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Part VII of IX
Environmental Monitoring Plan

Chaffee Landfill Facility
Facility DEC ID 9-1462-00001
Town of Sardinia, New York

Submitted to:
Waste Management of New York, LLC
Chaffee, New York

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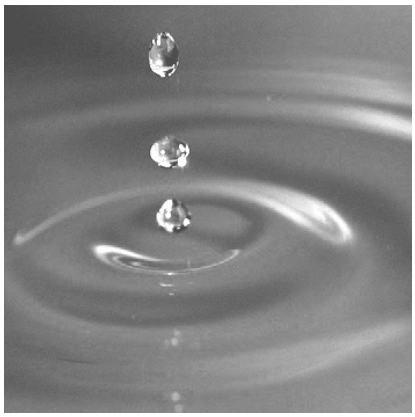

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1. Introduction

This Environmental Monitoring Plan (EMP) updates the Chaffee Landfill Facility EMP dated December 2012 and incorporates monitoring for lateral landfill development of Cells 7 and 8 (herein referred to as Area 7/8 Development) on the southern side of the existing landfill footprint of the Western Landfill Area and the Closed Landfill. The EMP addresses the requirements in the regulations at 6 NYCRR Part 363-4.6(f) and (g). The EMP for the Chaffee Facility is a separate document and is submitted as a component of the Facility Manual describing operational groundwater, surface water and leachate monitoring. The EMP also includes discussions pertaining to the operation and maintenance of the monitoring points and contingency plans. Sources of other information contributing to this EMP include the Hydrogeologic Investigation Report (HIR) (GEI, 2020), historic hydrogeologic studies, and environmental monitoring data collected from 15+ years of monitoring landfill containment systems and environmental media including groundwater, surface water and sediment at the Chaffee Landfill.

1.1 EMP Organization

The remainder of Section 1.0 provides general background information for the Chaffee Landfill Facility and the Area 7/8 Development. The sections which follow are summarized below:

- Section 2.0 summarizes geologic and hydrogeologic conditions and describes the Critical Stratigraphic Section (CSS) for the facility per Part 363-4.6(f)(1).

- Section 3.0 describes the environmental monitoring program for groundwater, surface water/sediment, landfill containment systems, and landfill gas per Part 363-4.6(f)(2) through (3) including a topographic site plan showing all monitoring points per Part 363-4.6(f)(6) with an implementation plan per Part 363-4.6(f)(7). Monitoring points described in Section 3.0 meet sampling design requirements per Part 363-4.6(f)(8) inclusive of Water Quality Monitoring Programs per Part 363-4.6(f)(9).

- Section 4.0 presents procedures to evaluate data obtained by the monitoring program per Part 363-4.6(f)(4).

- A Site Analytical Plan (SAP) is presented in Section 5.0 per Part 363-4.6(g) with a discussion of laboratory quality assurance/quality control in Section 6.0.

- Section 7.0 discusses the data quality review, reporting and recordkeeping procedures per Part 363-4.6(f)(5) and (10).

Background

The Chaffee Landfill Facility is located in the Town of Sardinia, Erie County, New York. The landfill is owned and operated by Waste Management of New York (WMNY) under Solid Waste Management Facility (SWMF) Permit I.D 9-1462-00001/00006. The location of the facility is shown on Figure 1. The landfill facility includes: the original 51-acre Closed Landfill; the 57.3-acre Western Area inclusive of cells 1 through 6; the 13.7-acre Valley Fill Area consisting of Overliner Cell 1 and Overliner Cell 2 situated between the Closed Landfill and Western Area; and permitted areas for soil borrow. These site features and the proposed Area 7/8 Development are shown on Figure 2.

Leachate collected at the Closed Landfill is conveyed by a perimeter collection trench and piping to leachate storage tanks. The Western Area is divided into six landfill cells (Cell 1 through Cell 6), each of which is constructed with a primary and secondary leachate collection system. Cell 6, the original landfill cell constructed in the Western Area, is equipped with a porewater drain. The porewater drain is constructed in the Upper Silty Clay and is checked quarterly for groundwater but has remained dry for several years. The Valley Fill Area includes the Overliner Cell 2 Area to the north and Overliner Cell 1 Area to the south. The primary leachate collection systems for the Overliners are joined while each Overliner cell is equipped with an individual secondary leachate collection system.

2. Hydrogeologic Setting and Critical Stratigraphic Section

2.1 Regional and Site Hydrogeology

The Chaffee Landfill disposal areas, including the Area 7/8 Development, are situated entirely on glacial moraine sediments (known as the Lake Escarpment Moraine) which overlie deeper glacially-derived soils that fill a scoured bedrock valley that trends in a northwest-southeast direction. Depth to bedrock is more than 400 feet below the ground surface in the area of the Chaffee Landfill Facility. The Sardinia Aquifer has been mapped by the USGS at a distance of approximately 1,600 feet the south of the Area 7/8 Development and consists of saturated outwash sand and gravel near the ground surface and confined deposits of sand and gravel at depths greater than 100 feet.

The 2022 Hydrogeologic Investigation Report (that is part of this Application) and the 2005 MMCE Hydrogeologic Investigation for the Western Area characterized the following geologic units to depths of 100 feet below ground surface at the Chaffee Landfill Facility. Based on hydrogeologic properties, the following hydrostratigraphic units within the moraine were identified:

- Discontinuous Perched Water in Upper Silty Clay/Till
- Upper Silty Sand and Gravel (also referred to as the Upper Water-Bearing Zone)
- Lower Silty Clay Aquitard
- Lower Silty Sand and Gravel (also referred to as the Lower Water-Bearing Zone)
- Deeper Till Aquitard

The hydrogeologic investigation findings are described below and the Critical Stratigraphic Section (CSS) is identified in Section 2.3.

Perched water exists within discontinuous lenses of sand and gravel in the Upper Silty Clay along the northern boundary of the Area 7/8 Development where the surface clay till is relatively thicker. In the southern half of the expansion area, perched water occurring within lenses of sand and gravel was not found. However, several Upper Silty Clay monitoring wells have been observed to accumulate small amounts of water over long periods of time. This accumulation does not represent a water table and is more likely a result of seepage into the well sand pack of water temporarily present in the larger pore spaces after precipitation events. Where observed, the rate of seepage is insufficient for sampling using conventional methods.

The Upper Silty Sand and Gravel is the Upper Water-Bearing Zone in the Area 7/8 Development and occurs under water table (unconfined) conditions. Depth to the water table in the expansion area is typically 15 feet or more at current grades. In the northern portion of the facility, the Upper Silty Clay is thicker and depth to the upper-water bearing zone is typically more than 40 feet below the ground surface. Recharge to the upper-water bearing zone occurs primarily through horizontal flow as vertical flow is restricted by the low permeability of the Upper Silty Clay. The Upper Water-Bearing Zone is bound at the bottom by the laterally continuous Lower Silty Clay Aquitard. This low permeability unit is approximately 7 to 22 feet thick below the Area 7/8 Development footprint. The aquitard was found to be thickest south of the Area 7/8 Development (i.e., more than 38 feet thick) and was encountered at thicknesses of 10 feet or more in borings completed in the northern portion of the facility during the MMCE 2005 Hydrogeologic Investigation. The aquitard is saturated but does not readily transmit groundwater as it primarily consists of medium plasticity silty clay having a geometric mean laboratory measured permeability of 4.62×10^{-8} cm/s. Hydrogeologic information collected during the 2019 investigation demonstrated that the Lower Silty Clay Aquitard is effective in restricting the vertical movement of groundwater between the Upper and Lower Water-Bearing zone thereby isolating deeper water-bearing zones from the Upper Water-Bearing Zone.

