |         |              |                   | 20.0 to 30.0 feet: <b>SILTY GRAVEL (GP-GM)</b> , yellow brown, fine to medium gravels, some fine to coarse sand, few fines. (ADVANCE OUTWASH)<br>@ 22.0 feet: percentage and size of gravel increasing downward.   |
| A5B-8a-25     | G           |                               |                     | 25            |         |              |                   | @ 27.0 feet: slow drilling in cobbles.   |
| A5B-8a-30     | G           |                               |                     | 30            |         |              |                   | 30.0 to 35.0 feet: <b>SILTY GRAVEL (GM)</b> , yellow brown, fine to coarse subrounded to subangular gravels, little fines, few fine to medium sand. (ADVANCE OUTWASH)<br>@ 32.0 feet: color changes to gray brown.   |
| A5B-8a-35     | G           |                               |                     | 35            |         |              |                   | 35.0 to 40.0 feet: <b>SILTY GRAVEL (GW)</b> , yellow brown, fine to coarse subrounded to subangular gravel, few fine to coarse sand, trace fines. (ADVANCE OUTWASH)<br>@ 37.0 feet: 1-foot-thick layer of fine to medium sand.<br>@ 38.0 feet: silt increasing with depth. |
|               |             |                               |                     | 40            |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 3 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-40     | G           |                               |                     |               |         |              |                   | 40.0 to 50.0 feet: <b>SILTY GRAVEL (GM)</b> , yellow brown, fine to coarse gravels, little fine to coarse sand, little fines in cobbles. (ADVANCE OUTWASH)   |
| A5B-8a-45     | G           |                               |                     | 45            |         |              |                   | @ 46.0 feet: boulder, slow drilling.   |
| A5B-8a-50     | G           |                               |                     | 50            |         |              |                   | 50.0 to 55.0 feet: <b>SILTY GRAVEL (GW)</b> , gray brown, fine to coarse subrounded gravels, few fine to coarse sands, trace fines. (ADVANCE OUTWASH)<br>@ 51.0 feet: boulder.<br>@ 53.0 feet: silt and sand increases with depth. |
| A5B-8a-55     | G           |                               |                     | 55            |         |              |                   | 55.0 to 60.0 feet: <b>SILTY GRAVEL (GP-GM)</b> , gray brown, fine to coarse gravels, little fine to coarse sand, few fines. (ADVANCE OUTWASH)<br><br>@ 58.0 feet: silts increasing with depth.                                     |
|               |             |                               |                     | 60            |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ta:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 4 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-60     | G           |                               |                     |               |         |              |                   | 60.0 to 80.0 feet: <b>SILTY GRAVEL (GW-GM)</b> , gray brown, fine to coarse gravels, little fine to coarse sand, few silts. (ADVANCE OUTWASH)<br>@ 61.0 feet: drilling easier, silts increasing with depth. |
| A5B-8a-65     | G           |                               |                     | 65            |         |              |                   | @ 65.0 feet: little fines.<br><br>@ 67.0 to 68.0 feet: <b>SANDY SILT (ML)</b> , gray brown, little fine to medium sand, trace fine gravels.   |
| A5B-8a-70     | G           |                               |                     | 70            |         |              |                   | @ 70.0 feet: yellow brown color, subangular gravels, fine to medium sand.   |
| A5B-8a-75     | G           |                               |                     | 75            |         |              |                   |   |
|               |             |                               |                     | 80            |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.es:4.CHRL...CHRI



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 5 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-80     | G           |                               |                     |               |         |              |                   | 80.0 to 86.0 feet: <b>SILTY GRAVEL (GW-GM)</b> , yellow brown, fine to coarse subrounded gravel, little fine to coarse sand, few fines. (ADVANCE OUTWASH)<br><br>@ 83.0 feet: softer drilling, gravels fining downward. |
| A5B-8a-85     | G           |                               |                     | 85            |         |              |                   | 86.0 to 95.5 feet: <b>SILTY SAND (SP-SM)</b> , yellow brown, fine to medium sands, few fines. (ADVANCE OUTWASH MARKER #1)   |
| A5B-8a-90     | G           |                               |                     | 90            |         |              |                   | @ 92.0 feet: orange brown color, little gray silt stringers.  |
| A5B-8a-95     | G           |                               |                     | 95            |         |              |                   | @ 95.0 feet: some silts.  |
|               |             |                               |                     | 100           |         |              |                   | 95.5 to 100.0 feet: <b>SILTY GRAVEL (GM)</b> , yellow to orange brown, fine to medium gravels, little fine to coarse sand, little fines. (ADVANCE OUTWASH)  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.sa-5.CHRL...CHRL

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 6 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-100    | G           |                               |                     |               |         |              |                   | 100.0 to 120.0 feet: <b>SILTY GRAVEL (GP-GM)</b> , yellow brown, fine to medium gravels, little fine to coarse sand, few fines. (ADVANCE OUTWASH) |
| A5B-8a-105    | G           |                               |                     | 105           |         |              |                   | @ 105.0 feet: as above, increasing to little silts.<br><br>@ 107.0 feet: gravels fining.  |
| A5B-8a-110    | G           |                               |                     | 110           |         |              |                   | @ 110.0 feet: color change to gray brown, fines decreasing to few.  |
| A5B-8a-115    | G           |                               |                     | 115           |         |              |                   | @ 115.0 feet: fines increasing to little.   |
|               |             |                               |                     | 120           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.es:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 7 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-120    | G           |                               |                     |               |         |              |                   | 120.0 to 130.0 feet: GRAVEL (GP), yellow brown, fine to medium subrounded gravels, few coarse sands, trace fines. (ADVANCE OUTWASH)                  |
| A5B-8a-125    | G           |                               |                     | 125           |         |              |                   | @ 125.0 feet: sands increase to little.  |
| A5B-8a-130    | G           |                               |                     | 130           |         |              |                   | 130.0 to 140.0 feet: SILTY GRAVEL (GP-GM), yellow brown, fine to medium subrounded gravels, little fine to coarse sand, few silts. (ADVANCE OUTWASH) |
| A5B-8a-135    | G           |                               |                     | 135           |         |              |                   | @ 135.0 feet: sands fining with depth.   |
|               |             |                               |                     | 140           |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.aa:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udalay/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 8 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 8 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET   | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|-----------------|---------|--------------|-------------------|--|
| A5B-8a-140    | G           |                               |                     |                 |         |              |                   | 140.0 to 150.0 feet: <b>SILTY GRAVEL (GW-GM)</b> , yellow brown, fine to coarse subrounded gravels, little fine to coarse sand, few fines. (ADVANCE OUTWASH) |
|               |             |                               |                     |                 |         |              |                   | @ 143.0 to 145.0 feet: smooth drilling.  |
| A5B-8a-145    | G           |                               |                     | 145             |         |              |                   | @ 145.0 feet: silts increase, gravels fining downward.   |
| A5B-8a-150    | G           |                               |                     | 150             |         |              |                   | 150.0 to 155.0 feet: <b>SILTY SAND (SM)</b> , yellow brown, fine to coarse sand, little fine gravels, little fines. (ADVANCE OUTWASH MARKER #2)              |
| A5B-8a-155    | G           |                               |                     | 155             |         |              |                   | 155.0 to 158.0 feet: <b>SILTY GRAVEL (GM)</b> , fine to medium subrounded gravels, some fine to coarse sand, little fines. (ADVANCE OUTWASH)                 |
| A5B-8a-158    | G           |                               | ▽                   | 5/28/98<br>1400 |         |              |                   | 158.0 to 164.0 feet: <b>SILTY SAND (SP-SM)</b> , yellow brown, fine to medium sands, few fines. (ADVANCE OUTWASH)  |
|               |             |                               |                     | 160             |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.aa:5.CHRL...CHRL

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 9 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-160    | G           |                               |                     |               |         |              |                   | 158.0 to 164.0 feet: <b>SILTY SAND (SP-SM)</b> , as above.<br><br>@ 162.0 feet: fining downward, wet.  |
| A5B-8a-164    | G           |                               |                     | 165           |         |              |                   | 164.0 to 167.0 feet: <b>SILTY SAND (SM)</b> , yellow brown, fine sand, few medium sand, little fines, dry. (ADVANCE OUTWASH)<br>@ 165.0 feet: fine to medium sand, few fines.  |
| A5B-8a-165    | G           |                               |                     |               |         |              |                   |  |
| A5B-8a-170    | G           |                               |                     | 170           |         |              |                   | 167.0 to 195.0 feet: <b>SILTY GRAVEL (GP-GM)</b> , yellow brown, fine to medium subrounded gravels, little fine to coarse sand, few fines. (ADVANCE OUTWASH)<br><br>@ 170.0 feet: silts decreasing with depth.<br><br>@ 172.0 feet: boulder. |
| A5B-8a-175    | G           |                               |                     | 175           |         |              |                   |  |
|               |             |                               |                     | 180           |         |              |                   |  |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHR

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 10 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-180    | G           |                               |                     |               |         |              |                   | 167.0 to 195.0 feet: SANDY GRAVEL (GP-GM), as above.   |
| A5B-8a-185    | G           |                               |                     | 185           |         |              |                   | @ 185.0 feet: decreasing sands and silts.  |
| A5B-8a-190    | G           |                               |                     | 190           |         |              |                   |  |
| A5B-8a-195    | G           |                               |                     | 195           |         |              |                   | 195.0 to 197.0 feet: SILTY SAND (SM), yellow brown, fine to medium sand, little fines, few fine subrounded gravels. (ADVANCE OUTWASH)              |
|               |             |                               |                     |               |         |              |                   | 197.0 to 210.0 feet: SILTY GRAVEL (GP-GM), yellow brown, fine to medium subrounded gravels, some fine to coarse sand, few fines. (ADVANCE OUTWASH) |
|               |             |                               |                     | 200           |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.a4.CHRL...CHRI

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 11 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-200    | G           |                               |                     |               |         |              |                   | 197.0 to 210.0 feet: SILTY GRAVEL (GP-GM), as above.   |
| A5B-8a-205    | G           |                               |                     | 205           |         |              |                   |  |
| A5B-8a-210    | G           |                               |                     | 210           |         |              |                   | 210.0 to 213.0 feet: SILTY GRAVEL (GM), yellow brown, fine to medium subrounded gravels, some fine to coarse sand, little fines. (ADVANCE OUTWASH) |
| A5B-8a-213    | G           |                               |                     |               |         |              |                   | 213.0 to 230.0 feet: SILTY SAND (SM), yellow brown, fine to medium sand, little fines, few fine gravels. (ADVANCE OUTWASH)                         |
| A5B-8a-215    | G           |                               |                     | 215           |         |              |                   |  |
|               |             |                               |                     | 220           |         |              |                   |  |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.aa:4.CHRL...CHR



### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 12 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER    | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-220       | G           |                               |                     |               |         |              |                   | 213.0 to 230.0 feet: SILTY SAND (SM), as above.  |
| A5B-8a-225       | G           |                               |                     | 225           |         |              |                   | @ 225.0 feet: as above, sands coarsening.  |
| A5B-8a-230       | G           |                               |                     | 230           |         |              |                   | 230.0 to 255.0 feet: SILTY SAND (SP-SM), gray, fine sand, few fines, few dark gray silt stringers. (PRE-VASHON)<br>@ 231.0 feet: wood fragments.<br>@ 232.0 feet: purplish-gray color. |
| A5B-8a-235       | G           |                               |                     | 235           |         |              |                   | @ 235.0 feet: interbedded fine subrounded gravels.   |
| A5B-8a-239-239.5 | SB          | 17-50/1" (6")                 |                     | 240           |         |              |                   | @ 239.0 feet: fine to medium sand, little fines, trace fine gravels.   |

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.es:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

PROJECT NAME CHRL Area 5 Borehole Project  
 LOCATION Cedar Hills Regional Landfill  
 DRILLED BY Hokkaido Drilling & Development  
 DRILL METHOD Air Rotary/Cable Tool  
 LOGGED BY A. Udaloy/T. Treat

BORING NO. A5B- 8a  
 PAGE 13 OF 21  
 GROUND ELEV. 610.00'  
 TOTAL DEPTH 410.00'  
 DATE COMPLETED 6/8/98

| SAMPLE NUMBER    | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-242.5-243 | SB          | 27-50/3" (12")                |                     |               |         |              |                   | 230.0 to 255.0 feet: SILTY SAND (SP-SM), as above.  |
| A5B-8a-245-245.5 | SB          | 50/4" (18")                   |                     | 245           |         |              |                   | @ 245.0 feet: silts increasing with depth.  |
| A5B-8a-247.5-248 | SB          | 50/5" (9")                    |                     |               |         |              |                   | @ 248.0 feet: no gravels.   |
| A5B-8a-250-250.5 | SB          | 50/6" (18")                   |                     | 250           |         |              |                   | @ 250.0 feet: dark gray, fine sand, few medium sands, little fines. (PRE-VASHON)  |
| A5B-8a-252.5-253 | SB          | 50/6"                         |                     |               |         |              |                   | @ 252.5 feet: trace fine subrounded gravels.  |
| A5B-8a-255-255.5 | SB          | 36-50/1" (12")                |                     | 255           |         |              |                   | @ 254.0 to 255.0 feet: GRAVEL (GP-GM), interbed, gray, fine to medium subrounded to subangular, some fine to medium sand, little coarse sand, little fines.<br>@ 255.0 feet: sandy silt on bit.   |
| A5B-8a-257.5-258 | SB          | 36-50/2"                      |                     |               |         |              |                   | 255.0 to 258.0 feet: SAND (SP), gray, fine to medium, few coarse. (PRE-VASHON MARKER #1)<br>@ 257.0 to 258.0 feet: INTERBEDS (1 to 2 mm) OF SILTY SAND (SP-SM) AND SANDY SILT (ML), trace medium subrounded gravels as clasts in sand matrix. |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.a:5.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 14 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER      | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|--------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-260-260.5   | SB          | 11-50/5" (1")                 |                     |               |         |              |                   | 258.0 to 264.0 feet: <b>SANDY SILT (ML)</b> , medium gray, coarse, trace clay, firm to soft. (PRE-VASHON MARKER #1)                       |
| A5B-8a-262.5-263   | SB          | 11-50/3" (8")                 |                     |               |         |              |                   | @ 263.0 feet: no structures except rounded to oblong air vesicles 1- to 5 mm-diameter, trace black "grass-like" organic fragments.        |
| A5B-8a-265-265.5   | SB          | 14-50/3"                      |                     | 265           |         |              |                   | 264.0 to 287.0 feet: <b>SILTY SAND (SM)</b> , fine sand, some silts, no bedding, air vesicles and trace organics. (PRE-VASHON)            |
| A5B-8a-267.5-268.5 | SB          | 14-50/5" (12")                |                     |               |         |              |                   | @ 267.0 feet: black and white when wet, light gray when dry, fine, 5 mm interbeds of silty sand (SP-SM), gray.                            |
| A5B-8a-270-270.5   | SB          | 50/2" (0")                    |                     | 270           |         |              |                   | @ 270.0 feet: fine, black and white, trace brown fines.<br>Note: no drive sample recovery, tools are very clean when removed from boring. |
| A5B-8a-272.5-273   | SB          | 50/1" (0")                    |                     |               |         |              |                   | @ 272.5 feet: trace coarse sand.  |
| A5B-8a-275-275.5   | SB          | 50/1" (0")                    |                     | 275           |         |              |                   | @ 274.5 feet: little silts, trace coal.   |
| A5B-8a-277.5-278   | SB          | 50/6" (9")                    |                     |               |         |              |                   |   |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.ss:5.CHRL...CHRL

## LOG OF EXPLORATORY BORING

PROJECT NAME CHRL Area 5 Borehole Project  
 LOCATION Cedar Hills Regional Landfill  
 DRILLED BY Hokkaido Drilling & Development  
 DRILL METHOD Air Rotary/Cable Tool  
 LOGGED BY A. Udaloy/T. Treat

BORING NO. A5B- 8a  
 PAGE 15 OF 21  
 GROUND ELEV. 610.00'  
 TOTAL DEPTH 410.00'  
 DATE COMPLETED 6/8/98

| SAMPLE NUMBER    | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-280-280.5 | SB          | 18-50/3"                      |                     |               |         |              |                   | 264.0 to 287.0 feet: SAND (SM), as above.<br>@ 280.0 feet: no gravel, occasional 1 to 5 mm air vesicles.  |
| A5B-8a-282.5-283 | SB          | 24-50/1"                      |                     |               |         |              |                   | @ 283.0 feet: 1 mm air vesicles.  |
| A5B-8a-285-285.5 | SB          | 37-50/2"                      |                     | 285           |         |              |                   | @ 285.0 feet: black and white, fine, trace coarse sand, trace fines.  |
| A5B-8a-287.5-288 | SB          | 50/6"                         |                     |               |         |              |                   | 287.0 to 295.0 feet: SILTY SAND WITH GRAVEL (SM), black and white, fine sand, some fine to medium subrounded gravels, matrix supported little gray silts, gravels decrease and silts increase down hole. (PRE-VASHON)<br>@ 289.0 feet: less gravels, finer. |
| A5B-8a-290-290.5 | SB          | 50/4"                         |                     | 290           |         |              |                   | @ 290.0 feet: few fine subrounded gravels, few silts.   |
| A5B-8a-292.5-293 | SB          | 25-50/2"                      | 6/4/98<br>0800      |               |         |              |                   | @ 293.0 feet: few fine to medium subrounded to subangular gravels, faint subhorizontal bedding (3/4-inch thick).  |
| A5B-8a-295-295.5 | SB          | 26-50/2"                      |                     | 295           |         |              |                   | 295.0 to 299.0 feet: SILTY SAND (SW-SM), black and white with gray fines, fine to coarse angular, few coarse sands, few fine to medium subrounded to subangular gravels, no structures. (PRE-VASHON)  |
| A5B-8a-297.5-298 | SB          | 27-50/3"                      |                     |               |         |              |                   | @ 298.0 feet: few medium to coarse gravels.   |
|                  |             |                               |                     | 300           |         |              |                   | 299.0 to 340.0 feet: GRAVEL (GP), black with white, green, etc., medium to coarse,  |

### REMARKS

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UDALOY ENVIRONMENTAL SERVICES

A15.002.01.10/31/98.ss:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 16 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER                  | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|--------------------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-300-300.5               | SB          | 50/5"                         |                     |               |         |              |                   | subrounded to rounded, few fine gravels, some fine to coarse sand, trace fines, trace cobbles. (PRE-VASHON)<br>@ 300.0 to 303.0 feet: eight cobbles to 6-inches diameter.<br><br>@ 303.0 to 305.0 feet: gravels and cobbles, 10 percent sands, trace fines. |
| A5B-8a-305-305.5<br>A5B-8a-306 | SB<br>G     | 50/5"<br>(0")                 |                     | 305           |         |              |                   | @ 306.0 feet: few fine to coarse sand.  |
| A5B-8a-310                     | G           |                               |                     | 310           |         |              |                   |   |
| A5B-8a-315                     | G           |                               |                     | 315           |         |              |                   | @ 315.0 feet: advance boring by driving and bailing without much drilling.  |
|                                |             |                               |                     | ∇<br>6/4/98   |         |              |                   |   |
|                                |             |                               |                     | 320           |         |              |                   |   |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 17 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-320    | G           |                               |                     |               |         |              |                   | 299.0 to 340.0 feet: GRAVEL (GP), as above.<br>@ 320.0 feet: as above.                                      |
| A5B-8a-325    | G           |                               |                     | 325           |         |              |                   |   |
| A5B-8a-330    | G           |                               |                     | 330           |         |              |                   | @ 332.5 to 334.5 feet: SAND (SP), medium, some medium to coarse subrounded to rounded gravels, trace fines. |
| A5B-8a-335    | G           |                               |                     | 335           |         |              |                   |   |
|               |             |                               |                     | 340           |         |              |                   |   |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.es:4.CHRL...CHRI

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 18 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER  | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|----------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-8a-340     | G           |                               |                     |               |         |              |                   | 340.0 to 342.0 feet: SAND (SP), black and white, fine to medium, some medium to coarse subrounded gravel, trace fines. (PRE-VASHON)                 |
| A5B-8a-345     | G           |                               |                     | 345           |         |              |                   | 342.0 to 345.0 feet: GRAVEL (GP), interbedded 6-inches to 1-foot-thick sand layers in gravels (interpreted based on drilling action).               |
| A5B-8a-350     | G           |                               |                     | 350           |         |              |                   | 345.0 to 362.0 feet: SAND (SP), black and white, fine to medium, few coarse sands, some fine to coarse subrounded gravel, trace fines. (PRE-VASHON) |
| A5B-8a-355-356 | G<br>SB     | 1-1-1<br>(0")                 |                     | 355           |         |              |                   | @ 356.0 feet: fining downward, less medium sand, trace fine to coarse subrounded gravel.  |
| 355-356        | SB          | 1-2-3<br>(0")                 |                     |               |         |              |                   |   |
|                |             |                               |                     | 360           |         |              |                   |   |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ss:4.CHRL...CHRL



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 19 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER    | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-360       | G           |                               |                     |               |         |              |                   | 345.0 to 362.0 feet: SAND (SP), as above.                            |
| A5B-8a-362.5-363 | SB          | 50/6" (18")                   |                     |               |         |              |                   | 362.0 to 380.0 feet: SILT (ML), gray, trace fine sands. (PRE-VASHON) |
| A5B-8a-365-366   | SB          | 8-50/5" (18")                 |                     | 365           |         |              |                   |  |
|                  | SB          | 7-40-50/6" (0")               |                     | 370           |         |              |                   |  |
| A5B-8a-373       | G           |                               |                     |               |         |              |                   |  |
| A5B-8a-375       | G           |                               |                     | 375           |         |              |                   | @ 375.0 feet: few (5 to 10 percent) 1 to 5 mm length wood fragments. |
|                  |             |                               |                     | 380           |         |              |                   |  |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.s4.CHRL...CHRI

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 20 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER    | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-380       | G           |                               |                     |               |         |              |                   | 380.0 to 400.0 feet: SILT (ML), gray, some light brown silt stringers, trace black fine sand, trace wood fragments. (PRE-VASHON)   |
|                  | SB          | (0")                          |                     | 385           |         |              |                   |  |
| A5B-8a-387-388.5 | SB          | 17-38-50/5" (15")             |                     |               |         |              |                   | @ 387.0 feet: SILT (ML), gray, fine sand laminae, abundant organic material including 4 mm-long, 0.5 cm-diameter vertical fragments, numerous fine roots, sulfur-like odor, firm, wet. (PRE-VASHON)<br>@ 388.0 feet: SILT (ML), gray, coarse, brown iron-oxide-like mottles. |
| A5B-8a-390-391   | SB          | 21-50/5" (0")                 |                     | 390           |         |              |                   |  |
| A5B-8a-395-396   | SB          | 34-50/5" (2")                 |                     | 395           |         |              |                   | @ 395.0 feet: faint laminations.   |
|                  |             |                               |                     | 400           |         |              |                   |  |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.es:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B- 8a  
**PAGE** 21 OF 21  
**GROUND ELEV.** 610.00'  
**TOTAL DEPTH** 410.00'  
**DATE COMPLETED** 6/8/98

| SAMPLE NUMBER    | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-8a-400-401   | SB          | 15-50 (14")                   |                     | 405           |         |              |                   | <b>400.0 to 410.0 feet: SILT (ML)</b> , gray, trace clay, nonplastic to low plasticity, rapid dilatency, stiff, trace vertical and sub horizontal organic material (roots), faint less than 5 mm horizontal bedding, trace iron-oxide-like mottles. (PRE-VASHON)<br><br>@ 405.0 feet: firm to stiff, trace clay.   |
| A5B-8a-405-406   | SB          | 16-50/5" (12")                |                     | 410           |         |              |                   | @ 410.0 feet: firm, no clay, one sub-horizontal laminae of fine sand (1-grain thick).<br><br>Total depth drilled = 410.0 feet.<br>Total depth sampled = 411.5 feet.  |
| A5B-8a-410-411.5 | SB          | 14-25-50 (18")                |                     | 415           |         |              |                   | <b>DECOMMISSIONING DETAILS:</b><br>0 to 68.0 feet: soil.<br>68.0 to 75.0 feet: Pure Gold™ bentonite grout.<br>75.0 to 95.0 feet: Pure Gold™ medium bentonite chips.<br>95.0 to 281.0 feet: Pure Gold™ bentonite grout.<br>281.0 to 390.0 feet: Pure Gold™ medium bentonite chips.<br>390.0 to 410.0 feet: Pure Gold™ bentonite grout.<br>Approximately 403.0 to 410.0 feet: casing remnant and drive shoe. |
|                  |             |                               |                     | 420           |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 20 to 158 ft. and from 164 to 310 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Blow counts do not represent SPT results. (6) Static water elevation for regional water table = 316.15 ft. on June 4, 1998. (7) Water level for perched groundwater encountered during drilling = 452 ft. (158-ft. depth) with the borehole at 160 ft. on May 28, 1998. (8) Drilling using air rotary to 239 ft., cable tool below 239 ft.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sp:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

PROJECT NAME CHRL Area 5 Borehole Project  
 LOCATION Cedar Hills Regional Landfill  
 DRILLED BY Hokkaido Drilling & Development  
 DRILL METHOD Air Rotary/Cable Tool  
 LOGGED BY A. Udaloy/T. Treat

BORING NO. A5B-10  
 PAGE 1 OF 15  
 GROUND ELEV. 600.62'  
 TOTAL DEPTH 290.00'  
 DATE COMPLETED 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-5      | G           | 6                             |                     | 5             | ■       |              | ○                 | <p>0 to 14.0 feet: <b>SILTY GRAVEL (GM)</b>, yellowish brown, medium to coarse, little fines, some fine to coarse sand, few cobbles and boulders, moist to 2.0 feet, damp below 2.0 feet. (ADVANCE OUTWASH)<br/>                     @ 2.0 to 3.5 feet: boulder.</p> <p>@ 12.0 to 13.0 feet: cobbles.<br/>                     @ 13.0 to 14.0 feet: boulder.</p> <p>14.0 to 63.0 feet: <b>SILTY GRAVEL (GP-GM)</b>, yellowish brown, medium to coarse, subrounded, few fines, some fine to coarse sand, few cobbles and boulders, damp. (ADVANCE OUTWASH)<br/>                     @ 16.0 to 17.0 feet: boulder.</p> |
| A5B-10-10     | G           |                               |                     | 10            | ■       |              | ○                 |  |
| A5B-10-15     | G           |                               |                     | 15            | ■       |              | ○                 |  |
|               |             |                               |                     | 20            |         |              | ○                 |  |

### REMARKS

(1) See General Remarks. (2) Potable water added from 0 to 145 ft. and from 149 to 290 ft. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa:3.CHRL...CHRL

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 2 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION                             |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-20     | G           |                               |                     |               |         |              |                   | 14.0 to 63.0 feet: SILTY GRAVEL (GP-GM), as above. |
| A5B-10-25     | G           |                               |                     | 25            |         |              |                   |  |
| A5B-10-30     | G           |                               |                     | 30            |         |              |                   | @ 33.0 feet: boulder.                              |
| A5B-10-35     | G           |                               |                     | 35            |         |              |                   | @ 36.0 feet: cobbles and boulders.                 |
|               |             |                               |                     | 40            |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 0 to 145 ft. and from 149 to 290 ft. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.ssr:3.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 3 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-10-40     | G           |                               |                     |               |         |              |                   | 14.0 to 63.0 feet: SILTY GRAVEL (GP-GM), as above.<br>@ 41.0 feet: cobbles. |
| A5B-10-45     | G           |                               |                     | 45            |         |              |                   | @ 45.0 to 55.0 feet: sand increases.  |
| A5B-10-50     | G           |                               |                     | 50            |         |              |                   |   |
| A5B-10-55     | G           |                               |                     | 55            |         |              |                   |   |
|               |             |                               |                     | 60            |         |              |                   |   |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa:3.CHRL...CHRL

### LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 4 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-10-60     | G           |                               |                     |               |         |              |                   | 14.0 to 63.0 feet: SILTY GRAVEL (GP-GM), as above.  |
| A5B-10-65     | G           |                               |                     | 65            |         |              |                   | 63.0 to 80.0 feet: SILTY GRAVEL (GM), dark yellowish brown, fine to coarse subrounded to subangular gravel to 70.0 feet, fine to medium subrounded to subangular below 70.0 feet, some fine to coarse sand, little fines. (ADVANCE OUTWASH) |
| A5B-10-70     | G           |                               |                     | 70            |         |              |                   |   |
| A5B-10-75     | G           |                               |                     | 75            |         |              |                   | @ 75.0 to 80.0 feet: lighter yellowish brown color.   |
|               |             |                               |                     | 80            |         |              |                   |   |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa:3.CHRL...CHRL



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 5 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-10-80     | G           |                               |                     |               |         |              |                   | 80.0 to 89.0 feet: <b>SILTY SAND (SM)</b> , yellowish brown, fine to medium, some fine to medium subrounded to subangular gravel, little fines, gradational upper contact. (ADVANCE OUTWASH MARKER #1)<br>@ 81.0 to 82.0 feet: drills easily like SAND. |
| A5B-10-85     | G           |                               |                     | 85            |         |              |                   | @ 85.0 to 90.0 feet: trace thin interbeds of cohesive gray silt.  |
| A5B-10-90     | G           |                               |                     | 90            |         |              |                   | 89.0 to 102.0 feet: <b>SILTY GRAVEL (GM)</b> , yellowish brown, fine to coarse, subangular to subrounded, some fine to coarse sand, little fines. (ADVANCE OUTWASH)   |
| A5B-10-95     | G           |                               |                     | 95            |         |              |                   |   |
|               |             |                               |                     | 100           |         |              |                   |   |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.ss:4.CHRL...CHRL

### LOG OF EXPLORATORY BORING

PROJECT NAME CHRL Area 5 Borehole Project  
 LOCATION Cedar Hills Regional Landfill  
 DRILLED BY Hokkaido Drilling & Development  
 DRILL METHOD Air Rotary/Cable Tool  
 LOGGED BY A. Udaloy/T. Treat

BORING NO. A5B-10  
 PAGE 6 OF 15  
 GROUND ELEV. 600.62'  
 TOTAL DEPTH 290.00'  
 DATE COMPLETED 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-100    | G           |                               |                     |               |         |              |                   | 89.0 to 102.0 feet: SILTY GRAVEL (GM), as above.   |
| A5B-10-105    | G           |                               |                     | 105           |         |              |                   | 102.0 to 106.0 feet: SILTY GRAVEL (GW-GM), yellow brown, fine to coarse, subangular, little fine to coarse sand, few fines. (ADVANCE OUTWASH)  |
| A5B-10-110    | G           |                               |                     | 110           |         |              |                   | 106.0 to 120.0 feet: SILTY GRAVEL (GM), yellowish brown, fine to coarse, subrounded, some fine to coarse sand, little fines. (ADVANCE OUTWASH) |
| A5B-10-115    | G           |                               |                     | 115           |         |              |                   |  |
|               |             |                               |                     | 120           |         |              |                   |  |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sr:3.CHRL...CHRI

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 7 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-120    | G           |                               |                     |               |         |              |                   | 120.0 to 140.0 feet: <b>SILTY GRAVEL (GW-GM)</b> , yellowish brown, fine to coarse, subrounded, little fine to coarse sand, few fines, trace cobbles to 127.0 feet, few cobbles below 127.0 feet. Fines content increases down hole. (ADVANCE OUTWASH) |
| A5B-10-125    | G           |                               |                     | 125           |         |              |                   |  |
| A5B-10-130    | G           |                               |                     | 130           |         |              |                   |  |
| A5B-10-135    | G           |                               |                     | 135           |         |              |                   |  |
|               |             |                               |                     | 140           |         |              |                   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 0 to 145 ft. and from 149 to 290 ft. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa:3.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 8 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-140    | G           |                               |                     |               |         |              |                   | 140.0 to 152.0 feet: <b>SILTY GRAVEL (GM)</b> , yellowish brown, fine to coarse, subrounded, little fine to coarse sand, little fines. (ADVANCE OUTWASH) |
| A5B-10-145    | G           |                               |                     | 145           |         |              |                   | @ 145.0 to 150.0 feet: no water added during drilling.   |
| A5B-10-150    | G           |                               |                     | 150           |         |              |                   | @ 149.0 to 150.0 feet: possible water-bearing zone, low production, if any.<br>@ 150.0 feet: drill bit stuck, dry hole, add water.                       |
| A5B-10-152    | G           |                               |                     |               |         |              |                   | 152.0 to 158.0 feet: <b>SILTY GRAVEL (GW-GM)</b> , yellowish brown, fine to coarse, subrounded, little fine to coarse sand, few fines. (ADVANCE OUTWASH) |
| A5B-10-155    | G           |                               |                     | 155           |         |              |                   |  |
|               |             |                               |                     | 160           |         |              |                   | 158.0 to 163.0 feet: <b>SILTY SAND (SP-SM)</b> , orange and yellowish brown, fine, few fines, little fine to medium gravel. (ADVANCE OUTWASH MARKER #2)  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 0 to 145 ft. and from 149 to 290 ft. (3) Reference elevation = ground surface.  
 (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.sp:4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 9 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-160    | G           |                               |                     |               |         |              |                   | 158.0 to 163.0 feet: SILTY SAND (SP-SM), as above.   |
| A5B-10-165    | G           |                               |                     | 165           |         |              |                   | 163.0 to 190.0 feet: SILTY GRAVEL (GW-GM), orange and yellowish brown, fine to coarse, subrounded, few fine to coarse sand, few fines. (ADVANCE OUTWASH) |
| A5B-10-170    | G           |                               |                     | 170           |         |              |                   |  |
| A5B-10-175    | G           |                               |                     | 175           |         |              |                   | @ 175.0 to 190.0 feet: yellowish brown color.  |
|               |             |                               |                     | 180           |         |              |                   |  |

**REMARKS**

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 (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa:3.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 10 OF 11  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-180    | G           |                               |                     |               |         |              |                   | 163.0 to 190.0 feet: SILTY GRAVEL (GW-GM), as above.   |
| A5B-10-185    | G           |                               |                     | 185           |         |              |                   |  |
| A5B-10-190    | G           |                               |                     | 190           |         |              |                   | 190.0 to 199.5 feet: GRAVEL (GW), grayish brown, fine to coarse, subrounded, few fine to coarse sand, trace fines. (ADVANCE OUTWASH) |
| A5B-10-195    | G           |                               |                     | 195           |         |              |                   |  |
|               |             |                               |                     | 200           |         |              |                   | 199.5 to 204.5 feet: SILTY SAND (SW-SM),   |

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa:3.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 11 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER    | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-10-200       | G           |                               |                     |               |         |              |                   | yellowish brown, fine to coarse, few fine subrounded gravel, few fines. Gravel may be carry-down. (ADVANCE OUTWASH)   |
|                  |             |                               |                     | 205           |         |              |                   | 204.5 to 215.0 feet: SILTY GRAVEL (GP-GM), yellowish brown, fine to medium, subrounded, little fine to coarse sand, few fines. (ADVANCE OUTWASH)  |
| A5B-10-207       | G           |                               |                     |               |         |              |                   |   |
|                  |             |                               |                     | 210           |         |              |                   |   |
| A5B-10-210       | G           |                               |                     |               |         |              |                   |   |
|                  |             |                               |                     | 215           |         |              |                   | 215.0 to 217.0 feet: SILTY SAND (SP-SM), black with yellowish brown matrix, little fine to medium subrounded gravel, trace fines. (ADVANCE OUTWASH)   |
| A5B-10-215       | G           |                               |                     |               |         |              |                   |   |
|                  |             |                               |                     | 217.0         |         |              |                   | 217.0 to 220.0 feet: SANDY SILT (ML), light gray, trace fine sand interbeds; one scour filled by dark gray and yellowish brown silt and clayey silt laminae; few fine sand cross-beds. (PRE-VASHON) |
| A5B-10-217-217.7 | SB          | 30-50/2"                      |                     |               |         |              |                   |   |
|                  |             |                               |                     | 220           |         |              |                   |   |

### REMARKS

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sz:3.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 12 OF 1  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER      | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|--------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-10-220-220.7   | SB          | 25-50/2" (6")                 |                     |               |         |              |                   | 220.0 to 222.0 feet: <b>SILTY SAND (SM)</b> , yellowish brown, little fine gravel or coarse sand, little fines. (PRE-VASHON)  |
| A5B-10-222.5-223.3 | SB          | 30-50/3" (9")                 |                     |               |         |              |                   | 222.0 to 227.8 feet: <b>SILT (ML)</b> , gray, nonplastic, stiff, moist. Numerous vertical fractures (probable desiccation cracks) in filled with brown gravelly silty sand to 223.0 feet. Below 223.0 feet, thin (approximately 1 mm) laminae, trace organic material on bedding planes. (PRE-VASHON) |
| A5B-10-225-225.5   | SB          | 50 (6")                       |                     | 225           |         |              |                   | @ 225.0 to 225.5 feet: some clayey silt laminae, common organic material on and oriented parallel with bedding planes.  |
| A5B-10-227.5-227.9 | SB          | 50/5" (5")                    |                     |               |         |              |                   | @ 227.5 to 227.8 feet: fine sand (SP) interbeds common woody debris.  |
| A5B-10-230-230.5   | SB          | 50 (0")                       |                     | 230           |         |              |                   | 227.8 to 229.0 feet: <b>SAND (SP)</b> , black with white grains, fine, moist. Trace medium to coarse subrounded to rounded sand. Trace organic debris (rootlets?) (PRE-VASHON)  |
| A5B-10-232.5-232.8 | SB          | 50/4" (4")                    |                     |               |         |              |                   | 229.0 to 232.8 feet: <b>SILTY GRAVEL (GM)</b> , gray, fine to medium, subrounded, little fines, some fine to medium sand. Gravels coarsen downhole. (PRE-VASHON)  |
| A5B-10-235-235.3   | SB          | 50/3" (3")                    |                     | 235           |         |              |                   | 232.8 to 236.5 feet: <b>GRAVEL (GP)</b> , green, fine to medium, some fine sand, trace medium and coarse sand, trace fines, trace cobbles. Clast supported. (PRE-VASHON)  |
| A5B-10-237.5-237.8 | SB          | 50/4"                         |                     |               |         |              |                   | 236.5 to 244.0 feet: <b>SILTY SAND (SP-SM)</b> , black and white with light gray fines, fine, little coarse sand and fine gravel, trace to few fines, fines increase downhole. (PRE-VASHON)   |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sp:3.CHRL...CHRI



## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 13 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER      | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION   |
|--------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|--|
| A5B-10-240-240.3   | SB          | 50/4" (4")                    |                     |               |         |              |                   | 236.5 to 244.0 feet: SILTY SAND (SP-SM), as above.   |
| A5B-10-242.5-243.2 | SB          | 10-50/2" (6")                 |                     |               |         |              |                   | 244.0 to 247.0 feet: SILTY GRAVEL (GP-GM), gray, fine, subrounded, few fines, some fine to coarse sand. (PRE-VASHON)   |
| A5B-10-245-245.8   | SB          | 50/4" (4")                    |                     | 245           |         |              |                   | 247.0 to 248.5 feet: SAND (SP), dark gray, fine, trace fines, moist to damp, loose. Aeolian? (PRE-VASHON MARKER #1)  |
| A5B-10-247.5-248   | SB          | 50                            |                     |               |         |              |                   | 248.5 to 254.0 feet: SILTY SAND (SP-SM), dark gray, fine, few fines, common air vesicles to 250.8 feet. Brown mottles below 250.8 feet. Trace vertical root-like organic material below 252.5 feet. Damp to moist. Aeolian? (PRE-VASHON MARKER #1) |
| A5B-10-250-251     | SB          | 12-50 (11")                   |                     | 250           |         |              |                   | 254.0 to 280.0 feet: SAND (SP), black with white grains, fine, trace fines. (PRE-VASHON)   |
| A5B-10-252.5-253.3 | SB          | 25-50/3"                      |                     |               |         |              |                   |  |
| A5B-10-255-255.3   | SB          | 5-50/4" (<6")                 |                     | 255           |         |              |                   |  |
| A5B-10-257.5-257.8 | SB          | 35-50/4" (10")                |                     |               |         |              |                   | @ 257.5 to 257.9 feet: T-shaped wood, tapers downhole, vertical and horizontal extensions, possible root?  |
|                    |             |                               |                     | 260           |         |              |                   |  |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.11/5/98.sr4.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 14 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER      | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN | LITHOLOGIC DESCRIPTION  |
|--------------------|-------------|-------------------------------|---------------------|---------------|---------|--------------|-------------------|---|
| A5B-10-260-260.5   | SB          | 50 (6")                       |                     |               |         |              |                   | 254.0 to 280.0 feet: SAND (SP), as above.                       |
| A5B-10-262.5-263   | SB          | 50                            |                     |               |         |              |                   | @ 260.0 to 260.5 feet: trace fine organic material (rootlets?). |
| A5B-10-265-265.8   | SB          | 15-50/3"                      |                     | 265           |         |              |                   | @ 265.0 to 265.8 feet: trace coarse sand.                       |
| A5B-10-267.5-268.2 | SB          | 50-50/2" (8")                 |                     |               |         |              |                   |   |
| A5B-10-270-270.7   | SB          | 26-50/2"                      |                     | 270           |         |              |                   | @ 270.0 to 270.7 feet: trace coarse sand, possible ventifacts.  |
| A5B-10-272.5-273   | SB          | 5                             |                     |               |         |              |                   |   |
| A5B-10-275-275.8   | SB          | 20-50/4"                      |                     | 275           |         |              |                   |   |
| A5B-10-277.5-277.9 | SB          | 50/5"                         |                     |               |         |              |                   |   |
|                    |             |                               |                     | 280           |         |              |                   |   |

**REMARKS**

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**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98 ss:3.CHRL...CHRL

## LOG OF EXPLORATORY BORING

**PROJECT NAME** CHRL Area 5 Borehole Project  
**LOCATION** Cedar Hills Regional Landfill  
**DRILLED BY** Hokkaido Drilling & Development  
**DRILL METHOD** Air Rotary/Cable Tool  
**LOGGED BY** A. Udaloy/T. Treat

**BORING NO.** A5B-10  
**PAGE** 15 OF 15  
**GROUND ELEV.** 600.62'  
**TOTAL DEPTH** 290.00'  
**DATE COMPLETED** 6/19/98

| SAMPLE NUMBER | SAMPLE TYPE | BLOWS PER 6 INCHES (RECOVERY) | GROUND WATER LEVELS         | DEPTH IN FEET | SAMPLES | WELL DETAILS | LITHOLOGIC COLUMN   | LITHOLOGIC DESCRIPTION   |
|---------------|-------------|-------------------------------|-----------------------------|---------------|---------|--------------|---|--|
| A5B-10-282    | G           |                               |                             |               |         |              |   | <b>280.0 to 291.0 feet: SILTY SAND (SW-SM)</b> , black with white and green grains and brownish gray fines, fine to coarse, few fines, few to some fine to medium subrounded gravel, wet. Gradational upper contact. Gravels decrease downhole. (PRE-VASHON)<br><br>@ 285.5 to 291.0 feet: light gray fines. |
| A5B-10-283    | G           |                               |                             |               |         |              |   |  |
|               |             |                               | 285<br>▽<br>6/19/98<br>0800 |               |         |              |   |  |
| A5B-10-287    | G           |                               |                             |               |         |              |   |  |
| A5B-10-289    | G           |                               |                             | 290           |         |              | <b>291.0 to 292.0 feet: GRAVEL (GP)</b> , wet, good water flow, poor sample recovery (uncased borehole). (PRE-VASHON)<br><br>Total depth drilled = 292.0 feet.<br>Total depth sampled = 292.0 feet. |  |
|               |             |                               |                             | 295           |         |              | <b>DECOMMISSIONING DETAILS:</b><br>0 to 47.0 feet: soil.<br>47.0 to 292.0 feet: Pure Gold™ medium bentonite chips.<br>280.8 to 288.0 feet: casing remnant and drive shoe.                           |  |
|               |             |                               |                             | 300           |         |              |   |  |

**REMARKS**

(1) See General Remarks. (2) Potable water added from 0 to 145 ft. and from 149 to 290 ft. (3) Reference elevation = ground surface. (4) Nominal 8-in.-diameter boring. (5) Sampler lost then recovered; blow counts not recorded. (6) Drilled using air rotary to 217 ft., cable tool below 217 ft. (7) Static water elevation for the regional water table = 314.9 ft. (285.7-ft.) depth with the borehole at 292.0 ft. on June 19, 1998.