The groundwater flow direction beneath the Area 7/8 Development in the Upper Water-Bearing Zone is seasonally dependent and transitions from a southerly direction during the spring and summer months to a northerly direction in the late summer, fall, and winter months. Surface water in Wetland SD-1 (shown on Figure 2) situated west and southwest of the development area and in the Sedimentation Basins influence the groundwater flow direction below the Area 7/8 Development by recharging groundwater in the Upper Water-Bearing Zone. The measured horizontal hydraulic gradients in the Upper Water-Bearing Zone beneath the development area are very low to flat causing low groundwater seepage velocities. Groundwater seepage velocities were estimated to average 0.59 feet/year in a south direction below the central and southernmost portion of the Area 7/8 Development during the spring and early to mid-summer months. When the groundwater flow direction transitions to a northeast direction during the late summer months, extending through the fall and winter months, the average estimated seepage rate was calculated to be 2.07 feet/year beneath the Area 7/8 Development. Site hydrogeologic data indicate theoretical particle transport (excluding natural attenuation processes) below the Area 7/8 Development within the Upper Water-Bearing Zone would occur at an annual net vector rate of approximately 1.33 feet/year in a northeastward direction.

Surface water in Wetland SD-1 and in Sedimentation Basins #1, #2, and #3 recharges groundwater near the Southern Expansion Area. Exfiltration of water from the Sedimentation Basins was found to influence the direction of groundwater flow in the Upper Water-Bearing Zone below the Area 7/8 Development. During regionally higher groundwater elevations which occur in the late winter and spring, exfiltration from the Sedimentation Basins has less of an influence on groundwater flow direction in the Area 7/8 Development and groundwater flow in

the Upper Silty Sand and Gravel occurs to the south. However, as groundwater elevations regionally decline during the summer and fall, a progressive shift in groundwater flow direction occurs in a northeast direction caused by higher heads maintained by the exfiltration of Sedimentation Basin surface water and heads in Wetland SD-1. These groundwater conditions are shown respectively on potentiometric surface maps for June 2019 and December 2019 included in Appendix A.

Groundwater quality of the Upper Water-Bearing Zone in the expansion area is representative of background conditions. Groundwater quality east, west, and south of the expansion area is very similar to the chemistry of existing wells located along the northern boundary of the expansion area indicating groundwater quality below the Area 7/8 Development in the Upper Water-Bearing Zone is consistent. PFAS compounds were detected in groundwater locally at well MWSE-4 near the Sedimentation Basins. Sampling of surface water in the Sedimentation Basins confirmed PFAS presence in surface water. Sampling of surface water in Hosmer Brook confirmed PFAS presence downstream from the Basin #3 discharge but the concentrations were below New York State Department of Health (NYSDOH) drinking water regulatory criteria established for public water supply in 10 NYCRR Part 5, Subpart 5-1 Public Water Systems.

2.2 Surface Water Conditions

The Chaffee Landfill is located near a watershed divide which occurs naturally at the maximum elevation of the Lake Escarpment Moraine near Hand Road. Surface water drainage on the north side of the moraine crest flows within the Cazenovia Creek Watershed System and drainage south of the crest flows within the Cattaraugus Creek Watershed System (MMCE, 2005). At the Chaffee Facility, surface water run-off from the eastern portion of the Closed Landfill is collected by drainage swales and directed to Sedimentation Basin #4 situated at the southeast corner of the landfill. Permitted discharge from this detention basin eventually discharges to Wetland SD-1 that is part of the Hosmer Brook sub-watershed within the Cattaraugus Creek Watershed.

Drainage in the Western Landfill Area and Area 7/8 Development are directed to Sedimentation Basins #5, #1, #2, and # 3 which in turn flows to the south within the Hosmer Brook sub-watershed (Cattaraugus Creek Watershed). Basin #5 is lined and surface water can be mechanically isolated from downstream Sedimentation Basins #1, #2, and #3.

Wetlands with perennial surface water exist east and west of the Area 7/8 Development and influence groundwater elevations in the study area. Drainage from Wetland SD-1 east of the West Soil Borrow Area and expansion area drains to Hosmer Brook having its headwaters in wetlands west and southwest of the Chaffee Facility. Drainage from Wetland SD-1 located west and southwest of the Area 7/8 Development occurs through a culvert installed beneath an access road southwest of Sedimentation Basin #3 (Figure 2).

The reclaimed West Borrow Area located southeast of the Area 7/8 Development footprint contains a sedimentation basin that will be removed during construction of Cell 8.

2.3 Critical Stratigraphic Section

The 2021 hydrogeologic investigation report for the Area 7/8 Development permit application described the Critical Stratigraphic Section (CSS) for the Facility. The CSS includes stratigraphic units into which contaminants that escape from a facility might reasonably be expected to enter and cause contamination. The CSS for the Chaffee Landfill Facility including the Area 7/8 Development includes:

- the Upper Silty Clay/Till; and
- the Upper Silty Sand and Gravel.

The CSS designation requires groundwater monitoring of the Upper Silty Clay/Till where perched conditions sporadically occur on the northeast side of the expansion area (area of overlap onto the Closed Landfill) and of the water-bearing zone in the Upper Silty Sand and Gravel unit below the Area 7/8 Development. This monitoring approach is consistent with the monitoring strategy previously developed for the facility.

3. Environmental Monitoring Program

The following sections describe the environmental monitoring program for the Chaffee Landfill Facility inclusive of the Area 7/8 Development. The monitoring program describes sampling and monitoring of environmental media including:

- Groundwater
- Leachate Containment Systems
- Surface water and sediment
- Landfill gas

Sampling locations are shown on Figure 2. Sampling procedures are described in the Site Analytical Plan presented in Section 5.0.

3.1 Groundwater Monitoring

3.1.1 Groundwater Monitoring Network Description

The groundwater monitoring network consists of either single wells or well pairs located at the perimeter of the Closed Landfill, Western Landfill Area, and Area 7/8 Development. Table 1 summarizes the list of groundwater monitoring wells that comprise the Chaffee Landfill Groundwater Monitoring Network (including the hydrostratigraphic unit monitored) and well locations are shown on Figure 2. Borehole logs and well completion details for each well are included in Appendix B.

New monitoring well construction will include installation of a well pair MWSE-5(S) and MWSE-5(I) at the northeast corner of the Area 7/8 Development to monitor potential perched groundwater in the thicker section of the Upper Silty Clay and groundwater occurring in the Upper Water-Bearing Zone of the Upper Silty Sand and Gravel, respectively.

3.1.2 Existing (Background) Groundwater Quality Monitoring

The hydrogeologic investigation preliminarily characterized existing groundwater quality in the Area 7/8 Development consistent with Part 363-4.6(f)(9)(i). The results found that groundwater quality in the southern portion of the Area 7/8 Development was similar to existing water quality monitored along the southern boundary of the Closed Landfill. Prior to completion of landfill cell construction and waste deposition in the Area 7/8 Development, a more comprehensive

assessment of existing groundwater quality will be conducted. Consistent with 6NYCRR 363-4.6(f)(9)(b)(3), existing water quality will be established in the new monitoring wells to characterize groundwater chemistry in the Area 7/8 Development for future evaluation of operational monitoring data. As discussed in Section 4.1.1, operational groundwater data will be evaluated utilizing intrawell comparison methods - a procedure in which chemistry of a sample collected from each monitoring well is evaluated in relation to its own historical data.

Establishing existing water quality in new wells in the monitoring network adjacent to the Area 7/8 Development will require eight quarterly events of groundwater sample collection and analysis (Part 363-4.6(f)(9)(i)(b)(3(iii)) where the first quarterly event (initial event) is analyzed for the Part 363 Expanded List of parameters followed by seven additional quarterly events of sampling and analysis for the Part 363 Baseline List of parameters plus any additional parameters that were detected in the initial event. Analytical data will establish existing (background) water quality prior to waste placement. Upon completing these sampling events and determination of Water Quality Action Values (WAQVs) (discussed in Section 4.1.1), waste placement in the constructed cell can occur. Based on the confirmed occurrence of PFAS in groundwater at MWSE-4, the list of PFAS constituents will be added to the Part 363 Baseline Parameter List for wells MWSE-3 and MWSE-4, located in proximity to the Area 7/8 Development.

Groundwater quality monitoring has occurred for decades at the Chaffee Landfill facility under the former NYSDEC Part 360 regulations, which required that the facility establish a database of existing water quality for the existing landfill disposal area. As the groundwater monitoring program for the entire landfill facility will be regulated under Part 363-4.6 with the operation of the Area 7/8 Development, existing groundwater quality has not been established for all parameters included on the Part 363-4.6(h) Expanded List. Per discussion with NYSDEC, the NYSDEC refers to these parameters as “emerging contaminants” and include the following constituents: Per- and polyfluoroalkyl substances (PFAS), 1,4-dioxane (Method 8270D SIM with isotope dilution), uranium and radium 226 and radium 228. To establish existing groundwater quality for the emerging contaminants for wells monitoring the existing landfill footprint (Western, Valley Fill, and Closed Landfill), the upgradient monitoring well MW-50 (monitors Upper Silty Sand and Gravel) and three downgradient well pairs (each pair monitoring saturated areas of the Upper Silty Clay and the Upper Silty Sand and Gravel), which include wells MW-16(S)/MW-16, MW-N(S)/MW-N(I) and MW-7R/MW-14R, will be sampled during two quarterly events (see Implementation Plan in Section 3.5) and analyzed for the emerging contaminants (see Figure 2). The results will be used to establish Water Quality Action Values (WQAVs) that will be representative of the existing groundwater quality for the saturated portions of the Silty Clay and the Upper Silty Sand and Gravel at the existing landfill areas outside the Area 7/8 Development.

A schedule for sampling is included in the Implementation Plan included in revised Section 3.5.

3.1.3 Operational (Detection) Groundwater Quality Monitoring

Groundwater samples will be collected from monitoring wells identified on Table 1 to monitor groundwater quality of the CSS during landfill operation. Sampling and analysis of groundwater will consist of three (3) quarters of sampling for the Part 363 Routine List of parameters and one (1) quarter of sampling for the Baseline List.

3.1.4 Water Level Monitoring

A synoptic round of water level measurements will be recorded in monitoring wells and piezometers screened in the Upper Silty Sand and Gravel listed in Table 1 on the first day of quarterly groundwater sample collection. Water level measurements will be used to assess horizontal groundwater flow direction and seepage velocity in the upper water-bearing zone. Water levels will be recorded in all monitoring wells prior to sample collection per Section 5.3.1.

3.1.5 Monitoring Well Installation and Decommissioning

Construction of the Area 7/8 Development will necessitate decommissioning of several existing monitoring wells on the northern boundary of the Area 7/8 Development as wells are within the areas of Cells 7 and 8 overlap and completion of water quality monitoring in the West Soil Borrow Area. New wells will be installed to monitor the Upper Silty Clay and Upper Sand and Gravel at the northeast corner of Area 7/8 Development to provide more appropriate well spacing. Piezometers PZ01-19 and PZ02-19 will be outfitted with a protective casing and completed with proper surface seals.

Monitoring wells requiring decommissioning include:

- MW-K(S), MW-K(I), MW-R4A, MW-4CR, MW-82B, and MW-R3 (aka MW-3R).

In addition, two groundwater monitoring wells (i.e., MWBA-2 and MWBA-3) in the former West Soil Borrow Area will be decommissioned. Monitoring well MWBA-1, situated southeast of the Area 7/8 development will be retained to provide groundwater elevation data in this portion of the property.

Piezometers requiring decommissioning include:

- PZ03-19, PZ04-19, PZ05S-19, PZSB11D-19, PZBA2D-19, PZMWSE3D-19, PZ04D-19, and PZ05D-19

Monitoring wells and piezometers will be decommissioned in accordance with Part 363-4.4(k)(6). The location of these piezometers are shown on Figure 4 of the Hydrogeologic Investigation Report.

Construction of new monitoring wells will conform to requirements outlined in Part 363-4.4(k)(2) and will include well development and hydraulic conductivity testing.

3.2 Leachate Containment Systems Monitoring

Following closure of the original landfill footprint (Closed Landfill), landfill cells at the Chaffee Landfill Facility were constructed utilizing double composite liner systems with leak detection. The purpose of the liner system is to prevent the release of leachate constituents into the environment. The double-liner system has primary and secondary composite liners and primary and secondary leachate collection systems.

Liquid in the secondary leachate collection and removal system (SLCS) from each of the eight landfill cells (Cells 1 through 8), as well as overliner sections (Cell 1, Cell 2, and Cell 7/8 Overliners), have separate leachate collection systems, and will be sampled at the leachate side riser ports and analyzed on a semiannual basis for the Part 363 Baseline list of parameters. Leachate sampling locations are shown on Figure 2. Pre-disposal SLCS liquid quality will be characterized in new cells prior to the deposition of waste and then semiannually thereafter for each operational cell for a period of five years. After five years, the monitoring frequency and parameters list will be evaluated and revised with concurrence from the NYSDEC if the concentrations of constituents have not changed significantly as supported by statistical analysis.

Leachate in the primary leachate collection and removal system will be collected and analyzed on a semi-annual basis for the Part 363 Expanded list of parameters (Table 2A). The sample from the primary leachate collection system will be a composite of the liquid from the entire landfill. The Western Landfill Area and Area 7/8 Development drain to a common storage tank area as shown on Figure 2 and sampled at the Leachate Loadout Building. The Closed Landfill drains to five leachate collection points, identified as Tanks #1 and #2, Manhole 3 / 4, and collection sump #5 as shown on Figure 2. Manhole 3 / 4 and collection sump #5 are pumped to the two above ground leachate storage tanks shown on the southwest side of the Closed Landfill shown on Figure 2. Therefore, a composite sample is taken from the above ground storage tanks and the Closed Landfill Tanks #1 and #2. The composite sample is combined based on approximate leachate volumes generated at each of the three sampling locations. After five years, the monitoring frequency and parameters list for primary leachate testing will be evaluated and revised with concurrence from the NYSDEC.

A porewater drain system is constructed beneath Cell 6 of the Western Landfill Expansion. The porewater drain is pumped quarterly. When water is present in the system, samples will be analyzed quarterly for the same parameter list concurrent with the groundwater monitoring program.