**UDALOY ENVIRONMENTAL SERVICES**

A15.002.01.10/31/98.sa-3.CHRL...CHRL



# Geologic & Monitoring Well Construction Log

Project Number: 000031      Boring Number: A6BH-2a      Sheet: 1 of 17

Project Name: Cedar Hills Regional Landfill Area 6 Development      Elevation (ft msl): 588.65  
 Drilling Location: Northing -169700      Easting -1699205      Start Date: February 15, 2002  
 Driller/Equipment: Boart-Longyear Rotary Sonic      Finish Date: March 6, 2002  
 Sample/Method: Continuous Core - except as noted in Remarks      Hole Diameter(s): 9" 0-57', 8" 57-294', 6" 294-334'

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks   |
|-------|--------------|----------------|-----------------|-------------|---|--|
| 588   | 1            |                |                 |             | <b>FILL</b><br>0' to 5' - Moist, gray-brown and rusty mottled SILTY SAND; with gravel in top 0.8', sand fine, with interbeds of fine sandy SILT, few fine to coarse gravel, subrounded (SM-ML)                                  | Complete sample recovery except as noted below   |
| 587   | 2            |                |                 |             |   |  |
| 586   | 3            |                |                 |             |   |  |
| 585   | 4            |                |                 |             |   | Times or dates of water quality measurements may not coincide with the times or dates of water level measurements<br>See Ground Water Level & Monitoring table for details |
| 584   | 5            |                |                 |             |   |  |
| 583   | 6            |                |                 |             | 5' to 12.3' - Moist, dark brown SILTY SAND, sand fine to coarse, with fine to coarse subrounded gravel; abundant organics including fine fragments and sticks; est. 20% organic (SM)<br>soil wet at 5.5' - drilling water added | Solid lines denote abrupt contacts; dashed lines denote gradational contacts   |
| 582   | 7            |                |                 |             |   |  |
| 581   | 8            |                |                 |             |   |  |
| 580   | 9            |                |                 |             |   |  |
| 579   | 10           |                |                 |             |   |  |
| 578   | 11           |                |                 |             |   |  |
| 577   | 12           |                |                 |             |   |  |
| 576   | 13           |                |                 |             | <b>VASHON GLACIAL DEPOSITS</b><br>12.3' to 13.5' - Moist, rusty brown and gray SILTY SAND, sand fine, few fine to coarse gravel, trace fine roots (SM)  |  |
| 575   | 14           |                |                 |             | 13.5' to 14.5' - Moist, gray-brown GRAVELLY SAND; sand fine to coarse, gravel fine to coarse, scattered cobbles (granitic) (SW)   |  |
| 574   | 15           |                |                 |             | 14.5' to 14.8' - 0.3' interbed of silty sand with gravel  |  |
| 573   | 16           |                |                 |             |   |  |
| 572   | 17           |                |                 |             | 16.3' to 18' - Mottled rusty and gray SILTY SAND with GRAVEL; (till-like) (SM)  |  |
| 571   | 18           |                |                 |             | 18' to 18.5' - Moist, gray SANDY GRAVEL with SILT (GW)  |  |
| 570   | 19           |                |                 |             | 18.5' to 20.5' - Gray-brown SILTY SAND with GRAVEL; (till-like) (SM)  |  |
| 569   |              |                |                 |             |   |  |

Lab Tests: TP = Total Porosity      AL = Atterberg Limits      Logged by: SJS  
 EC = Specific Conductance (µmhos/cm @ 25° C)      EP = Effective Porosity      K = Hydraulic Conductivity      Approved by: EWM  
 Static water level at date and time indicated      TOC = Total Organic Carbon      MC = Moisture Content  
 SC = Soil Classification      FC = Field Capacity  
 PS = Particle Size      C14 = Radiocarbon Age Dating      Figure No.



# Geologic & Monitoring Well Construction Log

Project Number: 000031  
 Boring Number: A6BH-2a  
 Sheet: 2 of 17

Project Name: Cedar Hills Regional Landfill Area 6 Development  
 Drilling Location: Northing -169700 Easting -1699205  
 Driller/Equipment: Boart-Longyear Rotary Sonic  
 Sample/Method: Continuous Core - except as noted in Remarks  
 Elevation (ft msl): 588.65  
 Start Date: February 15, 2002  
 Finish Date: March 6, 2002  
 Hole Diameter(s): 9" 0-57', 8" 57-294', 6" 25-

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks  |
|-------|--------------|----------------|-----------------|-------------|---|---|
| 568   | 21           |                |                 |             | 20.5' to 23.3' - Moist, brown SAND; sand fine to medium; with lens of silty fine to medium sand from 21.7'-21.9' (SP)   |   |
| 567   | 22           |                |                 |             |   |   |
| 566   | 23           |                |                 |             |   |   |
| 565   | 24           |                |                 |             | 23.3' to 23.8' - Moist, brown SILTY SAND; fine to medium (SM)<br>23.8' to 24.3' - Moist, brown SAND; fine to medium (SP)  |   |
| 564   | 25           |                |                 |             | 24.3' to 25.3' - Moist, gray and brown mottled SILTY SAND with GRAVEL; sand predominantly fine to medium, gravel fine to coarse subangular; (till-like) (SM)  |   |
| 563   | 26           |                |                 |             | 25.3' to 30' - Moist, brown SAND with GRAVEL; sand fine to medium, gravel fine to coarse, subangular; with cobbles (5%); thin interbed of well-graded sand with silt and gravel (SP)                    |   |
| 562   | 27           |                |                 |             |   |   |
| 561   | 28           |                |                 |             |   |   |
| 560   | 29           |                |                 |             |   |   |
| 559   | 30           |                |                 |             |   |   |
| 558   | 31           |                |                 |             | 30' to 30.8' - Moist, dark gray SANDY SILT with GRAVEL; sand fine to coarse, gravel fine to coarse, with cobbles (10%) (glacial till) (ML)<br>30.8' to 31.1' - Brown SILTY SAND with GRAVEL (SM)        | Boring depth 31'<br>Casing depth 6'<br>Slough depth 30.2'<br>No water after 10 minutes  |
| 557   | 32           |                |                 |             | 31.1' to 32.1' - Moist, dark gray SILT with GRAVEL; non-plastic silt, gravel fine to coarse, with lenses of GRAVELLY SILT (glaciolacustrine) (ML)   |   |
| 556   | 33           |                |                 |             | 32.1' to 33' - Very moist to wet, brown SANDY SILT; sand fine, laminated, trace air bubbles or rootcasts, trace fine gravel; perched on 0.2' thick gray GRAVELLY SILT with SAND (overbank deposit) (ML) |   |
| 555   | 34           |                |                 |             | 33' to 34.4' - Moist, gray-brown GRAVEL with SILT and SAND, with cobbles; sand fine to coarse, gravel fine to coarse (outwash) (GW-GM)  |   |
| 554   | 35           |                |                 |             | 34.4' to 43' - Moist, gray-brown SILTY GRAVEL with SAND; gravel fine to coarse, sand fine to coarse, with cobbles (5-10%) (glacial till), friable to cohesive (volcanic cobbles) (GM)                   | Boring depth 35'<br>Casing depth 16'<br>Slough depth 35.0'<br>No water after 10 minutes |
| 553   | 36           |                |                 |             |   |   |
| 552   | 37           |                |                 |             |   |   |
| 551   | 38           |                |                 |             |   |   |
| 550   | 39           |                |                 |             |   |   |
| 549   |              |                |                 |             |   |   |

Lab Tests:  
 EC = Specific Conductance (µmhos/cm @ 25° C)  
 TP = Total Porosity  
 EP = Effective Porosity  
 TOC = Total Organic Carbon  
 SC = Soil Classification  
 PS = Particle Size  
 AL = Atterberg Limits  
 K = Hydraulic Conductivity  
 MC = Moisture Content  
 FC = Field Capacity  
 C14 = Radiocarbon Age Dating  
 Logged by: SJS  
 Approved by: EWM  
 Figure No.



# Geologic & Monitoring Well Construction Log

Project Number: 000031      Boring Number: A6BH-2a      Sheet: 3 of 17

|                   |  |                    |                                   |
|-------------------|--|--------------------|-----------------------------------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl) | 588.65                            |
| Drilling Location | Northing -169700      Easting -1699205           | Start Date         | February 15, 2002                 |
| Driller/Equipment | Boart-Longyear Rotary Sonic                      | Finish Date        | March 6, 2002                     |
| Sample/Method     | Continuous Core - except as noted in Remarks     | Hole Diameter(s)   | 9" 0-57', 8" 57-294', 6" 294-334' |

| Elev. | Depth (feet) | Sample Testing             | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks                                       |
|-------|--------------|----------------------------|-----------------|-------------|---|--|
| 548   | 41           |                            |                 |             |   |  |
| 547   | 42           |                            |                 |             |   |  |
| 546   | 43           |                            |                 |             |   |  |
| 545   | 44           |                            |                 |             | 43' to 45' - Slightly moist, tan to brown, SILTY SAND with GRAVEL to SILTY GRAVEL with SAND; sand fine to coarse, gravel fine to coarse subangular (SM-GM)  |  |
| 544   | 45           |                            |                 |             | 45' to 46' - Moist, brown SILT with fine sand, thinly laminated, scattered fine gravel dropstones, trace fine organic fragments (lacustrine grading down to overbank) (ML)  |  |
| 543   | 46           | TP TOC SC PS AL K<br>MC FC |                 |             | 46' to 47.5' - Moist, brown SAND; fine 46' - 47', fine to coarse 47' - 47.5', grades to medium with depth (SP)  |  |
| 542   | 47           |                            |                 |             |   |  |
| 541   | 48           | C14                        |                 |             | UPPER FLUVIAL AND LACUSTRINE DEPOSITS   |  |
| 540   | 49           |                            |                 |             | 47.5' to 48' - Moist, brown GRAVEL with sand; gravel fine to coarse, sand predominantly fine to medium, with cobbles (GW)   | C14 Age 35500 +/- 830 YBP                                  |
| 539   | 50           |                            |                 |             | 48' to 49' - Moist to very moist SILTY SAND; sand fine, thin to indistinct laminae, trace fine organic fragments (lacustrine to overbank deposits) (SM)   | Boring depth 49'<br>Casing depth 26'<br>Slough depth 47.8' |
| 538   | 51           |                            |                 |             | 49' to 50' - Slightly moist light brown to brown SILTY SAND with GRAVEL; sand fine to coarse, gravel fine to coarse, rusty, indistinct laminae, scattered cobbles (SM)  | No water after 30 minutes or after overnight wait          |
| 537   | 52           |                            |                 |             | 50' to 54' - Light brown to light gray GRAVEL with SILT and SAND; gravel subangular to rounded, sand fine to coarse, rusty mottling in silty zones, grades to moist at 53.5' (GW-GM)  |  |
| 536   | 53           |                            |                 |             |   |  |
| 535   | 54           |                            |                 |             |   |  |
| 534   | 55           |                            |                 |             | 54' to 56.5' - Moist, light brown to greenish-gray SILTY GRAVEL with SAND; gravel subrounded to rounded, sand fine to coarse, rusty mottling 55.5'-56.5', scattered dark gray silty (trace clay) zones; free water in some gravel pockets (pocket created from removing gravel clast from intact sample) (GM) |  |
| 533   | 56           |                            |                 |             |   |  |
| 532   | 57           |                            |                 |             | 56.5' to 58.3' - Slightly moist, light to olive-gray GRAVEL with SAND, few silt; gravel fine to coarse, sand fine to coarse (GW)  |  |
| 531   | 58           |                            |                 |             |   |  |
| 530   | 59           |                            |                 |             | 58.3' to 59' - Light brown and yellow-orange SAND with GRAVEL, trace silt; sand fine to coarse, gravel fine to coarse, cobble at 58.8' (SP)   |  |
| 529   |              |                            |                 |             | 59' to 59.8' - Light brown and yellow-orange GRAVEL with SAND (GW), trace silt; sand fine to coarse, gravel fine to coarse  |  |

Lab Tests: TP = Total Porosity      AL = Atterberg Limits      K = Hydraulic Conductivity      Logged by: SJS  
 EC = Specific Conductance (µmhos/cm @ 25° C)      EP = Effective Porosity      MC = Moisture Content      Approved by: EWM  
 ∇ Static water level at date and time indicated      TOC = Total Organic Carbon      FC = Field Capacity      Figure No.  
 SC = Soil Classification      PS = Particle Size      C14 = Radiocarbon Age Dating



# Geologic & Monitoring Well Constr

Project Number  
000031

Boring Number  
A6BH-2a

|                   |  |                    |         |
|-------------------|--|--------------------|---------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl) | 588.65  |
| Drilling Location | Northing -169700 Easting -1699205                | Start Date         | Febru   |
| Driller/Equipment | Boart-Longyear Rotary Sonic                      | Finish Date        | March   |
| Sample/Method     | Continuous Core - except as noted in Remarks     | Hole Diameter(s)   | 9" 0-57 |

| Elev. | Depth (feet) | Sample Testing       | Well Completion | Graphic Log | Classification and Physical Condition  | Water Le  |
|-------|--------------|----------------------|-----------------|-------------|--|---|
| 528   | 61           |                      |                 |             | 59.8' to 62.5' - Slightly moist light brown and yellow-orange to light gray GRAVEL with SILT and SAND; gravel fine to coarse, angular to subrounded; sand fine to coarse, scattered rust-mottled zones (GW-GM)   |   |
| 527   | 62           |                      |                 |             | 62.5' to 65.5' - Slightly moist light brown and yellow-orange to light gray SILTY GRAVEL with SAND; gravel fine to coarse, angular to subrounded; sand fine to coarse, scattered rust-mottled zones (GM)   |   |
| 526   | 63           |                      |                 |             | 65.5' to 66.3' - Slightly moist light brown and yellow-orange SAND with SILT and GRAVEL; sand fine to medium (marker bed); gravel fine to coarse (SP-SM)   |   |
| 525   | 64           |                      |                 |             | <b>UPPER HIGH-ENERGY FLUVIAL DEPOSITS</b>  |   |
| 524   | 65           | TP TOC SC PS K MC FC |                 |             | 66.3' to 70.5' - Light brown to light gray GRAVEL with SAND, trace silt; gravel fine to coarse subrounded to rounded; scattered cobbles and boulders (GW)  |   |
| 523   | 66           | TP TOC SC PS K MC FC |                 |             | 70.5' to 72.7' - Moist, light brown to light gray GRAVEL with CLAY and SAND, little silt; gravel subangular to subrounded, sand fine to coarse, gray silty, clayey zones 3-10 mm thick, numerous cobbles; 71.9' - 72.5' light gray silty medium to coarse sand, few clay (GW-GC) |   |
| 522   | 67           |                      |                 |             | 72.7' to 73.5' - Very moist to wet, light brown and yellow-orange SAND, trace silt, trace fine gravel; few fine silty sand laminae 6-10 mm thick (marker sand) (SP)  |   |
| 521   | 68           |                      |                 |             | 73.5' to 74.8' - Very moist SILTY SAND with GRAVEL; sand fine to coarse, gravel fine to coarse (SM)  |   |
| 520   | 69           |                      |                 |             | 74.8' to 75.6' - Very moist to wet, light brown and yellow-orange to light gray SAND, trace silt, trace fine to coarse gravel; sand fine to medium (SP)  |   |
| 519   | 70           |                      |                 |             | 75.6' to 77' - Olive gray GRAVEL with CLAY and SAND, little silt, scattered cobbles, matrix-supported, some organic material (GW-GC)   | C14 Ag  |
| 518   | 71           |                      |                 |             | 77' to 84.5' - Wet at contact, scattered zones very moist to wet; light brown to light gray SILTY GRAVEL with SAND; sand fine to medium; silt content decreases downward; rust-mottled cobbles increase to with at 80'; (GM)   |   |
| 517   | 72           |                      |                 |             |  | Borin<br>Casir<br>Slougl<br>No water at<br>after o                  |
| 516   | 73           | TP SC PS K MC FC     |                 |             |  |   |
| 515   | 74           |                      |                 |             |  |   |
| 514   | 75           |                      |                 |             |  |   |
| 513   | 76           |                      |                 |             |  |   |
| 512   | 77           | C14                  |                 |             |  |   |
| 511   | 78           |                      |                 |             |  | Elev:<br>7<br>2/2<br>EC-<br>Borin<br>Casir<br>Slougl<br>Estimated s |
| 510   | 79           |                      |                 |             |  |   |



# Geologic & Monitoring Well Construction Log

Project Number  
000031

Boring Number  
A6BH-2a

Sheet  
5 of 17

Project Name  
Cedar Hills Regional Landfill Area 6 Development

Elevation (ft msl)  
588.65

Drilling Location  
Northing -169700 Easting -1699205

Start Date  
February 15, 2002

Driller/Equipment  
Boart-Longyear Rotary Sonic

Finish Date  
March 6, 2002

Sample/Method  
Continuous Core - except as noted in Remarks

Hole Diameter(s)  
9" 0-57', 6" 57-294', 6" 294-334'

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition  | Water Levels/Remarks |
|-------|--------------|----------------|-----------------|-------------|--|----------------------|
| 508   | 81           |                |                 |             |  |                      |
| 507   | 82           |                |                 |             |  |                      |
| 506   | 83           |                |                 |             |  |                      |
| 505   | 84           |                |                 |             |  |                      |
| 504   | 85           |                |                 |             | 84.5' to 86.6' - Moist olive gray and light brown to light gray GRAVEL with SILT and SAND, trace clay; gravel fine to coarse, subangular to rounded, scattered gray silty clay zones, trace organic material, very moist to wet zones around gravel clasts (GW-GM) |                      |
| 503   | 86           |                |                 |             |  |                      |
| 502   | 87           |                |                 |             | 86.6' to 91.8' - Moist olive gray and light brown to light gray GRAVEL with SILT and SAND, with cobbles; gravel fine to coarse, moisture content increases to very moist at 88.5', then slightly moist 88.5' to 91.8' (GW-GM)                                      |                      |
| 501   | 88           |                |                 |             |  |                      |
| 500   | 89           |                |                 |             |  |                      |
| 499   | 90           |                |                 |             |  |                      |
| 498   | 91           |                |                 |             |  |                      |
| 497   | 92           |                |                 |             | 91.8' to 93.8' - Light brown and yellow-orange SAND, little fine to coarse gravel; sand fine to coarse, slightly moist (SP)  |                      |
| 496   | 93           |                |                 |             |  |                      |
| 495   | 94           |                |                 |             | 93.8' to 98.2' - Slightly moist to moist, olive gray and light brown to light gray GRAVEL with SAND, trace silt, with cobbles, scattered organics (GW)   |                      |
| 494   | 95           |                |                 |             |  |                      |
| 493   | 96           |                |                 |             |  |                      |
| 492   | 97           |                |                 |             |  |                      |
| 491   | 98           |                |                 |             |  |                      |
| 490   | 99           |                |                 |             | 98.2' to 98.6' - Slightly moist, light brown and yellow-orange SAND with GRAVEL; sand fine to coarse, gravel fine, scattered cobbles (SP)  |                      |
| 489   |              |                |                 |             | 98.6' to 100.8' - Slightly moist to moist, olive gray and light brown to light gray GRAVEL with SAND, trace silt, with cobbles,  |                      |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)

∇ Static water level at date and time indicated

TP = Total Porosity  
EP = Effective Porosity  
TOC = Total Organic Carbon  
SC = Soil Classification  
PS = Particle Size

AL = Atterberg Limits  
K = Hydraulic Conductivity  
MC = Moisture Content  
FC = Field Capacity  
C14 = Radiocarbon Age Dating

Logged by: SJS

Approved by: EWM

Figure No.





# Geologic & Monitoring Well Construction Log

Project Number  
000031

Boring Number  
A6BH-2a

Sheet  
6 of 17

|                   |  |                    |                             |
|-------------------|--|--------------------|-----------------------------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl) | 588.65                      |
| Drilling Location | Northing -169700 Easting -1699205                | Start Date         | February 15, 2002           |
| Driller/Equipment | Boart-Longyear Rotary Sonic                      | Finish Date        | March 6, 2002               |
| Sample/Method     | Continuous Core - except as noted in Remarks     | Hole Diameter(s)   | 9" 0-57', 8" 57-294', 6" 2' |

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition  | Water Levels/Remarks |
|-------|--------------|----------------|-----------------|-------------|--|----------------------|
| 488   | -101         |                |                 |             | scattered organics (GW)  |                      |
| 487   | -102         |                |                 |             | 100.8' to 103.3' - Brown and yellow-orange SAND with GRAVEL, trace to no silt; sand fine to coarse, gravel fine to coarse, sand becomes brown and drier at 101.5' (SP)   |                      |
| 485   | -104         |                |                 |             | 103.3' to 104' - Slightly moist, olive gray with little yellow-orange SAND, trace gravel; sand fine to medium, gravel fine angular to subangular (SP)  |                      |
| 484   | -105         |                |                 |             | 104' to 112' - Slightly moist, light brown to light gray and yellow-orange GRAVEL with SAND, trace to no silt, scattered to few cobbles; light orange to pink band at 104.4' to 104.8', silt content increases downward to 106.5', scattered thin (up to 10 mm) fine to coarse sand laminae (GW) |                      |
| 480   | -109         |                |                 |             | 108' to 109' - Marker sand   |                      |
| 476   | -113         |                |                 |             | 112' to 113.3' - Light brown and yellow-orange SAND, little gravel; sand fine to coarse, gravel fine to coarse (SP)  |                      |
| 474   | -115         |                |                 |             | 113.3' to 131' - Dry to slightly moist, light brown and yellow-orange to light gray GRAVEL with SAND, trace to no silt; gravel fine to coarse, subangular to subrounded, sand fine to coarse, scattered cobbles (GW)   |                      |
| 469   | -119         |                |                 |             | 119.5' to 121.3' - Sand content increases (clean marker sand,  |                      |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)

∇ Static water level at date and time indicated

TP = Total Porosity  
EP = Effective Porosity  
TOC = Total Organic Carbon  
SC = Soil Classification  
PS = Particle Size

AL = Atterberg Limits  
K = Hydraulic Conductivity  
MC = Moisture Content  
FC = Field Capacity  
C14 = Radiocarbon Age Dating

Logged by: SJS  
Approved by: EWM

Figure No.



### Geologic & Monitoring Well Construction Log

|                          |                          |                  |
|--------------------------|--------------------------|------------------|
| Project Number<br>000031 | Boring Number<br>A6BH-2a | Sheet<br>7 of 17 |
|--------------------------|--------------------------|------------------|

|  |   |
|--|---|
| Project Name<br>Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl)<br>588.65                          |
| Drilling Location<br>Northing -169700 Easting -1699205           | Start Date<br>February 15, 2002                       |
| Driller/Equipment<br>Boart-Longyear Rotary Sonic                 | Finish Date<br>March 6, 2002                          |
| Sample/Method<br>Continuous Core - except as noted in Remarks    | Hole Diameter(s)<br>9" 0-57', 8" 57-294', 6" 294-334' |

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks |
|-------|--------------|----------------|-----------------|-------------|---|----------------------|
| 468   | -121         |                |                 |             | light brown and yellow-orange fine to coarse, predominantly medium sand, trace to no silt)  |                      |
| 467   | -122         |                |                 |             | 121.3' - Marker sand  |                      |
| 466   | -123         |                |                 |             |   |                      |
| 465   | -124         |                |                 |             |   |                      |
| 464   | -125         |                |                 |             |   |                      |
| 463   | -126         |                |                 |             |   |                      |
| 462   | -127         |                |                 |             | 126.5' to 128.5' - Increase in gravel size, few cobbles, scattered beds clean light brown and yellow-orange to light gray sand up to 3" thick   |                      |
| 461   | -128         |                |                 |             |   |                      |
| 460   | -129         |                |                 |             |   |                      |
| 459   | -130         |                |                 |             | 129.9' to 130.8' - Increase in moisture to moist, iron oxide staining   |                      |
| 458   | -131         | MC             |                 |             |   |                      |
| 457   | -132         |                |                 |             | 131' to 132.3' - Slightly moist, light brown to light gray and yellow-orange SAND, little gravel, trace silt; sand fine to coarse, gravel fine to coarse, subangular to subrounded (SP) |                      |
| 456   | -133         |                |                 |             | 132.3' to 135.3' - Light brown to light gray GRAVEL with SAND, trace to no silt; gravel fine to coarse, angular to subrounded, sand fine to coarse (GW)                                 |                      |
| 455   | -134         |                |                 |             | 133.1' to 133.5' - Sand with gravel   |                      |
| 454   | -135         |                |                 |             |   |                      |
| 453   | -136         |                |                 |             | 135.3' to 142.7' - Light brown to light gray GRAVEL with SAND, trace silt; gravel fine to coarse, sand fine to coarse (GP)  |                      |
| 452   | -137         |                |                 |             |   |                      |
| 451   | -138         |                |                 |             |   |                      |
| 450   | -139         |                |                 |             | 139' to 140' - Increase in sand content   |                      |
| 449   |              |                |                 |             |   |                      |

|   |                              |                  |
|---|------------------------------|------------------|
| Lab Tests:                                      |                              | Logged by: SJS   |
| EC = Specific Conductance (µmhos/cm @ 25° C)    | TP = Total Porosity          | Approved by: EWM |
| ∇ Static water level at date and time indicated | EP = Effective Porosity      |                  |
|   | TOC = Total Organic Carbon   |                  |
|   | SC = Soil Classification     |                  |
|   | PS = Particle Size           |                  |
|   | AL = Atterberg Limits        |                  |
|   | K = Hydraulic Conductivity   |                  |
|   | MC = Moisture Content        |                  |
|   | FC = Field Capacity          |                  |
|   | C14 = Radiocarbon Age Dating | Figure No.       |



# Geologic & Monitoring Well Construction Log

Project Number  
000031

Boring Number  
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Sheet  
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|                   |  |                  |                    |                               |
|-------------------|--|------------------|--------------------|-------------------------------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development |                  | Elevation (ft msl) | 588.65                        |
| Drilling Location | Northing -169700                                 | Easting -1699205 | Start Date         | February 15, 2002             |
| Driller/Equipment | Boart-Longyear Rotary Sonic                      |                  | Finish Date        | March 6, 2002                 |
| Sample/Method     | Continuous Core - except as noted in Remarks     |                  | Hole Diameter(s)   | 9" 0-57", 8" 57-294", 6" 294- |

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition  | Water Levels/Remarks |
|-------|--------------|----------------|-----------------|-------------|--|----------------------|
| 448   | -141         |                |                 |             |  |                      |
| 447   | -142         |                |                 |             |  |                      |
| 446   | -143         |                |                 |             | 142.7' to 143.6' - Slightly moist, light brown to light gray and yellow-orange SAND, trace to no silt, trace to few gravel; sand fine to coarse (SP) |                      |
| 445   | -144         |                |                 |             | 143.6' to 144.6' - Light brown to light gray GRAVEL with SILT and SAND, scattered cobbles; gravel fine to coarse, sand fine to coarse (GP-GM)        |                      |
| 444   | -145         |                |                 |             | 144.6' to 158.3' - Slightly moist GRAVEL with SAND, few cobbles (GW)   |                      |
| 443   | -146         |                |                 |             |  |                      |
| 442   | -147         |                |                 |             | 146.2' to 147.3' - Cobbles decrease to none  |                      |
| 441   | -148         |                |                 |             | 147.3' to 149.6' - Gravel size increases and cobbles become more numerous  |                      |
| 440   | -149         |                |                 |             | 148' to 149' - Some intact till-like fragments show very weathered gravel clasts and rusty mottling  |                      |
| 439   | -150         |                |                 |             | 149.6' to 150.5' - Gravel smaller, higher sand content   |                      |
| 438   | -151         |                |                 |             |  |                      |
| 437   | -152         |                |                 |             |  |                      |
| 436   | -153         |                |                 |             |  |                      |
| 435   | -154         |                |                 |             |  |                      |
| 434   | -155         |                |                 |             |  |                      |
| 433   | -156         |                |                 |             |  |                      |
| 432   | -157         |                |                 |             | 156.5' to 158.3' - Few to with cobbles   |                      |
| 431   | -158         |                |                 |             | 157' to 158' - Gravel slightly larger, weathered, iron oxide-stained clasts  |                      |
| 430   | -159         | SC PS MC       |                 |             | 158.3' to 160.5' - Slightly moist to moist, light gray to light brown and yellow-orange SAND with SILT; sand fine to medium (SP-SM)                  |                      |
| 429   |              |                |                 |             | 158.3' to 159' - Intact dense fragments show distinct bedding,   |                      |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)  
 ▽ Static water level at date and time indicated

TP = Total Porosity  
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Logged by: SJS  
 Approved by: EWM  
 Figure No.



# Geologic & Monitoring Well Construction Log

Project Number  
000031

Boring Number  
A6BH-2a

Sheet  
9 of 17

|                   |  |                    |                                   |
|-------------------|--|--------------------|-----------------------------------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl) | 588.65                            |
| Drilling Location | Northing -169700 Easting -1699205                | Start Date         | February 15, 2002                 |
| Driller/Equipment | Bpart-Longyear Rotary Sonic                      | Finish Date        | March 6, 2002                     |
| Sample/Method     | Continuous Core - except as noted in Remarks     | Hole Diameter(s)   | 9" 0-57', 8" 57-294', 6" 294-334' |

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks |
|-------|--------------|----------------|-----------------|-------------|---|----------------------|
| 428   | -161         |                |                 |             | slightly inclined and cross-bedded  |                      |
| 427   | -162         |                |                 |             | 160.5' to 162.8' - Slightly moist to moist GRAVEL with SAND (GW)  |                      |
| 426   | -163         |                |                 |             | 162.8' to 164.7' - Light brown to light gray and yellow-orange SAND, trace silt, little gravel; sand fine to medium, predominantly fine; gravel fine to coarse, predominantly fine (SP)   |                      |
| 425   | -164         |                |                 |             |   |                      |
| 424   | -165         |                |                 |             | 164.7' to 170.8' - Light brown to light gray GRAVEL with SAND, trace silt; gravel fine to coarse, predominantly fine to 165.6', then fine to coarse with few cobbles (GW)   |                      |
| 423   | -166         |                |                 |             |   |                      |
| 422   | -167         |                |                 |             |   |                      |
| 421   | -168         |                |                 |             | 168' to 170' - Increase in silt content, some intact but friable till-like fragments show rusty, indistinct bedding   |                      |
| 420   | -169         |                |                 |             |   |                      |
| 419   | -170         |                |                 |             |   |                      |
| 418   | -171         |                |                 |             | 170.8' to 171.4' - Slightly moist to moist light brown to light gray SAND with GRAVEL, trace silt; sand fine to coarse, predominantly medium to coarse, angular to subrounded, predominantly mafic, <5% quartz, some k-feldspar, metamorphic clasts, iron oxide-stained and weathered feldspar, epidote, gravel fine to coarse, predominantly fine (SP) |                      |
| 417   | -172         |                |                 |             | 171.4' to 187' - Slightly moist, light brown to light gray GRAVEL with SILT and SAND; gravel fine to coarse, scattered cobbles, subangular to subrounded, predominantly mafic, sand fine to coarse; pink color and coating 172.2' as an indistinct 0.4' layer (GW-GM)   |                      |
| 416   | -173         |                |                 |             |   |                      |
| 415   | -174         |                |                 |             |   |                      |
| 414   | -175         |                |                 |             | 175.5' to 177' - Cobbles increase to with, scattered rusty zones  |                      |
| 413   | -176         |                |                 |             |   |                      |
| 412   | -177         |                |                 |             |   |                      |
| 411   | -178         | SC PS MC       |                 |             |   |                      |
| 410   | -179         |                |                 |             |   |                      |
| 409   |              |                |                 |             |   |                      |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)

∇ Static water level at date and time indicated

TP = Total Porosity  
EP = Effective Porosity  
TOC = Total Organic Carbon  
SC = Soil Classification  
PS = Particle Size

AL = Atterberg Limits  
K = Hydraulic Conductivity  
MC = Moisture Content  
FC = Field Capacity  
C14 = Radiocarbon Age Dating

Logged by: SJS

Approved by: EWM

Figure No.



# Geologic & Monitoring Well Construction Log

Project Number 000031 Boring Number A6BH-2a Sheet 10 of 17

Project Name Cedar Hills Regional Landfill Area 6 Development Elevation (ft msl) 588.65  
 Drilling Location Northing -169700 Easting -1699205 Start Date February 15, 2002  
 Driller/Equipment Boart-Longyear Rotary Sonic Finish Date March 6, 2002  
 Sample/Method Continuous Core - except as noted in Remarks Hole Diameter(s) 9" 0-57', 8" 57'-294', 6" 294'-

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks |
|-------|--------------|----------------|-----------------|-------------|---|----------------------|
| 408   | -181         |                |                 |             | 180.5' - Large gravel and cobbles predominate to 180.5'; silt content decreases   |                      |
| 407   | -182         |                |                 |             | 181' to 184.5' - Uniform distribution (few to with) of cobbles  |                      |
| 406   | -183         |                |                 |             | 180.5' - 184.6'; some subangular; some large gravels coated with fine sand and trace to few silt, rusty; few very weathered, rusty, coarse gravel   |                      |
| 405   | -184         |                |                 |             |   |                      |
| 404   | -185         |                |                 |             | 184.5' to 187' - Gravel smaller, no cobbles   |                      |
| 403   | -186         |                |                 |             | 184.6' to 186' - 184.6' Cobbles decrease to scattered; 185' to 186' - rusty coating more evident  |                      |
| 402   | -187         |                |                 |             | 186.3' - Trace organics (soft, black material on gravel); some intact "baked" fragments show laminations, iron oxide-stained, alternating white and gray without distinct pattern; slightly moist   |                      |
| 401   | -188         |                |                 |             | 187' to 194.1' - Slightly moist to moist, light brown to light gray with yellow-orange SAND with SILT, trace gravel; sand fine to coarse, predominantly fine, gravel fine to coarse, predominantly fine; very weakly bedded, 90% quartz and feldspar, predominantly quartz, some epidote (SP-SM)              |                      |
| 399   | -190         |                |                 |             |   |                      |
| 398   | -191         |                |                 |             |   |                      |
| 397   | -192         |                |                 |             | 191.4' to 193.5' - Gravel content increases   |                      |
| 396   | -193         |                |                 |             |   |                      |
| 395   | -194         |                |                 |             | 193.5' to 194.1' - More coarse gravel, coarse sand  |                      |
| 394   | -195         |                |                 |             | 194.1' to 196.9' - Moist SAND with GRAVEL, sand fine to coarse, predominantly fine, gravel fine to coarse, predominantly fine, very weakly bedded (SP)  |                      |
| 393   | -196         |                |                 |             |   |                      |
| 392   | -197         |                |                 |             |   |                      |
| 391   | -198         |                |                 |             | 196.9' to 204.8' - Moist, light brown to light gray and yellow-orange SAND, trace silt, trace to few gravel; sand fine to coarse, predominantly fine to medium, quartz and feldspar (mafic sand appears as black speckling in undisturbed sample), gravel fine to coarse, predominantly fine, subrounded (SP) |                      |
| 390   | -199         |                |                 |             |   |                      |
| 389   | -199         |                |                 |             | 199.5' to 204.5' - Gravel to trace, predominantly fine  |                      |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)

Static water level at date and time indicated

TP = Total Porosity  
 EP = Effective Porosity  
 TOC = Total Organic Carbon  
 SC = Soil Classification  
 PS = Particle Size

AL = Atterberg Limits  
 K = Hydraulic Conductivity  
 MC = Moisture Content  
 FC = Field Capacity  
 C14 = Radiocarbon Age Dating

Logged by: SJS

Approved by: EWM

Figure No.



# Geologic & Monitoring Well Construction Log

Project Number  
000031

Boring Number  
A6BH-2a

Sheet  
11 of 17

|                   |  |                    |                                   |
|-------------------|--|--------------------|-----------------------------------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl) | 588.55                            |
| Drilling Location | Northing -169700 Easting -1699205                | Start Date         | February 15, 2002                 |
| Driller/Equipment | Boart-Longyear Rotary Sonic                      | Finish Date        | March 6, 2002                     |
| Sample/Method     | Continuous Core - except as noted in Remarks     | Hole Diameter(s)   | 9" 0-57', 8" 57-294', 6" 294-334' |

| Elev. | Depth (feet) | Sample Testing                 | Well Completion | Graphic Log | Classification and Physical Condition  | Water Levels/Remarks  |
|-------|--------------|--------------------------------|-----------------|-------------|--|---|
| 388   | -201         |                                |                 |             |  |   |
| 387   | -202         |                                |                 |             | 202' to 203' - Scattered orange (iron oxide-stained) zones   |   |
| 386   | -203         |                                |                 |             |  |   |
| 385   | -204         |                                |                 |             |  |   |
| 384   | -205         |                                |                 |             | 204.5' - Abrupt color change to light gray (95% quartz) clean fine to medium sand  |   |
| 383   | -206         | MC                             |                 |             | 204.8' to 205.4' - Moist to very moist, light brown to light gray and yellow-orange, iron oxide-stained SAND with GRAVEL, trace to no silt; sand fine to coarse, gravel fine to coarse, predominantly fine (SW)  |   |
| 382   | -207         |                                |                 |             | 205.4' to 206.5' - Very moist to wet SAND, trace silt, trace gravel; sand fine to coarse, predominantly fine to medium; silt iron oxide-stained; gravel fine to coarse, predominantly fine (SP)  |   |
| 381   | -208         |                                |                 |             | <b>FLUVIAL AND LACUSTRINE DEPOSITS</b>   |   |
| 380   | -209         | TP TOC SC PS AL K<br>MC<br>C14 |                 |             | 206.5' to 211.6' - Moist to very moist, light olive gray SILT; trace clay, trace sand, trace gravel; sand very fine; thin (<1 to 3 mm) light brown laminae (ML) 390 SILT   | C14 Age >46600 YBP  |
| 379   | -210         |                                |                 |             | 208.4' - Gray with fresh wood fragments and scattered dark brown organic (peat-like) zones and root casts; dark brown flat wood fragments; some large wood pieces  | Boring depth 210'<br>Casing depth 196'<br>Slough depth 209.7' |
| 378   | -211         |                                |                 |             | 209.5' - Moist, organics and laminae become less numerous; laminae evident but less distinct (sample "blocky")   | No water after overnight wait                                 |
| 377   | -212         |                                |                 |             | 211.0' to 211.4' - Light gray silty fine sand  |   |
| 376   | -213         |                                |                 |             | 211.6 to 225' - Slightly moist, light brown, iron oxide-stained GRAVEL with SAND interbedded with SAND with GRAVEL, trace to few silt; sand fine to coarse, predominantly fine to medium; gravel fine to coarse, predominantly fine, subangular to subrounded; intact core shows bedding ranging from fine (4mm to 5mm) laminae to very indistinct layering, some very weathered gravels (GP-SP) |   |
| 375   | -214         |                                |                 |             |  |   |
| 374   | -215         |                                |                 |             |  |   |
| 373   | -216         | SC PS MC                       |                 |             |  |   |
| 372   | -217         |                                |                 |             |  |   |
| 371   | -218         |                                |                 |             |  |   |
| 370   | -219         |                                |                 |             |  |   |
| 369   |              |                                |                 |             |  |   |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)

∇ Static water level at date and time indicated

TP = Total Porosity  
EP = Effective Porosity  
TOC = Total Organic Carbon  
SC = Soil Classification  
PS = Particle Size

AL = Atterberg Limits  
K = Hydraulic Conductivity  
MC = Moisture Content  
FC = Field Capacity  
C14 = Radiocarbon Age Dating

Logged by: SJS  
Approved by: EWM

Figure No.