3.3 Surface Water/Sediment Monitoring

Surface water samples will be collected quarterly from the discharge at Sedimentation Basin #3 and Sedimentation Basin #4 as shown on Figure 2. The discharge from the basins occurs into rip rap rock-filled conveyance channels. If sediment is observed to accumulate on the surface of the rip rap rock, a sample will be collected for laboratory analysis. Surface water will be analyzed for the same list of parameters as the concurrent groundwater sampling program. Basin #3 discharge will include the analysis for PFAS with the Baseline Parameter List in Table 2B. Sediment samples will be analyzed for parameters shown in Table 2D.

During Baseline sampling events, an additional surface water sample will be collected from Hosmer Brook downstream from the discharge area of Basin #3. The sample is designated as HBSW-1 and is shown on an aerial inset in Figure 2. The sample will be analyzed for the list of PFAS constituents consistent with sampling at wells MWSE-3 and MWSE-4 and Basin #3 discharge.

In the event a leachate release is suspected, a surface water sampling location in the containment area of Sedimentation Basin #5 will be included in the monitoring program.

3.4 Landfill Gas Control Monitoring

The potential for off-site migration of landfill gas will be monitored through permanent landfill gas monitoring probes. Permanent gas monitoring probes are constructed around the perimeter of the Closed Landfill and Western Landfill Expansion Areas. New gas probes to be located around the Area 7/8 Development include: GP- 29R through GP-34. New gas monitoring probes will be installed at locations shown on Figure 2.

Several existing landfill gas migration monitoring probes require decommissioning prior to Cell 7 and Cell 8 construction due to overlap of Area 7/8 Development on to the southern boundary of the Western and Closed Landfill Areas and include: GP-29, GP-5R, GP-3, and GP-4. Decommissioning of deeper gas probes GP-29 and GP-5R will follow monitoring well decommissioning protocols (see Section 3.1.5). Gas probes GP-3 and GP-4 are shallow, 14 feet and 12 feet deep respectively, and can be decommissioned by removal with an excavator bucket during cell construction. The NYSDEC will be notified prior to decommissioning and new gas probe installations.

Under Part 363-7.1(e), routine monitoring of potential landfill gas migration is required to demonstrate that the concentration of methane and other explosive gases generated by the landfill areas do not exceed:

- Twenty-five percent of the lower explosive limit for gases in structures on or off-site, excluding gas control or recovery system components; and

- The lower explosive limit for the gases at or beyond the property boundary.

Quarterly monitoring for the presence of landfill gas, pressure and water level will be completed at the gas probe locations. The quarterly gas monitoring results will be submitted separately from groundwater, surface water, and leachate containment system monitoring reports.

Upon detection of methane or other explosive gas levels exceeding the limits specified above, the facility will take the following actions to ensure safety and protection of human health:

- The NYSDEC will be immediately notified (within 24 hours of detection).
- Within seven days of detection, submit to the NYSDEC the methane gas levels detected and provide a description of the steps taken to protect health, safety, and property: and
- Within 30 days of detection, submit a plan to implement a remediation plan for the methane gas releases and schedule for the implementation of this plan within 60 days beyond the date of the detection. This plan will describe the nature and extent of the problem and the proposed remedy.

3.5 Environmental Monitoring Program Summary and Implementation Plan

This section summarizes the environmental monitoring program and includes an implementation plan per Part 363-4.6(f)(7). The Environmental Monitoring Program for the Chaffee Landfill Facility is summarized below:

<u>Groundwater Monitoring Well Sampling:</u> **(Upper Silty Clay)**	**Parameter List:**
• 18 monitoring perched water in Upper Silty Clay Till	• 1 Baseline List event (Q1) (Table 2B) / 3 Routine events (Q2, Q3, Q4) (Table 2C)
(Upper Water-Bearing Zone) • 23 monitoring Upper Silty Sand and Gravel	• 1 Baseline List event (Q1) (Table 2B) + PFAS analysis at wells MWSE-3 and MWSE-4 / 3 Routine events (Q2, Q3, Q4) (Table 2B)

Piezometer and Monitoring Well Water Levels: • 27 monitoring wells and piezometers for groundwater elevation (synoptic event for Upper Silty Sand and Gravel)	• None
<u>Surface Water and Sediment Sampling:</u> • Basin #3 Discharge Surface Water / Sediment	• 1 Baseline List event + PFAS in surface water (Q1) / 3 Routine events (Q2, Q3, Q4) (sediment per Table 2D)
• Basin #4 Discharge Surface Water / Sediment	• 1 Baseline List event (Q1) (Table 2B) / 3 Routine events (Q2, Q3, Q4) (Table 2C) (sediment per Table 2D)
• Hosmer Brook	• 1 Baseline event (Q1) for PFAS only
Secondary Leachate Collection Sampling: • Western Area – 6 SLCS samples • Valley Fill Area – 2 SLCS samples • Area 7/8 Development – 3 SLCS samples	• 2 Baseline List Events (Semi-annual, Q1 and Q3) (Table 2B)
Primary Leachate Collection Sampling: • Facility Composite Primary Leachate 1 Primary	• 2 Expanded List Events (Semi-annual, (Q1 and Q3) (Table 2A)
Landfill Gas Monitoring: • 27 Gas probe locations	• Quarterly for Lower Explosive Limit

The following is an Implementation Plan identifying the anticipated implementation schedule of EMP activities following NYSDEC permit issuance with an estimated time frame of two to three years to complete detailed design and Area 7/8 Development infrastructure buildout and complete Cell 1 South/Cell 7 construction:

EMP Activity	Schedule
Installation, development, and slug testing of wells MWSE-5(S) and -5(I) at Area 7/8 Development	Within 180 days of NYSDEC Permit approval
Decommissioning of the eight (8) wells listed in Section 3.5	Concurrent with new well installation
Decommissioning of the nine (9) piezometers listed in Section 3.5	Concurrent with new well installation
Decommission of gas probes listed in Section 3.4	Concurrent with new well installation
Installation of gas probes	GP-29R, GP-30, and GP-31 one quarter prior to Cell1 South/Cell 7 operation GP-32, GP-33, and GP-34 one quarter prior to Cell 8 operation
Initiation of Existing (Background) Water Quality (EWQ) Monitoring (Area 7/8 Development)	Following Installation of MWSE-5(S) and –(I) complete eight (8) Quarterly Events Concurrent with Site-Wide Monitoring events (complete prior a minimum of one quarter prior to DEC approval for waste deposition in Cell 1 South/Cell 7)
Initiation of Existing Water Quality for Emerging Contaminants (Existing Landfill Areas)	Concurrent with Site-Wide Monitoring events and EWQ monitoring above collect (two) Quarterly Events
Submit Background Water Quality Monitoring Report for Area 7/8 Development Area and emerging contaminants for Existing Landfill Areas	Submit at least one (1) Quarter prior to Initiating Operational Water Quality for Area 7/8 Development
Initiation of Operational Water Quality in Area 7/8 Development Area (6 new wells) with Existing Landfill Areas	Upon NYSDEC authorization to operate Cell 1 South/Cell 7
Contingency Monitoring Program	See Section 4.1.5

4. Data Evaluation

This section describes methods to evaluate environmental monitoring data during EMP implementation. Section 5.1.2 identifies reference documents for data comparison criteria described in this section.

4.1 Groundwater

The proposed methods to evaluate groundwater quality at the Chaffee Landfill Facility are based on landfill design, detailed understanding of the hydrogeological conditions, and the assessment of groundwater quality data gathered from historical groundwater monitoring. The data evaluation procedures are consistent with those specified in 6NYCRR Part 363-4.6(f)(9).

4.1.1 Background Monitoring

Background water quality will be established for wells in the Area 7/8 Development listed in Table 1. As described in Section 3.1.2, new wells will be installed to monitor the Area 7/8 Development. As required for intrawell monitoring evaluations, each monitoring well will be sampled a minimum of eight (8) times and the data collected will be used to calculate a mean concentration for each constituent using all available background monitoring data. The mean value will constitute the "existing water quality value". Natural and seasonal variability will produce variations in the detected concentration of naturally occurring constituents. Therefore, the standard deviation from the mean and the coefficient of variation will be determined for each constituent. Water Quality Action Values (WQAVs) will be established for each constituent for each well for intrawell data evaluation. Where the coefficient of variation is 0.5 or less and less than 15 percent of the data are non-detects, Type A statistical trigger values will be calculated by adding three standard deviations to the mean. Where the percentage of non-detected constituent concentrations exceed 15 percent, the coefficient of variation is greater than 0.5, or there are other indications that the data set is not normally distributed, the existing water quality value will be defined as the median data set and a Type B statistical trigger value corresponding to the 90th percentile of the data set will be used as the WQAV. The calculated statistical trigger values will be used to establish a threshold where further evaluation of operational groundwater monitoring data is required.

Similarly, WQAVs will be established for the NYSDEC emerging contaminants on the Part 363 Expanded Parameter List (PFAS, 1,4-dioxane, uranium and radium 226 and radium 228) for the existing landfill areas following two rounds of sampling from the seven wells specified in Section 3.12 and shown on Figure 2. The WQAVs will be established after four sampling events from the wells identified in Section 3.1.1 considered to be representative of existing water quality. Statistical trigger values will be determined as described above.

4.1.2 Operational Monitoring

Groundwater chemistry at the Chaffee Facility will continue to be evaluated using intrawell comparisons as described in Section 3.1.3. Operational groundwater monitoring using intrawell data comparisons is common practice and is fully supported by the NYSDEC and USEPA (USEPA Unified Guidance Document, 2009). In addition, intrawell data comparisons are more effective than upgradient to down-gradient comparisons at sites such as the Chaffee Facility where groundwater chemistry is spatially variable and groundwater flow patterns are seasonally controlled. Intrawell data evaluation methods primarily support the assessment of naturally occurring inorganic constituents in groundwater. Since landfill leachate contains low concentrations of man-made organic chemicals as well as natural inorganic constituents, the detection of organic chemicals in groundwater will be a leading indicator of a release of leachate to groundwater.

Analytical data obtained for groundwater samples collected during landfill operational monitoring (inclusive of the Western Area, Closed Landfill Area, Valley Fill, and Area 7/8 Development) will be evaluated through constituent-specific comparisons to:

- Organic and inorganic constituent detections above Class GA groundwater quality standards and guidance values presented in TOGS 1.1.1 (TOGS Standard).

- WQAVs established during background monitoring of the Areas 7/8 Development and development of WQAVs for the Western Area and Closed Landfill Area.

- Significant increasing chemical constituent concentration data trends either related or unrelated to overall background changes to water quality as observed on time-series plots and the pattern of well trilinear Piper Plots and/or Stiff diagrams changes.

If a constituent concentration (non-organic) is above the TOGS standard and WQAV, then the constituent in question will be evaluated for naturally increasing concentrations due to changing background chemistry per Section 4.1.3. If background chemistry has not substantially changed, the well in question will be re-sampled to increase the reliability of the data within 14 days after notification of the NYSDEC. If an organic detection above TOGS standard is determined not to be related to laboratory analytical bias (i.e., false positive), the well will be re-sampled. The re-sampling analyte list will be discussed and agreed upon with the NYSDEC prior to sampling. An evaluation of the geochemical conditions in the secondary leachate collection systems will be immediately undertaken to assess a potential relationship between the anomalous detections.

4.1.3 Alternative Source Demonstration

An alternative source demonstration is performed if analytical or sampling error is suspected or natural changes in background chemistry result in a statistically significant increase. If re-

sampling is undertaken and confirms the condition described in Section 4.1.2 where a constituent concentration is detected above the TOGS standard, above WQAVs, and background constituent concentrations change, further investigation into the cause of the detection will be undertaken. This assessment, known as an Alternative Source Demonstration, will address potential causes of the condition such as natural groundwater variability caused by landfill construction, potential issues with conveyance piping for leachate and LFG, and potential issues associated with storm water runoff that are conditions not associated with an integrity issue of a landfill liner system which could necessitate assessment monitoring (as described in Section 4.1.4). If such a condition is determined to be the cause of the anomalous detected conditions, a report will be completed and submitted to the NYSDEC that describes the results of the Alternative Source Demonstration.

4.1.4 Assessment Monitoring

Assessment monitoring will be undertaken following the confirmation of the anomalous condition described above. Assessment monitoring will be concurrent with any actions taken during the Alternative Source Demonstration. Assessment monitoring may involve expanding the analytical parameter list from the Routine Parameter List to either the Expanded List or Baseline List depending on the nature of the anomalous detection. For example, if organic chemicals are of concern, then the Expanded Parameter List will be used for the next two (2) quarterly sampling events. If the nature of the anomalous detection is related to inorganic constituents, then the Baseline Parameter List will be used for the next two (2) quarterly sampling events. Nearby wells may be included in the assessment monitoring program should the nature of the anomalous detection suggest an expanded assessment of groundwater chemistry is warranted. The selection of the assessment monitoring parameter list and identification of wells to be included in the assessment monitoring program will be discussed with the NYSDEC.

The assessment monitoring results will be documented in the quarterly monitoring reports. Assessment monitoring will be discontinued if the source of the anomalous detection is found to be unrelated to landfill activities or corrective actions address the anomalous detections and water quality returns to pre-condition levels.

4.1.5 Contingency Monitoring

If is determined that there is a significant increase for one or more of the parameters during two successive monitoring events at any monitoring well, and the Alternative Source Demonstration and Assessment Monitoring are unable to explain the significant increases or anomalous conditions, Waste Management will, within 14 days of this finding, notify the department indicating which parameters have shown significant increases. In addition, at that time, the facility will implement a contingency monitoring program meeting the requirements within 90 days. A contingency water quality monitoring program will be developed if:

- The Alternative Source Demonstration does not identify the cause of the anomalous detection; and
- Assessment monitoring continues to confirm the existence of the anomalous condition.

Contingency monitoring efforts under this plan will focus on characterizing the nature and extent of the release and initiate an analysis of corrective actions. Depending on the nature and magnitude of the condition causing the anomalous detections in groundwater, the assessment of groundwater quality farther downgradient from the facility may be warranted. Under conditions requiring implementation of contingency monitoring, a written Contingency Monitoring Plan (CMP) will be prepared describing a scope of work with sampling and analysis activities to be undertaken to address the anomalous conditions. The CMP will be provided to the NYSDEC for approval prior to implementation. Any additional wells installed to support contingency monitoring will be analyzed twice within 14 days for the Expanded Parameter List (or list agreed upon with the NYSDEC) to assess existing water quality. Results will be provided to the NYSDEC as outlined in the CMP. Contingency monitoring could also include, but not be limited to monitoring of additional monitoring wells for an expanded list of parameters; more frequent monitoring of landfill systems (i.e., secondary leachate collections systems); additional monitoring of surface water; monitoring of off-site selected domestic wells; and systems installed for corrective action.