# Geologic & Monitoring Well Construction Log

|                          |                          |                   |
|--------------------------|--------------------------|-------------------|
| Project Number<br>000031 | Boring Number<br>A6BH-2a | Sheet<br>12 of 17 |
|--------------------------|--------------------------|-------------------|

|  |   |
|--|---|
| Project Name<br>Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl)<br>588.65                    |
| Drilling Location<br>Northing -169700      Easting -1699205      | Start Date<br>February 15, 2002                 |
| Driller/Equipment<br>Boart-Longyear Rotary Sonic                 | Finish Date<br>March 6, 2002                    |
| Sample/Method<br>Continuous Core - except as noted in Remarks    | Hole Diameter(s)<br>9" 0-57', 8" 57-294', 6" 2' |

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks        |
|-------|--------------|----------------|-----------------|-------------|---|-----------------------------|
| 368   | -221         |                |                 |             | 220' to 225' - Sand with gravel, gravel iron oxide-stained and partially cemented with iron oxide-stained fine to medium silty sand; uniform color, including iron oxide-staining   |                             |
| 367   | -222         |                |                 |             | 221.0' to 221.8' - Gravels predominantly mafic  |                             |
| 366   | -223         |                |                 |             |   |                             |
| 365   | -224         |                |                 |             |   |                             |
| 364   | -225         |                |                 |             |   |                             |
| 363   | -226         |                |                 |             | 225' to 231.9' - Slightly moist to moist, yellow-orange SAND with SILT, trace gravel; sand clean, fine to coarse, predominantly fine to medium, weakly-bedded (thin, indistinct dark brown layers), gravel fine; scattered organics (dark brown peat-like material) (SM)                  |                             |
| 362   | -227         |                |                 |             |   |                             |
| 361   | -228         | SC PS MC       |                 |             |   |                             |
| 360   | -229         |                |                 |             |   |                             |
| 359   | -230         |                |                 |             | 229.1' - Grades to predominantly fine sand, no gravel, slightly lighter in color, intact sample shows fine laminae, alternating light (quartz-rich) and dark, sub-parallel, cross-bedded  |                             |
| 358   | -231         |                |                 |             |   |                             |
| 357   | -232         |                |                 |             |   |                             |
| 356   | -233         |                |                 |             | 231.9' to 235.6' - Light brown SILT, trace fine sand (ML) 350 SILT  | 84% recovery<br>230' - 235' |
| 355   | -234         |                |                 |             | 233.3' - Grades to slightly moist, light brown to yellow-orange silt, finely laminated, trace to no fine sand (more cohesive); iron oxide-stained laminae; trace to no organics (as laminae)  |                             |
| 354   | -235         | SC PS AL MC    |                 |             |   |                             |
| 353   | -236         |                |                 |             | 235.6' to 237.5' - Slightly moist, light gray to yellow-orange SAND; sand fine; 95% quartz (reworked ash?) (SP)   |                             |
| 352   | -237         |                |                 |             |   | 60% recovery<br>235' - 239' |
| 351   | -238         |                |                 |             | 237.5' to 237.9' - Silty fine SAND, with dark brown silty organic lamina 7 mm thick   |                             |
| 350   | -239         |                |                 |             | 237.9' to 258.4' - Light brown to yellow-orange SAND with SILT; sand fine; indistinct bedding (zones of iron oxide-staining 1-2 cm thick); intact "baked" samples show thin (up to 2 mm) laminae (white to light gray and dark brown alternating with light brown); rare organics (SP-SM) |                             |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)

∇ Static water level at date and time indicated

TP = Total Porosity  
EP = Effective Porosity  
TOC = Total Organic Carbon  
SC = Soil Classification  
PS = Particle Size

AL = Atterberg Limits  
K = Hydraulic Conductivity  
MC = Moisture Content  
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C14 = Radiocarbon Age Dating

Logged by: SJS

Approved by: EWM


Figure No.



# Geologic & Monitoring Well Construction Log

|                          |                          |                   |
|--------------------------|--------------------------|-------------------|
| Project Number<br>000031 | Boring Number<br>A6BH-2a | Sheet<br>13 of 17 |
|--------------------------|--------------------------|-------------------|

|  |   |
|--|---|
| Project Name<br>Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl)<br>588.65                          |
| Drilling Location<br>Northing -169700 Easting -1699205           | Start Date<br>February 15, 2002                       |
| Driller/Equipment<br>Boart-Longyear Rotary Sonic                 | Finish Date<br>March 6, 2002                          |
| Sample/Method<br>Continuous Core - except as noted in Remarks    | Hole Diameter(s)<br>9" 0-57', 8" 57-294', 6" 294-334' |

| Elev. | Depth (feet) | Sample Testing             | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks  |
|-------|--------------|----------------------------|-----------------|-------------|---|---|
| 348   | -241         |                            |                 |             | Indistinct iron oxide-stained zones (layers) 5 - 10 mm thick, scattered   | 92% recovery<br>239' - 243'   |
| 347   | -242         |                            |                 |             | 238.8' to 254.2' - Gray sandy silt layers 5 - 15 mm thick   |   |
| 346   | -243         |                            |                 |             |   |   |
| 345   | -244         |                            |                 |             |   |   |
| 344   | -245         |                            |                 |             |   |   |
| 343   | -246         |                            |                 |             |   |   |
| 342   | -247         |                            |                 |             |   |   |
| 341   | -248         |                            |                 |             |   |   |
| 340   | -249         |                            |                 |             | 248.3' to 249.0' - Gray sandy silt layers 0.5 to 3 cm thick, some dark brown organics, thinly laminated, indistinct   |   |
| 339   | -250         |                            |                 |             |   |   |
| 338   | -251         |                            |                 |             |   |   |
| 337   | -252         |                            |                 |             | 251.9' to 252.9' - Grades to fine to medium sand, predominantly fine  |   |
| 336   | -253         |                            |                 |             | 252.9' - Sand fine (abrupt change)  |   |
| 335   | -254         |                            |                 |             | 253' - Sand becomes more intact (corresponds with slight increase in moisture to moist)   |   |
| 334   | -255         |                            |                 |             | 254.2' to 255.1' - Sand grades fine to medium, wet  | <br>Elevation 334.5<br>254.2' bgs<br>2/28/02 14:05<br>EC-250 pH-7.7<br>Boring depth 260'<br>Casing depth 246'<br>Slough depth 255.1'<br>Estimated saturated thickness 4.3' |
| 333   | -256         |                            |                 |             | 255.1' to 256.1' - Sand fine to medium, predominantly fine  |   |
| 332   | -257         | TP EP TOC SC PS K<br>MC FC |                 |             | 256.2' to 257.6' - Sand fine to medium  |   |
| 331   | -258         |                            |                 |             | 257.6' to 258.4' - Sand fine, iron oxide-stained (color change to light reddish brown to yellow-orange); interbeds of fine to coarse, predominantly medium, sand, trace to few silt, trace fine gravel, iron oxide-stained, gray sandy silt layers 2 - 8 mm thick |   |
| 330   | -259         | TP TOC SC PS AL K<br>MC FC |                 |             | 258.4' to 260.4' - Slightly moist to moist, wet at contact, gray SILT with SAND to SILT with SAND and CLAY; sand fine; massive (ML) 330 SILT  |   |
| 329   |              |                            |                 |             |   |   |

Lab Tests:

|   |                            |                              |
|---|----------------------------|------------------------------|
| EC = Specific Conductance (µmhos/cm @ 25° C)    | TP = Total Porosity        | AL = Atterberg Limits        |
| ▽ Static water level at date and time indicated | EP = Effective Porosity    | K = Hydraulic Conductivity   |
|   | TOC = Total Organic Carbon | MC = Moisture Content        |
|   | SC = Soil Classification   | FC = Field Capacity          |
|   | PS = Particle Size         | C14 = Radiocarbon Age Dating |

Logged by: SJS  
Approved by: EWM

Figure No.





# Geologic & Monitoring Well Construction Log

Project Number: 000031      Boring Number: A6BH-2a      Sheet: 14 of 17

Project Name: Cedar Hills Regional Landfill Area 6 Development      Elevation (ft msl): 588.65  
 Drilling Location: Northing -169700      Easting -1699205      Start Date: February 15, 2002  
 Driller/Equipment: Boart-Longyear Rotary Sonic      Finish Date: March 6, 2002  
 Sample/Method: Continuous Core - except as noted in Remarks      Hole Diameter(s): 9" 0-57', 8" 57-294', 6" 294'-309'

| Elev. | Depth (feet) | Sample Testing                              | Well Completion | Graphic Log | Classification and Physical Condition  | Water Levels/Remarks              |
|-------|--------------|---|-----------------|-------------|--|-----------------------------------|
| 328   | -261         | SC PS MC FC                                 |                 |             | 260.4' to 263' - Moist, light olive gray SILTY SAND; sand fine to medium, predominantly fine, subangular to subrounded, 70% quartz, 25% mafic ( mafic grains predominantly sub-angular), 5% other, including green "pistachio" - colored grains (epidote?); silt mostly as gray silty interbeds 2 - 10 cm thick; flat dark brown wood fragments (SM)           | 53% - 83% recovery<br>263' - 271' |
| 327   | -262         |   |                 |             |  |                                   |
| 326   | -263         |   |                 |             |  |                                   |
| 325   | -264         |   |                 |             |  |                                   |
| 324   | -265         | TP TOC SC PS K MC                           |                 |             | 263' to 285.3' - Moist, light gray to light olive-gray SAND with SILT, trace gravel; sand fine to medium; gravel fine, angular to subrounded; grades to trace silt, few fine to coarse gravel 269.6' (predominantly fine); generally fines upward to 263'; gravels predominantly mafic (predominantly basalt) and sub-angular to rounded 263' - 269.6' (SP-SM) | 70% recovery<br>266' - 268'       |
| 323   | -266         |   |                 |             |  |                                   |
| 322   | -267         |   |                 |             |  |                                   |
| 321   | -268         |   |                 |             |  |                                   |
| 320   | -269         |   |                 |             |  |                                   |
| 319   | -270         |   |                 |             |  |                                   |
| 318   | -271         |   |                 |             |  |                                   |
| 317   | -272         |   |                 |             |  |                                   |
| 316   | -273         |   |                 |             |  |                                   |
| 315   | -274         |   |                 |             |  |                                   |
| 314   | -275         | 13% recovery<br>275' - 277'                 |                 |             |  |                                   |
| 313   | -276         |   |                 |             |  |                                   |
| 312   | -277         |   |                 |             |  |                                   |
| 311   | -278         |   |                 |             |  |                                   |
| 310   | -279         | 279.5' to 280.0' - Trace to few fine gravel |                 |             |  |                                   |
| 309   | -280         |   |                 |             |  |                                   |

Lab Tests: EC = Specific Conductance (µmhos/cm @ 25° C)      TP = Total Porosity      AL = Atterberg Limits  
 TOC = Total Organic Carbon      EP = Effective Porosity      K = Hydraulic Conductivity  
 SC = Soil Classification      TOC = Total Organic Carbon      MC = Moisture Content  
 PS = Particle Size      FC = Field Capacity  
 C14 = Radiocarbon Age Dating

Static water level at date and time indicated      Logged by: SJS      Approved by: EWM

Figure No.



# Geologic & Monitoring Well Construction Log

Project Number  
000031

Boring Number  
A6BH-2a

Sheet  
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|                   |  |                    |                                   |
|-------------------|--|--------------------|-----------------------------------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development | Elevation (ft msl) | 588.65                            |
| Drilling Location | Northing -169700 Easting -1699205                | Start Date         | February 15, 2002                 |
| Driller/Equipment | Boart-Longyear Rotary Sonic                      | Finish Date        | March 6, 2002                     |
| Sample/Method     | Continuous Core - except as noted in Remarks     | Hole Diameter(s)   | 9" 0-57', 8" 57-294', 6" 294-334' |

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition   | Water Levels/Remarks              |
|-------|--------------|----------------|-----------------|-------------|---|-----------------------------------|
| 308   | -281         |                |                 |             | 280.0' to 285.3' - Sand predominantly fine  |                                   |
| 307   | -282         |                |                 |             |   |                                   |
| 306   | -283         |                |                 |             |   |                                   |
| 305   | -284         |                |                 |             |   |                                   |
| 304   | -285         |                |                 |             |   |                                   |
| 303   | -286         |                |                 |             | LOWER HIGH-ENERGY FLUVIAL DEPOSITS  |                                   |
| 302   | -287         | SC PS MC       |                 |             | 285.3' to 288.8' - Light to olive-gray GRAVEL with SAND, trace silt; gravel fine to coarse, subrounded to rounded, predominantly mafic; sand fine to coarse, predominantly fine to medium, 70% quartz (GP)      |                                   |
| 301   | -288         |                |                 |             |   |                                   |
| 300   | -289         |                |                 |             | 288.8' to 289.9' - SAND, trace silt, trace gravel; sand fine to medium, predominantly fine; gravel fine, rare wood fragments (SP)   |                                   |
| 299   | -290         |                |                 |             |   |                                   |
| 298   | -291         |                |                 |             | 289.9' to 299.3' - GRAVEL with SAND, to GRAVEL with SILT and SAND; gravel fine to coarse, subangular to rounded; sand fine to coarse; indistinct sand with silt and gravel layers, some with trace clay (GW-GM) |                                   |
| 297   | -292         |                |                 |             |   | 92% - 96% recovery<br>286' - 300' |
| 296   | -293         |                |                 |             |   |                                   |
| 295   | -294         |                |                 |             |   |                                   |
| 294   | -295         |                |                 |             |   |                                   |
| 293   | -296         |                |                 |             |   |                                   |
| 292   | -297         |                |                 |             |   |                                   |
| 291   | -298         |                |                 |             |   |                                   |
| 290   | -299         |                |                 |             |   |                                   |
| 289   | -300         |                |                 |             | 299.3' to 300.5' - SAND, trace silt, trace gravel; sand fine to medium; gravel fine (SP)  |                                   |

Lab Tests:

|   |                            |                              |                  |
|---|----------------------------|------------------------------|------------------|
| EC = Specific Conductance (µmhos/cm @ 25° C)  | TP = Total Porosity        | AL = Atterberg Limits        | Logged by: SJS   |
| Static water level at date and time indicated | EP = Effective Porosity    | K = Hydraulic Conductivity   | Approved by: EWM |
|   | TOC = Total Organic Carbon | MC = Moisture Content        |                  |
|   | SC = Soil Classification   | FC = Field Capacity          |                  |
|   | PS = Particle Size         | C14 = Radiocarbon Age Dating | Figure No.       |



# Geologic & Monitoring Well Construction Log

Project Number: 000031  
 Boring Number: A6BH-2a  
 Sheet: 16 of 17

Project Name: Cedar Hills Regional Landfill Area 6 Development  
 Drilling Location: Northing -169700 Easting -1699205  
 Driller/Equipment: Boart-Longyear Rotary Sonic  
 Sample/Method: Continuous Core - except as noted in Remarks  
 Elevation (ft msl): 588.65  
 Start Date: February 15, 2002  
 Finish Date: March 6, 2002  
 Hole Diameter(s): 9" 0-57', 8" 57-294', 6" 294'-...

| Elev. | Depth (feet) | Sample Testing | Well Completion | Graphic Log | Classification and Physical Condition  | Water Levels/Remarks              |
|-------|--------------|----------------|-----------------|-------------|--|-----------------------------------|
| 288   | -301         |                |                 |             | 300.5' to 312' - Light gray and olive gray GRAVEL with SAND, to GRAVEL with SILT and SAND; gravel fine to coarse, subangular to rounded; sand fine to coarse (GW-GM)   |                                   |
| 287   | -302         |                |                 |             |  |                                   |
| 286   | -303         |                |                 |             | 302.9' - Abrupt color change to light olive-gray to light brown and yellow-orange, gravels angular to rounded, many iron oxide-stained, sand fine to coarse, iron oxide-stained grains, mafics dominate larger grain sizes, indistinct lenses 1 - 5 cm thick of olive-gray sandy silt, trace clay, gravels become silt-bounded at color change |                                   |
| 285   | -304         |                |                 |             |  |                                   |
| 284   | -305         |                |                 |             |  |                                   |
| 283   | -306         |                |                 |             |  |                                   |
| 282   | -307         |                |                 |             | 306.3' to 307' - Light to olive-gray   |                                   |
| 281   | -308         |                |                 |             |  |                                   |
| 280   | -309         |                |                 |             | 308.2' to 308.8' - Sand fine to medium, predominantly fine, trace silt, trace to few gravel<br>308.8' to 309.4' - Increase in iron oxide staining  |                                   |
| 279   | -310         |                |                 |             | 309.4' to 312' - Light to olive-gray, distinct, thin (3 - 10 mm) laminae of silt with sand, few clay, scattered organics and iron oxide staining   | 79% - 94% recovery<br>302' - 317' |
| 278   | -311         |                |                 |             |  |                                   |
| 277   | -312         |                |                 |             |  |                                   |
| 276   | -313         |                |                 |             | 312' to 313.5' - Light to olive gray GRAVEL with SAND, trace silt; gravel predominantly fine; sand fine to coarse (GP)   |                                   |
| 275   | -314         |                |                 |             | 313.5' to 316.1' - Light to olive gray GRAVEL with SAND, to GRAVEL with SILT and SAND; gravel predominantly fine; sand fine to coarse (GW-GM)  |                                   |
| 274   | -315         |                |                 |             |  |                                   |
| 273   | -316         |                |                 |             |  |                                   |
| 272   | -317         |                |                 |             | 316.1' to 317.6' - Light to olive-gray SAND with SILT, sand fine to medium, predominantly fine (SP-SM)   |                                   |
| 271   | -318         |                |                 |             | 317.6' to 318.8' - Light to olive-gray GRAVEL with SAND, to GRAVEL with SAND and SILT; gravel fine to coarse; sand fine to coarse; silty sand laminae 5 - 6 mm thick (GW-GM)   |                                   |
| 270   | -319         |                |                 |             | 318.8' to 319.7' - SAND, trace silt; sand fine to medium (SP)  |                                   |
| 269   |              |                |                 |             |  |                                   |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)

∇ Static water level at date and time indicated

TP = Total Porosity  
 EP = Effective Porosity  
 TOC = Total Organic Carbon  
 SC = Soil Classification  
 PS = Particle Size

AL = Atterberg Limits  
 K = Hydraulic Conductivity  
 MC = Moisture Content  
 FC = Field Capacity  
 C14 = Radiocarbon Age Dating

Logged by: SJS

Approved by: EWM

Figure No.



# Geologic & Monitoring Well Construction Log

Project Number  
000031

Boring Number  
A6BH-2a

Sheet  
17 of 17

|                   |  |                  |                    |                                   |
|-------------------|--|------------------|--------------------|-----------------------------------|
| Project Name      | Cedar Hills Regional Landfill Area 6 Development |                  | Elevation (ft msl) | 588.65                            |
| Drilling Location | Northing -169700                                 | Easting -1699205 | Start Date         | February 15, 2002                 |
| Driller/Equipment | Boart-Longyear Rotary Sonic                      |                  | Finish Date        | March 6, 2002                     |
| Sample/Method     | Continuous Core - except as noted in Remarks     |                  | Hole Diameter(s)   | 9" 0-57', 8" 57-294', 6" 294-334' |

| Elev. | Depth (feet) | Sample Testing       | Well Completion | Graphic Log | Classification and Physical Condition  | Water Levels/Remarks        |
|-------|--------------|----------------------|-----------------|-------------|--|-----------------------------|
| 268   | -321         |                      |                 |             | 319.7' to 324' - Light to olive-gray GRAVEL with SAND, to GRAVEL with SILT and SAND; gravel fine to coarse; sand fine to coarse; grades siltier with depth (GW-GM)   |                             |
| 267   | -322         |                      |                 |             |  |                             |
| 266   | -323         |                      |                 |             |  |                             |
| 265   | -324         |                      |                 |             |  | 70% recovery<br>322' - 324' |
| 264   | -325         |                      |                 |             | 324' to 328.1' - Wet, light olive-gray SILTY GRAVEL with SAND, few clay; gravel fine to coarse, subangular to subrounded, predominantly mafic, silt-coated; sand fine to coarse, silty; scattered, indistinct beds 1- 5 cm thick of clayey silt with fine gravel and sand (GM)   |                             |
| 263   | -326         | TP TOC SC PS K MC    |                 |             |  |                             |
| 262   | -327         |                      |                 |             |  |                             |
| 261   | -328         |                      |                 |             |  |                             |
| 260   | -329         |                      |                 |             | <b>REGIONAL AQUIFER BASAL AQUITARD</b>   |                             |
| 259   | -330         |                      |                 |             | 328.1' to 334' - Very moist to wet, light gray to olive-gray SILT with CLAY, trace sand; abundant dark brown woody organic material; sand fine; very faint laminae; distinct beds of fine and fine to medium silty sand 1 - 10 cm thick; sand exhibits some very fine laminae; scattered decayed roots 1 - 3 mm diameter, diminish in number downward (most organic material near top of silt); sand content and size increases upward; scattered iron oxide-stained zones 1 - 3 mm in diameter, some may be root casts (ML) | C14 Age >46880 YBP          |
| 258   | -331         | TP TOC SC PS AL K MC |                 |             |  |                             |
| 257   | -332         |                      |                 |             |  |                             |
| 256   | -333         |                      |                 |             |  |                             |
| 255   | -334         |                      |                 |             | 333' - Moisture content decreases to moist   |                             |
| 254   | -335         |                      |                 |             |  | Bottom of boring 334'       |
| 253   | -336         |                      |                 |             | 335' to 336' - Decommissioned boring with bentonite grout (minimum 20% solids by weight) 95 to 334 feet and hydrated bentonite chips from grade to 95 feet   |                             |
| 252   | -337         |                      |                 |             |  |                             |
| 251   | -338         |                      |                 |             |  |                             |
| 250   | -339         |                      |                 |             |  |                             |
| 249   |              |                      |                 |             |  |                             |

Lab Tests:

EC = Specific Conductance (µmhos/cm @ 25° C)  
 ▽ Static water level at date and time indicated

TP = Total Porosity  
 EP = Effective Porosity  
 TOC = Total Organic Carbon  
 SC = Soil Classification  
 PS = Particle Size

AL = Atterberg Limits  
 K = Hydraulic Conductivity  
 MC = Moisture Content  
 FC = Field Capacity  
 C14 = Radiocarbon Age Dating

Logged by: SJS  
 Approved by: EWM  
 Figure No.



**RECORD OF BOREHOLE A7B-1**

SHEET 2 OF 17

PROJECT: HDR/CHRLF-Area 7  
 LOCATION: Maple Valley, WA  
 PROJECT NUMBER: 063-1088.2503

BORING START DATE: 9/26/06  
 DRILLING CONTRACTOR: ProSonic Corp.  
 DRILL RIG: ProSonic Track

BORING END DATE: 10/3/06  
 NORTHING: 169998.93  
 EASTING: 1698086.67

DATUM: NAD27 (H), NGVD29 (V)  
 GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |             | USCS | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |
|---------------------|---------------|--|-------------|------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|----------------------------|
|                     |               | DESCRIPTION  | GRAPHIC LOG |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 20                  |               | --- CONTINUED FROM PREVIOUS PAGE ---   |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 20                  |               | Gray (Gley 4/5GY/1), non-stratified, silty fine to medium SAND, trace to little coarse sand, little fine to coarse gravel, trace small cobbles, subrounded to subangular, faceted, socketed, damp. (SM) (LODGMNT GLACIAL TILL) |             | SM   |                        | 4          | 100          | A7B-1-20.0-21.0          |                        |              |                  |                               |             |                      |                            |
| 22                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 24                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 24                  |               |  |             |      | 575.3                  |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 24                  |               |  |             |      | 25.0                   | 5          | 100          | A7B-1-25.0-26.0          |                        |              |                  |                               |             |                      |                            |
| 26                  |               | Gray (Gley 4/5GY/1), non-stratified, silty fine to coarse GRAVEL, some fine to medium sand, trace coarse sand, trace small cobbles, subrounded to subangular, faceted, socketed, damp. (GM) (LODGMNT GLACIAL TILL)             |             | GM   |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 26                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 28                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 28                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 30                  |               |  |             |      |                        | 6          | 100          | A7B-1-29.0-30.0          |                        |              |                  |                               |             |                      |                            |
| 30                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 32                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 32                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 34                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 34                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 36                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 36                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 38                  |               |  |             |      |                        | 7          | 100          | A7B-1-34.0-35.0          |                        |              |                  |                               |             |                      |                            |
| 38                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 40                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
| 40                  |               |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |
|                     |               | --- CONTINUED NEXT PAGE ---  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |

SONIC NO.WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

27.0 ft. Bottom of 7-inch (OD) casing.

**RECORD OF BOREHOLE A7B-1**

SHEET 3 OF 17

PROJECT: HDR/CHRLF-Area 7  
 LOCATION: Maple Valley, WA  
 PROJECT NUMBER: 063-1088.2503

BORING START DATE: 9/26/06  
 DRILLING CONTRACTOR: ProSonic Corp.  
 DRILL RIG: ProSonic Track

BORING END DATE: 10/3/06  
 NORTHING: 169998.93  
 EASTING: 1698086.67

DATUM: NAD27 (H), NGVD29 (V)  
 GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |             | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (psi) | WATER LEVEL | WATER LEVEL<br>NOTES  | DRILLING<br>NOTES/COMMENTS |
|---------------------|---------------|--|-------------|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------|-------------|---|----------------------------|
|                     |               | DESCRIPTION  | GRAPHIC LOG |       |                        |            |              |                          |                        |              |                  |                         |             |   |                            |
| 40                  |               | --- CONTINUED FROM PREVIOUS PAGE ---   |             |       |                        |            |              |                          |                        |              |                  |                         |             |   |                            |
| 40-46               |               | Gray (Gley 4/5GY1), non-stratified, silty fine to coarse GRAVEL, some fine to medium sand, trace coarse sand, trace small cobbles, subrounded to subangular, faceted, socketed, damp. (GM) (LODGMENT GLACIAL TILL)                 |             |       | 555.3                  | 8          | 100          | A7B-1-44.0-45.0          |                        |              |                  |                         |             |   |                            |
| 46-48               |               | Gray (Gley 4/5GY1), non-stratified, silty fine to coarse SAND, little to some fine to coarse gravel, trace small cobbles, subrounded to subangular, faceted, socketed, wet. (SM) (LODGMENT GLACIAL TILL)                           |             | SM    | 554.3                  |            |              |                          |                        |              |                  |                         |             |   |                            |
| 48-50               |               | Gray (Gley 5/5GY1), non-stratified, silty fine to coarse GRAVEL, some fine sand, trace medium to coarse sand, trace small cobbles, subrounded to subangular, clast supported, faceted socketed, damp. (GM) (LODGMENT GLACIAL TILL) |             |       | 546.3                  | 9          | 100          | A7B-1-49.0-50.0          |                        |              |                  |                         |             |   |                            |
| 50-52               |               |  |             | GM    | 546.3                  |            |              |                          |                        |              |                  |                         |             |   |                            |
| 52-54               |               |  |             |       | 546.3                  | 10         | 100          |                          |                        |              |                  |                         | ▽           | Perched, static water at 51.7 ft. measured 9/27/06 0710, left overnight; BOH=58 ft. |                            |
| 54-56               |               | Light brownish gray (5Y 7/2), non-stratified, fine to coarse GRAVEL, some fine to medium sand, trace to little coarse sand, little silt, subangular to subrounded, faceted, damp. (GW-GM) (GLACIAL TILL/DRIFT)                     |             |       | 541.3                  | 11         | 100          | A7B-1-54.0-55.0          |                        |              |                  |                         |             |   |                            |
| 56-58               |               |  |             | GW-GM | 541.3                  |            |              |                          |                        |              |                  |                         |             |   |                            |
| 58-60               |               |  |             |       | 513.3                  | 12         | 100          |                          |                        |              |                  |                         |             |   |                            |
| 60                  |               |  |             |       | 509.0                  | 13         | 100          |                          |                        |              |                  |                         |             |   |                            |
| 60                  |               | --- CONTINUED NEXT PAGE ---  |             |       |                        |            |              |                          |                        |              |                  |                         |             |   |                            |

SONIC NO.WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 4 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH/SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |             | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS                                    |
|---------------------|---------------|--|-------------|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|---|
|                     |               | DESCRIPTION  | GRAPHIC LOG |       |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 60                  |               | --- CONTINUED FROM PREVIOUS PAGE ---   |             |       |                        |            |              | A7B-1-60.0-61.1          |                        |              |                  |                               |             |                      | 60.0 feet - core barrel rotation                              |
| 62                  |               | Gray (Gley 4/5GY/1), non-stratified, silty fine SAND, little to some fine to coarse gravel, trace small cobbles, subrounded to subangular, faceted, socketed, wet. (SM) (LODGMNT GLACIAL TILL)   |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 64                  |               |  |             | SM    |                        | 13         | 100          | A7B-1-64.0-65.0          |                        |              |                  |                               |             |                      |   |
| 66                  |               | continuous soil core (4.25-inch diameter), drilled dry with core barrel rotation unless noted otherwise  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 68                  |               | roboconic  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 70                  |               |  |             | SW-SM | 530.3<br>70.0          | 14         | 100          | A7B-1-70.0-71.0          |                        |              |                  |                               |             |                      |   |
| 72                  |               | Gray (Gley 5/5GY/1), stratified, fine to coarse SAND, little to some fine to coarse gravel, little silt, subrounded to subangular, faceted, granular, damp. (SW-SM) (GLACIAL TILL/DRIFT)   |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 74                  |               |  |             |       | 527.3<br>73.0          |            |              |                          |                        |              |                  |                               |             |                      |   |
| 76                  |               | continuous soil core (4.25-inch diameter), drilled dry with core barrel rotation unless noted otherwise  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 78                  |               |  |             | SM/GM |                        | 15         | 100          | A7B-1-75.0-76.0          |                        |              |                  |                               |             |                      | 75 feet - core barrel stuck inside drive casing vibrate free. |
| 80                  |               | Gray (Gley 4/5GY/1), nonstratified, silty fine to medium SAND, some fine to coarse gravel, to silty fine to coarse GRAVEL, some fine to medium sand, trace small cobbles, rounded to subangular, faceted, socketed, damp. (SM/GM) (LODGMNT GLACIAL TILL) |             |       |                        | 16         | 100          | A7B-1-79.0-80.0          |                        |              |                  |                               |             |                      |   |
|                     |               | --- CONTINUED NEXT PAGE ---  |             |       | 520.3                  |            |              |                          |                        |              |                  |                               |             |                      |   |

SONIC NO. WELL: 063-1088-2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06



### RECORD OF BOREHOLE A7B-1

SHEET 5 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |                     | ELEV.<br>DEPTH<br>(ft)         | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (lb) | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |
|---------------------|---------------|--|---------------------|--------------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|------------------------|-------------|----------------------|----------------------------|
|                     |               | DESCRIPTION  | GRAPHIC LOG<br>USCS |                                |            |              |                          |                        |              |                  |                        |             |                      |                            |
| 80                  |               | -- CONTINUED FROM PREVIOUS PAGE --   |                     | 80.0                           |            |              |                          |                        |              |                  |                        |             |                      |                            |
|                     |               | Gray (Gley 4/5GY1), nonstratified, fine to medium sand, little silt, little fine to coarse gravel, trace coarse sand, trace small cobbles, subangular to subrounded, granular, damp. (SW-SM) (GLACIAL TILL/DRIFT)  | SW-SM               | 519.3                          |            |              |                          |                        |              |                  |                        |             |                      |                            |
|                     |               | Gray (Gley 4/5GY1), nonstratified, silty fine to medium SAND, some fine to coarse gravel, to silty fine to coarse GRAVEL, some fine to medium sand, trace small cobbles, rounded to subangular, faceted, socketed, damp. (SM/GM) (LODGE MENT GLACIAL TILL) | SM/GM               | 81.0<br>518.8<br>81.5          | 17         | 100          |                          |                        |              |                  |                        |             |                      |                            |
| 82                  |               | Gray (Gley 4/5GY1), nonstratified, fine to medium sand, little silt, some fine to coarse gravel, trace coarse sand, trace small cobbles, subangular to subrounded, granular, damp. (SW-SM) (GLACIAL TILL/DRIFT)  | SW-SM               | 516.3                          |            |              |                          |                        |              |                  |                        |             |                      |                            |
| 84                  |               | Light brownish gray (2.5Y 4/3), crudely stratified (6-inch-thick beds), fine to medium SAND and fine to coarse SAND beds, trace to little fine to medium gravel, subangular to subrounded, granular, damp. (SW) (GLACIOFLUVIAL)                            | SW                  | 84.0                           | 18         | 100          | A7B-1-85.0-86.0          |                        |              |                  |                        |             |                      |                            |
| 86                  |               | becomes fine to medium SAND, trace to little coarse sand. (SW)   | SW                  |                                |            |              |                          |                        |              |                  |                        |             |                      |                            |
| 88                  |               | 87.5 feet becomes fine to coarse gravelly, fine to medium SAND. (SP)   | SP                  |                                | 19         | 100          |                          |                        |              |                  |                        |             |                      |                            |
| 90                  |               | Light brownish gray (2.5Y 4/3), nonstratified, silty fine SAND, damp. (SM) (GLACIOFLUVIAL)   | SM                  | 510.8<br>89.5<br>89.8          |            |              | A7B-1-89.5-90.0          |                        |              |                  |                        |             |                      |                            |
|                     |               | light brown, stratified, fine to medium SAND, little fine gravel, granular, damp. (SP) (GLACIOFLUVIAL)   | SP                  | 509.3                          |            |              |                          |                        |              |                  |                        |             |                      |                            |
|                     |               | 90.0 feet becomes medium SAND. (SP)  |                     | 91.0                           |            |              |                          |                        |              |                  |                        |             |                      |                            |
|                     |               | 90.5 feet becomes fine SAND. (SP)  |                     |                                |            |              |                          |                        |              |                  |                        |             |                      |                            |
| 92                  |               | Gray (Gley 4/5GY1), nonstratified, fine to medium SAND, little silt, little to some fine to coarse gravel, trace small cobbles, mostly granular, damp. (SP-SM)   | SP-SM               |                                | 20         | 100          |                          |                        |              |                  |                        |             |                      |                            |
| 94                  |               |  |                     |                                |            |              | A7B-1-95.0-95.5          |                        |              |                  |                        |             |                      |                            |
| 96                  |               |  |                     |                                | 21         | 100          |                          |                        |              |                  |                        |             |                      |                            |
| 98                  |               | Gray (Gley 4/5GY1), nonstratified, matrix of silty fine SAND to fine sandy SILT, little fine to coarse gravel, matrix is dense and brittle, damp. (SM/ML)  | SM/ML               | 502.8<br>97.5<br>502.3<br>98.0 |            |              | A7B-1-97.5-98.0          |                        |              |                  |                        |             |                      |                            |
|                     |               | Light gray, nonstratified, fine to medium SAND, trace to little coarse sand, little to some fine to coarse gravel, subangular to subrounded, granular, damp. (SW)  | SW                  |                                | 22         | 100          |                          |                        |              |                  |                        |             |                      |                            |
| 100                 |               | Gray, nonstratified, silty fine SAND, damp. (SM)   |                     | 500.8<br>99.5                  |            |              |                          |                        |              |                  |                        |             |                      |                            |
|                     |               | -- CONTINUED NEXT PAGE --  |                     |                                |            |              |                          |                        |              |                  |                        |             |                      |                            |

SONIC NO WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 6 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |             | USCS  | ELEV.<br>DEPTH<br>(ft)           | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (psi) | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |
|---------------------|---------------|--|-------------|-------|----------------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------|-------------|----------------------|----------------------------|
|                     |               | DESCRIPTION  | GRAPHIC LOG |       |                                  |            |              |                          |                        |              |                  |                         |             |                      |                            |
| 100                 |               | --- CONTINUED FROM PREVIOUS PAGE ---   |             |       |                                  |            |              |                          |                        |              |                  |                         |             |                      |                            |
|                     |               | Gray, nonstratified, silty fine SAND, damp. (SM)   |             | SM    | 499.8<br>100.5                   |            |              | A7B-1-100.0-100.5        |                        |              |                  |                         |             |                      |                            |
| 102                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine SAND, some fine to coarse gravel, to fine to coarse GRAVEL with matrix of silty fine sand, trace medium to coarse sand, trace small cobbles, subrounded to subangular, faceted, mostly matrix supported, dense matrix, moderately socketed, damp. (SM/GM) (DIAMICTON) |             | SM/GM | 492.8<br>107.5                   | 22         | 100          | A7B-1-105.0-106.0        |                        |              |                  |                         |             |                      |                            |
| 108                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine to medium SAND, some fine to coarse gravel, trace small cobbles, subrounded to subangular, faceted, mildly socketed, moist. (SM) (DIAMICTON)  |             | SM    | 490.3<br>110.0<br>489.8<br>110.5 |            |              | A7B-1-110.0-110.5        |                        |              |                  |                         |             |                      |                            |
| 110                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine SAND, trace medium to coarse sand, little fine to medium gravel, subrounded to subangular, (faceted, socketed, damp. (SM) (DIAMICTON)   |             | SM    | 488.3<br>112.0                   |            |              |                          |                        |              |                  |                         |             |                      |                            |
| 112                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine to medium SAND, trace to little fine to medium gravel, trace coarse gravel and small cobbles, wet. (SM)   |             | SM    | 484.8<br>115.5<br>484.3<br>116.0 | 23         | 100          |                          |                        |              |                  |                         |             |                      |                            |
| 114                 |               | Gray, nonstratified, fine to medium SAND, little silt, little fine to coarse gravel, little small cobbles, subrounded to subangular, faceted, mildly socketed, moist to wet. (SP-SM)   |             | SP-SM |                                  |            |              |                          |                        |              |                  |                         |             |                      |                            |
| 116                 |               | Hard, gray, nonstratified, CLAY, trace fine gravel, subangular to subrounded, socketed, damp. (CL)   |             | CL    |                                  |            |              |                          |                        |              |                  |                         |             |                      |                            |
| 118                 |               | Gray, nonstratified, silty fine to medium SAND, trace coarse sand, little fine to coarse gravel, subangular to subrounded, faceted, damp to moist. (SM)  |             | SM    | 480.3                            | 24         | 100          |                          |                        |              |                  |                         |             |                      |                            |
| 120                 |               | --- CONTINUED NEXT PAGE ---  |             |       |                                  |            |              |                          |                        |              |                  |                         |             |                      |                            |

SONIC NO. WELL: 063-1088-2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT: robsonic

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06








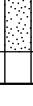


▽ Perched, static water at 109.0 ft. measured 9/27/06 1300 after 70 minutes; BOH=117.0 ft, BOC=97 ft, slough at 113.9 ft

117 ft. - sound hole to 166.6 feet (0.4 ft slough)

**RECORD OF BOREHOLE A7B-1**

SHEET 7 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE  |   | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (lb) | WATER LEVEL | WATER LEVEL<br>NOTES                                 | DRILLING<br>NOTES/COMMENTS          |
|---------------------|---------------|---|---|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|------------------------|-------------|--|-------------------------------------|
|                     |               | DESCRIPTION   | GRAPHIC LOG<br>USCS   |                        |            |              |                          |                        |              |                  |                        |             |  |                                     |
| 120                 |               | --- CONTINUED FROM PREVIOUS PAGE ---  |   |                        |            |              |                          |                        |              |                  |                        |             |  |                                     |
|                     |               | Gray, nonstratified, fine to coarse SAND, little silt, some fine to coarse gravel, subangular to rounded, faceted, moist. (SW-SM)   |    | 120.0                  |            |              | A7B-1-120.0-121.0        |                        |              |                  |                        |             |  |                                     |
| 122                 |               |   |   |                        | 24         | 100          |                          |                        |              |                  |                        |             |  |                                     |
| 124                 |               |   |   |                        |            |              | A7B-1-125.0-126.0        |                        |              |                  |                        |             |  |                                     |
| 126                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine to medium SAND, little coarse sand, some fine to medium gravel, subrounded to subangular, moist. (SM)  |    | 474.3<br>126.0         |            |              |                          |                        |              |                  |                        |             |  |                                     |
| 128                 |               | Light grayish brown (2.5Y 4/3), nonstratified, fine to medium GRAVEL, trace coarse gravel, some medium to coarse sand, trace to little fine sand, trace silt, subangular to subrounded, granular, moist to wet. (GW)  |   | 472.3<br>128.0         |            |              | A7B-1-129.0-129.5        |                        |              |                  |                        |             |  |                                     |
| 130                 |               | Light grayish brown (2.5Y 4/3), nonstratified, fine to medium GRAVEL, trace coarse gravel, some medium to coarse sand, trace to little fine sand, little silt, subangular to subrounded, granular, moist to wet. (GW)   |  | 470.3<br>130.0         |            |              |                          |                        |              |                  |                        |             |  |                                     |
| 132                 |               | Light grayish brown (2.5Y 4/3), nonstratified, fine to coarse SAND, little fine to medium gravel, trace silt, subangular to subrounded, granular, moist to wet. (SW)  |  | 468.3<br>132.0         |            |              |                          |                        |              |                  |                        |             |  |                                     |
| 134                 |               | Light grayish brown (2.5Y 4/3), nonstratified, medium SAND, moist to wet. (SP)  |  | 467.3<br>133.0         |            |              |                          |                        |              |                  |                        |             |  |                                     |
| 136                 |               | Gray (Gley 4/5GY/1), crudely stratified, alternating fine to coarse SAND with some fine to coarse gravel, trace silt, and, fine to coarse SAND with some fine to coarse gravel, little silt, faceted, subangular to subrounded, faceted, moist to wet. (SW-SM/SW) |  | 466.8<br>133.5         |            |              |                          |                        |              |                  |                        |             |  |                                     |
| 138                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine SAND to fine sandy SILT, little fine to coarse gravel, moderately socketed, subangular to subrounded, moist. (SM/ML) (DIAMICTON)   |  | 464.3<br>136.0         |            |              | A7B-1-136.0-136.5        |                        |              |                  |                        |             | 136 ft. measured 9/27/06; dry hole after 45 minutes. | 136 ft. - sound hole to 136.75 feet |
| 140                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine to medium SAND, little to some fine to medium gravel, little small cobbles, subrounded, moist to wet. (SM)   |  | 463.3<br>137.0         |            |              |                          |                        |              |                  |                        |             |  |                                     |
| 142                 |               | Gray (Gley 4/5GY/1), nonstratified, fine to medium SAND, trace fine to coarse gravel, subangular to subrounded, moist. (SP)   |  | 462.3<br>138.0         |            |              | A7B-1-139.0-140.0        |                        |              |                  |                        |             |  |                                     |
| 144                 |               |   |   | 460.3                  |            |              |                          |                        |              |                  |                        |             |  |                                     |
|                     |               | --- CONTINUED NEXT PAGE ---   |   |                        |            |              |                          |                        |              |                  |                        |             |  |                                     |