4.2 Surface Water and Sediment

The results of surface water quality sampling and analysis will be compared with historical data from the same sampling point using one (1) or more of the following: time series plots, Piper Plots, and/or Stiff Diagrams to assess overall changes in surface water quality. Data tables will include comparisons to New York State surface water quality standards and guidance values and appropriate New York State Sediment Guidance.

4.3 Landfill Containment Systems

Data for composite primary leachate samples and individual cell secondary leachate collection systems will be evaluated for overall changes in leachate quality. Sample results may be compared with historical data using time series, Piper Plots, and/or Stiff Diagrams to assess overall changes in leachate water quality, as required to evaluate conditions different than background. If quarterly checks of the Cell 6 porewater drain produces a sampleable quantity of water, results will be compared to groundwater quality standards and guidance values.

5. Site Analytical Plan

This section of this EMP constitutes the SAP as required under 6NYCRR Part 363-4.6(g) and is subdivided into three (3) subsections:

- Data Quality Objectives
- Analytical Quality Assurance/Analytical Quality Control
- Field Sampling Procedures

Laboratory procedures and data quality review are discussed in Sections 6.0 and 7.0, respectively.

5.1 Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements which specify the quality of the data required to support the goals of the monitoring program and are determined based upon the end use of the data. The end use of the data collected under this monitoring plan will be to document or monitor the functional performance of the engineered containment systems at the Chaffee Landfill Facility including the Area 7/8 Development and to demonstrate to the regulatory agency that the facility is not causing adverse impacts to the environment. The users of the data include regulatory agencies, landfill owner, landfill operator and the public (i.e., interested parties and environmental professionals). The DQOs will be met by establishing standardized field and lab procedures. Given that most of these procedures are specified within the regulations, the DQOs are essentially already established by the NYSDEC and will thus be attained by following the regulations. The goals of the various components of the regulations designed to meet the DQOs are discussed below.

5.1.1 Monitoring Programs

The primary objective of monitoring program implementation is to demonstrate that landfill operations are not adversely impacting environmental media. A monitoring program has been established to meet this objective.

Existing Groundwater Quality

The goal for Existing Water Quality monitoring (also referred to as background water quality) is to collect and analyze representative groundwater samples such that the data can be used to establish a benchmark for comparison to future sampling events. The collected data will be

processed and evaluated for both spatial and temporal variability and will be used to establish WQAVs as described in Section 4.1.1.

Operational Groundwater Quality

The goal of the operational water quality monitoring program is to collect and analyze samples and evaluate the resulting data to determine if groundwater quality at a particular sample location has changed through landfill operation activities. The methods used to evaluate impacts to groundwater are described in Section 4.1.2.

Landfill Containment Systems

The goal of monitoring landfill systems is to assess potential changes in leachate quality; liquid quality in secondary leachate collection systems; groundwater quality in underdrains and storm water quality discharged from storm water retention ponds. Understanding the quality of liquids in landfill systems is important since it is the primary source of potential impact to site media.

Surface Water/Sediment

The goal of the surface water/ sediment quality monitoring program is to collect and analyze samples to determine if surface water/sediment quality has changed through landfill operation activities.

Landfill Gas Control Monitoring

The goal of landfill gas monitoring is to determine if landfill gas vapors are migrating below the ground surface near the landfill containment systems.

5.1.2 Regulatory Programs and Standards

Data collected from various media monitored and sampled will be compared to regulatory guidance. The most current New York State Ambient Water Quality Standards and Guidance Values will be used, in part, to provide a comparative basis for the evaluation of the results of the environmental monitoring program. Applicable water quality regulations, standards, and criteria include:

Groundwater Monitoring Results

- Official Compilation of Codes, Rules, and Regulations of the State of New York, Chapter X, Division of Water Resources, Article 2, Part 703.5 (Classes and Quality Standards for Ground Waters as Applicable to Class GA Waters).
- Maximum Contaminant Levels (MCL's) as established under 40 CFR Part 141 (Safe Drinking Water Act).

Surface Water Monitoring Results

- Official Compilation of Codes, Rules, and Regulations of the State of New York, Chapter X, Division of Water Resources, Article 2, Title 6, Part 70 1, Classification and Standards of Quality and Purity.

Sediment Monitoring Results

- NYSDEC Technical Guidance for Screening Contaminated Sediments dated November 22, 1993 and January 2014 update

Landfill Operations

- 6NYCRR Part 363-7 Operating Requirements for Solid Waste Management Facilities

5.1.3 Analytical Parameters and Detection Limits

The analytical parameters for liquids incorporated into this EMP have been subdivided into three (3) groups: Routine Parameters, Baseline Parameters and Expanded Parameters as defined by 6NYCRR Part 363-4.6(h). The analytical methods and detection limits for liquids to be employed for this EMP are presented in Table 2A through 2C. Table 2D presents the analytical methods and detection limits for sediment samples.

5.2 Analytical Quality Assurance/Analytical Quality Control

The following section presents and discusses the analytical objectives and procedures, which will be employed to meet the DQOs.

5.2.1 Analytical Goals and Protocols

The goal of the analytical program is to collect, document, and analyze the environmental samples in accordance with established methods and procedures such that the resulting data is representative of the sample matrix in the field and can be used for comparison to existing environmental conditions and standards. This goal will be accomplished through the assignment of qualified personnel, adherence to established quality control procedures, and the use of standardized methods and protocols for the collection, shipping, and analysis of the environmental samples.

5.2.2 Project Personnel and Responsibilities

The EMP will be implemented and managed by WMNY under the regulatory authority of the NYSDEC. WMNY subcontracts EMP implementation services including environmental reporting, sampling and laboratory analytical services to a NYSDOH ELAP certified laboratory in accordance with the NYSDEC's ASP.

The following shows affiliates and responsibility participation in this monitoring plan:

Responsibility	Current Affiliation
Program Management	WMNY – Market Area Engineer
Environmental Compliance and Sampling Manager	WMNY – Environmental Compliance Manager and Landfill Operations Manager (Landfill Containment System Sampling Assistance)
Environmental Reporting	GEI Consultants, Inc. or WMNY approved contractor
Field Sampling	Golder Associates or WMNY approved contractor
Laboratory Analytical Services	Eurofins TestAmerica-Buffalo or other ELAP certified laboratory

If listed affiliate and/or responsibility change, a revised table will be provided to the NYSDEC.

5.2.3 Quality Control Procedures and Objectives for Measurement

To ensure that the data generated as a part of the EMP fulfills the needs of the DQOs, quality assurance practices will be maintained both in the field and in the laboratory. Quality control procedures and standards related to the field and laboratory are discussed in greater detail below.

Field Methodologies
It is essential to any monitoring program that samples (i.e., groundwater, surface water, leachate etc.) collected in the field and destined for laboratory analyses be representative of the conditions present at the time of sampling. To ensure sample representativeness and completeness, all sampling procedures will be completed in accordance with the Field Sampling Procedures (Section 5.3) and in Waste Management's internal sampling guidelines which are consistent with EPA sampling protocols for environmental media.

For field-generated data (e.g. temperature, specific conductivity, pH measurements and turbidity measurements), the accuracy and precision of the data will be within the limits of the field instrument. Field instruments will be calibrated, used, and maintained according to the instrument manufacturer's directions and those procedures described in this SAP and Waste Management's Environmental Media Sampling Procedures.