SONIC NO WELL: 063-1088-2503 CHRLF-AREA 7.GPJ MI-OH-GDT: 17/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 8 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE                         |   | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (psi) | WATER LEVEL | WATER LEVEL<br>NOTES  | DRILLING<br>NOTES/COMMENTS |  |
|---------------------|---------------|--------------------------------------|---|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------|-------------|---|----------------------------|--|
|                     |               | DESCRIPTION                          | GRAPHIC LOG   |       |                        |            |              |                          |                        |              |                  |                         |             |   |                            |  |
| 140                 |               | --- CONTINUED FROM PREVIOUS PAGE --- |   |       | 140.0                  |            |              |                          |                        |              |                  |                         |             |   |                            | 140  |
|                     |               |                                      | Gray (Gley 4/5GY/1), nonstratified, silty fine to coarse GRAVEL, subangular to subrounded, moist. (GM)  | GM    | 459.3                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
|                     |               |                                      | Gray (Gley 4/5GY/1), nonstratified, fine to medium SAND, moist. (SP)  | SP    | 141.0                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
| 142                 |               |                                      | Gray (Gley 4/5GY/1), nonstratified, silty fine to coarse GRAVEL, trace little fine to coarse sand, faceted, subangular to subrounded, moist. (GM)   | GM    | 458.3                  | 26         | 100          | A7B-1-143.0-144.0        |                        |              |                  |                         |             |   |                            | 142  |
|                     |               |                                      | Gray, nonstratified, fine sandy SILT, little fine to coarse gravel, cohesive, socketed, damp. (ML)  | ML    | 143.5                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
| 144                 |               |                                      | Gray (Gley 4/5GY/1), nonstratified, fine to medium SAND, trace fine to coarse gravel, subangular to subrounded, moist. (SP)   | SP    | 144.0                  |            |              | A7B-1-144.5-145.0        |                        |              |                  |                         |             |   |                            | 144  |
|                     |               |                                      | Gray, stratified, contorted bedding, fine sandy SILT, little fine to medium gravel, thin deformed laminations of fine sand, dense matrix, socketed, damp. (ML)  | ML    | 144.5                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
|                     |               |                                      | Gray (Gley 4/5GY/1), nonstratified, fine to coarse GRAVEL, trace small cobbles, matrix of fine sandy silt with trace coarse sand, moderately socketed, subangular to subrounded, faceted, moist. (GM) (DIAMICTON)                           | GM/GC | 455.3                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
| 146                 |               |                                      | 148 ft. matrix becomes SILTY CLAY or CLAY. (GC)   |       | 145.0                  |            |              |                          |                        |              |                  |                         |             |   |                            | 146  |
|                     |               |                                      | Gray (Gley 4/5GY/1), stratified, silty fine SAND to SILT with trace to little fine sand, nonplastic, slightly dilatant, moist to wet. (SM/ML)   | SM/ML | 451.3                  |            |              | A7B-1-149.0-149.5        | 21.3                   | 21           | 0                |                         |             | Perched, static water at 148.0 ft. measured 9/28/06 0725, left overnight; BOH=156.0 ft, B.O.C.=147.0 ft, slough at 151.9 ft |                            | 148  |
|                     |               |                                      | Gray (Gley 4/5GY/1), stratified, contorted/deformed bedding, silty fine SAND to fine sandy SILT, grading to CLAYEY SILT, little to some fine to coarse gravel, dense matrix, faceted, socketed, trace degraded woody debris, moist. (SM/ML) | SM/ML | 149.0                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
| 150                 |               |                                      | Gray, nonstratified, SILTY, little fine sand, livery, dilatant, moist. (ML)   | ML    | 448.8                  | 27         | 100          | A7B-1-151.5-152.0        | 26.1                   | 25           | 0                |                         |             |   |                            | 150  |
|                     |               |                                      | Gray, nonstratified, CLAYEY SILT, little fine to coarse gravel, trace to little coarse sand, socketed, damp. (CL-ML)  | CL-ML | 151.5                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
|                     |               |                                      | Gray (Gley 4/5GY/1), nonstratified, fine to coarse GRAVEL, matrix fine sandy silt, trace coarse sand, trace small cobbles, moderately socketed, subangular to subrounded, faceted, moist. (GM) (DIAMICTON)                                  | GM    | 447.8                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
| 152                 |               |                                      | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)   | GM    | 152.5                  |            |              | A7B-1-153.0-153.5        | 13.1                   | 18           | 4                |                         |             |   |                            |  |
|                     |               |                                      | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)   | GM    | 446.8                  | 28         | 0            |                          |                        |              |                  |                         |             |   |                            | 154  |
|                     |               |                                      | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)   | GM    | 153.5                  |            |              |                          |                        |              |                  |                         |             |   |                            |  |
| 154                 |               |                                      | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)   | GM    | 445.3                  | 29         | 100          |                          |                        |              |                  |                         |             |   |                            | 154 ft. Sound hole to 144 feet (10 feet of slough/cave) 155 ft. Drilled through slough plus 1 foot sample fell out of core barrel. 156 ft. Drilled through slough plus 1 foot sample retained in core barrel. 156.5 ft. Drilling becomes easier. |
| 156                 |               |                                      | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)   | GM    | 155.0                  |            |              |                          |                        |              |                  |                         |             |   |                            | 156  |
| 158                 |               |                                      | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)   | GM    |                        | 30         | 100          |                          |                        |              |                  |                         |             |   |                            | 158  |
| 160                 |               |                                      | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)   | GM    |                        |            |              |                          |                        |              |                  |                         |             |   |                            | 160  |
|                     |               |                                      | --- CONTINUED NEXT PAGE ---   |       |                        |            |              |                          |                        |              |                  |                         |             |   |                            |  |

SONIC NO WELL: 063-1088-2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

| <p style="text-align: center;"><b>RECORD OF BOREHOLE A7B-1</b></p> <p>PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/28/06      BORING END DATE: 10/3/06      SHEET 9 OF 17</p> <p>LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)</p> <p>PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29</p> |               |   |  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |     |
|---|---------------|---|--|-------------|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|----------------------------|-----|
| DEPTH SCALE<br>FEET   | BORING METHOD | SOIL PROFILE  |  | GRAPHIC LOG | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |     |
|   |               | DESCRIPTION   |  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |     |
| 160   |               | --- CONTINUED FROM PREVIOUS PAGE ---  |  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 160 |
| 162   |               | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, slightly socketed, angular to rounded, damp to moist. (GM)<br>160.5 ft. brick-red clast.<br>161.0 ft. small cobble     |  |             |       |                        |            |              | A7B-1-161.0-161.5        |                        |              |                  |                               |             |                      |                            | 162 |
| 164   |               | Gray, crudely stratified, fine to medium SAND, some fine to coarse gravel, trace silt; subangular to subrounded, moist to wet, slightly dilatant. (SP)  |  |             | SP    | 436.3<br>164.0         | 30         | 100          | A7B-1-164.0-164.5        |                        |              |                  |                               |             |                      |                            | 164 |
| 166   |               | Gray, nonstratified, silty fine to coarse GRAVEL, little fine to coarse sand, trace small cobbles, subangular to rounded, dense matrix, matrix supported, socketed, damp to moist. (GM)                                   |  |             |       | 434.3<br>166.0         |            |              | A7B-1-166.0-166.5        |                        |              |                  |                               |             |                      |                            | 166 |
| 168   |               | 168 ft. becomes more gravelly, clast supported.   |  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 168 |
| 170   |               |   |  |             | GM    |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 170 |
| 172   |               | 172 ft. matrix becomes brittle.   |  |             |       |                        | 31         | 100          | A7B-1-171.0-171.5        |                        |              |                  |                               |             |                      |                            | 172 |
| 174   |               | Gray, non-stratified, SILT to CLAYEY SILT to CLAY, little fine to coarse gravel, trace coarse sand, subangular to subrounded, faceted, dense matrix, matrix supported, brittle, socketed, damp. (ML/CL-ML-CL) (DIAMICTON) |  |             | ML/CL | 427.3<br>173.0         |            |              | A7B-1-173.0-173.5        |                        |              |                  |                               |             |                      |                            | 174 |
| 176   |               | Gray, nonstratified, fine to coarse GRAVEL, some silt to clayey silt, little fine to coarse sand, trace small cobbles, subangular to subrounded, damp. (GM/GC)  |  |             |       | 426.3<br>174.0         |            |              | A7B-1-175.0-175.5        |                        |              |                  |                               |             |                      |                            | 176 |
| 178   |               |   |  |             |       |                        | 32         | 100          |                          |                        |              |                  |                               |             |                      |                            | 178 |
| 180   |               |   |  |             |       |                        |            |              | A7B-1-179.0-179.5        |                        |              |                  |                               |             |                      |                            | 180 |
|   |               | --- CONTINUED NEXT PAGE ---   |  |             |       | 420.3                  |            |              |                          |                        |              |                  |                               |             |                      |                            |     |

SONIC NO WELL: 063-1088-2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 10 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE  |  | GRAPHIC LOG | USCS     | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS                              |
|---------------------|---------------|---|--|-------------|----------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|---|
|                     |               | DESCRIPTION   |  |             |          |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 180                 |               | --- CONTINUED FROM PREVIOUS PAGE ---  |  |             |          | 180.0                  |            |              |                          |                        |              |                  |                               |             |                      |   |
| 182                 |               | Gray (Gley 4/5GY/1), nonstratified, silty fine to coarse GRAVEL, trace to little fine to coarse sand, angular to subrounded, dense matrix, socketed, damp. (GM)   |  |             |          |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
| 184                 |               | 184-185 ft. becomes moist.<br>184-186 ft. small to medium cobbles present.<br>185 ft. becomes clast supported, fine to medium gravel, same matrix as above.<br>186 ft. matrix becomes hard, brittle.  |  |             | GM       |                        | 33         | 100          | A7B-1-184.0-184.5        |                        |              |                  |                               |             |                      | 4-inch diameter cobbles are sticking inside core barrel |
| 188                 |               | Gray (Gley 4/5GY/1), nonstratified, SILT or CLAYEY SILT, some fine to coarse sand, some fine to coarse gravel, subangular to subrounded, slightly plastic, damp to moist. (ML/CL-ML)  |  |             | ML/CL-ML | 412.3<br>188.0         |            |              |                          |                        |              |                  |                               |             |                      |   |
| 190                 |               | Gray (Gley 4/5GY/1), nonstratified, fine to coarse GRAVEL, matrix of silt to clayey silt with little sand, subangular to subrounded, faceted, clast supported, damp to moist. (GM)  |  |             | GM       | 411.3<br>189.0         | 34         | 100          | A7B-1-189.0-189.5        |                        |              |                  |                               |             |                      |   |
| 192                 |               | 191.0 ft. small to medium cobble zone in silt matrix, oxidized clasts.  |  |             |          | 408.3<br>192.0         |            |              |                          |                        |              |                  |                               |             |                      |   |
| 194                 |               | Gray (Gley 4/5GY/1), nonstratified, SILT, trace to little fine gravel, trace to little fine to coarse sand, trace medium gravel, matrix supported, brittle, socketed, faceted, scattered black lithics, trace fine peat-like organics, damp. (ML) |  |             | ML       |                        | 35         | 100          | A7B-1-195.0-195.5        |                        |              |                  |                               |             |                      |   |
| 196                 |               | 195.0 ft. weathered/oxidized sandstone clast.   |  |             |          | 403.8<br>196.5         |            |              |                          |                        |              |                  |                               |             |                      |   |
| 198                 |               | Grayish brown (5Y 4/2), nonstratified, SILT, some fine sand, little to some fine to medium gravel, subangular to subrounded, dense matrix, socketed, brittle, damp. (ML)  |  |             | SM       | 402.3<br>198.0         |            |              |                          |                        |              |                  |                               |             |                      |   |
| 200                 |               | Grayish brown (5Y 5/3), nonstratified, fine to coarse GRAVEL, matrix of clayey silt with little fine to coarse sand, angular to subrounded, moist. (GM)   |  |             | GM       | 401.3<br>199.0         | 36         | 100          |                          |                        |              |                  |                               |             |                      | hard drilling   |
| 200                 |               | Grayish brown (5Y 4/3), stratified, fine to coarse SAND, some fine to medium gravel, subangular to subrounded, granular, faceted, damp. (SW)  |  |             |          |                        |            |              |                          |                        |              |                  |                               |             |                      |   |
|                     |               | --- CONTINUED NEXT PAGE ---   |  |             |          |                        |            |              |                          |                        |              |                  |                               |             |                      |   |

SONIC NO WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 17708 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 11 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH/SCALE<br>FEET | BORING METHOD | SOIL PROFILE  |             | USCS | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS   |
|---------------------|---------------|---|-------------|------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|--|
|                     |               | DESCRIPTION   | GRAPHIC LOG |      |                        |            |              |                          |                        |              |                  |                               |             |                      |  |
| 200                 |               | --- CONTINUED FROM PREVIOUS PAGE ---  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |  |
|                     |               | Grayish brown (5Y 4/3), stratified, fine to coarse SAND, some fine to medium gravel, subangular to subrounded, granular, faceted, damp. (SW)  |             | SW   | 398.8<br>201.5         | 36         | 100          | A7B-1-200.0-200.5        |                        |              |                  |                               |             |                      |  |
| 202                 |               | Grayish brown (5Y 4/2), nonstratified, fine to coarse GRAVEL, clast supported, matrix of clay with trace silt and sand, moist. (GC)   |             | GC   | 397.8<br>202.5         |            |              |                          |                        |              |                  |                               |             |                      | attempted to drill without rotation but not possible in very dense formation |
|                     |               | Grayish brown (5Y 4/3), stratified, fine to medium SAND, trace to little coarse sand, some fine to coarse gravel, trace silt, subrounded, granular, damp. (SW)  |             | SW   |                        | 37         | 100          | A7B-1-205.0-205.5        |                        |              |                  |                               |             |                      |  |
| 206                 |               | Grayish brown (5Y 4/2), nonstratified, fine to coarse GRAVEL, scattered small to large cobbles, angular to subrounded, clast supported, hard matrix of fine sandy silt, socketed, scattered oxidized clasts, damp. (GM) |             | GM   | 393.8<br>206.5         |            |              |                          |                        |              |                  |                               |             |                      |  |
| 210                 |               | 209.0 ft. matrix becomes very dense, silty fine to medium sand.   |             |      |                        | 38         | 100          | A7B-1-210.0-210.5        |                        |              |                  |                               |             |                      |  |
| 214                 |               | 214.0 ft. oxidized clasts.  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |  |
| 216                 |               | 215.0 ft. matrix becomes hard, fine sandy silt.   |             | GM   |                        | 39         | 100          | A7B-1-215.0-215.5        |                        |              |                  |                               |             |                      | very hard drilling cobbles   |
| 220                 |               | --- CONTINUED NEXT PAGE ---   |             |      |                        | 40         | 100          |                          |                        |              |                  |                               |             |                      |  |

SONIC NO. WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 12 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      DATUM: NAD27 (H), NGVD29 (V)  
 GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE  |  | GRAPHIC LOG | USCS | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |     |
|---------------------|---------------|---|--|-------------|------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|----------------------------|-----|
|                     |               | DESCRIPTION   |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |     |
| 220                 |               | --- CONTINUED FROM PREVIOUS PAGE ---  |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 200 |
| 222                 |               | Grayish brown (5Y 4/2), nonstratified, fine to coarse GRAVEL, scattered small to large cobbles, angular to subrounded, clast supported, hard matrix of fine sandy silt, socketed, scattered oxidized clasts, damp. (GM) |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 222 |
| 224                 |               | Light brownish gray (5Y 6/3), crudely stratified, medium to coarse SAND, some fine to medium gravel, trace fine sand, trace coarse gravel, subangular to rounded, granular, mild facets on some clasts, damp. (SP)      |  |             |      | 376.8<br>223.5         | 40         | 100          |                          |                        |              |                  |                               |             |                      |                            | 224 |
| 226                 |               | 225 ft. becomes orange brown (10 YR 3/4).   |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 226 |
| 228                 |               | 226 ft. becomes medium SAND, trace to little coarse sand.   |  |             |      |                        |            |              | A7B-1-226.0-226.5        |                        |              |                  |                               |             |                      |                            | 228 |
| 230                 |               | 227.0 ft. becomes medium to coarse SAND, some fine to medium gravel.  |  |             | SP   |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 230 |
| 232                 |               | 228.5 ft. becomes orange brown (10YR 4/4), stratified, fine to medium SAND, trace fine gravel, trace charcoal flakes.   |  |             |      |                        | 41         | 100          |                          |                        |              |                  |                               |             |                      |                            | 232 |
| 234                 |               | 229.5 ft. becomes fine to medium SAND, little to some fine to coarse gravel.  |  |             |      |                        |            |              |                          |                        |              |                  |                               |             |                      |                            | 234 |
| 236                 |               | Orange brown (10YR 4/4), stratified, fine to medium GRAVEL, little medium to coarse sand, trace fine sand, subangular to subrounded, oxidized clasts, black organic coatings on one clast, damp. (GP)                   |  |             | GP   | 370.3<br>230.0         |            |              | A7B-1-230.0-230.5        |                        |              |                  |                               |             |                      |                            | 236 |
| 238                 |               | Orange brown (10YR 4/4), stratified, fine to medium SAND, little coarse sand and fine gravel, trace coarse gravel, subangular to subrounded, damp. (SW)   |  |             | SW   | 369.3<br>231.0         |            |              |                          |                        |              |                  |                               |             |                      |                            | 238 |
| 240                 |               | Orange brown (10YR 4/4), stratified, medium SAND, trace fine and coarse sand, trace fine gravel, subangular to subrounded, damp. (SP)   |  |             |      | 366.8<br>233.5         | 42         | 100          |                          |                        |              |                  |                               |             |                      |                            | 240 |
| 242                 |               | 236.0 ft. becomes medium SAND, trace fine and coarse sand, little fine to medium gravel.  |  |             | SP   |                        |            |              | A7B-1-236.0-236.5        |                        |              |                  |                               |             |                      |                            | 242 |
| 244                 |               | Banded orange brown (10YR 4/4) and light grayish brown (5Y 5/2), stratified, fine SAND, trace to little silt, granular, damp. (SP-SM)   |  |             |      | 362.3<br>238.0         | 43         | 100          |                          |                        |              |                  |                               |             |                      |                            | 244 |
| 246                 |               | --- CONTINUED NEXT PAGE ---   |  |             |      |                        |            |              | A7B-1-239.5-240.0        |                        |              |                  |                               |             |                      |                            | 246 |

SONIC NO. WELL: 063-1088-2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT: rbsb3onic

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06



**RECORD OF BOREHOLE A7B-1**

SHEET 13 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |             | USCS  | ELEV.<br>DEPTH<br>(ft)  | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR LOG | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS  |
|---------------------|---------------|--|-------------|-------|-------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-----------------------|-------------|----------------------|---|
|                     |               | DESCRIPTION  | GRAPHIC LOG |       |                         |            |              |                          |                        |              |                  |                       |             |                      |   |
| 240                 |               | --- CONTINUED FROM PREVIOUS PAGE ---   |             |       |                         |            |              |                          |                        |              |                  |                       |             |                      |   |
|                     |               | Banded orange brown (10YR 4/4) and light grayish brown (5Y 5/2), stratified, fine SAND, trace to little silt, granular, damp. (SP-SM)<br>240.5 ft. becomes fine SAND, little silt, little fine to medium gravel, subangular to subrounded, non faceted.<br>241.0 ft. becomes fine SAND, little silt. |             | SP-SM | 358.3<br>242.0          | 43         | 100          | A7B-1-242.0-242.5        | 16.5                   | 25           | 3                |                       |             |                      |   |
| 242                 |               | Brown (2.5Y 4/3), nonstratified, SILT, damp to moist. (ML)   |             | ML    | 357.3<br>243.0          |            |              |                          |                        |              |                  |                       |             |                      |   |
| 244                 |               | Very light gray (2.5Y 6/1), thinly laminated, silty fine SAND to fine sandy SILT, mostly granular with scattered cohesive laminae, dry to damp. (SMML)   |             | SMML  | 354.3<br>246.0          | 44         | 100          | A7B-1-245.0-245.5        |                        |              |                  |                       |             |                      |   |
| 246                 |               | Very light gray (2.5Y 6/1), thinly laminated, fine SAND, mostly granular with scattered cohesive laminae, dry to damp. (SP)  |             | SP    | 350.8<br>249.5          | 45         | 100          | A7B-1-249.5-250.0        |                        |              |                  |                       |             |                      |   |
| 250                 |               | Very light gray (2.5Y 6/1), thin, wavy laminations, interbedded fine SAND, SILT, and black ORGANIC SILT, slightly lithified, brittle, damp. (SMML)   |             | SMML  | 349.3<br>251.0<br>348.8 |            |              |                          |                        |              |                  |                       |             |                      |   |
| 252                 |               | Light grayish brown (2.5Y 6/2), laminated, silty fine SAND, damp. (SM)   |             | SM    | 251.5                   |            |              |                          |                        |              |                  |                       |             |                      |   |
| 254                 |               | Light grayish brown (2.5Y 6/2), thinly laminated, fine SAND, trace silt, granular to slightly lithified, damp. (SP)  |             | SP    | 345.3<br>255.0          | 46         | 100          | A7B-1-254.0-254.5        |                        |              |                  |                       |             |                      |   |
| 256                 |               | Dark grayish brown (10YR 4/2), nonstratified, fine SAND, trace to little silt, trace to little medium sand, damp. (SP/SP-SM)   |             | SP-SM | 343.3<br>257.0          | 47         | 100          | A7B-1-259.0-259.5        |                        |              |                  |                       |             |                      | drill action is destroying fine/delicate structures within formation add water to make drilling easier. |
| 258                 |               | Medium grayish brown (2.5Y 5/4), laminated, fine SAND, trace silt, granular to slightly lithified, damp. (SP)  |             | SP    | 341.8<br>258.5          |            |              |                          |                        |              |                  |                       |             |                      |   |
| 260                 |               | Orange brown (10YR 4/4), thinly laminated, fine SAND, little silt, trace to little medium to coarse sand, granular to slightly lithified, trace fine black organic flakes, oxidized, damp. (SP-SM)   |             | SP-SM | 340.3                   |            |              |                          |                        |              |                  |                       |             |                      |   |
|                     |               | --- CONTINUED NEXT PAGE ---  |             |       |                         |            |              |                          |                        |              |                  |                       |             |                      |   |

SONIC NO WELL: 063-1088-2503 CHRLF AREA 7.GPJ MI-OH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 14 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |                     | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (psi) | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |
|---------------------|---------------|--|---------------------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------|-------------|----------------------|----------------------------|
|                     |               | DESCRIPTION  | GRAPHIC LOG<br>USCS |                        |            |              |                          |                        |              |                  |                         |             |                      |                            |
| 260                 |               | --- CONTINUED FROM PREVIOUS PAGE ---   |                     | 260.0                  |            |              |                          |                        |              |                  |                         |             |                      | 260                        |
|                     |               | Dark gray (Gley 3), vague stratification, SILT to CLAY, moderately plastic, damp. (CL/ML)  | CL/ML               | 338.3                  | 47         | 100          | A7B-1-261.0-261.5        | 24.5                   | 38           | 11               |                         |             |                      |                            |
| 262                 |               | interbedded contact at bottom of unit.<br>Dark grayish brown (2.5Y 4/3), stratified, silty fine SAND, damp. (SM)   | SM                  | 262.0                  |            |              |                          |                        |              |                  |                         |             |                      | 262                        |
|                     |               | Light brownish gray (2.5Y 6/2), stratified, fine SAND, trace medium sand, granular, scattered chunks of oxidized clay or clay stone at top of unit, damp. (SP)   | SP                  | 337.3                  |            |              |                          |                        |              |                  |                         |             |                      | 264                        |
| 264                 |               | Orange brown (10YR 4/4), laminated, fine SAND, little silt, granular, damp. (SP)   | SP-SM               | 334.8                  | 48         | 100          | A7B-1-265.0-265.5        |                        |              |                  |                         |             |                      | 266                        |
| 266                 |               | Light grayish brown (2.5Y 6/2), thinly laminated, fine SAND, granular, scattered laminae (2-4 mm thick) of silt, dry to damp. (SP)   | SP                  | 333.3                  |            |              |                          |                        |              |                  |                         |             |                      | 268                        |
| 268                 |               | Dark grayish brown (2.5Y 4/2), stratified, silty fine SAND, trace coarse sand, angular, damp to moist. (SM)  | SM                  | 268.0                  |            |              | A7B-1-268.5-269.0        |                        |              |                  |                         |             |                      | 268                        |
|                     |               | Light grayish brown (2.5Y 6/2), laminated, interbedded fine to medium SAND with scattered lenses of laminated silt (5-10 mm thick), trace fine gravel, subangular to subrounded, mixed lithology, damp. (SP) | SP                  | 332.3                  |            |              |                          |                        |              |                  |                         |             |                      | 270                        |
| 270                 |               | Medium grayish brown (2.5Y 5/3), stratified, medium SAND, trace to little coarse sand, trace fine gravel, damp. (SP)   | SP                  | 330.3                  |            |              | A7B-1-271.0-271.5        |                        |              |                  |                         |             |                      | 270                        |
|                     |               | Grayish brown (2.5Y 5/3), nonstratified, fine to medium SAND, damp. (SP)   | SP                  | 328.8                  |            |              |                          |                        |              |                  |                         |             |                      | 272                        |
| 272                 |               | Brownish gray (2.5Y 5/2), stratified, interbedded fine to medium SAND and silty fine SAND, and fine sandy SILT, granular to slightly lithified, damp. (SP/SM)  | SP/SM               | 271.5                  | 49         | 100          |                          |                        |              |                  |                         |             |                      | 272                        |
|                     |               | Light brownish gray (2.5Y 6/2), stratified, silty fine SAND with trace fine gravel, damp, with interbeds of dry cohesive silt. (SM)  | SM                  | 326.3                  |            |              | A7B-1-274.0-274.5        |                        |              |                  |                         |             |                      | 274                        |
| 274                 |               | Grayish brown (2.5Y 5/3), stratified, fine SAND, damp, with interbeds of dry cohesive silt. (SM)   | SM                  | 325.3                  |            |              |                          |                        |              |                  |                         |             |                      | 274                        |
|                     |               | 276.0 ft. becomes fine to medium SAND, trace fine gravel, subangular to subrounded, oxidized, damp.  | SP                  | 275.0                  |            |              |                          |                        |              |                  |                         |             |                      | 276                        |
| 276                 |               | Dark brown (2.5Y 4/3), stratified, silty fine SAND, trace fine gravel, damp to moist. (SM)   | SM                  | 322.8                  |            |              |                          |                        |              |                  |                         |             |                      | 278                        |
| 278                 |               | Grayish brown (2.5Y 5/3), stratified, fine to medium SAND, trace fine gravel, subangular to subrounded, oxidized, damp. (SP)   | SP                  | 277.5                  | 50         | 80           |                          |                        |              |                  |                         |             |                      | 278                        |
|                     |               |  | SM/ML/SC            | 278.0                  |            |              |                          |                        |              |                  |                         |             |                      | 278                        |
| 280                 |               |  |                     | 278.3                  |            |              | A7B-1-279.5-280.0        | 1.5                    | 15           | 2                |                         |             |                      | 280                        |
|                     |               | --- CONTINUED NEXT PAGE ---  |                     | 320.3                  |            |              |                          |                        |              |                  |                         |             |                      | 280                        |

SONIC NO. WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 17/08 DATA INPUT:  LOGGED: JILC  
 DEPTH SCALE 1 inch to 2.5 feet CHECKED: DPF  
 DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 15 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |             | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (psi) | WATER LEVEL | WATER LEVEL<br>NOTES   | DRILLING<br>NOTES/COMMENTS  |
|---------------------|---------------|--|-------------|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------|-------------|--|---|
|                     |               | DESCRIPTION  | GRAPHIC LOG |       |                        |            |              |                          |                        |              |                  |                         |             |  |   |
| 280                 |               | --- CONTINUED FROM PREVIOUS PAGE ---   |             |       | 280.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               | Light brownish gray (2.5Y 6/2), thinly laminated, interbedded, silty fine SAND, fine sandy SILT, clayey fine to medium SAND with little coarse sand and fine gravel, subangular to subrounded, oxidized clasts, mixed lithologies, dry to damp. (SMML(SC)) |             | SW    | 318.3                  |            |              |                          |                        |              |                  |                         |             |  |   |
| 282                 |               | Grayish brown (2.5Y 5/4), stratified, fine to coarse SAND, some fine to coarse gravel, angular to subrounded, mixed lithologies, damp. (SW)  |             | SP    | 282.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               | Dark brown (2.5Y 4/3), stratified, fine to medium SAND, little to some fine to coarse gravel, trace coarse sand, damp. (SP)  |             | SP    | 317.3                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               | Medium brown, stratified, fine to coarse GRAVEL, some fine to coarse sand, little silt, wet. (GW-GM)   |             | GW-GM | 283.0                  | 51         | 100          | A7B-1-284.0-284.5        |                        |              |                  |                         |             |  | drilling becomes easier   |
| 284                 |               | Medium grayish brown, stratified, fine to coarse GRAVEL, little fine to coarse sand, trace silt, wet. (GW)   |             | GW    | 315.8                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               |  |             | GW    | 284.5                  |            |              | A7B-1-286.0-286.5        |                        |              |                  |                         | ▽           | Perched, static water at 284.7 ft. measured 10/3/06 0710, left overnight. BOH=288 ft., slough at 285 ft. |   |
| 286                 |               | Grayish brown (2.5Y 5/4), nonstratified, fine to coarse GRAVEL, matrix of silty fine sand, angular to subrounded, socketed, moist. (GM)  |             | GM    | 313.3                  |            |              | A7B-1-287.0-287.5        |                        |              |                  |                         |             |  |   |
|                     |               |  |             | GM    | 287.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
| 288                 |               | Gray (Gley 4/5B1), stratified, fine to coarse SAND, little fine to coarse gravel, trace silt, subrounded, wet. (SW)  |             | SW    | 312.3                  |            |              |                          |                        |              |                  |                         |             |  | drilling becomes harder<br>auger bit is used to retain core inside barrel |
|                     |               |  |             | SW    | 288.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               | Disturbed sample: Grayish brown (5Y 4/3), nonstratified, fine to medium SAND, trace to little coarse sand, trace fine to coarse gravel, wet. (SP)  |             | SP    | 311.3                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               |  |             | SP    | 289.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
| 290                 |               | Disturbed sample: Grayish brown, fine to coarse GRAVEL, some fine to coarse sand, subangular to rounded, wet. (GW)   |             | GW    | 310.3                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               |  |             | GW    | 290.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
| 292                 |               |  |             |       |                        | 52         | 100          |                          |                        |              |                  |                         |             |  | drilling becomes easier   |
| 294                 |               |  |             |       |                        |            |              |                          |                        |              |                  |                         |             |  |   |
| 296                 |               | 295.0 ft. Undisturbed sample: Gray, crudely stratified, fine to coarse GRAVEL, some fine to coarse sand, subangular to rounded, wet. (GW)  |             | GW    | 302.8                  |            |              | A7B-1-296.0-296.5        |                        |              |                  |                         |             |  |   |
|                     |               |  |             | GW    | 297.5                  |            |              | A7B-1-297.5-298.0        |                        |              |                  |                         |             |  |   |
| 298                 |               | Gray (Gley 4/2.5), nonstratified, fine to medium GRAVEL, matrix of silty fine sand with trace medium sand, matrix supported, socketed, subangular to subrounded, moist (GP-GM)   |             | GP-GM | 302.3                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               |  |             | GP-GM | 298.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               | Gray (Gley 3/), medium to coarse SAND, little fine to medium gravel, trace silt, subangular, white quartz sand grains, wet. (SP)   |             | SP    | 301.3                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               |  |             | SP    | 299.0                  |            |              |                          |                        |              |                  |                         |             |  |   |
|                     |               | Gray (Gley 3/), stratified, fine to coarse GRAVEL, little fine to coarse sand, trace silt, wet. (GW)   |             | GW    | 300.3                  |            |              |                          |                        |              |                  |                         |             |  | 298 ft. - sound hole to 290 ft<br>8 feet of slough                        |
| 300                 |               | --- CONTINUED NEXT PAGE ---  |             |       |                        |            |              |                          |                        |              |                  |                         |             |  |   |

SONIC NO WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 17/08 DATA INPUT: continuous soil core (4.25-inch diameter), drilled dry with core barrel rotation unless noted otherwise

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 16 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93      DATUM: NAD27 (H), NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE                       |  | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS   |  |
|---------------------|---------------|------------------------------------|--|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|--|--|
|                     |               | DESCRIPTION                        | GRAPHIC LOG  |       |                        |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               | -- CONTINUED FROM PREVIOUS PAGE -- |  |       |                        |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 300                 |               |                                    | 299.5 ft. becomes fine to coarse GRAVEL, some fine to coarse sand.   | SP    | 300.0                  |            |              | A7B-1-300.0-300.5        |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Gray (Gley 3/), stratified, medium to coarse SAND, little to some fine to medium GRAVEL, trace coarse gravel, mixed lithologies, brick-red clasts, wet. (SP)             |       | 299.3                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Gray (Gley 3/), stratified, fine to coarse GRAVEL, little fine to coarse sand, subangular to subrounded, wet. (SP)   | GW    | 301.0                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 302                 |               |                                    | Gray (Gley 3/), stratified, fine to coarse GRAVEL, little fine to coarse sand, subangular to subrounded, wet. (GW)   | GW-GM | 298.3                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Gray (Gley 3/), stratified, fine to coarse GRAVEL, little fine to coarse sand, little silt, subangular to subrounded, socketed, wet. (GW-GM)                             |       | 302.0                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Gray (Gley 3/), stratified, medium to coarse SAND, wet. (SP)   | SP    | 297.3                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 303.0                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 304                 |               |                                    | Gray (Gley 3/), stratified, fine to coarse GRAVEL, little fine to coarse sand, little silt, subangular to subrounded, socketed, wet. (GW-GM)                             | SP    | 296.3                  | 53         | 100          | A7B-1-304.0-304.5        |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  | GW-GM | 304.0                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 294.3                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 306                 |               |                                    | Gray (Gley 3/), stratified, medium to coarse SAND, wet. (SP)   | SP    | 306.0                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 293.8                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Gray (Gley 3/), stratified, fine to coarse GRAVEL, little silty fine sand to fine sandy silt, angular to subrounded, moist. (GM)   | GM    | 306.5                  |            |              | A7B-1-307.0-307.5        |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 292.3                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 308                 |               |                                    | Gray (Gley 3/) speckled with black, gray, white, and trace red clasts, stratified, fine to coarse GRAVEL, little medium to coarse sand, subangular to rounded, wet. (GW) | GW    | 308.0                  |            |              |                          |                        |              |                  |                               |             |                      | 308 ft. - sound hole to 297 ft<br>11 feet of slough                |  |
|                     |               |                                    |  |       | 290.8                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Gray (Gley 3/), stratified, fine to medium SAND, trace fine gravel, subrounded, slightly dilatant, wet. (SP)   | SP    | 309.5                  |            |              |                          |                        |              |                  |                               |             |                      | 309 ft. - bottom of bentonite chips<br>bottom of Natural Gamma Log |  |
|                     |               |                                    |  |       | 288.8                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 312                 |               |                                    | Speckled gray (Gley 3/), stratified, medium to coarse SAND, little fine sand, little fine to medium gravel, wet. (SW)  | SW    | 311.5                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 287.8                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Gray (Gley 3/), stratified, fine to medium SAND, trace fine to coarse gravel, subrounded, wet. (SP)  | SP    | 312.5                  | 54         | 100          | A7B-1-312.5-313.0        |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 286.3                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 314                 |               |                                    | Speckled gray (Gley 3/), stratified, fine to coarse GRAVEL, little medium to coarse sand, subrounded to rounded, mixed lithologies, wet. (GW)                            | GW    | 314.0                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 283.8                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 316                 |               |                                    | Gray (Gley 3/), stratified, medium SAND, little to some fine to coarse gravel, trace coarse sand, subangular to rounded, wet. (SP)                                       | SP    | 316.5                  |            |              | A7B-1-316.0-316.5        |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 282.3                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    | Speckled gray (Gley 3/), stratified fine to coarse GRAVEL, some medium to coarse sand, subangular to subrounded, wet. (GW)   | GW    | 318.0                  |            |              |                          |                        |              |                  |                               |             |                      | 318 ft. - bottom of 6-inch (OD) drive casing                       |  |
|                     |               |                                    |  |       | 280.8                  | 55         | 100          |                          |                        |              |                  |                               |             |                      |  |  |
|                     |               |                                    |  |       | 319.5                  |            |              |                          |                        |              |                  |                               |             |                      |  |  |
| 320                 |               |                                    | -- CONTINUED NEXT PAGE --  |       |                        |            |              |                          |                        |              |                  |                               |             |                      |  |  |

SONIC NO WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 17/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-1**

SHEET 17 OF 17

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 9/26/06      BORING END DATE: 10/3/06  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169998.93  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698086.67      DATUM: NAD27 (H), NGVD29 (V)  
 GROUND ELEV.(ft): 600.29

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE  |             | USCS | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PERCENT<br>FINER<br>SIEVE NO.<br>200 | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |  |
|---------------------|---------------|---|-------------|------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|--------------------------------------|-------------|----------------------|----------------------------|--|
|                     |               | DESCRIPTION   | GRAPHIC LOG |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
|                     |               | — CONTINUED FROM PREVIOUS PAGE —  |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 320                 | robotronic    | Speckled gray (Gley 3/), stratified, medium to coarse SAND, little to some fine to coarse gravel, subangular to subrounded, wet. (SP)                   |             | SP   | 279.3<br>321.0         |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
|                     |               | Gray (Gley 3/), nonstratified fine to coarse GRAVEL, little fine to coarse sand, trace silt, subrounded, clast supported, wet. (GW)                     |             | GW   | 278.3                  |            |              | A7B-1-322.0-322.5        |                        |              |                  |                                      |             |                      |                            |  |
| 322                 |               | Speckled gray (Gley 3/), stratified, medium SAND, trace fine gravel, wet. (SP)  |             | SP   | 277.3                  |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
|                     |               | Gray (Gley 3/), nonstratified fine to coarse GRAVEL, some medium to coarse sand, trace fine sand, subangular to subrounded, wet. (GW)                   |             | GW   | 273.3<br>327.0         |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 324                 |               |   |             |      |                        | 55         | 100          |                          |                        |              |                  |                                      |             |                      |                            |  |
| 326                 |               |   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
|                     |               | Gray (Gley 4/1), very faintly laminated, SILT, trace very fine brown organics, mild livery texture, nonplastic, black lithics at top of unit, wet. (ML) |             | ML   | 272.3                  |            |              | A7B-1-327.0-327.5        | 31                     | 33           | 3                |                                      |             |                      |                            |  |
| 328                 |               | Boring terminated at target depth of 328 feet below ground surface.   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 330                 |               |   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 332                 |               |   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 334                 |               |   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 336                 |               |   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 338                 |               |   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |
| 340                 |               |   |             |      |                        |            |              |                          |                        |              |                  |                                      |             |                      |                            |  |

SONIC NO WELL: 063-1088.2503 CHRLF AREA 7.GPJ MI-OH.GDT 17708 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-3**

SHEET 1 OF 5

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 10/18/2006      BORING END DATE: 10/19/2006  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169650.22  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698952.33      DATUM: NAD27 (H) NGVD29 (V)  
 GROUND ELEV.(ft): 582.80