Field Precision

The precision for field measurements is as follows:

pH meter - consecutive readings should agree within +/-0.2 pH units after the instrument has been field calibrated with standard buffers.

Conductivity meter - consecutive readings of a thermally stable sample should agree within ±5% after the instrument has been calibrated.

Thermometer - consecutive measurements of a given sample should agree to within +/-1 degree Celsius.

Eh Meter- consecutive readings should agree to within +/-0.25 millivolt (Mv). after meter calibration.

Dissolved Oxygen Meter - consecutive readings should agree to within +/-0.2 milligram/liter (mg/l) after meter calibration.

Turbidimeter - consecutive readings should agree to within +/- 20% after meter calibration.

Particulate Monitor - ±0.1% of reading or 0.001 mg/m^3,

Multi-gas - consecutive readings should agree to within +/-1% LEL, after meter calibration.

Noise Meter - consecutive readings should agree to within +/-0.1 dB after meter calibration.

Field Accuracy

The objective for accuracy of field measurements is to achieve and maintain factory equipment specifications for the field equipment. Field measurements cannot be assessed for accuracy by spiking the medium with the analytical parameter and measuring the increase in response; therefore, these instruments can only be assessed for accuracy by the response to a known sample (such as calibration standard) used to standardize them. For example, the pH meter is calibrated with buffer solutions traceable to the NIST (formerly the National Bureau of Standards).

Laboratory Certification and Methodologies

Eurofins TestAmerica-Buffalo is certified under the NELAC Program on an annual basis and audited every two (2) years by NYSDEC. As such all laboratory procedures utilized by Eurofins TestAmerica have been pre-approved by the NYSDEC. Laboratory procedures will adhere to established analytical method protocols and Eurofins TestAmerica's SOPs.

Parameters to be tested for as a part of this EMP include the 6NYCRR Part 363 (Effective date November 4, 2017) Routine Parameters, Baseline Parameters and Expanded Parameters. Samples will be analyzed following the methods in the NYSDEC ASP or an equivalent method.

The analytical methods and laboratory PQLs are provided in Table 2A to 2D. A discussion related to some of these quality assurance measurements is provided below. The laboratory analysis plan is provided in Section 6.0.

Precision

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value. Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), range (maximum value minus minimum value), and relative range are common.

Analytical precision will be assessed by analyzing MS and MSD samples organics and matrix spike and laboratory duplicate samples (inorganics) and determining the RPD.

For all Part 363 Baseline and Expanded Parameter analyses a MS/MSD or laboratory duplicate pair will be collected at a frequency of not less than five (5) percent (one per twenty samples) or one (1) per sampling event, whichever is more frequent.

Total system precision, including field precision will be determined by analyzing duplicate samples collected in the field at the same location. The formula for calculating RPD is as follows:

$$RPD = \{(V1 - V2)/(V1+V2)/2\} \times 100$$

Where:	RPD	=	Relative Percent Difference.
	V1, V2	=	The 2 values obtained by analyzing the duplicate samples or spike and spike recovery values.
	|V1-V2|	=	The absolute value of the difference between the two measurements.
	(V1+V2)/2	=	Concentration of analyte obtained by analyzing the sample duplicate or spike recovery.

Accuracy

Accuracy is a measure of the difference between a measured value and the "true" or accepted reference value. The accuracy of an analytical procedure is best determined by the analysis of a sample containing a known quantity of material and is expressed as the percent of the known quantity, which is recovered, or measured. The recovery of a given analyte is dependent upon the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the detection limit of the analytical method is also a major factor in determining the accuracy of the measurement. Additionally, initial and continuing calibrations must be performed and accomplished within the established method control limits to define the instrument accuracy before analytical accuracy can be determined for any sample set. Sampling accuracy may be determined through the assessment of trip blanks (volatile organics only) for each sample set.

Accuracy is normally measured as the percent recovery (%R) of a known amount of analyte. The %R for a matrix spike is calculated as follows:

$$\%R = \frac{SSR-SR}{SA} \times 100$$

Where:
- %R = Percent recovery
- SSR = Concentration of analyte obtained by analyzing the sample plus the spike
- SR = The background value; i.e., the concentration of the analyte obtained by analyzing the sample.
- SA = Concentration of the analyte spike added to the sample.

Percent recovery of a laboratory control sample is determined by dividing the measured value by the known value and multiplying by 100.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program. Samples must be representative of the environmental media being sampled. Selection of sample locations and sampling procedures will incorporate consideration of obtaining the most representative sample possible.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree that is technically possible, that the data derived represents the in-place quality of the material sampled. Every effort will be made to ensure chemical compounds will not be introduced into the sample via sample containers, handling, and analysis. Dedicated sampling devices will be employed whenever possible, and Waste Management's Environmental Media Sampling Procedures included in C will be followed. Analysis of trip blanks (volatile organics only) and method blanks will also be performed to monitor for possible sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. The analytical laboratory will follow acceptable procedures to assure the samples are adequately homogenized prior to taking aliquots for analysis, so the reported results are representative of the sample received.

Finally, samples will be taken and Chain-of-Custody (COC) procedures will be followed to document that contamination of samples has not occurred during container preparation, shipment, and sampling. Details of COC, and blank/duplicate procedures will be discussed in sections to follow.

Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid (USEPA, 1987). The QC objective for completeness is generation of valid data for at least 90 percent of the analyses requested. Completeness is defined as follows for all sample measurements:

$$\%C = (V/T) \times 100$$

Where: %C = Percent completeness
V = Number of measurements judged valid.
T = Total number of measurements.

Comparability

Comparability expresses the degree of confidence with which one (1) data set can be compared to another. The comparability of all data collected for this EMP will be ensured by:

- Using identified standard methods for both sampling and analysis phases;
- Requiring traceability of all analytical standards and/or source materials to USEPA or NIST;
- Requiring that all calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable);
- Using standard reporting units and reporting formats including the reporting of QC data;
- Performing a complete data validation on a representative fraction of the analytical results, including the use of data qualifiers in all cases where appropriate; and
- Requiring that all validated flags be used at any time an analytical result is used for any purpose whatsoever.

These steps will ensure all future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

5.2.4 Standard Operating Procedures

Field sampling methods are described in Section 5.3. Standard operating procedures are followed by the field sampling team and are consistent with Waste Management and EPA sampling protocols for the collection of environmental samples from the media identified in this EMP. SOPs can be provided to the NYSDEC if requested.

Standard operating procedures related to the laboratory have been pre-approved by the NYSDOH as part of the NELAP Certification of Eurofins TestAmerica-Buffalo. All laboratory analytical procedures will be completed in accordance with ASP protocols. The laboratory analysis plan is provided below in Section 6.0.

5.3 Field Sampling Procedures

The following section describes the procedures for collecting and shipping samples for laboratory analysis.

5.3.1 Procedures Prior to Sampling

General procedures followed prior to sample collection at each sampling point are as follows:

1. Locate the sampling point.
2. Observe and record the condition of the sampling point and its surrounding area on a Field Information Form. Information to be noted includes:
    - The condition of monitoring point's identification sign;
    - Recent disturbance in vicinity of sampling point;
    - Condition of the security system for sampling point;
    - Well, tank, or manhole integrity including condition of any cement footing or protective casing. In addition, note physical surroundings, obstructions, or kinks in well casing, water in annular space, grease around top of well on threaded cap, etc.;
    - Weather conditions (i.e., wind direction when sampling for volatiles and note if sampling was performed downwind of an active area); and
    - Evidence of suspected contamination.