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE   |  | GRAPHIC LOG | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |    |
|---------------------|---------------|--|--|-------------|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|----------------------------|----|
|                     |               | DESCRIPTION  |  |             |       |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
| 0                   |               | GRAVEL ROAD SURFACE  |  |             | GP    | 0.0                    |            |              |                          |                        |              |                  |                               |             |                      |                            | 0  |
|                     |               | Gray, nonstratified, fine to medium GRAVEL, little fine to coarse sand, angular, damp. (GP) (ROAD FILL)  |  |             | GP    | 581.8                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
| 2                   |               | Orange brown (2.5Y 4/2), nonstratified, fine to coarse GRAVEL, some fine to coarse sand, little silt, trace small cobbles, damp. (GW-GM) (FILL)                        |  |             | GW-GM | 1.0                    | 1          | 100          | A7B-3-1.0-2.0            |                        |              |                  |                               |             |                      |                            | 2  |
| 4                   |               | Gray, nonstratified, silty fine SAND, little medium to coarse sand, little fine to medium gravel, damp. (SM) (FILL)  |  |             | SM    | 578.8                  |            |              |                          |                        |              |                  |                               |             |                      |                            | 4  |
| 6                   |               | Orange brown (2.5Y 4/2) to brown, fine to coarse SAND, little silt, little fine to coarse gravel, damp. (SW-SM) (FILL?)  |  |             | SW-SM | 577.8                  | 2          | 100          | A7B-3-5.0-6.0            |                        |              |                  |                               |             |                      |                            | 6  |
| 8                   |               | 7.0 to 7.5 ft. Oxidized zone   |  |             |       | 575.3                  |            |              |                          |                        |              |                  |                               |             |                      |                            | 8  |
| 10                  |               | Brown, nonstratified, fine to coarse GRAVEL, some fine to coarse sand, little silt, trace small cobbles, subangular to rounded, granular, damp. (GW-GM)                |  |             | GW-GM | 7.5                    |            |              |                          |                        |              |                  |                               |             |                      |                            | 10 |
| 12                  |               | Brown, stratified, fine to coarse SAND, and, fine to coarse GRAVEL, little silt, trace small cobbles, subangular to rounded, granular, damp. (SW-SM)                   |  |             | SW-SM | 573.8                  | 3          | 100          | A7B-3-10.0-12.0          | 5.6                    |              | 10.4             |                               |             |                      |                            | 12 |
| 14                  |               | Light brown, stratified, fine SAND, little silt, granular, damp. (SP-SM)   |  |             | SP-SM | 570.3                  |            |              | A7B-3-12.5-13.0          |                        |              |                  |                               |             |                      |                            | 14 |
| 16                  |               | Brown, nonstratified, fine to coarse GRAVEL, some fine to coarse sand, little silt, trace small cobbles, subangular to rounded, granular, damp. (GW-GM)                |  |             | GW-GM | 12.5                   |            |              |                          |                        |              |                  |                               |             |                      |                            | 16 |
| 18                  |               | Dark reddish brown (2.5Y 3/2), stratified, fine to medium GRAVEL, dense matrix of silty fine sand with trace medium to coarse sand, trace fine organics, damp. (GP-GM) |  |             | GP-GM | 569.8                  | 4          | 100          | A7B-3-15.0-16.0          |                        |              |                  |                               |             |                      |                            | 18 |
| 20                  |               | Light brown (2.5Y 5/3), stratified, fine to coarse GRAVEL, some fine to coarse sand, trace silt, subangular to subrounded, granular, damp. (GW)                        |  |             | GW    | 13.0                   |            |              |                          |                        |              |                  |                               |             |                      |                            | 20 |
|                     |               | Brownish gray, nonstratified, fine to coarse GRAVEL, some fine sand, little silt, trace fine to medium cobbles, damp. (GW-GM)  |  |             | GW-GM | 568.8                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               | Orange brown (2.5Y 4/2), stratified, fine to medium SAND, oxidized, damp. (SP)   |  |             | SP    | 568.3                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               | Dark reddish brown (2.5Y 3/2), stratified, fine to coarse GRAVEL, matrix of silty fine sand, damp. (GW-GM)   |  |             | GW-GM | 14.0                   | 5          | 100          |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               |  |  |             |       | 568.3                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               |  |  |             |       | 565.8                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               |  |  |             |       | 564.8                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               |  |  |             |       | 18.0                   |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               |  |  |             |       | 564.3                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               |  |  |             |       | 18.5                   |            |              |                          |                        |              |                  |                               |             |                      |                            |    |
|                     |               |  |  |             |       | 562.8                  |            |              |                          |                        |              |                  |                               |             |                      |                            |    |

SONIC NO WELL: A7B-2-GPJ MLCH-GDT 1/7/08 DATA INPUT:

-- CONTINUED NEXT PAGE --

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

### RECORD OF BOREHOLE A7B-3

SHEET 2 OF 5

|                               |                                     |                             |
|-------------------------------|-------------------------------------|-----------------------------|
| PROJECT: HDR/CHRLF-Area 7     | BORING START DATE: 10/18/2006       | BORING END DATE: 10/19/2006 |
| LOCATION: Maple Valley, WA    | DRILLING CONTRACTOR: ProSonic Corp. | NORTHING: 169650.22         |
| PROJECT NUMBER: 063-1088.2503 | DRILL RIG: ProSonic Track           | EASTING: 1698952.33         |
|                               |                                     | DATUM: NAD27 (H) NGVD29 (V) |
|                               |                                     | GROUND ELEV.(ft): 582.80    |

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE  |             | USCS     | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (lb) | WATER LEVEL | WATER LEVEL<br>NOTES          | DRILLING<br>NOTES/COMMENTS |
|---------------------|---------------|---|-------------|----------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|------------------------|-------------|-------------------------------|----------------------------|
|                     |               | DESCRIPTION   | GRAPHIC LOG |          |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               | -- CONTINUED FROM PREVIOUS PAGE --  |             |          |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
| 20                  |               | Orange brown (2.5Y 4/2), stratified, fine to coarse SAND, trace to little fine to medium gravel, damp. (SW)   |             | SW       | 20.0                   |            |              | A7B-3-20.0-21.0          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 561.8                  |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 21.0                   | 5          | 100          |                          |                        |              |                  |                        |             |                               |                            |
| 22                  |               | Orange brown (2.5Y 4/2), stratified, fine to coarse GRAVEL, some fine to coarse sand, trace fine to medium cobbles, subrounded to subangular, damp. (GW)                                    |             | GW       |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 558.8                  |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 24.0                   |            |              |                          |                        |              |                  |                        |             |                               |                            |
| 24                  |               | Orange brown (2.5Y 4/2), stratified, fine to medium SAND, trace coarse sand, trace fine gravel, subangular to subrounded, damp. (SP)  |             | SP       |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 557.8                  |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 25.0                   |            |              |                          |                        |              |                  |                        |             |                               |                            |
| 26                  |               | Dark grayish brown, stratified, fine to coarse GRAVEL, matrix of silty fine sand, moderately brittle, damp. (GW-GM)   |             | GW-GM    |                        | 6          | 100          |                          |                        |              |                  |                        |             | hard drilling                 |                            |
|                     |               |   |             |          | 556.3                  |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 26.5                   |            |              | A7B-3-27.0-28.0          |                        |              |                  |                        |             |                               |                            |
| 28                  |               | Medium brown (2.5Y 5/3), stratified, fine to medium SAND, trace to little silt, trace to little fine gravel, granular, damp. (SP/SP-SM)   |             | SP/SP-SM |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 554.8                  |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          | 28.0                   |            |              |                          |                        |              |                  |                        |             |                               |                            |
| 30                  |               | Brownish gray, stratified, fine to coarse GRAVEL, little fine to medium cobbles, clast supported, subangular to subrounded, dense matrix of silty fine to coarse sand, socketed, damp. (GM) |             |          |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
| 32                  |               |   |             |          |                        | 7          | 100          | A7B-3-31.0-33.0          | 3.6                    |              | 75.9             |                        |             | very hard drilling in cobbles |                            |
|                     |               |   |             |          |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
| 34                  |               |   |             |          |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |
| 36                  |               | 35.0 ft. matrix alternating between dense/brittle and granular  |             | GM       |                        |            |              | A7B-3-35.0-35.5          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          |                        | 8          | 100          | A7B-3-36.0-38.0          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          |                        | 9          | 100          |                          |                        |              |                  |                        |             |                               |                            |
|                     |               |   |             |          |                        | 10         | 100          |                          |                        |              |                  |                        |             |                               |                            |
| 40                  |               | -- CONTINUED NEXT PAGE --   |             |          |                        |            |              |                          |                        |              |                  |                        |             |                               |                            |

SONIC NO WELL: A7B-2.GPJ MLOH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
CHECKED: DPF  
DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-3**

SHEET 3 OF 5

PROJECT: HDR/CHRLF-Area 7 BORING START DATE: 10/18/2006 BORING END DATE: 10/19/2006  
 LOCATION: Maple Valley, WA DRILLING CONTRACTOR: ProSonic Corp. NORTHING: 169650.22 DATUM: NAD27 (H) NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503 DRILL RIG: ProSonic Track EASTING: 1698952.33 GROUND ELEV.(ft): 582.80

| DEPTH SCALE<br>FEET | BORING METHOD | SOIL PROFILE                         |   | USCS  | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR (lb) | WATER LEVEL | WATER LEVEL<br>NOTES   | DRILLING<br>NOTES/COMMENTS |
|---------------------|---------------|--------------------------------------|---|-------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|------------------------|-------------|--|----------------------------|
|                     |               | DESCRIPTION                          | GRAPHIC LOG   |       |                        |            |              |                          |                        |              |                  |                        |             |  |                            |
|                     |               | --- CONTINUED FROM PREVIOUS PAGE --- |   |       |                        |            |              |                          |                        |              |                  |                        |             |  |                            |
| 40                  |               |                                      | Brownish gray, stratified, fine to coarse GRAVEL, little fine to medium cobbles, clast supported, subangular to subrounded, dense matrix of silty fine to coarse sand, socketed, damp. (GM) |       |                        |            |              | A7B-3-40.0-42.0          |                        |              |                  |                        |             |  |                            |
|                     |               |                                      |   |       | 540.8                  | 10         | 100          | A7B-3-41.0-41.5          | 12.6                   |              | 21.0             |                        |             |  |                            |
| 42                  |               |                                      | Medium brown, nonstratified, fine to coarse GRAVEL, some fine to coarse sand, trace silt, subrounded to angular, damp. (GW)   |       | 42.0                   |            |              |                          |                        |              |                  |                        |             |  |                            |
| 44                  |               |                                      | 45.0 ft. oxidized clast   | GW    |                        | 11         | 100          | A7B-3-45.0-46.0          |                        |              |                  |                        |             | Hole remained dry when left overnight                          |                            |
| 46                  |               |                                      |   |       | 535.8                  |            |              |                          |                        |              |                  |                        |             |  |                            |
| 48                  |               |                                      | Medium brown, stratified, fine to coarse GRAVEL, some fine to coarse sand, little silt, trace fine to medium cobbles, subrounded to subangular, damp. (GW-GM)                               | GW-GM | 47.0                   | 12         | 100          |                          |                        |              |                  |                        |             | broke drill rod while drilling at 46 ft drill string recovered |                            |
| 50                  |               |                                      | Light brown (2.5Y 5/4), stratified, fine SAND, granular, scattered 1/4-inch thick silty fine sand layers, damp. (SP)  | SP    | 532.8                  | 13         | 100          | A7B-3-50.0-50.5          |                        |              |                  |                        |             |  |                            |
| 52                  |               |                                      | Light brown (2.5Y 5/4), stratified, fine to coarse SAND, little silt, trace to little fine to coarse gravel, damp. (SW-SM)  |       | 531.8                  |            |              |                          |                        |              |                  |                        |             |  |                            |
| 54                  |               |                                      | 54.5 ft. becomes fine SAND, little fine to coarse gravel, trace medium to coarse sand, damp. (SP)   |       | 51.0                   | 14         | 100          | A7B-3-52.5-53.0          |                        |              |                  |                        |             |  |                            |
| 56                  |               |                                      | 55.5 ft. becomes fine to medium SAND, little fine to coarse gravel, damp. (SP)  | SW-SM |                        | 15         | 100          |                          |                        |              |                  |                        |             |  |                            |
| 58                  |               |                                      |   |       | 523.8                  |            |              |                          |                        |              |                  |                        |             |  |                            |
| 60                  |               |                                      | Light brown (2.5Y 5/4), stratified, fine to coarse SAND, little fine to coarse gravel, granular, damp. (SW)   | SW    | 59.0                   | 16         | 100          |                          |                        |              |                  |                        |             |  |                            |
|                     |               |                                      |   |       | 522.8                  |            |              |                          |                        |              |                  |                        |             |  |                            |
|                     |               |                                      | --- CONTINUED NEXT PAGE ---   |       |                        |            |              |                          |                        |              |                  |                        |             |  |                            |

SONIC NO WELL: A7B-2-GPJ MLCHGDT: 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06



**RECORD OF BOREHOLE A7B-3**

SHEET 4 OF 5

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 10/18/2006      BORING END DATE: 10/19/2006  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169650.22      DATUM: NAD27 (H) NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698952.33      GROUND ELEV.(ft): 582.80

| DEPTH SCALE<br>FEET | BORING METHOD                    | SOIL PROFILE  |                             | USCS     | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR<br>STRENGTH | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |    |    |
|---------------------|----------------------------------|---|-----------------------------|----------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-------------------------------|-------------|----------------------|----------------------------|----|----|
|                     |                                  | DESCRIPTION   | GRAPHIC LOG                 |          |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |    |    |
| 60                  | continuous soil core<br>robsonic | --- CONTINUED FROM PREVIOUS PAGE ---  |                             |          | 60.0                   | 16         | 100          | A7B-3-60.5-61.0          |                        |              |                  |                               |             |                      |                            | 60 |    |
|                     |                                  | Light brown (2.5Y 5/4), stratified, fine to medium SAND, trace fine to medium gravel, trace silt, damp. (SP)  |                             | SP       | 520.3                  | 17         | 100          | A7B-3-63.0-64.0          |                        |              |                  |                               |             |                      |                            |    | 62 |
| 62                  |                                  | Light gray (2.5Y 7/1), stratified, fine SAND, grading to fine sand with little silt, granular, dry to damp. (SP/SP-SM)  |                             | SP/SP-SM | 62.5                   | 17         | 100          | A7B-3-63.0-64.0          |                        |              |                  |                               |             |                      |                            |    | 62 |
|                     |                                  | Dark brown (2.5Y 4/3), nonstratified, fine sandy SILT, little fine to coarse gravel, trace medium to coarse sand, socketed, matrix supported, rounded to subangular, damp to moist. (ML/GM)                       |                             | ML       | 518.8                  | 18         | 100          | A7B-3-64.0-64.5          |                        |              |                  |                               |             |                      |                            |    | 64 |
| 64                  |                                  | Light brown (2.5Y 5/4), stratified, fine to coarse GRAVEL, trace to little fine to medium cobbles, some fine to coarse sand, little silt, subrounded to subangular, granular, damp. (GW/GW-GM)                    |                             | GW/GW-GM | 64.0                   | 18         | 100          | A7B-3-64.0-64.5          |                        |              |                  |                               |             |                      |                            |    | 64 |
|                     |                                  | Light brown (2.5Y 5/4) grading to gray (Gley 4), nonstratified, fine to coarse GRAVEL, matrix of fine sandy silt, trace medium to coarse sand, socketed, brittle, subangular to subrounded, DIAMICTON, damp. (GM) |                             | GM       | 517.8                  | 19         | 100          | A7B-3-68.0-68.5          |                        |              |                  |                               |             |                      |                            |    | 66 |
| 66                  |                                  | Light brown (2.5Y 5/4) grading to gray (Gley 4), nonstratified, fine to coarse GRAVEL, matrix of fine sandy silt, trace medium to coarse sand, socketed, brittle, subangular to subrounded, DIAMICTON, damp. (GM) |                             | GM       | 65.0                   | 19         | 100          | A7B-3-68.0-68.5          |                        |              |                  |                               |             |                      |                            |    | 66 |
|                     |                                  | Light brown, stratified, fine to coarse GRAVEL, some fine to medium sand, trace to little coarse sand, granular, damp. (GW)   |                             | GW       | 516.3                  | 20         | 100          | A7B-3-71.0-72.0          |                        |              |                  |                               |             |                      |                            |    | 70 |
| 70                  |                                  | Light brown, stratified, fine to coarse GRAVEL, some fine to medium sand, trace to little coarse sand, granular, damp. (GW)   |                             | GW       | 66.5                   | 20         | 100          | A7B-3-71.0-72.0          |                        |              |                  |                               |             |                      |                            |    | 70 |
|                     |                                  | 72.0 ft. becomes mostly gravel, little sand matrix, clast supported. (GW)   |                             | GW       | 513.3                  | 21         | 100          | A7B-3-71.0-72.0          |                        |              |                  |                               |             |                      |                            |    | 72 |
| 72                  |                                  | 72.0 ft. becomes mostly gravel, little sand matrix, clast supported. (GW)   |                             | GW       | 69.5                   | 21         | 100          | A7B-3-71.0-72.0          |                        |              |                  |                               |             |                      |                            |    | 72 |
|                     |                                  | 74.0 ft. matrix becomes dense and brittle   |                             | GW       |                        | 22         | 100          |                          |                        |              |                  |                               |             |                      |                            |    | 74 |
| 74                  |                                  | 74.0 ft. matrix becomes dense and brittle   |                             | GW       |                        | 22         | 100          |                          |                        |              |                  |                               |             |                      |                            |    | 74 |
|                     |                                  |   |                             | GW       |                        | 23         | 100          |                          |                        |              |                  |                               |             |                      |                            |    | 76 |
| 76                  |                                  |   |                             | GW       |                        | 23         | 100          |                          |                        |              |                  |                               |             |                      |                            |    | 76 |
|                     |                                  |   |                             | SP       | 504.8                  | 23         | 100          | A7B-3-78.0-78.5          |                        |              |                  |                               |             |                      |                            |    | 78 |
| 78                  |                                  |   |                             | SP       | 78.0                   | 23         | 100          | A7B-3-78.0-78.5          |                        |              |                  |                               |             |                      |                            |    | 78 |
|                     |                                  |   |                             | SP       | 504.3                  | 23         | 100          | A7B-3-78.0-78.5          |                        |              |                  |                               |             |                      |                            |    | 78 |
| 80                  |                                  |   |                             | SP       | 78.5                   | 23         | 100          | A7B-3-78.0-78.5          |                        |              |                  |                               |             |                      |                            |    | 80 |
|                     |                                  |   | --- CONTINUED NEXT PAGE --- |          |                        |            |              |                          |                        |              |                  |                               |             |                      |                            |    | 80 |

SONIC NO WELL: A7B-2-GPJ MLCH-GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: JILC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

**RECORD OF BOREHOLE A7B-3**

SHEET 5 OF 5

PROJECT: HDR/CHRLF-Area 7      BORING START DATE: 10/18/2006      BORING END DATE: 10/19/2006  
 LOCATION: Maple Valley, WA      DRILLING CONTRACTOR: ProSonic Corp.      NORTHING: 169650.22      DATUM: NAD27 (H) NGVD29 (V)  
 PROJECT NUMBER: 063-1088.2503      DRILL RIG: ProSonic Track      EASTING: 1698952.33      GROUND ELEV.(ft): 582.80

| DEPTH SCALE<br>FEET | BORING METHOD  | SOIL PROFILE  |  | GRAPHIC LOG | USCS | ELEV.<br>DEPTH<br>(ft) | RUN NUMBER | RECOVERY (%) | GRAB<br>SAMPLE<br>NUMBER | MOISTURE<br>CONTENT(%) | LIQUID LIMIT | PLASTICITY INDEX | PRESSURE<br>SHEAR LOG | WATER LEVEL | WATER LEVEL<br>NOTES | DRILLING<br>NOTES/COMMENTS |    |
|---------------------|--|---|--|-------------|------|------------------------|------------|--------------|--------------------------|------------------------|--------------|------------------|-----------------------|-------------|----------------------|----------------------------|----|
|                     |  | DESCRIPTION   |  |             |      |                        |            |              |                          |                        |              |                  |                       |             |                      |                            |    |
| 80                  | continuous soil core<br>robotonic  | — CONTINUED FROM PREVIOUS PAGE —  |  |             | SM   |                        |            |              |                          |                        |              |                  |                       |             |                      | 80                         |    |
|                     |  | Brown, stratified, silty fine SAND, little fine to coarse gravel, trace medium to coarse sand, damp. (SM) |  |             |      | 501.3                  |            |              |                          |                        |              |                  |                       |             |                      |                            |    |
| 82                  |  | Brown, stratified, fine to medium SAND, trace silt, damp. (SP)  |  |             | SP   | 81.5                   | 23         | 100          | A7B-3-82.0-82.5          |                        |              |                  |                       |             |                      |                            | 82 |
| 84                  | Boring terminated at target depth of 83 feet below ground surface.<br>No ground water encountered. |   |  |             |      | 499.8                  |            |              |                          |                        |              |                  |                       |             |                      | 84                         |    |
|                     |  |   |  |             |      | 83.0                   |            |              |                          |                        |              |                  |                       |             |                      |                            |    |

SONIC NO WELL: A7B-2.GPJ MLOH.GDT 1/7/08 DATA INPUT:

DEPTH SCALE  
1 inch to 2.5 feet



LOGGED: J4LC  
 CHECKED: DPF  
 DATE CHECKED: 11/30/06

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-1  
Page 1 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 16, 2014 - April 23, 2014  
Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169416.23  
Easting: 1699528.13  
Ground Elevation: 594.04  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 594       | 0     |               |   |          |                |             |   |
| 593       | -1    |               | G   |          |                |             | 0 - 2.4: SILTY SAND WITH GRAVEL (SM), olive gray, fine to medium, some fines, little medium to coarse gravel, compacted with loose matrix, moist to wet. (FILL)                                 |
| 592       | -2    |               |   |          |                |             |   |
| 591       | -3    |               |   |          |                |             | 2.4 - 4.5: SILTY SAND (SM), gray with orange mottles, fine, few fine to coarse subrounded to subangular gravel compacted with loose matrix, moist to wet. (FILL)                                |
| 590       | -4    |               |   |          |                |             |   |
| 589       | -5    | 0-10          |   |          |                |             | 4.5 - 6.6: SILTY SAND (SM), olive, fine to medium, trace coarse sand, little fines, few to little fine to medium subrounded to subangular gravel. (FILL)  |
| 588       | -6    |               | G: PSA  |          |                |             |   |
| 587       | -7    |               |   |          |                |             | 6.6 - 7.7: SILT (ML), gray, trace fine sand, low plasticity, low toughness, firm, moist. (FILL)   |
| 586       | -8    |               |   |          |                |             |   |
| 585       | -9    |               | G   |          |                |             | 7.7 - 14.0: SANDY SILT WITH GRAVEL (ML), gray fines, subrounded to subangular (many are broken), some fine to coarse sand, moist. (FILL)  |
| 584       | -10   |               |   |          |                |             |   |
| 583       | -11   |               |   |          |                |             |   |
| 582       | -12   |               | G   |          |                |             |   |
| 581       | -13   |               |   |          |                |             |   |
| 580       | -14   |               |   |          |                |             |   |
| 579       | -15   | 10-20         |   |          |                |             | 14.0 - 15.0: SAND (SP), gray brown, medium, trace fines, trace fine subrounded gravel, moist. (FILL)  |
| 578       | -16   |               |   |          |                |             | 15.0 - 21.5: SAND WITH SILT AND GRAVEL (SP-SM), gray, firm to hard few to little fine to medium subrounded to subangular gravel, grades to SILT WITH GRAVEL AND SAND (ML), moist to wet. (FILL) |
| 577       | -17   |               |   |          |                |             |   |
| 576       | -18   |               |   |          |                |             |   |
| 575       | -19   |               | G   |          |                |             |   |
| 574       | -20   |               |   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   | Boring A8B-1<br>Page 2 of 15 |                |             |  |
|---|-------|--|---|------------------------------|----------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 16, 2014 - April 23, 2014<br>Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Northing: 169416.23<br>Easting: 1699528.13<br>Ground Elevation: 594.04<br>Depth: 280.0 feet |                              |                |             |  |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests)                           | Backfill                     | Depth to Water | Graphic Log | Classification and Description   |
| 574   | -20   |  |   |                              |                |             | 15 - 21.5 feet: See description on previous page.  |
| 573   | -21   |  | SB: 3/5/9; DS,<br>USCS  |                              |                |             |  |
| 572   | -22   |  |   |                              |                |             | 21.5 - 41.6: SILTY SAND AND GRAVEL (SM), gray, fine, some nonplastic fines, wet (saturated), loose (sloughing), (soils may be liquified due to drilling action). May grade to SANDY SILT AND GRAVEL (ML). Yellow paint flecks on gravels within upper portion of recovered sample. Sample cores from 24.5 to 30 feet and 35 to 40 feet were lost (sloughed) and not recovered during subsequent sampling. (FILL) |
| 571   | -23   |  |   |                              |                |             | Depth to perched groundwater 21.6 feet at 13:16 on April 16, 2014 with casing at 20 feet and borehole open to 25 feet after losing 5 feet of core.   |
| 570   | -24   |  |   |                              |                |             |  |
| 569   | -25   | 20-30  |   |                              |                |             |  |
| 568   | -26   |  |   |                              |                |             |  |
| 567   | -27   |  |   |                              |                |             |  |
| 566   | -28   |  |   |                              |                |             |  |
| 565   | -29   |  |   |                              |                |             |  |
| 564   | -30   |  |   |                              |                |             |  |
| 563   | -31   |  |   |                              |                |             |  |
| 562   | -32   |  |   |                              |                |             |  |
| 561   | -33   |  |   |                              |                |             |  |
| 560   | -34   |  |   |                              |                |             |  |
| 559   | -35   | 30-40  | G   |                              |                |             |  |
| 558   | -36   |  |   |                              |                |             |  |
| 557   | -37   |  |   |                              |                |             |  |
| 556   | -38   |  |   |                              |                |             |  |
| 555   | -39   |  |   |                              |                |             |  |
| 554   | -40   |  | G   |                              |                |             |  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/> Logged by AGU</p> |       |  |   |                              |                |             |  |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-1  
Page 3 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 16, 2014 - April 23, 2014  
Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169416.23  
Easting: 1699528.13  
Ground Elevation: 594.04  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 554       | -40   |               |   |          |                |             | 21.5 - 41.6 feet: See description on previous page.   |
| 553       | -41   |               | G   |          |                |             |   |
| 552       | -42   | 40-44         |   |          |                |             |   |
| 551       | -43   |               | G: PSA  |          |                |             | 41.6 - 47.3: SILTY GRAVEL WITH SAND (GM), very dark gray to black, fine to about 44 feet, fine to coarse below 44 feet, some fines, few to little fine to medium gravel angular to subangular gravel, trace subrounded flattened cobbles, trace to few boulders, moist to wet, trace fibrous roots at 45'. Upper ~1 foot includes overlying soils settled into and mixed with this deposit. (FILL - former pond?) |
| 550       | -44   |               | G   |          |                |             |   |
| 549       | -45   |               | G   |          |                |             |   |
| 548       | -46   |               |   |          |                |             |   |
| 547       | -47   | 44-50         |   |          |                |             |   |
| 546       | -48   |               |   |          |                |             | 47.3 - 50.0: SILTY GRAVEL WITH SAND (GP-GM), gray, fine to medium, subangular to subrounded, some fine to coarse sand, little fines. (FILL?)  |
| 545       | -49   |               | G   |          |                |             |   |
| 544       | -50   |               |   |          |                |             | 50.0 - 54.0: SAND WITH SILTY FINES (SP-SM), light olive brown, fine, few fines, few fine to coarse subrounded to subangular gravel, moist, loose.   |
| 543       | -51   |               | G   |          |                |             |   |
| 542       | -52   |               |   |          |                |             |   |
| 541       | -53   |               | G   |          |                |             |   |
| 540       | -54   |               |   |          |                |             |   |
| 539       | -55   | 50-60         | G: PSA  |          |                |             | 54.0 - 65.5: SILTY GRAVEL WITH SAND (GW-GM), olive, little to some fine to coarse sand, few to little fines, trace cobbles to 6" diameter, moist to dry. Generally clast supported. At 56'-60.5': little to some fines with medium plasticity and low toughness. At 56'-57' feet: some cobbles.   |
| 538       | -56   |               |   |          |                |             |   |
| 537       | -57   |               |   |          |                |             |   |
| 536       | -58   |               | G   |          |                |             |   |
| 535       | -59   |               |   |          |                |             |   |
| 534       | -60   |               |   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   |   | Boring A8B-1<br>Page 4 of 15 |             |   |
|---|-------|--|---|---|------------------------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 16, 2014 - April 23, 2014<br>Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  |   | Northing: 169416.23<br>Easting: 1699528.13<br>Ground Elevation: 594.04<br>Depth: 280.0 feet |                              |             |   |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill  | Depth to Water               | Graphic Log | Classification and Description  |
| 534   | -60   |  | SB: 37-50/3"  |   |                              |             | 54.0 - 65.5 feet: See description on previous page.   |
| 533   | -61   |  |   |   |                              |             |   |
| 532   | -62   |  |   |   |                              |             |   |
| 531   | -63   |  |   |   |                              |             |   |
| 530   | -64   |  |   |   |                              |             |   |
| 529   | -65   | 60-70  |   |   |                              |             |   |
| 528   | -66   |  | G   |   |                              |             | 65.5 - 68.0: SILTY SAND (SM), olive gray with orange staining at basal contact, little nonplastic fines, few to little fine to medium gravel to 66', gravels absent below, trace cobbles, dry to moist.   |
| 527   | -67   |  | G   |   |                              |             |   |
| 526   | -68   |  |   |   |                              |             |   |
| 525   | -69   |  | G   |   |                              |             | 68.0 - 73.0: SAND WITH SILTY FINES (SW-SM), olive gray, fine to coarse, subrounded to angular, few fines, few fine to coarse subrounded to subangular gravel, trace cobbles to 4" diameter, rapid dilatancy, dry. Below 71': little to some fine to medium gravel.      |
| 524   | -70   |  |   |   |                              |             |   |
| 523   | -71   | 70-72.5  |   |   |                              |             |   |
| 522   | -72   |  | G   |   |                              |             |   |
| 521   | -73   |  |   |   |                              |             |   |
| 520   | -74   |  | G   |   |                              |             | 73.0 - 77.0: SILTY SAND (SM), olive gray, fine, few fine to medium gravel to 75 feet, trace gravels below 75'. Core is hot and dry (dusty) due to drilling action.  |
| 519   | -75   |  |   |   |                              |             |   |
| 518   | -76   | 72.5-80  |   |   |                              |             |   |
| 517   | -77   |  | G   |   |                              |             |   |
| 516   | -78   |  |   |   |                              |             |   |
| 515   | -79   |  | G   |   |                              |             | 77.0 - 85.0: SAND WITH SILTY FINES (SP-SM), light olive brown, very fine to fine, few fine, trace fine to medium subrounded gravel, loose, dry to moist, rapid dilatancy, cannot roll thread. At 82 - 82.5: thin horizontal orange (iron?)-stained laminae of SM or ML. |
| 514   | -80   |  |   |   |                              |             |   |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/> Logged by AGU</p> |       |  |   |   |                              |             |   |

**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation UEC Project 002.01.001 Task 3222 Boring A8B-1 Page 5 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
 Start and End Dates: April 16, 2014 - April 23, 2014  
 Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  
 Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169416.23  
 Easting: 1699528.13  
 Ground Elevation: 594.04  
 Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 514       | -80   |               | SB: 30-50/3*  |          |                |             | 77.0 - 85.0 feet: See description on previous page.   |
| 513       | -81   |               |   |          |                |             |   |
| 512       | -82   |               |   |          |                |             |   |
| 511       | -83   |               |   |          |                |             |   |
| 510       | -84   |               |   |          |                |             |   |
| 509       | -85   | 80-90         |   |          |                |             |   |
| 508       | -86   |               | G   |          |                |             | 85.0 - 89.5: SILTY SAND (SM), olive gray to olive, very fine to fine, some fines, trace subangular gravel and trace subrounded medium to coarse gravel to 86.5', dry, very soft to soft, matrix supported. At 86.5'-89.5': horizontal orange (iron?) stained laminae. At 89'-90': little to some fines. Hot and dry core.   |
| 507       | -87   |               | G   |          |                |             |   |
| 506       | -88   |               |   |          |                |             |   |
| 505       | -89   |               | G   |          |                |             |   |
| 504       | -90   |               |   |          |                |             |   |
| 503       | -91   |               | G: USCS, PSA  |          |                |             | 89.5 - 91.5: SANDY SILTY CLAY (CL-ML) and SILT (ML), dark gray with lighter gray laminae of silt or clayey silt and orange (iron?) stained laminae of fine sand occurring as subvertical cross-cutting features. Thinly laminated (1mm), very hard, slightly sticky, moist.   |
| 502       | -92   |               | ATT, OC   |          |                |             | 91.5 - 101.5: SILTY SAND WITH GRAVEL (SM), olive brown, fine to medium, little nonplastic to low plasticity fines, little to some fine to coarse subrounded to subangular gravel, trace cobbles to 4", matrix supported, dry to moist. At 95', orange staining at gravel point contacts. At 98' - 99', some nonplastic fines. At 99' - 101.5', olive gray fines and cobbles or boulder. |
| 501       | -93   |               |   |          |                |             |   |
| 500       | -94   | 90-98         |   |          |                |             |   |
| 499       | -95   |               | G   |          |                |             |   |
| 498       | -96   |               |   |          |                |             |   |
| 497       | -97   |               |   |          |                |             |   |
| 496       | -98   |               |   |          |                |             |   |
| 495       | -99   | 98-100        |   |          |                |             |   |
| 494       | -100  |               | G   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   | Boring A8B-1<br>Page 6 of 15 |                |             |   |
|---|-------|--|---|------------------------------|----------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  |       |  | Northing: 169416.23   |                              |                |             |   |
| Start and End Dates: April 16, 2014 - April 23, 2014  |       |  | Easting: 1699528.13   |                              |                |             |   |
| Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet   |       |  | Ground Elevation: 594.04  |                              |                |             |   |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  |       |  | Depth: 280.0 feet   |                              |                |             |   |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill                     | Depth to Water | Graphic Log | Classification and Description  |
| 494   | -100  |  | SB: 14-14-50/5";  |                              |                |             | 91.5 - 101.5 feet: See description on previous page.  |
| 493   | -101  |  | USCS  |                              |                |             |   |
| 492   | -102  |  | G   |                              |                |             | 101.5 - 103.5: SAND WITH SILTY FINES (SP-SM), olive, very fine to fine, few nonplastic slightly sticky fines with low toughness, gravels absent, loose, rapid dilatency, cannot roll thread. At 102.5' - 103': common horizontal silt (ML) interbeds or laminae, trace laminae or fine orange-stained sand. Core is hot and dry (dusty) due to drilling action. |
| 491   | -103  |  | G   |                              |                |             |   |
| 490   | -104  |  | G   |                              |                |             |   |
| 489   | -105  | 100-110  | G   |                              |                |             | 103.5 - 104.5: SILTY SAND (SM), olive with orange staining, very fine to fine, some nonplastic slightly sticky fines with low toughness, gravels absent, loose, rapid dilatency, cannot roll thread, horizontal beds, dry.  |
| 488   | -106  |  | G   |                              |                |             |   |
| 487   | -107  |  | G   |                              |                |             | 104.5 - 107.9: SAND WITH SILTY FINES (SP-SM), olive to olive gray, very fine to fine, few nonplastic fines, trace subrounded to angular fine to medium gravel (several gravel have surficial orange staining), dry. At 107' to 107.9', some medium to coarse gravel trace cobbles.  |
| 486   | -108  |  | G   |                              |                |             |   |
| 485   | -109  |  | G   |                              |                |             |   |
| 484   | -110  |  | G   |                              |                |             | 107.9 - 111.0: SILTY GRAVELLY SAND (SM), gray, fine to coarse, some nonplastic to low plasticity fines, dry, matrix supported. At 111', cobble to 6" diameter.  |
| 483   | -111  |  | G   |                              |                |             |   |
| 482   | -112  | 110-115  | G   |                              |                |             | 111.0 - 117.0: GRAVEL WITH SAND AND SILTY FINES (GW-GM), gray, fine to coarse, subrounded to angular, little fine to coarse angular to subrounded sand, few to little low plasticity fines, clast supported. At 112', cobble fragment. Core is hot and dry due to drilling action.  |
| 481   | -113  |  | G   |                              |                |             |   |
| 480   | -114  |  | G   |                              |                |             |   |
| 479   | -115  |  | G   |                              |                |             |   |
| 478   | -116  |  | G   |                              |                |             |   |
| 477   | -117  | 115-120  | G   |                              |                |             | 117.0 - 120.5: SILTY SAND WITH GRAVEL (SM), gray, fine to medium (trace coarse), some low plasticity fines with medium toughness, trace clay, some fine to coarse subrounded to subangular gravel, dry, hard (consistency may be affected by drilling, core is hot), matrix supported.  |
| 476   | -118  |  | G   |                              |                |             |   |
| 475   | -119  |  | G   |                              |                |             |   |
| 474   | -120  |  | G   |                              |                |             |   |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet.<br/>           Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/>           Logged by AGU</p> |       |  |   |                              |                |             |   |



# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-1  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 16, 2014 - April 23, 2014  
Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169416.23  
Easting: 1699528.13  
Ground Elevation: 594.04  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|--|----------|----------------|-------------|---|
| 474       | -120  |               | SB: 5/6"; USCS,  |          |                |             | 117.0 - 120.5 feet: See description on previous page.   |
| 473       | -121  |               |  |          |                |             |   |
| 472       | -122  |               | MC   |          |                |             | 120.5 - 127.2: SILTY GRAVELLY SAND (SM), gray, fine to coarse, angular to subrounded, little to some low plasticity fines, trace clay, some fine to medium and trace coarse subrounded to subangular coarse gravel, trace cobbles to 5" diameter. At 124', orange staining as a horizontal layer of weak iron cement. Cobbles at 122.5, 125, 126'. Gravels include grus (weathered granite); clasts break into pieces when core is broken open.   |
| 471       | -123  |               |  |          |                |             |   |
| 470       | -124  |               |  |          |                |             |   |
| 469       | -125  | 120-130       |  |          |                |             |   |
| 468       | -126  |               |  |          |                |             |   |
| 467       | -127  |               |  |          |                |             |   |
| 466       | -128  |               |  |          |                |             | 127.2 - 134: SILTY SAND WITH GRAVEL (SM), gray, fine, some medium plasticity, very hard fines (core was very hot due to drilling action which may have affected consistency of fines), trace clay, little fine to coarse subrounded to subangular gravel, trace cobbles. At 130', cobble or boulder. At 132.5' - 133.5', clast supported, few cobbles. At 133.5' - 134', few gravel, cobbles absent, trace iron stains.   |
| 465       | -129  |               | G  |          |                |             |   |
| 464       | -130  |               |  |          |                |             |   |
| 463       | -131  |               |  |          |                |             |   |
| 462       | -132  |               | G  |          |                |             |   |
| 461       | -133  | 130-136       |  |          |                |             |   |
| 460       | -134  |               | G  |          |                |             |   |
| 459       | -135  |               |  |          |                |             | 134.0 - 135.0: CLAYEY SILT WITH SAND (CL), gray, hard, little fine to coarse sand, few to little clay, dry, possible infill between boulders or cobbles.  |
| 458       | -136  |               |  |          |                |             |   |
| 457       | -137  |               |  |          |                |             | 135.0 - 151.4: GRAVEL WITH SAND AND SILTY FINES (GW-GM), olive gray, fine to coarse, subrounded to subangular, few fines, little fine to coarse sand, trace to few cobbles to 4" diameter, trace boulders, dry, clast supported. Grades to GW. At 135' - 136', boulder. At 144 - 145', matrix supported: SILTY SAND (SM), olive gray, fine to coarse, some low plasticity hard to very hard fines (core is very hot, moisture and consistency of fines may be affected by drilling action), some fine to medium subrounded to angular gravel, little cobbles to 4" diameter. At 150.8 - 151.4', mostly cobbles. |
| 456       | -138  | 136-140       |  |          |                |             |   |
| 455       | -139  |               | G  |          |                |             |   |
| 454       | -140  |               |  |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   |   | Boring A8B-1<br>Page 8 of 15 |             |   |
|---|-------|--|---|---|------------------------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 16, 2014 - April 23, 2014<br>Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  |   | Northing: 169416.23<br>Easting: 1699528.13<br>Ground Elevation: 594.04<br>Depth: 280.0 feet |                              |             |   |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill  | Depth to Water               | Graphic Log | Classification and Description  |
| 454   | -140  |  | SB: 30/4"   |   |                              |             | 135.0 - 151.4 feet: See description on previous page.   |
| 453   | -141  |  |   |   |                              |             |   |
| 452   | -142  |  |   |   |                              |             |   |
| 451   | -143  |  |   |   |                              |             |   |
| 450   | -144  |  | G   |   |                              |             |   |
| 449   | -145  | 140-150  |   |   |                              |             |   |
| 448   | -146  |  |   |   |                              |             |   |
| 447   | -147  |  |   |   |                              |             |   |
| 446   | -148  |  |   |   |                              |             |   |
| 445   | -149  |  |   |   |                              |             |   |
| 444   | -150  |  |   |   |                              |             |   |
| 443   | -151  |  |   |   |                              |             |   |
| 442   | -152  |  | G   |   |                              |             | 151.4 - 159.5: SILTY SAND (SM), gray with brown mottles, fine to medium, some nonplastic to low plasticity hard to very hard fines, little fine to medium subrounded to subangular gravel, trace coarse gravel. At 154' - 155', trace to few clay, slightly sticky fines. At 156.5: cobbles. At 157.6: cobbles. 4/17/14 End of day: cased + cleared to 160', 160' sample driven (no drive sample recovery). |
| 441   | -153  |  |   |   |                              |             |   |
| 440   | -154  |  | G   |   |                              |             |   |
| 439   | -155  | 150-160  |   |   |                              |             |   |
| 438   | -156  |  |   |   |                              |             |   |
| 437   | -157  |  |   |   |                              |             |   |
| 436   | -158  |  |   |   |                              |             |   |
| 435   | -159  |  |   |   |                              |             |   |
| 434   | -160  |  | G   |   |                              |             | 159.5 - 160.0 feet: See description on following page.  |
| Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br>Logged by AGU |       |  |   |   |                              |             |   |



# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-1  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 16, 2014 - April 23, 2014  
Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169416.23  
Easting: 1699528.13  
Ground Elevation: 594.04  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill   | Depth to Water | Graphic Log  | Classification and Description   |
|-----------|-------|---------------|--|--|----------------|--|--|
| 434       | -160  | 160-170       | SB: 50/2"<br>G   |  |                |  | 159.5 - 160.6: GRAVEL WITH SAND AND SILTY FINES (GW-GM), light olive brown, fine to medium, subrounded to subangular, few fines, little fine to coarse sand, loose, dry.   |
| 433       | -161  |               | G  |  |                |  | 160.6 - 161.4: SAND WITH SILTY FINES (SP-SM), olive with orange (iron?) staining, very fine to fine, trace coarse, trace to few fines, gravel absent, trace coal as coarse sand. Thinly laminated.   |
| 432       | -162  | 170-175       | G  |  |                |  | 161.4 - 163.0: SILTY SAND WITH GRAVEL (SM), olive with orange (iron?) stains below cobbles at upper contact, fine to medium, some firm to hard fines, little fine to coarse gravel, few cobbles to 162 feet, dry, loose. 161.4' - 162', clast supported with few cobbles and medium to coarse gravel; matrix supported below 162'.   |
| 431       | -163  |               | G  |  |                |  | 163.0 - 169.3: SILTY GRAVELLY SAND (SW-SM), olive, fine to coarse, subrounded to subangular, few to little fines, some fine to coarse gravel, dry, loose. At 166.5' - 167', few coarse gravel and cobbles. At 167', 1/2"-thick interbed of hard SILTY SAND (SM). At 168', 1/2"-thick interbed of hard SILTY GRAVELLY SAND (SM) with some gravel. At 168.2' - 168.5', few coarse gravel and cobbles.  |
| 430       | -164  | 175-180       | G  |  |                |  | 169.3 - 179.0: GRAVEL WITH SAND (GP), gray to pale olive, gap-graded, trace fines (very high dry strength), rounded (nearly spherical) to angular, few to little fine to coarse angular sand, some cobble to 4" diameter, dry, clast supported. At 170' - 175': no core recovery in very coarse material. About 1.5' of core barrel and shoe sheared off during drilling and was successfully recovered. Very coarse recovered sample may not be representative; driller is injecting copious amounts of water. At 178: gray silt matrix, still clast-supported. |
| 429       | -165  |               |  |  |                |  | 170-175  |
| 428       | -166  | 176.5-178     | G  |  |                |  |  |
| 427       | -167  |               |  |  |                |  | 175-180  |
| 426       | -168  | 180-184.5     | G  |  |                |  |  |
| 425       | -169  |               |  |  |                |  | 176.5-178  |
| 424       | -170  | 184.5-188     | G  |  |                |  |  |
| 423       | -171  |               |  |  |                |  | 180-184.5  |
| 422       | -172  | 188-192       | G  |  |                |  |  |
| 421       | -173  |               |  |  |                |  | 184.5-188  |
| 420       | -174  | 192-196       | G  |  |                |  |  |
| 419       | -175  |               |  |  |                |  | 188-192  |
| 418       | -176  | 196-200       | G  |  |                |  |  |
| 417       | -177  |               |  |  |                |  | 192-196  |
| 416       | -178  | 200-204       | G  |  |                |  |  |
| 415       | -179  |               |  |  |                |  | 196-200  |
| 414       | -180  | 204-208       | G  |  |                |  |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
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| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |  |   | Boring A8B-1<br>Page 10 of 15 |             |  |
|--|-------|--|--|---|-------------------------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 16, 2014 - April 23, 2014<br>Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  |       |  |  | Northing: 169416.23<br>Easting: 1699528.13<br>Ground Elevation: 594.04<br>Depth: 280.0 feet |                               |             |  |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill  | Depth to Water                | Graphic Log | Classification and Description   |
| 414  | -180  |  | SB: 50/6"  |   |                               |             | 179.0 - 184.5: SILTY SAND WITH GRAVEL (SM), light olive brown, fine to medium, subrounded to angular, few fines, little fine to coarse subrounded to angular gravel, very weakly indurated, matrix supported. At 180: Sampler contains cobble fragments and few fine to medium sand; sample is nonrepresentative because most of the fine fraction was washed out when the borehole was washed to remove settle out prior to sampling. At 181 - 184, olive to yellowish brown, little fines, little to some fine to medium gravel. |
| 413  | -181  |  |  |   |                               |             |  |
| 412  | -182  | 180-184  |  |   |                               |             |  |
| 411  | -183  |  |  |   |                               |             |  |
| 410  | -184  |  | G: USCS, MC, PSA   |   |                               |             |  |
| 409  | -185  |  |  |   |                               |             | 184.5 - 188.0: SAND WITH SILTY FINES (SP-SM), olive, fine, trace medium, trace coarse, trace to few fines, few fine to coarse subrounded to subangular gravel, loose, dry.   |
| 408  | -186  |  |  |   |                               |             |  |
| 407  | -187  | 184-190  | G  |   |                               |             |  |
| 406  | -188  |  |  |   |                               |             |  |
| 405  | -189  |  |  |   |                               |             | 188.0 - 193.0: SAND WITH GRAVEL AND SILTY FINES (SW-SM), olive, few fines, some fine to medium rounded to subangular gravel, loose, dry.   |
| 404  | -190  |  |  |   |                               |             |  |
| 403  | -191  |  |  |   |                               |             |  |
| 402  | -192  |  |  |   |                               |             |  |
| 401  | -193  |  |  |   |                               |             |  |
| 400  | -194  | 190-198.5  | G  |   |                               |             | 193.0 - 195.3: SAND (SP), olive, fine, fines absent to trace, trace coarse sand and fine subrounded to subangular gravel, dry, loose.  |
| 399  | -195  |  |  |   |                               |             |  |
| 398  | -196  |  | G  |   |                               |             | 195.3 - 197.2: SILTY GRAVELLY SAND (SM), olive gray, fine to medium, trace coarse sand, little fines, some fine to medium subrounded to angular gravel, dry, loose, (core is very hot, moisture and consistency of fines may be affected by drilling action). Abrupt upper contact, gradational basal contact.   |
| 397  | -197  |  | G  |   |                               |             |  |
| 396  | -198  |  |  |   |                               |             |  |
| 395  | -199  | 198.5-200  | SB: 50/5.5"  |   |                               |             | 197.2 - 200.5: SILTY SAND (SM), olive gray, fine, trace coarse sand, little fines, few fine subrounded to subangular gravel, dry, loose, hot core. At 199.5-200.0: SAND WITH SILTY FINES (SW-SM), few fines.   |
| 394  | -200  |  | G  |   |                               |             |  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.</p> <p style="text-align: right;">Logged by AGU</p> |       |  |  |   |                               |             |  |

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |  |   | Boring A8B-1<br>Page 11 of 15 |             |  |
|---|-------|--|--|---|-------------------------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 16, 2014 - April 23, 2014<br>Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample |       |  |  | Northing: 169416.23<br>Easting: 1699528.13<br>Ground Elevation: 594.04<br>Depth: 280.0 feet |                               |             |  |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill  | Depth to Water                | Graphic Log | Classification and Description   |
| 394   | -200  |  |  |   |                               |             | 197.2 - 200.5 feet: See description on previous page.  |
| 393   | -201  |  | G  |   |                               |             | 200.5 - 203.5: SAND (SW), olive brown, fine to coarse, subrounded to angular, fines trace to absent, trace subrounded to angular fine gravel, dry, loose.                                    |
| 392   | -202  |  |  |   |                               |             |  |
| 391   | -203  |  |  |   |                               |             |  |
| 390   | -204  | 200-208  | G  |   |                               |             | 203.5 - 204.5: SAND (SP), olive brown, fine to medium, fines trace to absent, trace subrounded to subangular coarse sand, dry, loose.  |
| 389   | -205  |  |  |   |                               |             | 204.5 - 205.0: SAND (SW), olive brown, fine to coarse, subrounded to angular sand, trace to absent, trace subrounded to angular fine gravel, dry, loose.                                     |
| 388   | -206  |  |  |   |                               |             |  |
| 387   | -207  |  | G  |   |                               |             | 205.0 - 206.5: SAND WITH SILTY FINES (SW-SM), olive gray, few fines, few to little fine to medium subrounded to angular gravel, dry, loose.  |
| 386   | -208  |  |  |   |                               |             |  |
| 385   | -209  | 208-210  |  |   |                               |             | 206.5 - 207.5: SAND (SW), olive gray, trace fines at upper contact, fines absent below 207', trace fine to medium subrounded to subangular gravel, dry, loose. Trace fines at upper contact. |
| 384   | -210  |  |  |   |                               |             |  |
| 383   | -211  |  |  |   |                               |             | 207.5 - 209.0: SAND (SP), olive gray, fine to medium, trace coarse, gravel absent, dry, loose. Gradational upper contact.  |
| 382   | -212  |  |  |   |                               |             |  |
| 381   | -213  | 210-215  | G  |   |                               |             | 209.0 - 210.0: SILTY SAND (SM), olive gray, fine, little fines, trace fine to medium subrounded gravel. Basal 0.3' = wet from added water. Gradational basal contact.                        |
| 380   | -214  |  | G  |   |                               |             | 210.0 - 211.5 SAND WITH SILTY FINES (SP-SM), olive gray, fine, few fines, trace fine to medium subrounded gravel. Gradational basal contact.   |
| 379   | -215  |  | G  |   |                               |             | 211.5 - 213.8: SAND (SP), olive, gray, fine, trace subrounded to subangular medium to coarse, trace subrounded to subangular fine gravel, dry, loose. Abrupt basal contact.                  |
| 378   | -216  |  |  |   |                               |             |  |
| 377   | -217  |  |  |   |                               |             |  |
| 376   | -218  | 215-220  |  |   |                               |             | 213.8 - 214.3: SILTY SAND (SM), dark yellowish brown, fine, some nonplastic fines, trace medium gravel embedded within upper 1" oriented with long axis parallel to horizontal bedding.      |
| 375   | -219  |  |  |   |                               |             | 214.3 - 220.0 feet: See descriptions on following page.  |
| 374   | -220  |  |  |   |                               |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222   |   | Boring A8B-1<br>Page 12 of 15 |                |             |  |
|--|-------|--|---|-------------------------------|----------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic |       |  | Northing: 169416.23   |                               |                |             |  |
| Start and End Dates: April 16, 2014 - April 23, 2014                             |       |  | Easting: 1699528.13   |                               |                |             |  |
| Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet                            |       |  | Ground Elevation: 594.04                                    |                               |                |             |  |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Depth: 280.0 feet   |                               |                |             |  |
| Elevation  | Depth | Core Interval  | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill                      | Depth to Water | Graphic Log | Classification and Description   |
| 374  | -220  | 220-230  | G   |                               |                |             | 214.3 - 216.7: SAND WITH SILTY FINES (SP-SM), olive gray, little fines, fine to medium, trace fine to medium subrounded to subangular gravel, loose, dry. Abrupt upper contact.  |
| 373  | -221  |  |   |                               |                |             | 216.7 - 217.0: SILTY SAND (SM), dark grayish brown, fine and coarse (gap graded), subrounded to subangular, some nonplastic to low plasticity fines, trace fine gravel, dry.   |
| 372  | -222  |  |   |                               |                |             | 217.0 - 220.0: SAND (SP), yellowish brown, fine, trace fines at upper contact, fines absent below except as clasts of SILTY SAND (SM) which are present throughout, dry, loose.  |
| 371  | -223  |  |   |                               |                |             | 220.0 - 223.5: SILTY SAND (SM), yellowish brown with common orange mottles, fine and coarse (gap graded), subrounded to angular, some nonplastic to low plasticity fines, few subrounded to angular fine gravel to ~221', gravels absent below ~221', dry.                                       |
| 370  | -224  |  |   |                               |                |             | 223.5 - 226.4: SAND WITH SILTY FINES (SP-SM), light olive brown, fine, trace to few fines, gravel absent, dry, loose.  |
| 369  | -225  |  |   |                               |                |             | 226.4 - 226.8: SILTY SAND (SM), olive gray, fine, little nonplastic fines, dry.  |
| 368  | -226  |  |   |                               |                |             | 226.8 - 232.3: SAND WITH SILTY FINES (SP-SM), light olive brown, fine, trace to few fines, gravel absent, dry, loose. At 229' - 230': thin interbedded (<5mm) laminae of fine SAND (SP) and gray SILT (ML). At 230' - 232.3': silt occurs as clasts, possibly disrupted laminae (rip-up clasts). |
| 367  | -227  |  |   |                               |                |             | 232.3 - 234.8: SILT (ML), brown with orange mottles trace to few very fine sand, soft to very soft, slightly spongy, includes possible rootlets. Moist from water added during drilling. Abrupt upper contact. At 232.8': wood (1/2" diameter branch or root).                                   |
| 366  | -228  |  |   |                               |                |             | 234.8 - 235.3: SAND WITH SILTY FINES (SP-SM), olive brown, fine, few fines, gravel absent, loose, dry.   |
| 365  | -229  |  |   |                               |                |             | 230-240  |
| 364  | -230  | 237.5 - 238.7: SILT (ML), light gray with orange laminae and common orange mottles, dark yellowish brown overall, sand absent except trace to few very fine sand as thin laminae, gravel absent, low plasticity, low toughness, slightly sticky, firm to hard. Very thin (<1mm) laminated. Abrupt upper contact. |   |                               |                |             |  |
| 363  | -231  |  |   |                               |                |             |  |
| 362  | -232  |  |   |                               |                |             |  |
| 361  | -233  |  |   |                               |                |             |  |
| 360  | -234  |  |   |                               |                |             |  |
| 359  | -235  |  |   |                               |                |             |  |
| 358  | -236  |  |   |                               |                |             |  |
| 357  | -237  |  |   |                               |                |             |  |
| 356  | -238  |  |   |                               |                |             |  |
| 355  | -239  |  |   |                               |                |             |  |
| 354  | -240  |  |   |                               |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation UEC Project 002.01.001 Task 3222 **Boring A8B-1**  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
 Start and End Dates: April 16, 2014 - April 23, 2014  
 Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  
 Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  
 Northing: 169416.23  
 Easting: 1699528.13  
 Ground Elevation: 594.04  
 Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 354       | -240  |               |   |          |                |             |   |
| 353       | -241  | G             |   |          |                |             | 238.7 - 242.7: SILT (ML), olive brown, sand absent, gravel absent, hard, dry. At 241' - 242.7': common subvertical structures (root casts?) infilled with fine sand.  |
| 352       | -242  |               |   |          |                |             |   |
| 351       | -243  |               |   |          |                |             | 242.7 - 243.5: SAND WITH SILTY FINES (SP-SM), olive, very fine to fine, little fines, nonplastic, dry, loose. Abrupt upper contact. Gradational basal contact.  |
| 350       | -244  |               |   |          |                |             |   |
| 349       | -245  | 240-250       | G   |          |                |             | 243.5 - 244.5: SILTY SAND (SM), olive, very fine to fine, some fines, nonplastic, dry, loose.   |
| 348       | -246  |               |   |          |                |             | 244.5 - 245.0: SAND WITH SILTY FINES (SP-SM), olive, very fine to fine, little fines, nonplastic, dry, loose.   |
| 347       | -247  |               |   |          |                |             | 245.0 - 248.8: SILTY SAND (SM), olive gray, very fine to fine, little fines, gravel absent.   |
| 346       | -248  |               |   |          |                |             |   |
| 345       | -249  |               |   |          |                |             | 248.8 - 249.2: SAND (SP), olive gray, very fine to fine, trace fines, gravel absent, dry, loose.  |
| 344       | -250  |               |   |          |                |             |   |
| 343       | -251  |               |   |          |                |             | 249.2 - 251.5: SILTY SAND (SM), light gray to olive gray with orange-stained grain-scale sand laminae as weak iron cement, very fine to fine, dry, some nonplastic fines, micaceous, very thin (<1 - 2mm) subhorizontal laminae, transitional to sandy ML, dry.   |
| 342       | -252  | G             |   |          |                |             |   |
| 341       | -253  |               |   |          |                |             | 251.5 - 257.5: SAND WITH SILTY FINES (SP-SM), light olive brown with orange staining at upper contact, fine, gravel absent, dry, loose. At 255'-257.5': common thin laminae of dark yellowish brown SILTY SAND (SM) and SAND (SP), core breaks along subhorizontal bedding planes, sand occurs as discrete orange-stained grain-thick very thin (<1-2mm) laminae. |
| 340       | -254  |               |   |          |                |             |   |
| 339       | -255  | 250-260       |   |          |                |             |   |
| 338       | -256  |               |   |          |                |             |   |
| 337       | -257  |               |   |          |                |             |   |
| 336       | -258  | G             |   |          |                |             | 257.5 - 263.5: SAND (SP), olive brown, fine, fines trace to absent except as common olive brown SILT (ML) clasts (rip-up clasts or disrupted interbeds to 10mm thickness, nonplastic to low plasticity), gravel absent. At 260'-263': silt clasts absent. At 262'-263': fine to medium. At 263'-263.3': dark gray.  |
| 335       | -259  |               |   |          |                |             |   |
| 334       | -260  |               |   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   | Boring A8B-1<br>Page 14 of 15 |                |             |   |
|--|-------|--|---|-------------------------------|----------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic   |       |  | Northing: 169416.23   |                               |                |             |   |
| Start and End Dates: April 16, 2014 - April 23, 2014   |       |  | Easting: 1699528.13   |                               |                |             |   |
| Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  |       |  | Ground Elevation: 594.04  |                               |                |             |   |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Depth: 280.0 feet   |                               |                |             |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill                      | Depth to Water | Graphic Log | Classification and Description  |
| 334  | -260  |  |   |                               |                |             | 257.5 - 263.5 feet: See description on previous page.   |
| 333  | -261  |  |   |                               |                |             |   |
| 332  | -262  |  |   |                               |                |             |   |
| 331  | -263  |  |   |                               |                |             |   |
| 330  | -264  |  | G   |                               |                |             |   |
| 329  | -265  | 260-270  | G   |                               |                |             | 263.5 - 268.7: CLAYEY SILT (MU <sub>CL</sub> ), black, sand absent, gravel absent, medium to low plasticity, firm to hard (greasy when wetted), dry. Rare very thin (<1mm) zones. At upper contact (263.3' - 265.5'): common yellowish brown sand apparently as infill (possible root or mud crack structures). |
| 328  | -266  |  |   |                               |                |             |   |
| 327  | -267  |  |   |                               |                |             | Regional aquifer depth measured at 269.8 feet at 10:42 on April 23, 2014 with borehole cased and cleared to 280 feet.   |
| 326  | -268  |  |   |                               |                |             |   |
| 325  | -269  |  |   |                               |                |             |   |
| 324  | -270  |  | G   |                               |                |             | 268.7 - 275.5: SAND WITH SILTY FINES (SP-SM), gray fines with black sand, fine, few to little fines, includes interbeds of SILTY SAND (SM) to 5mm thickness, wet. Regional aquifer depth measured at 267.65 feet at 11:10 on April 23, 2014 with borehole cased to 270 feet and open to 273.5 feet.             |
| 323  | -271  |  |   |                               |                |             |   |
| 322  | -272  |  |   |                               |                |             |   |
| 321  | -273  |  | G   |                               |                |             |   |
| 320  | -274  |  |   |                               |                |             |   |
| 319  | -275  | 270-280  |   |                               |                |             |   |
| 318  | -276  |  | G   |                               |                |             | 275.5 - 276.0: SAND (SP), fine, as above but fines trace to absent, little subangular fine gravel, wet. Gradational upper contact.  |
| 317  | -277  |  |   |                               |                |             | 276.0 - 276.3: SILTY SAND (SM), black, fine, little nonplastic fines, trace fine to medium subangular gravel, trace wood, wet.  |
| 316  | -278  |  | G   |                               |                |             |   |
| 315  | -279  |  |   |                               |                |             | 276.3 - 277.5: SAND WITH SILTY FINES (SW-SM), gray, fine to coarse, subrounded to subangular, trace to few fine gravel, wet.  |
| 314  | -280  |  | G   |                               |                |             | 277.5 - 280.0 feet: See description on following page.  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet.</p> <p>Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.</p> <p style="text-align: right;">Logged by AGU</p> |       |  |   |                               |                |             |   |



# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-1  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 16, 2014 - April 23, 2014  
Borehole diameter: 8" 0 - 140 feet, 6" 140 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169416.23  
Easting: 1699528.13  
Ground Elevation: 594.04  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 314       | -280  |               |  |          |                |             | 277.5 - 280.0: SAND (SP), fine to 280', fine to medium below 280', gravel absent to 280', few medium subrounded to subangular gravel below 280' (overall fines upward), wet. |
| 313       | -281  |               |  |          |                |             |  |
| 312       | -282  |               |  |          |                |             | Boring backfill:<br>0 - 2 feet: Concrete<br>2 - 10 feet: Soil cuttings<br>10 - 280.0 feet: 3/4" Baroid Wyo-ben bentonite chips hydrated concurrent with placement.           |
| 311       | -283  |               |  |          |                |             |  |
| 310       | -284  |               |  |          |                |             |  |
| 309       | -285  |               |  |          |                |             |  |
| 308       | -286  |               |  |          |                |             |  |
| 307       | -287  |               |  |          |                |             |  |
| 306       | -288  |               |  |          |                |             |  |
| 305       | -289  |               |  |          |                |             |  |
| 304       | -290  |               |  |          |                |             |  |
| 303       | -291  |               |  |          |                |             |  |
| 302       | -292  |               |  |          |                |             |  |
| 301       | -293  |               |  |          |                |             |  |
| 300       | -294  |               |  |          |                |             |  |
| 299       | -295  |               |  |          |                |             |  |
| 298       | -296  |               |  |          |                |             |  |
| 297       | -297  |               |  |          |                |             |  |
| 296       | -298  |               |  |          |                |             |  |
| 295       | -299  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 150 feet.  
Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation UEC Project 002.01.001 Task 3222 **Boring A8B-2**  
Page 1 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
 Start and End Dates: April 10, 2014 - April 16, 2014  
 Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
 Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  
 Northing: 168950.10  
 Easting: 1699528.95  
 Ground Elevation: 586.32  
 Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 586       | 0     |               |   |          |                |             |   |
| 585       | -1    |               |   |          |                |             |   |
| 584       | -2    |               |   |          |                |             |   |
| 583       | -3    | G             |   |          |                |             | 0 - 6.0: GRAVELLY SILTY SAND (SM), gray with brown mottles, fine, trace medium to coarse, some low plasticity fines, little to some fine to medium subrounded to subangular gravel, trace cobbles, matrix supported, hard, moist. At 6": 6" cobble. (FILL)  |
| 582       | -4    |               |   |          |                |             |   |
| 581       | -5    | 0-10          |   |          |                |             |   |
| 580       | -6    | G             |   |          |                |             | 6.0 - 10.0: SANDY SILT WITH GRAVEL (ML), gray with common orange mottles, low to medium plasticity, firm, few to little fine to medium sand, trace coarse sand, few fine to coarse gravel, moist. At 9': little gravel. (FILL)  |
| 579       | -7    |               |   |          |                |             |   |
| 578       | -8    |               |   |          |                |             |   |
| 577       | -9    |               |   |          |                |             |   |
| 576       | -10   |               |   |          |                |             |   |
| 575       | -11   | G             |   |          |                |             | 10.0 - 14.5: SILTY SANDY GRAVEL (GM), gray, well graded, some low plasticity fines, some fine to coarse sand, trace to few cobbles, trace boulders, clast supported, firm to hard, moist. At 13.5' - 14.5': mostly cobbles and boulders. (FILL)   |
| 574       | -12   |               |   |          |                |             |   |
| 573       | -13   |               |   |          |                |             |   |
| 572       | -14   |               |   |          |                |             |   |
| 571       | -15   | 10-20         |   |          |                |             | 14.5 - 25.0: SILTY SAND WITH GRAVEL (SM), gray, fine, few fine to medium subrounded to subangular gravel, trace coarse gravel, matrix supported, hard, hot and moist to -15', very hot and dry hard core below 15'. Dry below -15', core disaggregated to dust when pressed. Hot from drilling. At 20-25': very slow drilling. (FILL) |
| 570       | -16   |               |   |          |                |             |   |
| 569       | -17   |               |   |          |                |             |   |
| 568       | -18   | G: PSA        |   |          |                |             |   |
| 567       | -19   |               |   |          |                |             |   |
|           | -20   |               |   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
 Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
 Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   |   | Boring A8B-2<br>Page 2 of 15 |             |   |
|---|-------|--|---|---|------------------------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 10, 2014 - April 16, 2014<br>Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample |       |  |   | Northing: 168950.10<br>Easting: 1699528.95<br>Ground Elevation: 586.32<br>Depth: 280.0 feet |                              |             |   |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill  | Depth to Water               | Graphic Log | Classification and Description  |
| 566   | -20   |  |   |   |                              |             | 14.5 - 25.0 feet: See description on previous page.   |
| 565   | -21   |  |   |   |                              |             |   |
| 564   | -22   |  |   |   |                              |             |   |
| 563   | -23   |  |   |   |                              |             |   |
| 562   | -24   |  |   |   |                              |             |   |
| 561   | -25   | 20-30  |   |   |                              |             |   |
| 560   | -26   |  | G   |   |                              |             | 25.0 - 27.0: GRAVELLY SILTY FINES (GP-GM), brown, medium to coarse subrounded to subangular, few fines, few fine to coarse sand, clast supported, dry (warm from coring). (FILL)  |
| 559   | -27   |  |   |   |                              |             |   |
| 558   | -28   |  |   |   |                              |             | 27.0 - 29.0: SILTY SAND (SM), brown with orange mottles, fine to coarse, little low plasticity fines, few fine to coarse subrounded to subangular gravel, matrix supported, firm, dry. (FILL)   |
| 557   | -29   |  | G   |   |                              |             |   |
| 556   | -30   |  |   |   |                              |             | 29.0 - 36.8: GRAVELLY SILTY SAND (SM), gray, fine to medium, little fines with low plasticity, little to some fine to coarse subrounded to subangular gravel, dry, matrix supported except clast supported at 29.5 - 29.8, firm, dry. At 30.5'-31.3': Few gravel. At 34'-34.5': some gravel, trace cobbles, clast supported, trace organic matter (sticks). At 36'-36.8', cobbles and boulder to 8". (FILL) |
| 555   | -31   |  |   |   |                              |             |   |
| 554   | -32   |  |   |   |                              |             |   |
| 553   | -33   |  |   |   |                              |             |   |
| 552   | -34   |  |   |   |                              |             |   |
| 551   | -35   | 30-40  |   |   |                              |             |   |
| 550   | -36   |  |   |   |                              |             |   |
| 549   | -37   |  |   |   |                              |             |   |
| 548   | -38   |  |   |   |                              |             | 36.8 - 42.5: SILTY SAND WITH GRAVEL (SM), brown with orange mottles, fine to medium, little nonplastic to low plasticity fines, little fine to coarse subrounded to subangular gravel, soft, dry, abundant organic matter (peat, sticks), possible former pond. (FILL)  |
| 547   | -39   |  |   |   |                              |             |   |
|   | -40   |  | G   |   |                              |             |   |









Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation UEC Project 002.01.001 Task 3222 Boring A8B-2 Page 3 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
 Start and End Dates: April 10, 2014 - April 16, 2014  
 Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
 Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  
 Northing: 168950.10  
 Easting: 1699528.95  
 Ground Elevation: 586.32  
 Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 546       | -40   |               |   |          |                |             | 36.8 - 42.5 feet: See description on previous page.   |
| 545       | -41   |               |   |          |                |             |   |
| 544       | -42   |               |   |          |                |             |   |
| 543       | -43   |               |   |          |                |             |   |
| 542       | -44   |               | G: PSA  |          |                |             | 42.5 - 45.5: SILTY SAND (SM), gray, fine to coarse, little nonplastic to low plasticity fines with low toughness, few gravel to 44', little fine to coarse gravel below 44', trace cobbles to 7" at 44', hard, dry.   |
| 541       | -45   | 40-50         |   |          |                |             |   |
| 540       | -46   |               |   |          |                |             |   |
| 539       | -47   |               |   |          |                |             | 45.5 - 54.5: SILTY SAND (SM), brown, fine to coarse, some low plasticity fines with medium toughness and high dry strength, few fine to coarse subrounded to subangular gravel, trace cobbles to 6", dry to 53', wet below 53'.   |
| 538       | -48   |               |   |          |                |             |   |
| 537       | -49   |               |   |          |                |             |   |
| 536       | -50   |               | SB: 18-100/4.5"   |          |                |             |   |
| 535       | -51   |               |   |          |                |             |   |
| 534       | -52   |               | G   |          |                |             |   |
| 533       | -53   |               |   |          |                |             |   |
| 532       | -54   |               |   |          |                |             |   |
| 531       | -55   | 50-60         |   |          |                |             | 54.5 - 58.5: GRAVELLY SILTY SAND (SM), brown, fine to coarse, some fines, some fine to coarse subrounded to subangular gravel, moist to wet. At 55.5'-56": Clast supported interbed of GRAVEL WITH SILTY FINES (GP-GM). Depth to perched groundwater 55.5 feet at 11:35 on 4/10/14, borehole cased to 50 feet and cored to 60 feet. |
| 530       | -56   |               |   |          |                |             |   |
| 529       | -57   |               | G   |          |                |             |   |
| 528       | -58   |               |   |          |                |             |   |
| 527       | -59   |               |   |          |                |             | 58.6 - 69.0 feet: See description on following page.  |
| 527       | -60   |               | G: PSA  |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
 Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
 Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   | Boring A8B-2<br>Page 4 of 15  |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
|--|-------|--|---|---|----------------|---|--|-------|-------|--|--|--|--|---|---|--|---|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic |       |  | Northing: 168950.10   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| Start and End Dates: April 10, 2014 - April 16, 2014                             |       |  | Easting: 1699528.95   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet                            |       |  | Ground Elevation: 586.32  |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Depth: 280.0 feet   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill  | Depth to Water | Graphic Log   | Classification and Description   |       |       |  |  |  |  |   |   |  |   |   |
| 526  | -60   | 60-67  | SB: 10-100/3"   |   |                |    | 58.6 - 69.0: SILTY GRAVEL WITH SAND (GM), olive gray with trace orange mottling, fine to coarse, subrounded to subangular, some fines with low plasticity, medium toughness, and high dry strength to ~67', little to some fine to coarse sand, trace subrounded cobbles, clast supported, hard, dry. At 60'-67': core is so hot that PVC soil bags melt on contact. |       |       |  |  |  |  |   |   |  |   |   |
| 525  | -61   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 524  | -62   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 523  | -63   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 522  | -64   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 521  | -65   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 520  | -66   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 519  | -67   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 518  | -68   |  |   |   |                |   |  | G     | 67-70 |  |  |  | 69.0 - 76.5: SILTY SAND WITH GRAVEL (SM), gray with trace orange (iron?) stains at gravel point contacts, some fines with low plasticity, low toughness, and low dry strength, little fine to coarse subrounded to subangular gravel, trace subrounded cobbles, matrix supported with some gravels in point contact, hard, dry. Very hot core. |   |   |  |   |   |
| 517  | -69   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 516  | -70   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 515  | -71   | SS: 9-39-50/3"   | G   |  |                |  | 76.5 - 78.0: SANDY SILT (ML), gray, low plasticity, low toughness, and low dry strength, some fine sand, few fine to coarse gravel, subrounded cobble at 77', dry to moist.  |       |       |  |  |  |  |   |   |  |   |   |
| 514  | -72   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 513  | -73   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 512  | -74   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 511  | -75   |  |   |   |                |   |  | 70-80 |       |  |  |  |  | G |  |  |  | 78.0 - 81.0: SILTY SAND (SM), gray, fine to coarse, some low plasticity fines with medium toughness and high dry strength, few fine to coarse subrounded to subangular gravel, trace cobbles, dry. Uncertain basal contact. |
| 510  | -76   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 509  | -77   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 508  | -78   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
| 507  | -79   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |
|  | -80   |  |   |   |                |   |  |       |       |  |  |  |  |   |   |  |   |   |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
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 Logged by AGU

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-2  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 10, 2014 - April 16, 2014  
Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168950.10  
Easting: 1699528.95  
Ground Elevation: 586.32  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 506       | -80   |               | SB: 100/6"   |          |                |             | 78.0 - 81.0 feet: See description on previous page.  |
| 505       | -81   |               | G  |          |                |             | 81.0 - 82.0: SAND (SM), gray, fine, trace coarse, little fines, trace fine subangular gravel, wet.   |
| 504       | -82   |               | G  |          |                |             | 82.0 - 83.0: SANDY GRAVEL (GP), gray, trace fines, medium to coarse, subrounded to subangular, some very fine to fine sand, trace cobbles, wet. Fining upward sequence, gradational upper contact.   |
| 503       | -83   |               |  |          |                |             |  |
| 502       | -84   |               |  |          |                |             |  |
| 501       | -85   | 80-90         |  |          |                |             | 83.0 - 88.0: SILTY SAND (SM), gray, fine, some fines with low plasticity, little to some fine to medium subrounded to subangular gravel, trace coarse gravel, hard to very hard, dry, very hot core.   |
| 500       | -86   |               | G  |          |                |             |  |
| 499       | -87   |               |  |          |                |             |  |
| 498       | -88   |               | G  |          |                |             | 88.0 - 89.3: SAND (SP), gray, fine, trace coarse, trace fines, trace fine subangular gravel, wet. Includes common interbeds of SILTY SAND (SM), brown gray, fine, some fines.  |
| 497       | -89   |               |  |          |                |             |  |
| 496       | -90   |               |  |          |                |             |  |
| 495       | -91   |               | SB: 10-20-100/4"<br>USCS, MC, PSA                              |          |                |             | 89.3 - 91.2: SAND WITH SILTY FINES (SP-SM), fine, yellowish brown, some fines, thinly (<5mm) laminated, moist to wet. At 90.4: yellowish brown to brown with orange stains, very fine to fine, very thin (1-2mm) horizontal SILT (ML) laminations, trace coal.   |
| 494       | -92   |               | G  |          |                |             | 91.2 - 92.5: SILT (ML), gray, low to medium plasticity, trace clay, few fine to medium sand, trace coarse sand, trace fine gravel, very thin (<2mm) laminated, soft to firm. At 92.0' - 92.5': SILTY SAND (SM), brown, fine, few to little nonplastic to low plasticity fines with very high dry strength, trace clay, moist.  |
| 493       | -93   |               |  |          |                |             |  |
| 492       | -94   |               | G  |          |                |             | 92.5 - 102.5: GRAVELLY SILTY SAND (SM), gray to 100 feet, olive brown below 100 feet, fine to medium, some fines with high to very high dry strength, some fine to coarse subrounded to subangular gravel, matrix supported, hard to very hard, dry to -101', wet below. At 95.5: cobble to 9". No core recovery 95.5-100' (dropped core). Depth to perched groundwater 93.5 feet at 16:15 on 4/10/14, borehole cased to 90 feet, cored to 100 feet, and clear to 94 feet. Depth to perched groundwater 101.0 feet at 8:40 on 4/11/14, borehole cased to 100 feet, cored to 110 feet, and clear to 103.5 feet. |
| 491       | -95   | 90-100        |  |          |                |             |  |
| 490       | -96   |               |  |          |                |             |  |
| 489       | -97   |               |  |          |                |             |  |
| 488       | -98   |               |  |          |                |             |  |
| 487       | -99   |               |  |          |                |             |  |
| 487       | -100  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   |   | Boring A8B-2<br>Page 6 of 15 |             |  |
|---|-------|--|---|---|------------------------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 10, 2014 - April 16, 2014<br>Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  |   | Northing: 168950.10<br>Easting: 1699528.95<br>Ground Elevation: 586.32<br>Depth: 280.0 feet |                              |             |  |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill  | Depth to Water               | Graphic Log | Classification and Description   |
| 486   | -100  |  |   |   |                              |             | 92.5 - 102.5 feet: See description on previous page.   |
| 485   | -101  |  | SB: 17-38-50/3"   |   |                              |             |  |
| 484   | -102  |  | PSA   |   |                              |             |  |
| 483   | -103  |  | G   |   |                              |             | 102.5 - 103.5: SILTY SAND (SM), brown, fine, trace subrounded to rounded medium to coarse gravel, matrix supported, wet.   |
| 482   | -104  |  | G   |   |                              |             | 103.5 - 105.0: SANDY GRAVEL WITH SILTY FINES (GW-GM), subrounded, few fines as ±1"-thick clods (possible pore infill) and as coatings on gravel, some well graded sand, coarse sand is rounded to angular, wet, gradational basal contact. At 105': cobble.  |
| 481   | -105  | 100-110  |   |   |                              |             |  |
| 480   | -106  |  |   |   |                              |             | 105.0 - 109.0: SANDY GRAVEL (GP), yellow brown, fine to medium, trace fines, some well graded subrounded to subangular sand, wet. At 107.5': fine to medium subrounded to angular gravel, fine gravel appear freshly fractured with sharply flaked edges (not due to drill action); silt occurs as thick coatings on gravel and has low dry strength.  |
| 479   | -107  |  |   |   |                              |             |  |
| 478   | -108  |  | G: PSA  |   |                              |             |  |
| 477   | -109  |  | G   |   |                              |             | 109.0 - 110.0: SAND (SP), gray to gray-brown, fine, trace fines, trace subrounded fine gravel, moist to wet.   |
| 476   | -110  |  |   |   |                              |             |  |
| 475   | -111  |  | SB: 4-16-19<br>USCS, MC, PSA                                      |   |                              |             | 110.0 - 115.5: SILTY SAND WITH GRAVEL (SM), gray, fine, some fines with low plasticity, low toughness, and high dry strength, little fine subrounded to subangular gravel, trace to few cobbles to 5", firm to hard, moist. Gradational to GM (clast supported). Basal 0.5': GRAVELLY SILTY SAND (SM), brown with orange (iron?) staining, well graded, subrounded to angular, some fines, some fine to medium subrounded to angular gravel, matrix supported, hard to very hard, dry. |
| 474   | -112  |  |   |   |                              |             |  |
| 473   | -113  |  | G   |   |                              |             |  |
| 472   | -114  |  |   |   |                              |             |  |
| 471   | -115  | 110-120  |   |   |                              |             |  |
| 470   | -116  |  | G   |   |                              |             | 115.5 - 120.0: SILTY SAND (SM), dark grayish brown with orange (iron?) stains, fine to medium, some fines, some fine to coarse angular gravel, dry. At 117': 6" cobble underlain by 3" thick layer of gray SILTY SAND WITH GRAVEL (SM) then orange-stained SILTY SAND (SM).  |
| 469   | -117  |  | G   |   |                              |             |  |
| 468   | -118  |  |   |   |                              |             |  |
| 467   | -119  |  | G   |   |                              |             |  |
|   | -120  |  |   |   |                              |             |  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/> Logged by AGU</p> |       |  |   |   |                              |             |  |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-2  
Page 7 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 10, 2014 - April 16, 2014  
Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168950.10  
Easting: 1699528.95  
Ground Elevation: 586.32  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 466       | -120  |               |  |          |                |             |  |
| 465       | -121  |               | SB: 4-12-16  |          |                |             | 120.0 - 124.5: SILTY SAND (SM), brown, fine, trace coarse, little fines, trace fine gravel, few medium to coarse subrounded to subangular gravel.  |
| 464       | -122  |               | USCS, MC   |          |                |             |  |
| 463       | -123  |               |  |          |                |             |  |
| 462       | -124  |               | G  |          |                |             |  |
| 461       | -125  | 120-130       |  |          |                |             | 124.5 - 127.0: SILTY SAND (SM), brown, fine, trace coarse, some low plasticity fines, trace clay, trace fine gravel, few medium to coarse subrounded to subangular gravel, trace cobbles, some fines. Gradational upper contact. |
| 460       | -126  |               | G  |          |                |             |  |
| 459       | -127  |               |  |          |                |             |  |
| 458       | -128  |               | G: PSA, OC   |          |                |             | 127.0 - 131.0: SILTY SAND WITH GRAVEL (SM), gray with orange stains at upper contact, fine, little fine to medium gravel, hard, moist. At basal contact: SAND (SP), fine, trace fines, in sampler shoe.                          |
| 457       | -129  |               | Rad  |          |                |             |  |
| 456       | -130  |               | SB: 50/6"  |          |                |             | 131.0 - 132.0: SILTY SAND (SM), gray with common orange-brown mottles, fine, some low to medium plasticity fines with low toughness and medium dry strength, soft to very soft, moist, possible soil horizon.                    |
| 455       | -131  |               |  |          |                |             |  |
| 454       | -132  |               | G  |          |                |             | 132.0 - 138.5: SAND (SP), brown, fine, trace fines, trace fine to medium subrounded to subangular gravel, loose, wet (water likely derived from 124-foot perched zone), includes silty interbeds to 133', common coal.           |
| 453       | -133  |               |  |          |                |             |  |
| 452       | -134  |               |  |          |                |             |  |
| 451       | -135  | 130-140       | G  |          |                |             |  |
| 450       | -136  |               |  |          |                |             |  |
| 449       | -137  |               |  |          |                |             |  |
| 448       | -138  |               | G  |          |                |             | 138.5 - 139.2: SAND (SP), gray, very fine to fine, trace fines, gravels absent, thinly laminated, moist to wet.  |
| 447       | -139  |               | G: PSA, ATT, OC  |          |                |             | 139.2 - 139.5 feet: See description on following page.   |
|           | -140  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU



| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   | Boring A8B-2<br>Page 8 of 15 |                |             |  |
|---|-------|--|---|------------------------------|----------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  |       |  | Northing: 168950.10   |                              |                |             |  |
| Start and End Dates: April 10, 2014 - April 16, 2014  |       |  | Easting: 1699528.95   |                              |                |             |  |
| Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet   |       |  | Ground Elevation: 586.32  |                              |                |             |  |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  |       |  | Depth: 280.0 feet   |                              |                |             |  |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill                     | Depth to Water | Graphic Log | Classification and Description   |
| 446   | -140  |  |   |                              |                |             | 139.2 - 139.5: SILTY SAND WITH GRAVEL (SM) and SILT (ML), gray grading downhole to brown, trace clay, some subrounded medium gravel, SILT is very thinly laminated, low plasticity, low toughness, low dry strength, slightly sticky when wetted, hard.  |
| 445   | -141  |  | SB: 0-10-75/5*<br>PSA, OC,<br>Hyd Cond                            |                              |                |             | 139.8 - 148.0: GRAVEL WITH SAND AND SILTY FINES (GP-GM), olive to yellowish brown, fine to medium, trace coarse, few fines, some fine to coarse sand, trace subrounded cobbles to 5", loose, moist to wet.   |
| 444   | -142  |  |   |                              |                |             | 145.0 - 148.0: SAND WITH GRAVEL AND SILTY FINES (SW-SM), olive to yellowish brown with orange-brown stains at 147 feet, few fine to medium gravel, trace coarse gravel, cobbles absent, loose, moist to wet.   |
| 443   | -143  |  |   |                              |                |             | 148.0 - 150.0: SAND (SP), olive, fine to medium, subangular to angular, trace subrounded to subangular coarse, trace fines, trace fine to medium subrounded to subangular gravel, moist. At 149.7: 2"-thick bed of SP-SM, as above with few silty fines. |
| 442   | -144  |  |   |                              |                |             | 150.0 - 156.0: GRAVELLY SAND (SW), olive gray with common orange staining, fine to coarse, subrounded to subangular, trace fines, some fine to coarse rounded to subangular gravel, trace cobbles, moist, loose.   |
| 441   | -145  | 140-150  |   |                              |                |             | 156.0 - 156.8: SAND (SP), light olive brown, fine, trace fines, gravel absent, wet.  |
| 440   | -146  |  |   |                              |                |             | 156.8 - 159.6: SAND (SW), fine to coarse, subrounded to subangular, trace fines, few fine to coarse rounded to subangular gravel, trace cobbles, moist to wet.   |
| 439   | -147  |  |   |                              |                |             | 159.6 - 162.5: See description on following page.  |
| 438   | -148  |  | G   |                              |                |             |  |
| 437   | -149  |  |   |                              |                |             |  |
| 436   | -150  |  | SB: 20-100/5*   |                              |                |             |  |
| 435   | -151  |  |   |                              |                |             |  |
| 434   | -152  |  |   |                              |                |             |  |
| 433   | -153  |  |   |                              |                |             |  |
| 432   | -154  |  |   |                              |                |             |  |
| 431   | -155  | 150-160  |   |                              |                |             |  |
| 430   | -156  |  | G   |                              |                |             |  |
| 429   | -157  |  |   |                              |                |             |  |
| 428   | -158  |  |   |                              |                |             |  |
| 427   | -159  |  |   |                              |                |             |  |
|   | -160  |  | G   |                              |                |             |  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/> Logged by AGU</p> |       |  |   |                              |                |             |  |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-2  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 10, 2014 - April 16, 2014  
Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168950.10  
Easting: 1699528.95  
Ground Elevation: 586.32  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 426       | -160  |               |  |          |                |             |  |
| 425       | -161  |               | SB: 39-59-50   |          |                |             | 159.6 - 162.5: SILTY SAND (SM), olive, fine to medium, few to little fines to 161', little to some fines below 161', little fine to medium subrounded to subangular gravel, matrix supported, hard.  |
| 424       | -162  |               |  |          |                |             | 162.5 - 163.6: GRAVEL WITH SILTY FINES (GP-GM), olive, fine to ~163.2', coarse below, rounded to subrounded, few to little fines, clast-supported, loose, moist to wet.  |
| 423       | -163  |               | G  |          |                |             | 163.6 - 189.5: SAND (SP), olive, fine, trace coarse, trace fines, trace fine gravel, loose, moist to dry.<br>At 163.6' - 164.0': coarse sand and gravels absent.<br>At 164.0' - 164.3': little subrounded to subangular fine gravel.<br>At 164.3-169.5: Includes 1/8" - 1/4"-thick interbeds of SILTY SAND (SM). |
| 422       | -164  | 160-170       |  |          |                |             |  |
| 421       | -165  |               |  |          |                |             |  |
| 420       | -166  |               |  |          |                |             |  |
| 419       | -167  |               |  |          |                |             |  |
| 418       | -168  |               |  |          |                |             |  |
| 417       | -169  |               |  |          |                |             |  |
| 416       | -170  |               | SB: 100/6"   |          |                |             | At 169.5'-169.8': mostly medium to coarse gravel (GP) underlain by SILTY SAND (SM).<br>At 170'-171': few to little medium to coarse gravel. At 171'-175': rare silty interbeds to 1/2" thick.  |
| 415       | -171  |               |  |          |                |             |  |
| 414       | -172  |               |  |          |                |             |  |
| 413       | -173  |               |  |          |                |             |  |
| 412       | -174  |               |  |          |                |             |  |
| 411       | -175  | 170-180       |  |          |                |             |  |
| 410       | -176  |               |  |          |                |             |  |
| 409       | -177  |               |  |          |                |             |  |
| 408       | -178  |               |  |          |                |             | At 178'-178.4': some medium to coarse subrounded gravel.<br>At 178.4'-178.8': SM, olive brown, fine, trace clay, some fines with very high dry strength, laminated, moist.   |
| 407       | -179  |               |  |          |                |             | At 179'-179.2': SP-SM, olive, few fines, otherwise as above, moist.  |
|           | -180  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   | Boring A8B-2<br>Page 10 of 15 |                |             |  |
|--|-------|--|---|-------------------------------|----------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic   |       |  | Northing: 168950.10   |                               |                |             |  |
| Start and End Dates: April 10, 2014 - April 16, 2014   |       |  | Easting: 1699528.95   |                               |                |             |  |
| Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  |       |  | Ground Elevation: 586.32  |                               |                |             |  |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Depth: 280.0 feet   |                               |                |             |  |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill                      | Depth to Water | Graphic Log | Classification and Description   |
| 406  | -180  |  | SB: 60-100/5"   |                               |                |             | 163.6 - 189.5 feet: See description on previous page.  |
| 405  | -181  |  |   |                               |                |             | At 181': 1"-thick interbed of SILTY SAND (SM).   |
| 404  | -182  |  |   |                               |                |             | At 181.1'-185.3': fine to medium, trace coarse, trace fine to medium gravel.   |
| 403  | -183  |  |   |                               |                |             |  |
| 402  | -184  |  | G   |                               |                |             |  |
| 401  | -185  | 180-190  |   |                               |                |             | At 185.3'-186': interbed of SAND WITH SILTY FINES (SP-SM), few nonplastic fines.   |
| 400  | -186  |  |   |                               |                |             | At 185'-189.5': fine to medium, few fine to medium subrounded to angular gravel.   |
| 399  | -187  |  |   |                               |                |             |  |
| 398  | -188  |  |   |                               |                |             |  |
| 397  | -189  |  | G   |                               |                |             |  |
| 396  | -190  |  | SB: 50-100/5"   |                               |                |             | 189.5 - 190.8: SILTY SAND (SM), olive, very fine to fine, moist, some nonplastic to low plasticity fines with low toughness and low dry strength, slightly sticky when wetted, gravels absent, very soft, moist.                                   |
| 395  | -191  |  |   |                               |                |             | 190.8 - 191.1: SAND (SP), olive, fine, trace fines, loose, moist.  |
| 394  | -192  |  |   |                               |                |             | 191.1 - 193.8: SAND (SP), brown, fine to medium, trace coarse, trace fine subrounded to subangular gravel, moist.  |
| 393  | -193  |  |   |                               |                |             | 193.8 - 194.3: SAND WITH GRAVEL (SP), brown, fine to medium, trace fines, few fine to medium subrounded to subangular gravel, loose, moist.  |
| 392  | -194  |  |   |                               |                |             |  |
| 391  | -195  | 190-200  | G   |                               |                |             | 194.3 - 197.9: SAND WITH SILTY FINES (SP-SM), olive, very fine to fine, few fines, loose, moist. At 195.7'-196.3': little to some fines (gradational to SM)  |
| 390  | -196  |  |   |                               |                |             |  |
| 389  | -197  |  |   |                               |                |             | 197.9 - 198.8: SILT (ML), brownish gray with light gray laminae, trace clay, low plasticity, very high dry strength, slightly sticky when wetted, trace fine sand as laminae, gravels absent, moist, hard, thinly laminated, abrupt upper contact. |
| 388  | -198  |  | G   |                               |                |             |  |
| 387  | -199  |  | G   |                               |                |             | 198.8 - 201.8: See description on following page.  |
|  | -200  |  |   |                               |                |             |  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.</p> <p>Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.</p> <p style="text-align: right;">Logged by AGU</p> |       |  |   |                               |                |             |  |

**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation UEC Project 002.01.001 Task 3222 Boring A8B-2 Page 11 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
 Start and End Dates: April 10, 2014 - April 16, 2014  
 Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
 Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  
 Northing: 168950.10  
 Easting: 1699528.95  
 Ground Elevation: 586.32  
 Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 386       | -200  |               | SB: 40-44-100/3"  |          |                |             | 198.8 - 201.8: SILTY SAND (SM), grayish brown with orange staining below 198.8', very fine to fine, little to some low plasticity fines with low dry strength, moist. Upper contact has subvertical tubules infilled with clayey silt or clay (possible former soil). |
| 385       | -201  |               | G   |          |                |             |   |
| 384       | -202  |               | G   |          |                |             | 201.8 - 202.6: GRAVEL WITH SILTY FINES (GP-GM), gray brown, fine to medium, subrounded to angular, few fines, some fine to coarse rounded to angular sand, loose, clast-supported.  |
| 383       | -203  |               | G   |          |                |             |   |
| 382       | -204  |               | G   |          |                |             | 202.6 - 205.0: SAND (SP), gray brown, fine, trace coarse, trace fines, trace to few fine to medium gravel, gravel content increases and coarsen downhole loose, moist, gradational basal contact.   |
| 381       | -205  | 200-210       | G   |          |                |             |   |
| 380       | -206  |               | G   |          |                |             | 205.0 - 209.5: SANDY GRAVEL (GP), gray brown with orange staining on gravels, medium to coarse, subrounded to angular trace fines, some fine to coarse subrounded to angular sand with weak iron cementation, trace to few cobbles, clast-supported.                  |
| 379       | -207  |               |   |          |                |             |   |
| 378       | -208  |               |   |          |                |             |   |
| 377       | -209  |               |   |          |                |             |   |
| 376       | -210  |               |   |          |                |             | 209.5 - 214.5: GRAVEL WITH SAND AND SILTY FINES (GP-GM), gray, fine to medium, subrounded to subangular, few fines, little fine to coarse sand, trace cobbles, clast supported. At 213.5': Cobble with weak red mud coating.  |
| 375       | -211  |               |   |          |                |             |   |
| 374       | -212  |               | G   |          |                |             |   |
| 373       | -213  |               |   |          |                |             |   |
| 372       | -214  |               |   |          |                |             | 214.5 - 215.4: SILTY SAND (SM), olive gray, fine to coarse subrounded to angular, little nonplastic fines with low dry strength, little fine to medium subrounded to angular gravel, firm to hard, dry.   |
| 371       | -215  | 210-220       | G   |          |                |             |   |
| 370       | -216  |               | G   |          |                |             | 215.4 - 218.8: SAND (SP), olive gray with trace orange (iron?) staining, fine to medium, trace coarse, subrounded to angular, trace fine gravel, loose. At 216.5'-218.8': little fine to medium gravel, trace coarse gravel.  |
| 369       | -217  |               |   |          |                |             |   |
| 368       | -218  |               |   |          |                |             |   |
| 367       | -219  |               |   |          |                |             | 218.8 - 220.0: SAND WITH SILTY FINES (SP-SM), gray brown, fine to very fine, little fines, gravels absent, dry, loose, abrupt upper contact.  |
|           | -220  |               | G   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
 Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
 Logged by AGU

**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation Boring A8B-2  
 UEC Project 002.01.001 Task 3222 Page 12 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
 Start and End Dates: April 10, 2014 - April 16, 2014  
 Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
 Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  
 Northing: 168950.10  
 Easting: 1699528.95  
 Ground Elevation: 586.32  
 Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|---|----------|----------------|-------------|--|
| 366       | -220  |               |   |          |                |             | 220.0 - 223.3: GRAVELLY SILTY SAND (SM), olive with brown and red mottles, fine to medium, some fines, little to some fine to coarse subrounded to angular gravel, trace cobbles, hard, dry.   |
| 365       | -221  |               |   |          |                |             |  |
| 364       | -222  | G             |   |          |                |             | 223.3 - 224.0: SAND WITH SILTY FINES (SP-SM), olive brown, very fine to fine, few nonplastic fines, gravels absent, rapid dilatancy, loose, dry. At 224-224.5: Cobble or boulder.  |
| 363       | -223  |               |   |          |                |             |  |
| 362       | -224  | G             |   |          |                |             | 224.0 - 228.8: GRAVELLY SAND WITH SILTY FINES (SW-SM), olive brown, subangular to angular, few fines, some fine to coarse subrounded to subangular gravel, trace to few cobbles, loose, dry, gradational basal contact.                                      |
| 361       | -225  | 220-230       |   |          |                |             |  |
| 360       | -226  |               |   |          |                |             |  |
| 359       | -227  | G             |   |          |                |             | 228.8 - 230.0: SANDY GRAVEL (GW), fine to coarse, subrounded and subangular, trace fines, some fine to coarse sand, clast supported, sand is weakly cemented (iron?), clast-supported, dry.  |
| 358       | -228  |               |   |          |                |             |  |
| 357       | -229  |               |   |          |                |             |  |
| 356       | -230  |               |   |          |                |             | 230.0 - 237.7: GRAVELLY SILTY SAND (SM), olive with trace orange stains, fine to medium, some nonplastic fines with no dry strength, little fine to medium subrounded gravel, trace cobbles, soft, moist. At 235: gravels coated with weak red silt or clay. |
| 355       | -231  |               |   |          |                |             |  |
| 354       | -232  |               |   |          |                |             |  |
| 353       | -233  |               |   |          |                |             |  |
| 352       | -234  | G             |   |          |                |             | 237.7 - 239.5: SANDY GRAVEL (GP), brown, medium to coarse, subrounded to subangular, trace fines, some fine to medium sand, trace coarse sand, wet, loose.   |
| 351       | -235  | 230-240       |   |          |                |             |  |
| 350       | -236  |               |   |          |                |             |  |
| 349       | -237  |               |   |          |                |             |  |
| 348       | -238  | G             |   |          |                |             | 239.5 - 245.0: See description on following page.  |
| 347       | -239  | G             |   |          |                |             |  |
| 347       | -240  | G             |   |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
 Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
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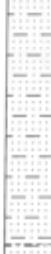




# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-2  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 10, 2014 - April 16, 2014  
Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168950.10  
Easting: 1699528.95  
Ground Elevation: 586.32  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill   | Depth to Water | Graphic Log   | Classification and Description   |
|-----------|-------|---------------|---|--|----------------|---|--|
| 346       | -240  | 240-250       | G   |  |                |    | 239.5 - 245.0: SAND WITH SILTY FINES (SP-SM), dark yellow brown with trace orange stains, very fine to fine, few to little nonplastic fines with no dry strength, rapid dilatancy, loose, dry. Includes numerous 2mm - 5mm-thick interbeds of SILT (ML). Possible former soil. At 241.8': interbed of SILT (ML), 1/2" thick, dark yellowish brown, sand absent, high to very high dry strength, low plasticity, low toughness. NOTE: sample from 241.8-250 feet was dropped during coring and the disturbed sample was subsequently recovered. |
| 345       | -241  |               | G   |  |                |   | 245.0 - 250.0: SAND WITH SILTY FINES (SP-SM), light olive brown, very fine to fine, few to little fines, gravel absent, very rapid dilatancy, loose, dry. At 247'-247.5': trace rounded coarse sand and fine gravel, trace gray ML as thin interbeds. At 249': SAND (SP), very fine to fine, light olive brown, trace fines, loose, dry, uncertain upper and basal contacts.   |
| 344       | -242  |               | G   |  |                |   | 250.0 - 252.5: SAND WITH SILTY FINES (SP-SM), brown, very fine to fine, few fines, rapid dilatancy, loose, moist to dry.   |
| 343       | -243  |               | G   |  |                |   | 252.2 - 257.8: SAND (SP), yellowish brown with trace orange stains, fine, trace medium, fines trace to absent, gravel absent, loose, wet.  |
| 342       | -244  |               | G   |  |                |   | 257.8 - 261.0: SILTY SAND (SM), yellowish brown, fine, some fines, gravels absent, soft to firm, moist to dry. At ~259.7': interbed of SANDY SILT (ML), light olive brown, trace coarse sand and fine gravel, firm to hard. Regional aquifer groundwater level: 257.8 feet at 17:02 on 4/15/2014 with borehole cased and cleared to 270 feet;  |
| 341       | -245  | 250-260       | G   |  |                |   |  |
| 340       | -246  |               | G   |  |                |   |  |
| 339       | -247  |               | G   |  |                |   |  |
| 338       | -248  |               | G   |  |                |   |  |
| 337       | -249  |               | G   |  |                |   |  |
| 336       | -250  | 250-260       | G   |  |                |  |  |
| 335       | -251  |               | G   |  |                |   |  |
| 334       | -252  |               | G   |  |                |   |  |
| 333       | -253  |               | G   |  |                |   |  |
| 332       | -254  |               | G   |  |                |   |  |
| 331       | -255  | 250-260       | G   |  |                |  |  |
| 330       | -256  |               | G   |  |                |   |  |
| 329       | -257  |               | G   |  |                |   |  |
| 328       | -258  |               | G   |  |                |   |  |
| 327       | -259  |               | G   |  |                |   |  |
| 327       | -260  |               |   |  |                |   |  |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3222 |   | Boring A8B-2<br>Page 14 of 15 |                |             |  |
|---|-------|--|---|-------------------------------|----------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  |       |  | Northing: 168950.10   |                               |                |             |  |
| Start and End Dates: April 10, 2014 - April 16, 2014  |       |  | Easting: 1699528.95   |                               |                |             |  |
| Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet   |       |  | Ground Elevation: 586.32                                    |                               |                |             |  |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  |       |  | Depth: 280.0 feet   |                               |                |             |  |
| Elevation   | Depth | Core Interval  | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill                      | Depth to Water | Graphic Log | Classification and Description   |
| 326   | -260  |  |   |                               |                |             | groundwater level 258.4 feet at 7:15 on 4/16/2014 with borehole cased and cleared to 270 feet.   |
| 325   | -261  |  |   |                               |                |             | 261.0 - 263.1: SAND (SP), brown, fine, trace fines, gravel absent, moist to wet.   |
| 324   | -262  | G  |   |                               |                |             | 263.1 - 264.0: CLAYEY SILT (ML), dark gray except olive with orange stains at upper contact and 1" above basal contact, sand absent, gravel absent, medium plasticity, medium toughness, slightly sticky when wetted, hard, thinly laminated, abrupt upper and basal contacts. |
| 323   | -263  |  |   |                               |                |             |  |
| 322   | -264  |  |   |                               |                |             |  |
| 321   | -265  | 260-270 G  |   |                               |                |             | 264.0 - 267.2: SAND WITH SILTY FINES (SP-SM), brown, very fine to fine, few fines, moist, gradational basal contact.   |
| 320   | -266  |  |   |                               |                |             |  |
| 319   | -267  |  |   |                               |                |             |  |
| 318   | -268  |  |   |                               |                |             |  |
| 317   | -269  |  | G: PSA, OC,   |                               |                |             |  |
| 316   | -270  |  | Hyd Cond  |                               |                |             |  |
| 315   | -271  |  |   |                               |                |             | 270.0 - 280.0: SAND (SP), gray brown, fine to medium, trace coarse, fines trace to absent, trace fine gravel, loose, wet, gradational upper contact.   |
| 314   | -272  |  |   |                               |                |             |  |
| 313   | -273  |  | G   |                               |                |             |  |
| 312   | -274  |  |   |                               |                |             |  |
| 311   | -275  | 270-280  |   |                               |                |             |  |
| 310   | -276  |  |   |                               |                |             | At 276' - 277.5': trace subrounded coarse sand and fine gravel.  |
| 309   | -277  |  | G   |                               |                |             | At 277.3': weak red (iron?) cement, trace coal.  |
| 308   | -278  |  | G   |                               |                |             | At 278' - 278.5': few fine subrounded gravel.  |
| 307   | -279  |  |   |                               |                |             | At 279.0' - 280.0': no sample recovery.  |
|   | -280  |  |   |                               |                |             |  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/> Logged by AGU</p> |       |  |   |                               |                |             |  |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3222

Boring A8B-2  
Page 15 of 15

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 10, 2014 - April 16, 2014  
Borehole diameter: 8" 0 - 160 feet, 6" 160 - 280 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168950.10  
Easting: 1699528.95  
Ground Elevation: 586.32  
Depth: 280.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 306       | -280  |               |  |          |                |             | Boring backfill:<br>0 - 1 feet: Concrete<br>1 - 8 feet: Soil cuttings<br>8 - 280.0 feet: 3/4" Baroid Wyo-ben bentonite chips hydrated concurrent with placement. |
| 305       | -281  |               |  |          |                |             |  |
| 304       | -282  |               |  |          |                |             |  |
| 303       | -283  |               |  |          |                |             |  |
| 302       | -284  |               |  |          |                |             |  |
| 301       | -285  |               |  |          |                |             |  |
| 300       | -286  |               |  |          |                |             |  |
| 299       | -287  |               |  |          |                |             |  |
| 298       | -288  |               |  |          |                |             |  |
| 297       | -289  |               |  |          |                |             |  |
| 296       | -290  |               |  |          |                |             |  |
| 295       | -291  |               |  |          |                |             |  |
| 294       | -292  |               |  |          |                |             |  |
| 293       | -293  |               |  |          |                |             |  |
| 292       | -294  |               |  |          |                |             |  |
| 291       | -295  |               |  |          |                |             |  |
| 290       | -296  |               |  |          |                |             |  |
| 289       | -297  |               |  |          |                |             |  |
| 288       | -298  |               |  |          |                |             |  |
| 287       | -299  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. No water added during drilling.  
 Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
 Logged by AGU



# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-4  
Page 1 of 6

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: May 1, 2014 - May 5, 2014  
Borehole diameter: 6"  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169452.83  
Easting: 1698505.84  
Ground Elevation: 552.64  
Depth: 100.2 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 552       | 0     | 0-5           | G   |          |                |             | 0 - 2.5: SILTY SAND (SM), dark grayish brown, fine to medium, some fines with low plasticity and low toughness, few fine to coarse subrounded to subangular gravel, firm where moist, very soft where wet, wet from 1.5' - 2.5', moist elsewhere, trace organic material as twigs and roots. FILL.  |
| 551       | -1    |               |   |          |                |             | 2.5 - 5.0: SILTY SAND (SM), dark grayish brown, fine to medium, some fines with low to medium dry strength, little fine to coarse subrounded to subangular gravel, hard to very hard where moist, very soft where wet, wet to 3.5', moist below 3.5'. FILL.   |
| 550       | -2    | 5-10          | G   |          |                |             | 5.0 - 7.0: SILTY SAND (SM), gray, fine to coarse, some fines with medium plasticity, medium toughness, and low dry strength, little fine to medium subrounded to subangular gravel, trace coarse subrounded to angular gravel, trace cobbles, very hard, moist. FILL.   |
| 549       | -3    |               |   |          |                |             | 7.0 - 8.4: SILTY SAND (SM), olive brown, fine to medium, little to some fines, trace to few fine to medium subrounded to subangular gravel, very soft, moist. FILL.   |
| 548       | -4    |               |   |          |                |             | 8.4 - 12.0: SILTY SAND (SM), dark gray, fine to coarse, some fines with low plasticity, low toughness, and low to very low dry strength, few fine to coarse subrounded to angular gravel, trace cobbles, loose, moist. FILL.  |
| 547       | -5    | 10-18         | G   |          |                |             | 12.0 - 14.5: GRAVEL WITH SAND AND SILTY FINES (GW-GM), dark gray, subrounded to angular, little fines with low plasticity, low toughness, and rapid dilatancy, little fine to medium sand, trace coarse sand, trace cobbles to 3/4" diameter, loose, moist to wet. FILL.  |
| 546       | -6    |               |   |          |                |             | 14.5 - 23.0: SAND WITH SILT (SM), gray, fine to medium, little fines with low plasticity, low toughness, and low dry strength, few fine to coarse subrounded to angular gravel, trace cobbles, hard where dry, soft where moist to wet, wet at upper contact, dry below contact to 18', moist to wet at 18' - 18.5', moist at 18.5' - 20'.<br>Depth to perched groundwater 14.95 feet at 7:47 on May 2, 2014 with borehole cased and cleared to 20 feet.<br>At 21.5': 5" cobble.<br>Water added when coring from 20' - 30' to recover broken drill rod. |
| 545       | -7    | 18-20         | G   |          |                |             |   |
| 544       | -8    |               |   |          |                |             |   |
| 543       | -9    |               |   |          |                |             |   |
| 542       | -10   |               |   |          |                |             |   |
| 541       | -11   |               |   |          |                |             |   |
| 540       | -12   |               |   |          |                |             |   |
| 539       | -13   |               |   |          |                |             |   |
| 538       | -14   |               |   |          |                |             |   |
| 537       | -15   |               |   |          |                |             |   |
| 536       | -16   |               |   |          |                |             |   |
| 535       | -17   |               |   |          |                |             |   |
| 534       | -18   |               |   |          |                |             |   |
| 533       | -19   |               |   |          |                |             |   |
|           | -20   |               |   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 20 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |   | Boring A8B-4<br>Page 2 of 6 |                |             |   |
|--|-------|--|---|-----------------------------|----------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic   |       |  | Northing: 169452.83   |                             |                |             |   |
| Start and End Dates: May 1, 2014 - May 5, 2014   |       |  | Easting: 1698505.84   |                             |                |             |   |
| Borehole diameter: 6"  |       |  | Ground Elevation: 552.64  |                             |                |             |   |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Depth: 100.2 feet   |                             |                |             |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill                    | Depth to Water | Graphic Log | Classification and Description  |
| 532  | -20   |  | SB: 1-1-5   |                             |                |             | 14.5 - 23 feet: See description on previous page.   |
| 531  | -21   | 20-24  | G   |                             | 14             |             | Depth to perched groundwater 22.55 feet at 11:37 on May 2, 2014 with borehole cased to 50 feet and open to 60.4 feet.   |
| 530  | -22   |  | G   |                             |                |             |   |
| 529  | -23   |  | G   |                             |                |             | 23.0 - 42.0: SILTY SAND (SM), dark gray to 27', dark gray, very dark gray, and black below 27', fine to coarse, some fines with low plasticity, low toughness, low dry strength at 23' and 28', very high dry strength at 33', trace clay, little fine to medium gravel, trace coarse gravel, trace to few cobbles, very hard, dry. Water added when coring from 20' - 30' to recover broken drill rod. At 24.5' - 25.5': mostly cobbles to 5" diameter. At 40': trace orange (iron?) stains. |
| 528  | -24   |  |   |                             |                |             |   |
| 527  | -25   | 20-29  | G: USCS, MC,  |                             |                |             |   |
| 526  | -26   |  |   |                             |                |             |   |
| 525  | -27   |  |   |                             |                |             |   |
| 524  | -28   |  | PSA   |                             |                |             |   |
| 523  | -29   |  |   |                             |                |             |   |
| 522  | -30   |  | SB: 50/5.5"   |                             |                |             |   |
| 521  | -31   | 30-32  |   |                             |                |             |   |
| 520  | -32   |  |   |                             |                |             |   |
| 519  | -33   |  | G   |                             |                |             |   |
| 518  | -34   |  |   |                             |                |             |   |
| 517  | -35   | 32-39  |   |                             |                |             |   |
| 516  | -36   |  |   |                             |                |             |   |
| 515  | -37   |  | G   |                             |                |             |   |
| 514  | -38   |  |   |                             |                |             |   |
| 513  | -39   |  |   |                             |                |             |   |
|  | -40   | 39-41  |   |                             |                |             |   |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 20 feet.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/> Logged by AGU</p> |       |  |   |                             |                |             |   |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-4  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: May 1, 2014 - May 5, 2014  
Borehole diameter: 6"  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169452.83  
Easting: 1698505.84  
Ground Elevation: 552.64  
Depth: 100.2 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|---|----------|----------------|-------------|--|
| 512       | -40   |               |   |          |                |             | 23 - 42 feet: See description on previous page.  |
| 511       | -41   | 41-43         | SS: 33-50/2"  |          |                |             |  |
| 510       | -42   |               | G   |          |                |             | 42.0 - 43.0: GRAVEL WITH SAND AND SILTY FINES (GW-GM), dark gray, subrounded to angular, few slightly sticky fines with low plasticity and very high dry strength occurring as infill in open-work gravel, some fine to medium sand, trace coarse sand, trace to few cobbles, gravels and cobbles are in point contact, hard, dry. |
| 509       | -43   |               | G   |          |                |             | 43.0 - 46.0: SILTY SAND (SM), very dark gray to black, fine to coarse, some fines with low plasticity, low toughness, and very high dry strength, trace clay, little fine to medium gravel, trace coarse gravel, trace to few cobbles, very hard, dry.   |
| 508       | -44   |               | G   |          |                |             | 46.0 - 50.5: SILTY SAND (SM), black, fine to coarse, subrounded to angular, few fines with low plasticity, low toughness, and very high dry strength, few fine to medium subrounded to angular gravel, trace coarse gravel, very hard, dry.  |
| 507       | -45   | 43-50.5       | G   |          |                |             |  |
| 506       | -46   |               | G   |          |                |             |  |
| 505       | -47   |               | G   |          |                |             |  |
| 504       | -48   |               | G   |          |                |             |  |
| 503       | -49   |               | G   |          |                |             |  |
| 502       | -50   |               | G   |          |                |             |  |
| 501       | -51   | 50.5-55       | G   |          |                |             | 50.5 - 52.2: SILT (ML), black, medium plasticity, medium toughness, low dry strength, slow dilatancy, trace clay, trace coarse sand, trace fine to medium subrounded to angular gravel, very hard, dry, micaceous.   |
| 500       | -52   |               | G   |          |                |             | 52.2 - 57.8: GRAVEL (GW), gray brown, subrounded to subangular, trace fines to fines absent, some fine to coarse subrounded to angular sand, few cobbles to 4", loose, wet. Orange staining and weak iron cement at upper contact.   |
| 499       | -53   |               | G   |          |                |             |  |
| 498       | -54   |               | G   |          |                |             |  |
| 497       | -55   |               | G   |          |                |             |  |
| 496       | -56   |               | G   |          |                |             |  |
| 495       | -57   | 55-60.5       | G   |          |                |             | 57.8 - 58.4: SAND (SP), gray, coarse, trace fine to medium, trace fines, some fine gravel, wet, loose.   |
| 494       | -58   |               | G   |          |                |             |  |
| 493       | -59   |               | G   |          |                |             | 58.4 - 60 feet: See description on next page.  |
|           | -60   |               |   |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 20 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU



# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-4  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: May 1, 2014 - May 5, 2014  
Borehole diameter: 6"  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169452.83  
Easting: 1698505.84  
Ground Elevation: 552.64  
Depth: 100.2 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description                       |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 472       | -80   |               | SS: 16-50/3"   |          |                |             | 67.5 - 100.2 feet: See description on previous page. |
| 471       | -81   | 80-83         | G  |          |                |             |  |
| 470       | -82   |               |  |          |                |             |  |
| 469       | -83   |               |  |          |                |             |  |
| 468       | -84   |               |  |          |                |             |  |
| 467       | -85   |               |  |          |                |             |  |
| 466       | -86   | 83-90         | G: PSA   |          |                |             |  |
| 465       | -87   |               |  |          |                |             |  |
| 464       | -88   |               |  |          |                |             |  |
| 463       | -89   |               |  |          |                |             |  |
| 462       | -90   |               | SB: 47-50/3"   |          |                |             |  |
| 461       | -91   |               |  |          |                |             |  |
| 460       | -92   |               |  |          |                |             |  |
| 459       | -93   |               |  |          |                |             |  |
| 458       | -94   | 90-100        | G  |          |                |             |  |
| 457       | -95   |               |  |          |                |             |  |
| 456       | -96   |               | G  |          |                |             |  |
| 455       | -97   |               |  |          |                |             |  |
| 454       | -98   |               | G  |          |                |             |  |
| 453       | -99   |               |  |          |                |             |  |
|           | -100  |               | SB: 50/2"  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 20 feet.  
Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation UEC Project 002.01.001 Task 3221 Boring A8B-4 Page 6 of 6

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
 Start and End Dates: May 1, 2014 - May 5, 2014  
 Borehole diameter: 6"  
 Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 169452.83  
 Easting: 1698505.84  
 Ground Elevation: 552.64  
 Depth: 100.2 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| -100      |       |               | SB: 50/2"  |          |                |             |  |
| 452       | -101  |               |  |          |                |             | Boring backfill:<br>0 - 1 feet: Concrete<br>1 - 5 feet: Soil cuttings<br>5 - 100.2 feet: 3/4" Baroid Wyo-ben bentonite chips hydrated concurrent with placement. |
| 451       | -102  |               |  |          |                |             |  |
| 450       | -103  |               |  |          |                |             |  |
| 449       | -104  |               |  |          |                |             |  |
| 448       | -105  |               |  |          |                |             |  |
| 447       | -106  |               |  |          |                |             |  |
| 446       | -107  |               |  |          |                |             |  |
| 445       | -108  |               |  |          |                |             |  |
| 444       | -109  |               |  |          |                |             |  |
| 443       | -110  |               |  |          |                |             |  |
| 442       | -111  |               |  |          |                |             |  |
| 441       | -112  |               |  |          |                |             |  |
| 440       | -113  |               |  |          |                |             |  |
| 439       | -114  |               |  |          |                |             |  |
| 438       | -115  |               |  |          |                |             |  |
| 437       | -116  |               |  |          |                |             |  |
| 436       | -117  |               |  |          |                |             |  |
| 435       | -118  |               |  |          |                |             |  |
| 434       | -119  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 20 feet.  
 Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
 Logged by AGU

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-5  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: May 5, 2014 - May 8, 2014  
Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168812.17  
Easting: 1698719.30  
Ground Elevation: 530.6  
Depth: 180.4 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill  | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|---|-----------|----------------|-------------|--|
| 530       | 0     |               |   |           |                |             |  |
| 529       | -1    | 0-5           | G   | [Pattern] |                | [Pattern]   | 0 - 3.0: GRAVEL WITH SAND (GP), brown, fine to medium, trace fines, little fine to coarse sand, trace cobbles to 3.5" diameter, loose, wet to .5', moist below. FILL/ROAD BED.   |
| 528       | -2    |               |   |           |                |             |  |
| 527       | -3    |               | G   |           |                | [Pattern]   | 3.0 - 3.7: SILTY SAND (SM), brown, fine to medium, some fines, few fine to coarse gravel, trace cobbles to 4" diameter, soft, moist. Trace plastic bags. Reworked soil/FILL  |
| 526       | -4    |               |   |           |                | [Pattern]   | 3.7 - 4.0: ORGANIC SILT (OH/MH), dark reddish brown, medium plasticity, low toughness, little fine to medium sand, trace fine to coarse gravel, common fibrous roots, spongy, wet. Former pond.  |
| 525       | -5    | 5-10          | G   | [Pattern] |                | [Pattern]   | 4.0 - 5.0: GRAVELLY SILTY SAND (SM), dark gray, fine to medium, some fines, few fine to coarse subrounded to subangular gravel, moist.   |
| 524       | -6    |               |   |           |                |             |  |
| 523       | -7    |               |   |           |                |             |  |
| 522       | -8    |               | G   |           |                | [Pattern]   | 5.0 - 6.5: GRAVELLY SAND WITH SILTY FINES (SP-SM), olive, fine, few fines, some fine to medium subrounded to subangular gravel, trace cobbles to 5", loose, moist.   |
| 521       | -9    |               |   |           |                | [Pattern]   | 6.5 - 9.8: GRAVEL (GP), brown, fine and coarse (gap-graded), subrounded to subangular, trace fines, some fine to coarse subrounded to angular sand, few cobbles to 6", loose, moist.   |
| 520       | -10   |               | G 10-10.5: ATT<br>SB: 7-45-50/5"                            |           |                | [Pattern]   |  |
| 519       | -11   | 10-15         | G   | [Pattern] |                | [Pattern]   | 9.8 - 11.0: GRAVELLY SILT (ML), grayish brown, trace clay, few fine to coarse sand, few fine gravel, slightly sticky, hard, moist.   |
| 518       | -12   |               |   |           |                |             |  |
| 517       | -13   |               |   |           |                |             |  |
| 516       | -14   |               |   |           |                | [Pattern]   | 11.0 - 20.0: SILTY SAND WITH GRAVEL (SM), grayish brown, fine to medium, some fines, few fine gravel, trace cobbles to 4", loose, moist. At 19.3' - 20': mostly cobbles to 6" diameter, dry to wet. Uncertain basal contact. Matrix supported. |
| 515       | -15   | 15-20         | G   | [Pattern] |                | [Pattern]   |  |
| 514       | -16   |               |   |           |                |             |  |
| 513       | -17   |               |   |           |                |             |  |
| 512       | -18   |               |   |           |                |             |  |
| 511       | -19   |               |   |           |                | [Pattern]   | Depth to perched groundwater could not be measured with borehole cased and cleared to 20.0 feet; however, soils in sampler driven from 20.0 to 20.5 feet were saturated at the contact between the silty sand and underlying silt.             |
|           | -20   |               |   |           |                | [Pattern]   |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |  |  | Boring A8B-5<br>Page 2 of 10 |             |   |
|--|-------|--|--|--|------------------------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: May 5, 2014 - May 8, 2014<br>Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  |  | Northing: 168812.17<br>Easting: 1698719.30<br>Ground Elevation: 530.6<br>Depth: 180.4 feet |                              |             |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill   | Depth to Water               | Graphic Log | Classification and Description  |
| 510  | -20   |  | SB: 50/3*  |  |                              |             | 20.0 - 31.9: GRAVELLY SILT WITH SAND (ML), dark gray to -22.5', dark grayish brown from 22.5' - 30' except greenish gray to olive gray at 24.6, gray below 30', orange staining at upper and basal contacts, trace clay, few fine to coarse sand, little fine to coarse gravel, trace cobbles to 6", slightly sticky when wetted, hard, dry. Gravel are randomly oriented in matrix, matrix supported. At 27.5' - 30': subhorizontal laminae, alternating gray/olive brown, to 5mm thick. |
| 509  | -21   |  | G  |  |                              |             |   |
| 508  | -22   | 20-25.5  |  |  |                              |             |   |
| 507  | -23   |  |  |  |                              |             |   |
| 506  | -24   |  |  |  |                              |             |   |
| 505  | -25   |  | G  |  |                              |             |   |
| 504  | -26   |  | G  |  |                              |             |   |
| 503  | -27   |  |  |  |                              |             |   |
| 502  | -28   | 25.5-30  |  |  |                              |             |   |
| 501  | -29   |  | G 29-29.3: PSA   |  |                              |             |   |
| 500  | -30   |  | SB: 30-50/1*   |  |                              |             | 31.9 - 39.0: SILTY SAND WITH GRAVEL (SM), dark gray, fine to coarse, some fines with medium plasticity, low toughness, and medium dilatency, few fine to coarse gravel, trace to few cobbles, dry, hard. At 33': 5" diameter flattened rounded cobble. At 35.7' - 36': yellow precipitate, (weak cement?) overlies bed of mostly cobbles at 36' - 36.5'. At 38': few cobbles. At 39: trace clay, trace gravel.  |
| 499  | -31   |  | G  |  |                              |             |   |
| 498  | -32   | 30-35  | G  |  |                              |             |   |
| 497  | -33   |  |  |  |                              |             |   |
| 496  | -34   |  |  |  |                              |             |   |
| 495  | -35   |  |  |  |                              |             |   |
| 494  | -36   |  | G  |  |                              |             |   |
| 493  | -37   | 35-40  |  |  |                              |             |   |
| 492  | -38   |  |  |  |                              |             |   |
| 491  | -39   |  | G  |  |                              |             |   |
|  | -40   |  |  |  |                              |             | 39.0 - 52.5 feet: See description on following page.  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet.<br/> Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br/> Logged by AGU</p> |       |  |  |  |                              |             |   |



# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-5  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: May 5, 2014 - May 8, 2014  
Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168812.17  
Easting: 1698719.30  
Ground Elevation: 530.6  
Depth: 180.4 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 490       | -40   |               | SB: 50/2"  |          |                |             |  |
| 489       | -41   |               |  |          |                |             |  |
| 488       | -42   | 40-45         | G  |          |                |             | 39.0 - 52.5: SILTY SAND (SM), gray, very fine to fine and coarse (gap-graded), some fines with low plasticity, low toughness, and medium dilatancy, trace clay at upper contact, few fine subrounded to angular gravel, trace subrounded to angular cobbles to 4" diameter, hard, dry, hot core. At 41.7 - 43: trace fine to medium gravel, massive.             |
| 487       | -43   |               |  |          |                |             |  |
| 486       | -44   |               |  |          |                |             |  |
| 485       | -45   |               |  |          |                |             |  |
| 484       | -46   |               |  |          |                |             |  |
| 483       | -47   | 45-50         |  |          |                |             |  |
| 482       | -48   |               |  |          |                |             |  |
| 481       | -49   |               | G  |          |                |             |  |
| 480       | -50   |               | SB: 50/2"  |          |                |             |  |
| 479       | -51   |               |  |          |                |             |  |
| 478       | -52   |               |  |          |                |             |  |
| 477       | -53   |               |  |          |                |             | 52.5 - 67.5: SILTY SAND WITH GRAVEL (SM), dark gray, very fine to fine and coarse (gap-graded), some fines with low plasticity, low toughness, and medium dilatancy, little fine subrounded to angular gravel, trace to few subrounded to angular cobbles to 4" diameter, hard, dry, matrix supported, hot core. At 60' - 67.5: silt content increases downhole. |
| 476       | -54   |               |  |          |                |             |  |
| 475       | -55   | 50-60         |  |          |                |             |  |
| 474       | -56   |               | G  |          |                |             |  |
| 473       | -57   |               |  |          |                |             |  |
| 472       | -58   |               |  |          |                |             |  |
| 471       | -59   |               |  |          |                |             |  |
|           | -60   |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU



| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |  |  | Boring A8B-5<br>Page 6 of 10 |             |  |
|---|-------|--|--|--|------------------------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: May 5, 2014 - May 8, 2014<br>Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  |       |  |  | Northing: 168812.17<br>Easting: 1698719.30<br>Ground Elevation: 530.6<br>Depth: 180.4 feet |                              |             |  |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill   | Depth to Water               | Graphic Log | Classification and Description   |
| 430   | -100  |  | SB: 50/3"  |  |                              |             | 95.0 - 96.0: GRAVEL WITH SAND AND SILTY FINES (GW-GM), olive to olive brown, little fines as pore infill, little fine to coarse sand, few cobbles to 5", clast supported with nearly-complete infilling of pores, hard to very hard, dry.  |
| 429   | -101  |  |  |  |                              |             | 96.0 - 101.2: SAND WITH SILTY FINES (SW-SM), light olive brown, loose to firm, moist. At 98": orange iron stains on dark yellowish brown highly weathered cemented clay.   |
| 428   | -102  |  |  |  |                              |             | 101.2 - 102.8: GRAVEL WITH SILTY FINES (GW-GM), light olive brown, subrounded to subangular, few fines, little fine to coarse sand, moist, clast supported, gradational upper contact.   |
| 427   | -103  | G  |  |  |                              |             | 102.8 - 104.5: SAND WITH SILTY FINES (SP-SM), gray, fine to medium, trace coarse, little fines at upper contact, fines content decreases downhole, few medium to coarse gravel, gravel content decreases downhole, trace cobbles to 3/8", loose, moist. Abrupt upper contact, gradational basal contact.   |
| 426   | -104  | 100-110  |  |  |                              |             | 104.5 - 117.8 SAND (SP), olive brown, fine to medium, trace fines, trace fine to medium subrounded to subangular gravel, loose, moist. At 109'-110.5': SAND (SW) fine to coarse, few fine to medium gravel. At 110': driven sample is non-representative, fines were washed away during drilling. At 110.5'-115': gravels absent. At 115'-115.8': SAND (SW), gray brown, subrounded to angular, trace fines, few fine to medium subrounded to subangular gravel, loose, wet. |
| 425   | -105  |  |  |  |                              |             | At 115.8'-116.4': SAND WITH SILTY FINES (SP-SM), gray brown, fine, few fines, trace fine gravel and coarse sand, moist.  |
| 424   | -106  |  |  |  |                              |             | 117.8 - 119.5: SAND (SW), gray brown with orange stains at basal contact, trace fines as orange brown nonplastic to medium plasticity rip-up clasts and as gray brown coating on gravels, few fine to medium subrounded to angular gravel, moist.  |
| 423   | -107  |  |  |  |                              |             |  |
| 422   | -108  |  |  |  |                              |             |  |
| 421   | -109  | G  |  |  |                              |             |  |
| 420   | -110  |  | SB: 40-50/3"   |  |                              |             |  |
| 419   | -111  |  |  |  |                              |             |  |
| 418   | -112  | 110-115  |  |  |                              |             |  |
| 417   | -113  | G  |  |  |                              |             |  |
| 416   | -114  |  |  |  |                              |             |  |
| 415   | -115  | G  |  |  |                              |             |  |
| 414   | -116  | G  |  |  |                              |             |  |
| 413   | -117  | G  |  |  |                              |             |  |
| 412   | -118  | 115-120  |  |  |                              |             |  |
| 411   | -119  | G  |  |  |                              |             |  |
|   | -120  | G  |  |  |                              |             |  |
| Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet.<br>Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br>Logged by AGU |       |  |  |  |                              |             |  |





# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-5  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: May 5, 2014 - May 8, 2014  
Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168812.17  
Easting: 1698719.30  
Ground Elevation: 530.6  
Depth: 180.4 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill   | Depth to Water | Graphic Log  | Classification and Description   |  |  |  |  |
|-----------|-------|---------------|--|--|----------------|--|--|--|--|--|--|
| 410       | -120  | 120-130       | SB: 40-50/5"<br>G  |  |                |  | 119.5 - 122.5: SILTY SAND (SM), olive gray, fine to coarse, some fines with low plasticity and low toughness, slightly sticky when wetted, trace clay, little fine to medium gravel, very hard, dry.   |  |  |  |  |
| 409       | -121  |               |  |  |                |  |  |  |  |  |  |
| 408       | -122  |               |  |  |                |  |  |  |  |  |  |
| 407       | -123  |               |  |  |                |  |  |  |  |  |  |
| 406       | -124  |               |  |  |                |  |  |  |  |  |  |
| 405       | -125  |               |  |  |                |  |  |  |  |  |  |
| 404       | -126  |               |  |  |                |  |  |  |  |  |  |
| 403       | -127  |               |  |  |                |  |  |  |  |  |  |
| 402       | -128  |               |  |  |                |  |  |  |  |  |  |
| 401       | -129  |               |  |  |                |  |  |  |  |  |  |
| 400       | -130  | 130-140       | SB: 130.1-131.6:<br>USCS, MC<br>G                              |  |                |  | At 126.4' - 126.8': few fine to coarse gravel.   |  |  |  |  |
| 399       | -131  |               |  |  |                |  |  |  |  |  |  |
| 398       | -132  |               |  |  |                |  |  |  |  |  |  |
| 397       | -133  |               |  |  |                |  |  |  |  |  |  |
| 396       | -134  |               |  |  |                |  |  |  |  |  |  |
| 395       | -135  |               |  |  |                |  |  |  |  |  |  |
| 394       | -136  |               |  |  |                |  |  |  |  |  |  |
| 393       | -137  |               |  |  |                |  |  |  |  |  |  |
| 392       | -138  |               |  |  |                |  |  |  |  |  |  |
| 391       | -139  |               |  |  |                |  |  |  |  |  |  |
|           | -140  |               |  |  |                |  | At 127.4' - 127.7': fine to coarse sand, few fine to coarse gravel.<br>At 128.2' - 128.8': 1/4" thick interbed of SAND WITH SILTY FINES (SP-SM), olive, fine to medium few fines, moist.<br>At ~130': dry.<br>At 131.5' - 131.8': armored mud balls covered with silty sand, gray, medium to coarse.<br>At 132.5' - 132.9': little medium to coarse gravel.<br>At 133.8' - 134.6': 1/2" to 3/4"-thick weakly indurated beds of SAND (SP), fine to medium, trace fines.<br>At ~135': trace to few subrounded to angular fine to medium gravel, trace subrounded to angular coarse sand, loose, moist, trace muscovite.<br>At 139': cobble fragment. At 139.2' - 140': thin interbeds of SILTY SAND (SM), olive gray, fine to medium, some fines with low plasticity, low toughness, and very high dry strength, hard to very hard, moist. |  |  |  |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet.  
Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
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| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |  | Boring A8B-5<br>Page 8 of 10 |                |             |   |
|--|-------|--|--|------------------------------|----------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic   |       |  | Northing: 168812.17  |                              |                |             |   |
| Start and End Dates: May 5, 2014 - May 8, 2014   |       |  | Easting: 1698719.30  |                              |                |             |   |
| Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet   |       |  | Ground Elevation: 530.6  |                              |                |             |   |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Depth: 180.4 feet  |                              |                |             |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill                     | Depth to Water | Graphic Log | Classification and Description  |
| 390  | -140  |  | SB: 50/5"  |                              |                |             |   |
| 389  | -141  |  |  |                              |                |             |   |
| 388  | -142  | 140-145  |  |                              |                |             | 140.0 - 149.8: GRAVEL WITH SAND AND SILTY FINES (GW-GM), olive, subrounded to angular, few fines, trace fine to medium sand and some coarse sand to ~143.5', some medium to coarse sand below 143.5', clast supported, open work to ~143.5', wet, loose. At 142.5 - 143: few cobbles to 4" including weathered red volcanic with red mud coating. At 143.6', 148', and 148.7': Interbeds or rip-up clasts of GRAVELLY SILTY SAND (SM), olive with trace orange staining on embedded grains, fine to coarse, little fines, little fine to medium gravel, hard, dry. At 145' - 147': mostly cobbles to 4" diameter. |
| 387  | -143  |  |  |                              |                |             |   |
| 386  | -144  |  |  |                              |                |             |   |
| 385  | -145  |  |  |                              |                |             |   |
| 384  | -146  |  |  |                              |                |             |   |
| 383  | -147  | 145-150  | G  |                              |                |             |   |
| 382  | -148  |  |  |                              |                |             |   |
| 381  | -149  |  | G  |                              |                |             |   |
| 380  | -150  |  |  |                              |                |             |   |
| 379  | -151  |  | G<br>SB: 50/5"   |                              |                |             | 149.8 - 151.4: SAND (SP), grayish-brown, fine, trace fines, few fine to coarse subrounded gravel, trace cobbles to 4", fines, loose, moist.   |
| 378  | -152  | 150-155  |  |                              |                |             | 151.4 - 154.7: GRAVEL (GW), olive gray, subrounded to angular, mostly angular, trace fines, few fine to coarse sand, few cobbles to 4", trace SILTY SAND (SM) matrix as hard infill between large clasts, dry, loose.   |
| 377  | -153  |  | G  |                              |                |             |   |
| 376  | -154  |  |  |                              |                |             |   |
| 375  | -155  |  | G  |                              |                |             | 154.7 - 155.3: GRAVEL (GP), gray, fine to medium, trace fines as coatings on gravel, coarse gravel trace to absent, cobbles trace to absent, open work, dry, loose.   |
| 374  | -156  |  |  |                              |                |             |   |
| 373  | -157  | 155-160  |  |                              |                |             | 155.3 - 159.2: SAND (SP), olive, medium to coarse, trace fines as coatings on coarse sand and fine gravel, some fine to medium gravel, open - work, loose, wet.   |
| 372  | -158  |  |  |                              |                |             |   |
| 371  | -159  |  |  |                              |                |             |   |
|  | -160  |  |  |                              |                |             | 159.2 - 160.0 feet: See description on following page.  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.</p> <p style="text-align: right;">Logged by AGU</p> |       |  |  |                              |                |             |   |

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |   |  | Boring A8B-5<br>Page 9 of 10 |  |   |
|--|-------|--|---|--|------------------------------|--|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: May 5, 2014 - May 8, 2014<br>Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample |       |  |   | Northing: 168812.17<br>Easting: 1698719.30<br>Ground Elevation: 530.6<br>Depth: 180.4 feet |                              |  |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill   | Depth to Water               | Graphic Log  | Classification and Description  |
| 370  | -160  | 160-165  | SB: 50/4"<br>G  |          |                              |  | 159.2 - 160.0: SILTY SANDY GRAVEL (GM), olive, fine to coarse, little fines, some fine to coarse subrounded to angular sand, few cobbles to 5" diameter, soft, moist.   |
| 369  | -161  |  |   |  |                              |  | 160.0 - 167.0: GRAVEL WITH SAND AND SILTY FINES (GW-GM), olive gray, few fines, little fine to coarse sand, few cobbles to 5", clast supported, almost open work, loose, moist to dry.  |
| 368  | -162  |  |   |  |                              |  |   |
| 367  | -163  | 165-170  | G   |          |                              |  | At 165': washed casing to 170, collected drive sample at 175 to minimize influence of drilling water.   |
| 366  | -164  |  |   |  |                              |  | 167.0 - 169.0: GRAVEL WITH SAND AND CLAYEY FINES (GP-GC), olive brown with reddish brown mottles, fine to medium, subrounded to rounded, few fines, fines are sticky when wetted, few fine to coarse sand, some cobbles at basal contact, loose, open work. |
| 365  | -165  |  |   |  |                              |  | 169.0 - 170.0: SAND WITH SILTY FINES (SW-SM), light olive brown, angular, few fines, little fine to coarse subrounded to angular gravel, open work, loose, moist to dry.  |
| 364  | -166  | 170-175  | G   |          |                              |  | 170.0 - 171.5: SANDY GRAVEL (GW), brown, little fine to coarse sand, trace fines, loose. NOTE: 170 - 175 core was dropped and recovered.  |
| 363  | -167  |  |   |  |                              |  | 171.5 - 173.0: SAND (SP), reddish brown, fine to medium, trace coarse, trace fines, little to some fine to medium subrounded to subangular gravel, loose, gradational basal contact.  |
| 362  | -168  |  |   |  |                              |  | 173.0 - 174.5: SAND WITH SILTY FINES (SP-SM), fine to medium, trace coarse, strong brown, few fines, few fine to medium subrounded to subangular gravel, loose.   |
| 361  | -169  | 175-180  | SB: 5-35-50<br>G  |          |                              |  | 174.5 - 180: SAND (SP), strong brown with orange (iron?) stains, fine, trace medium, subangular to angular, trace fines, coarse sand absent, gravel absent, loose, moist. Gravel absent.  |
| 360  | -170  |  |   |  |                              |  |   |
| 359  | -171  |  |   |  |                              |  |   |
| 358  | -172  |  |   |  |                              |  |   |
| 357  | -173  |  |   |  |                              |  |   |
| 356  | -174  |  |   |  |                              |  |   |
| 355  | -175  |  |   |  |                              |  |   |
| 354  | -176  |  |   |  |                              |  |   |
| 353  | -177  |  |   |  |                              |  |   |
| 352  | -178  |  |   |  |                              |  |   |
| 351  | -179  |  |   |  |                              |  |   |
|  | -180  |  |   |  |                              |  |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
Logged by AGU

| U <sub>E</sub> C Soil Boring Log  |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |   |  | Boring A8B-5<br>Page 10 of 10 |  |
|---|-------|--|---|--|-------------------------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: May 5, 2014 - May 8, 2014<br>Borehole diameters: 8" for 0 - 10 feet; 6" for 10 - 180 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample  |       |  |   | Northing: 168812.17<br>Easting: 1698719.30<br>Ground Elevation: 530.6<br>Depth: 180.4 feet |                               |  |
| Elevation   | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill   | Depth to Water                | Graphic Log  |
| 350   | -180  |  | SB: 50/5"   |  |                               |  |
| 349   | -181  |  |   |  |                               | 180 - 180.4: SILTY SAND (SM), dark olive gray, fine to medium, trace coarse, some fines with medium plasticity and low toughness, slightly sticky when wetted, trace clay, very hard, dry.<br><br>Boring backfill:<br>0 - 1 feet: Concrete<br>1 - 7 feet: Soil cuttings<br>7 - 180.1 feet: 3/4" Baroid Wyo-ben bentonite chips hydrated concurrent with placement. |
| 348   | -182  |  |   |  |                               |  |
| 347   | -183  |  |   |  |                               |  |
| 346   | -184  |  |   |  |                               |  |
| 345   | -185  |  |   |  |                               |  |
| 344   | -186  |  |   |  |                               |  |
| 343   | -187  |  |   |  |                               |  |
| 342   | -188  |  |   |  |                               |  |
| 341   | -189  |  |   |  |                               |  |
| 340   | -190  |  |   |  |                               |  |
| 339   | -191  |  |   |  |                               |  |
| 338   | -192  |  |   |  |                               |  |
| 337   | -193  |  |   |  |                               |  |
| 336   | -194  |  |   |  |                               |  |
| 335   | -195  |  |   |  |                               |  |
| 334   | -196  |  |   |  |                               |  |
| 333   | -197  |  |   |  |                               |  |
| 332   | -198  |  |   |  |                               |  |
|   | -199  |  |   |  |                               |  |
| Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet.<br>Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.<br>Logged by AGU |       |  |   |  |                               |  |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-6  
Page 1 of 10

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 2, 2014 - April 7, 2014  
Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168737.07  
Easting: 1699198.57  
Ground Elevation: 544.9  
Depth: 181.0 feet

| Elevation | Depth | Core Interval  | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|--|---|----------|----------------|-------------|--|
| 544       | -1    | 0-4  |   |          |                |             | 0 - 12.0: SANDY SILTY GRAVEL (GM), olive gray to brown, fine and coarse, subangular to subrounded, little to some nonplastic fines, some fine to medium sand, trace cobbles, firm to hard (compacted), moist, matrix supported. (FILL) |
| 543       | -2    |  |   |          |                |             |  |
| 542       | -3    | 4-10   | G   |          |                |             | At 4' - 4.5': SILTY SAND (SM), olive gray, fine to medium, some low plasticity fines, little fine to medium subrounded to subangular gravel.   |
| 541       | -4    |  |   |          |                |             |  |
| 540       | -5    |  |   |          |                |             |  |
| 539       | -6    |  |   |          |                |             |  |
| 538       | -7    | SB: 2-5-7  | G   |          |                |             | At 9.5': trace cobbles, locally wet.   |
| 537       | -8    |  |   |          |                |             |  |
| 536       | -9    | 10-20  | G   |          |                |             | 12.0 - 19.5: SILTY GRAVEL (GM), olive to brown with brown staining at gravel contacts, medium to coarse, subrounded to subangular some fines with no to low plasticity, matrix is firm, moist, matrix supported.                       |
| 535       | -10   |  |   |          |                |             |  |
| 534       | -11   |  |   |          |                |             |  |
| 533       | -12   |  |   |          |                |             |  |
| 532       | -13   |  |   |          |                |             |  |
| 531       | -14   |  |   |          |                |             |  |
| 530       | -15   | 19.5 - 37.5 feet: See description on following page. |   |          |                |             | 19.5 - 37.5 feet: See description on following page.   |
| 529       | -16   |  |   |          |                |             |  |
| 528       | -17   |  |   |          |                |             |  |
| 527       | -18   |  |   |          |                |             |  |
| 526       | -19   |  |   |          |                |             |  |
| 525       | -20   |  |   |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU



| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |   |  | Boring A8B-6<br>Page 2 of 10 |             |  |
|--|-------|--|---|--|------------------------------|-------------|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 2, 2014 - April 7, 2014<br>Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  |   | Northing: 168737.07<br>Easting: 1699198.57<br>Ground Elevation: 544.9<br>Depth: 181.0 feet |                              |             |  |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill   | Depth to Water               | Graphic Log | Classification and Description   |
| 525  | -20   |  | SB: 100/6";<br>USCS, MC   |  |                              |             | 19.5 - 37.5: GRAVELLY SILTY SAND (SM), yellowish brown to 37.5', fine to medium, some fines, some fine to coarse angular to subrounded gravel, trace to few subrounded to angular cobbles, dry, very hot core, matrix supported. Possible breaks reflecting internal layering at about 23.5', 27', 29' 34', and 37.5'. |
| 524  | -21   |  |   |  |                              |             |  |
| 523  | -22   |  | G   |  |                              |             |  |
| 522  | -23   |  |   |  |                              |             |  |
| 521  | -24   |  |   |  |                              |             |  |
| 520  | -25   | 20-30  | G   |  |                              |             |  |
| 519  | -26   |  |   |  |                              |             |  |
| 518  | -27   |  |   |  |                              |             |  |
| 517  | -28   |  |   |  |                              |             |  |
| 516  | -29   |  |   |  |                              |             |  |
| 515  | -30   |  |   |  |                              |             | 37.5: - 50.0: GRAVELLY SILTY SAND (SM), light gray, fine to medium, some fines with low plasticity, low toughness, low dry strength, and slow dilatancy, little fine to medium subrounded to subangular gravel, dry, hot core.   |
| 514  | -31   |  | SB: 9/6"-100/12"<br>USCS, MC                                      |  |                              |             |  |
| 513  | -32   |  |   |  |                              |             |  |
| 512  | -33   |  |   |  |                              |             |  |
| 511  | -34   | 30-37  |   |  |                              |             |  |
| 510  | -35   |  | G   |  |                              |             |  |
| 509  | -36   |  |   |  |                              |             |  |
| 508  | -37   |  |   |  |                              |             |  |
| 507  | -38   |  |   |  |                              |             |  |
| 506  | -39   | 37-40  |   |  |                              |             |  |
| 505  | -40   |  | G   |  |                              |             |  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.</p> <p style="text-align: right;">Logged by AGU</p> |       |  |   |  |                              |             |  |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-6  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 2, 2014 - April 7, 2014  
Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168737.07  
Easting: 1699198.57  
Ground Elevation: 544.9  
Depth: 181.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 505       | -40   |               | SB: 20-100/4"  |          |                |             | 37.5 - 50.0: See description on previous page.   |
| 504       | -41   |               | USCS, MC   |          |                |             |  |
| 503       | -42   |               |  |          |                |             |  |
| 502       | -43   |               |  |          |                |             |  |
| 501       | -44   | 40-47         |  |          |                |             |  |
| 500       | -45   |               | G  |          |                |             | At 45'-46': gradational to sandy gravelly SILT ML.   |
| 499       | -46   |               |  |          |                |             |  |
| 498       | -47   |               |  |          |                |             |  |
| 497       | -48   | 47-50         |  |          |                |             | At 47.7'-48.7': SILT (CL-ML), gray, trace to few clay, medium plasticity and toughness, slow dilatancy, very high dry strength, few fine sand, trace fine to medium subrounded gravel, dry.  |
| 496       | -49   |               | G  |          |                |             |  |
| 495       | -50   |               |  |          |                |             |  |
| 494       | -51   |               | SB: 7-35-100/4"  |          |                |             | 50.0 - 51.3: SANDY SILT (ML), brownish gray with trace orange-stained sand grains, some fine sand, few fine to medium gravel, soft, sand content increases down hole.  |
| 493       | -52   |               |  |          |                |             | 51.3 - 57.2: SANDY SILT (ML), brownish gray, no to slow dilatancy, low plasticity, low dry strength, little fine to medium sand, trace angular to subrounded gravel, hard, moist. At 57': thin sand bed (SP).  |
| 492       | -53   |               |  |          |                |             |  |
| 491       | -54   |               |  |          |                |             | Depth to perched groundwater in developed piezometer A8P-1 = 51.85 feet below top of casing (elevation 492.72 feet) at 13:24 on 4/14/2014.   |
| 490       | -55   | 50-60         |  |          |                |             |  |
| 489       | -56   |               |  |          |                |             |  |
| 488       | -57   |               |  |          |                |             |  |
| 487       | -58   |               | G  |          |                |             | 57.2 - 64.0: GRAVELLY SANDY SILT (ML), gray to dark gray, low plasticity, medium to low dry strength, few to little fine to medium sand, little to some fine to subrounded to angular coarse gravel, gravel content increase downhole, hard to very hard, moist, thinly laminated. At 60': blow counts biased, coarse gravel fragment in sample catcher. |
| 486       | -59   |               |  |          |                |             |  |
| 485       | -60   |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

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|--|-------|--|--|------------------------------|----------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic   |       |  | Northing: 168737.07  |                              |                |             |   |
| Start and End Dates: April 2, 2014 - April 7, 2014   |       |  | Easting: 1699198.57  |                              |                |             |   |
| Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet   |       |  | Ground Elevation: 544.9  |                              |                |             |   |
| Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  | Depth: 181.0 feet  |                              |                |             |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill                     | Depth to Water | Graphic Log | Classification and Description  |
| 485  | -60   |  | SB: 29-100/6"  |                              |                |             | 57.2 - 64.0 feet: See description on previous page.   |
| 484  | -61   |  | G  |                              |                |             |   |
| 483  | -62   |  |  |                              |                |             |   |
| 482  | -63   |  |  |                              |                |             |   |
| 481  | -64   |  | G  |                              |                |             |   |
| 480  | -65   | 60-70  | G: PSA,<br>Hyd Cond  |                              |                |             | 64.0 - 68.0: GRAVELLY SILTY SAND (SM), dark gray, fine, some fines, some fine to medium subrounded to subangular gravels, includes ~1"-thick bed of SP - SM at upper contact, wet. Contact elevations uncertain (core disturbed when extracted).<br>Depth to perched groundwater 65.9 feet at 8:42 on 4/3/2014 with the borehole cased to 60 feet and sampled to 70, with open hole at 68.7 feet. |
| 479  | -66   |  |  |                              |                |             |   |
| 478  | -67   |  |  |                              |                |             |   |
| 477  | -68   |  |  |                              |                |             |   |
| 476  | -69   |  | G  |                              |                |             | 68.0 - 77.7: GRAVELLY SILTY SAND (SM), dark gray with brown mottles, fine to medium, little to some fines, some fine to coarse angular to rounded gravel, trace cobbles, hard to very hard, dry to moist.   |
| 475  | -70   |  | SB: 55/6"  |                              |                |             |   |
| 474  | -71   |  |  |                              |                |             |   |
| 473  | -72   |  |  |                              |                |             |   |
| 472  | -73   | 70-77  |  |                              |                |             |   |
| 471  | -74   |  |  |                              |                |             |   |
| 470  | -75   |  |  |                              |                |             |   |
| 469  | -76   |  |  |                              |                |             |   |
| 468  | -77   |  |  |                              |                |             |   |
| 467  | -78   |  | G  |                              |                |             | 77.7 - 78.5: SILT WITH GRAVEL (ML), gray, trace to few clay, trace fine sand, medium plasticity, high dry strength, few subangular fine gravel, very hard, dry.   |
| 466  | -79   | 77-80  |  |                              |                |             |   |
| 465  | -80   |  |  |                              |                |             | 78.5 - 84.5 feet: See description on following page.  |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.</p> <p style="text-align: right;">Logged by AGU</p> |       |  |  |                              |                |             |   |

# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221




Boring A8B-6  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 2, 2014 - April 7, 2014  
Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168737.07  
Easting: 1699198.57  
Ground Elevation: 544.9  
Depth: 181.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 465       | -80   |               | SB: 40-100/5*<br>USCS, MC                                      |          |                |             | 78.5 - 84.5: GRAVELLY SILTY SAND (SM), gray, fine to medium, little to some fines with low plasticity, some fine to coarse angular to subrounded gravel, hard, dry to moist.             |
| 464       | -81   |               |  |          |                |             |  |
| 463       | -82   |               |  |          |                |             |  |
| 462       | -83   |               |  |          |                |             |  |
| 461       | -84   |               |  |          |                |             |  |
| 460       | -85   | 80-90         | G  |          |                |             | 84.5 - 87.0: SAND WITH SILTY FINES (SP-SM), gray, fine to medium, trace coarse, few fines with no to low plasticity, firm, moist. At 87' - 88': cobbles                                  |
| 459       | -86   |               |  |          |                |             |  |
| 458       | -87   |               |  |          |                |             |  |
| 457       | -88   |               |  |          |                |             |  |
| 456       | -89   |               |  |          |                |             | 88.0 - 95.0: SILTY SAND (SM), light gray, fine to medium, some fines with no to low plasticity, trace coarse gravel, firm, moist. Gradational basal contact, contact position uncertain. |
| 455       | -90   |               | SB: 100/4*   |          |                |             |  |
| 454       | -91   |               |  |          |                |             |  |
| 453       | -92   |               |  |          |                |             |  |
| 452       | -93   |               |  |          |                |             |  |
| 451       | -94   |               |  |          |                |             |  |
| 450       | -95   | 90-100        |  |          |                |             | 95.0 - 100.0: SANDY SILT (ML), light gray, some fine to medium sand, no to low plasticity, trace coarse gravel, firm, moist.   |
| 449       | -96   |               |  |          |                |             |  |
| 448       | -97   |               |  |          |                |             |  |
| 447       | -98   |               |  |          |                |             |  |
| 446       | -99   |               |  |          |                |             |  |
| 445       | -100  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |  |  | Boring A8B-6<br>Page 6 of 10 |   |   |  |  |   |  |
|--|-------|--|--|--|------------------------------|---|---|--|--|---|--|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 2, 2014 - April 7, 2014<br>Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample |       |  |  | Northing: 168737.07<br>Easting: 1699198.57<br>Ground Elevation: 544.9<br>Depth: 181.0 feet |                              |   |   |  |  |   |  |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill   | Depth to Water               | Graphic Log   | Classification and Description  |  |  |   |  |
| 445  | -100  | 100-110  | SB: 35-60-100/1"<br>USCS, MC                                   |          |                              |  | 100.0 - 105.1: SILTY SAND WITH GRAVEL (SM), grayish brown with trace orange staining on gravels, some fines with no to low plasticity, fines content increases downhole, little to some subrounded to subangular fine to coarse gravels, firm, wet to -101.5', moist below. |  |  |   |  |
| 444  | -101  |  |  |  |                              |   | G   | 105.1 - 106.0: SILTY SAND (SM), gray, fine to medium, little fines with no to low plasticity, trace fine gravel, soft to very soft, moist.         |  |   |  |
| 439  | -106  |  |  |  |                              |   |   | 106.0 - 108.5: SILT (ML), gray at upper contact grading downhole to brown, no dilatency, trace fine sand, gravel absent, hard to very hard, moist. |  |   |  |
| 438  | -107  |  |  |  |                              |   |   | G  | 108.5 - 110.0: SILTY SAND (SM), brown, fine to medium, little nonplastic fines, few fine gravel, trace coarse gravel, very soft, moist to wet. |   |  |
| 437  | -108  |  |  |  |                              |   | 110-120   |  |   | 110.0 - 122.0 SANDY GRAVEL (GP), brown, fine to medium, trace coarse, subrounded to subangular, trace to few fines, some fine to coarse subangular to angular sand, loose, moist. At 112'-112.5', 117'-117.5', 119'-119.5', and 120.0 - 122.0: Interbeds of SAND (SP/SP-SM), brown, fine to medium, trace to few nonplastic fines, trace fine to medium gravel. Basal contact position uncertain. |  |
| 436  | -109  |  |  |  |                              |   |   | G  |  |   |  |
| 435  | -110  |  |  |  |                              |   |   |  |  |   |  |
| 434  | -111  |  |  |  |                              |   |   | G  |  |   |  |
| 433  | -112  |  |  |  |                              |   |   |  |  |   |  |
| 432  | -113  |  |  |  |                              |   |   | G  |  |   |  |
| 431  | -114  | G  |  |  |                              |   |   |  |  |   |  |
| 430  | -115  |  | G  |  |                              |   |   |  |  |   |  |
| 429  | -116  | G  |  |  |                              |   |   |  |  |   |  |
| 428  | -117  |  | G  |  |                              |   |   |  |  |   |  |
| 427  | -118  | G  |  |  |                              |   |   |  |  |   |  |
| 426  | -119  |  | G  |  |                              |   |   |  |  |   |  |
| 425  | -120  | G  |  |  |                              |   |   |  |  |   |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
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# U<sub>E</sub>C Soil Boring Log

Cedar Hills Regional Landfill Area 8 Development and Facility Relocation  
UEC Project 002.01.001 Task 3221

Boring A8B-6  
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Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
Start and End Dates: April 2, 2014 - April 7, 2014  
Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet  
Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample

Northing: 168737.07  
Easting: 1699198.57  
Ground Elevation: 544.9  
Depth: 181.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth (Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description  |
|-----------|-------|---------------|---|----------|----------------|-------------|---|
| 425       | -120  |               |   |          |                |             | 110.0 - 122.0 feet: See description on previous page.   |
| 424       | -121  |               | SB: 25-57-60  |          |                |             |   |
| 423       | -122  |               |   |          |                |             | 122.0 - 130.0: SAND WITH GRAVEL (SW), dark brown and brown, fine to coarse, trace nonplastic fines including trace thin silty sand interbeds or rip-up clasts, few subrounded to angular fine to coarse gravel, loose, moist.                           |
| 422       | -123  |               |   |          |                |             | At 124.5' - 126.0': SAND (SP), fine to medium, trace fines, gravel absent, dry to moist.  |
| 421       | -124  |               | G   |          |                |             |   |
| 420       | -125  | 120-130       |   |          |                |             |   |
| 419       | -126  |               |   |          |                |             |   |
| 418       | -127  |               |   |          |                |             |   |
| 417       | -128  |               |   |          |                |             |   |
| 416       | -129  |               |   |          |                |             |   |
| 415       | -130  |               | SB: 34-100/6"   |          |                |             | 130.0 - 152.0: SAND (SP), brown, fine to medium, trace coarse, trace silt except as thin silty sand (SM) interbeds which occur throughout, trace fine subangular to subrounded gravels, trace cobbles to 135', cobbles absent below 135', loose, moist. |
| 414       | -131  |               |   |          |                |             |   |
| 413       | -132  | 130-135       |   |          |                |             | At 133.0' - 134.0': SILTY SAND (SM), trace subangular fine gravels, dry (powdery) with 3-inch-thick interbed of very hard dry SILT (ML).  |
| 412       | -133  |               | G   |          |                |             |   |
| 411       | -134  |               |   |          |                |             |   |
| 410       | -135  |               | G   |          |                |             | At 135'-135.5' and 138' - 138.5': interbeds of SILTY SAND (SM) brown, fine to medium, trace coarse, some low plasticity fines, dry, very soft.  |
| 409       | -136  |               |   |          |                |             |   |
| 408       | -137  | 135-140       |   |          |                |             |   |
| 407       | -138  |               | G   |          |                |             |   |
| 406       | -139  |               |   |          |                |             |   |
| 405       | -140  |               |   |          |                |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |  |  | Boring A8B-6<br>Page 8 of 10 |             |   |
|--|-------|--|--|--|------------------------------|-------------|---|
| Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic<br>Start and End Dates: April 2, 2014 - April 7, 2014<br>Borehole diameters: 8" for 0 - 50 feet; 6" for 50 - 180 feet<br>Sampling Methods: G = grab; SS = 2-inch drive sample; SB = 3-inch drive sample   |       |  |  | Northing: 168737.07<br>Easting: 1699198.57<br>Ground Elevation: 544.9<br>Depth: 181.0 feet |                              |             |   |
| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill   | Depth to Water               | Graphic Log | Classification and Description  |
| 405  | -140  |  |  |  |                              |             | 130.0 - 152.0 feet: See description on previous page.<br>At 140' - 148.5': Orange staining on some gravels, layer of strong iron cementation at 145'.   |
| 404  | -141  |  | SB: 35-47-100/6"   |  |                              |             |   |
| 403  | -142  |  |  |  |                              |             |   |
| 402  | -143  |  |  |  |                              |             |   |
| 401  | -144  |  |  |  |                              |             |   |
| 400  | -145  | 140-150  |  |  |                              |             |   |
| 399  | -146  |  | G  |  |                              |             | At 148.5' - 150.0': SAND WITH SILTY FINES (SP-SM), brown, fine to medium, trace coarse, few nonplastic fines, few fine subrounded gravel.   |
| 398  | -147  |  |  |  |                              |             |   |
| 397  | -148  |  |  |  |                              |             |   |
| 396  | -149  |  |  |  |                              |             |   |
| 395  | -150  |  |  |  |                              |             | At 150 - 152: common thin interbeds of brown SILT (ML), moist, very soft.   |
| 394  | -151  |  | SB: 47-58-100/2"   |  |                              |             |   |
| 393  | -152  |  |  |  |                              |             |   |
| 392  | -153  |  |  |  |                              |             | 152.0 - 154.0: GRAVEL WITH SAND AND SILTY FINES (GW-GM), brown with orange staining, fine to coarse, subrounded to subangular, few nonplastic fines, some medium to coarse sand, trace cobbles, loose, moist. Gradational basal contact.  |
| 391  | -154  |  |  |  |                              |             |   |
| 390  | -155  | 150-160  |  |  |                              |             |   |
| 389  | -156  |  | G  |  |                              |             | 154.0 - 160.5: SANDY GRAVEL (GW), brown with trace orange staining along gravel surfaces, fine to coarse, subrounded to subangular, trace fines, some medium to coarse sand, trace subrounded to subangular cobbles, loose, moist except wet with weak iron staining and cementation at 156-157'. Strong iron cementation at 155' and 160'. |
| 388  | -157  |  |  |  |                              |             |   |
| 387  | -158  |  |  |  |                              |             |   |
| 386  | -159  |  |  |  |                              |             |   |
| 385  | -160  |  |  |  |                              |             |   |
| <p>Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.</p> <p style="text-align: right;">Logged by AGU</p> |       |  |  |  |                              |             |   |

| U <sub>E</sub> C Soil Boring Log   |       | Cedar Hills Regional Landfill Area 8 Development and Facility Relocation<br>UEC Project 002.01.001 Task 3221 |   |  | Boring A8B-6<br>Page 9 of 10 |             |   |
|--|-------|--|---|--|------------------------------|-------------|---|
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| Elevation  | Depth | Core Interval  | Sample Type and Depth<br>(Blow Counts per 6-inches;<br>Lab tests) | Backfill   | Depth to Water               | Graphic Log | Classification and Description  |
| 385  | -160  |  | SB: 62-100/1"   |  |                              |             | 154.0 - 160.5 feet: See description on previous page.   |
| 384  | -161  | 160-165  | G   |  |                              |             | 160.5 - 168.5: SAND (SP), brown, sand fines downhole from medium to coarse to fine to medium, trace silt except as silty sand (SM) rip-up clasts or interbeds which occur throughout, few subrounded to subangular fine gravels, trace subrounded to subangular coarse gravels, loose, moist. |
| 383  | -162  |  |   |  |                              |             |   |
| 382  | -163  |  |   |  |                              |             |   |
| 381  | -164  |  |   |  |                              |             |   |
| 380  | -165  |  |   |  |                              |             |   |
| 379  | -166  | 165-170  | G   |  |                              |             | 168.5 - 171.5: GRAVEL WITH SILTY FINES (GP-GM), brown, fine and coarse, angular to subangular fine, few silt as pore infill, hard to very hard, moist to dry.   |
| 378  | -167  |  |   |  |                              |             |   |
| 377  | -168  |  |   |  |                              |             |   |
| 376  | -169  |  |   |  |                              |             |   |
| 375  | -170  |  |   |  |                              |             |   |
| 374  | -171  |  | SB: 25-62-100/0"  |  |                              |             |   |
| 373  | -172  | 170-175  | G   |  |                              |             | 171.5 - 173.5: SAND (SP), brown, fine, trace silt except as silty sand (SM) interbeds, loose, moist.  |
| 372  | -173  |  |   |  |                              |             |   |
| 371  | -174  |  |   |  |                              |             |   |
| 370  | -175  |  |   |  |                              |             |   |
| 369  | -176  |  |   |  |                              |             |   |
| 368  | -177  | 175-180  | G   |  |                              |             | 173.5 - 177.5: SAND WITH GRAVEL AND SILTY FINES (SP-SM), strong brown sand, fine to medium, few fines, little coarse subrounded to subangular gravel, trace cobbles, moist.   |
| 367  | -178  |  |   |  |                              |             |   |
| 366  | -179  |  |   |  |                              |             |   |
| 365  | -180  |  |   |  |                              |             |   |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age.  
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**U<sub>E</sub>C Soil Boring Log** Cedar Hills Regional Landfill Area 8 Development and Facility Relocation UEC Project 002.01.001 Task 3221 **Boring A8B-6**  
Page 10 of 10

Drilling Contractor and Method: Holt Services, Inc; Continuous core rotary sonic  
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Northing: 168737.07  
 Easting: 1699198.57  
 Ground Elevation: 544.9  
 Depth: 181.0 feet

| Elevation | Depth | Core Interval | Sample Type and Depth<br>(Blow Counts per 6-inches; Lab tests) | Backfill | Depth to Water | Graphic Log | Classification and Description   |
|-----------|-------|---------------|--|----------|----------------|-------------|--|
| 365       | -180  |               | SB: 24-58-100/2"   |          |                |             | Piezometer A8P-1 construction details:<br>0 - 1 feet: Concrete with flush-grade monument.<br>1 - 61 feet: 3/4" Baroid Wyo-ben bentonite chips hydrated concurrent with placement<br>61 - 70 feet: 20 x 40 Colorado silica sand surrounding pre-packed well screen<br>7 - 180.1 feet: 3/4" Baroid Wyo-ben bentonite chips hydrated concurrent with placement<br><br>0.3 - 63.7 feet: 2-inch diameter flush-threaded Schedule 40 PVC casing<br>63.7 - 68.3 feet: Pre-packed 2-inch diameter flush-threaded Schedule 40 PVC screen with 0.010-inch machined slots surrounded by 20x40 silica sand encased by 60-mesh external screen<br>68.3 - 68.6 feet: 2-inch diameter flush-threaded Schedule 40 PVC sump |
| 364       | -181  |               |  |          |                |             |  |
| 363       | -182  |               |  |          |                |             |  |
| 362       | -183  |               |  |          |                |             |  |
| 361       | -184  |               |  |          |                |             |  |
| 360       | -185  |               |  |          |                |             |  |
| 359       | -186  |               |  |          |                |             |  |
| 358       | -187  |               |  |          |                |             |  |
| 357       | -188  |               |  |          |                |             |  |
| 356       | -189  |               |  |          |                |             |  |
| 355       | -190  |               |  |          |                |             |  |
| 354       | -191  |               |  |          |                |             |  |
| 353       | -192  |               |  |          |                |             |  |
| 352       | -193  |               |  |          |                |             |  |
| 351       | -194  |               |  |          |                |             |  |
| 350       | -195  |               |  |          |                |             |  |
| 349       | -196  |               |  |          |                |             |  |
| 348       | -197  |               |  |          |                |             |  |
| 347       | -198  |               |  |          |                |             |  |
| 346       | -199  |               |  |          |                |             |  |

Notes: See General Remarks. All depths and elevations are in feet. Water added during drilling below 60 feet. Borehole was completed as piezometer A8P-1. Top of monument = 544.99 feet; top of PVC casing = 544.57 feet elevation. Abbreviations for laboratory testing: USCS = Visual UCSC classification. MC = Moisture content and density. PSA = Particle size analysis. ATT = Atterberg limits. Hyd Cond = Hydraulic Conductivity. DS = Direct Shear. OC = Organic Carbon. Rad = Radiometric age. Logged by AGU