Prior to groundwater well purging and sampling, an accurate water level measurement is taken with a portable, conventional electric probe indicator that is triple rinsed with deionized water before each use. A permanent datum is provided at each well location. The water level measurement is recorded on the Field Information Form. Additionally, if previous analytical results suggest the potential presence of NAPLs, the well will be checked for immiscible layers prior to evacuation using an oil water interface probe. Otherwise, any observations of floaters or sinkers will be noted on the field data sheet during sampling.

In addition to the procedures above, a well condition inspection will be performed each sampling event as described in the sampling procedures. During inspection on a once every five (5) year basis, sediment accumulation in the well will be checked. The pump will be pulled from the well and the well depth will be measured and compared to well completion logs. If well condition inspections find sediment accumulation in the well (within one {1} foot of the pump intake), the well will be redeveloped to remove accumulated sediment.

5.3.2 Sample Collection

Groundwater Sampling
WMNY groundwater monitoring well sampling systems dedicate all purging and sampling equipment to each well, thus minimizing any potential cross-contamination between wells that may be otherwise incurred during conventional water sampling. Samples will be collected using low flow sampling methods with dedicated QED sampling pumps, peristaltic pumps, or bailers.

Field measurements consisting of specific conductance, Eh, pH, turbidity, and groundwater temperature measurements will be measured and recorded after collection of the volatile sample. Procedures provided with the instruments will be used for calibration and testing. All results will be recorded on the Field Information Form.

For the field measurements of Eh, pH, specific conductivity, dissolved oxygen and turbidity, an appropriately calibrated meter such as a Cole Palmer ORPTESTR, Myron L (pH & sc), YSI Model 55 DO Meter and DRT-15C field turbidity meters (or similar) will be utilized. The frequency of calibration of all field parameter measuring equipment will be in accordance with the manufacturer's requirements. If the values obtained are not within the normal range, the WMNY Program Manager will be notified immediately as it may be necessary to resample. The initial sample will not be discarded. Additional samples may be requested by the WMNY Program Manager to ascertain the cause of abnormal readings.

The collected groundwater samples will not be filtered. However, in the event that the turbidity of the sample cannot be reduced to 50 NTUs through sampling techniques or well development, micropurging and/or collection, analysis of both filtered and unfiltered samples for metals parameters may be used. A standard 0.45 micro filter capsule will be used if filtering is required. Once the sample has been collected the sample point will be secured and all sampling disposables will be removed from the area and properly disposed. Samples requiring organic analysis will not be field filtered.

The groundwater parameters which are collected at any site are collected based upon their volatilization sensitivity. The following order is followed by the sampling team.

1. Volatile Organics
2. Field Readings
3. Total Organic Carbon
4. Extractable Organics
5. Total Metals
6. Phenols
7. Cyanides
8. Wet Chemistry
9. Others

Notes:

- Other samples may be collected and analyzed in addition to those listed above.
- If the monitoring well is very turbid, collections of samples for metals shall be performed immediately after volatile organics to minimize the influence of turbidity. Filtered samples for metals analysis may be collected in addition to a total metals sample if sample turbidity is greater than 50 NTU.

Surface Water Sampling

Upon arrival at the sampling location the general condition of the sample location and its surroundings will be recorded on a Field information Form. In addition, general sampling point integrity, weather conditions, visible contamination, odors, and unusual surface conditions will be observed. Surface water samples will be obtained as grab samples. Samples will be obtained from near the water surface.

Surface water samples will not be collected during precipitation events. The sampling conditions will be evaluated by the sampling team immediately prior to sample collection. A suitable work area will be set up as close to the sampling station as possible. Individual sample containers will be filled in the same priority order as detailed for groundwater.

Sediment Sampling

Upon arrival at the sampling location the general condition of the sample location and its surroundings will be recorded on a Field information Form. In addition, general sampling point integrity, weather conditions, visible contamination, odors, and unusual surface conditions will be observed. Sediment samples will be obtained from the upper five centimeters of sediment. Sediment samples at any location will be collected once the surface water sampling at the location has been completed. As with surface water samples, the sequence for collection of sediment samples will be from the most downstream location to the most upstream location.

Samples will be collected in such a manner as to minimize disturbance of the sediment and minimize washing of the sediment as it is retrieved through the water column. Due to the shallowness of the water column, sediment samples will be collected with a stainless steel spatula. The collected sediment will be placed into a stainless steel bowl and the water will be decanted from the bowl. The process will be repeated until sufficient volume is present to fill required sample jars. The sample material in the bowl will be homogenized. Because none of the samples will be submitted for analysis for volatile organic compounds, constituent loss due to volatilization is not a concern. If analysis is required for volatile organic compounds, a grab sample will be collected. Note the approximate percentages of organic matter and soil particles on the Field Information Form. The mixing bowl and all non-dedicated sampling equipment will be cleaned by washing with a non-phosphate detergent and rinsing with distilled/deionized water. Once the sample has been collected the sample point will be secured and all sampling disposables will be removed from the area and properly disposed.

Leachate Sampling

Upon arrival at the sampling location the general condition of the sample location and its surroundings will be recorded on a Field information Form. Leachate samples will be collected from sample ports off of the side riser piping at the leachate station pump house with assistance from WMNY operational staff. Adequate time for venting between collecting landfill system samples should LFG be present. Leachate should be the last sample collected if pore water and secondary leachate collection systems are sampled.

Field QC Sample

Field QC samples are used to monitor the reproducibility and representativeness of field sampling activities. The field QC samples are handled transported and analyzed in the same manner as the associated field samples. Field QC samples will include trip blanks, field duplicates and MS/MSDs. The quantity, field QC sample type and analysis are discussed in the Laboratory Analysis Plan in Section 6.0.

5.3.3 Sample Preservation, Shipment, and Holding Times

Since multiple analyses will be required, different types of containers and preservatives may be necessary. In these situations, multiple pre-labeled containers will be supplied by the laboratory for each sampling point. The appropriate preservatives will be provided in small vials during sample bottle preparation by the analytical laboratory. The volume requirements, containers, preservatives, and holding times for each parameter are listed in Table 3.

The appropriate sample bottles that have been prepared in the laboratory with the appropriate preservative will be used to collect samples from each location. Containers for collecting samples for volatile organics analysis will be filled to slightly more than full before the septum and cap are placed on the container to ensure that it is free of head space (sampling personnel will check for air bubbles by inverting the container and tapping it). Following filling and capping the bottles will be inverted to mix the preservatives with the sample.

Immediately after collection, bottles will be placed in insulated shuttles or coolers with ice packs. Volatile organic containers will be arranged such that they do not come into contact with the ice packs. Executed Field Information Forms and Chain-of-Custody Forms will be placed inside the sample coolers and custody sealed. Samples will then be transported to Eurofins-Buffalo, or other approved laboratory, and will arrive within 48 -hours of collection or sooner as necessary to meet sample holding time requirements.

5.3.4 Chain-Of-Custody

At the time each sample is taken, a COC form will be completed by the sampler and placed in the sample chest. Upon transfer of sample possession to subsequent custodians, the COC form will be signed by the person taking custody of the sample container. Upon receipt of samples at

the laboratory, the shipping container seal will be broken and the condition of samples, including temperature, will be recorded by the receiver. The COC forms will be included in the analytical report prepared by the laboratory and will be considered an integral part of that report.

As part of the COC procedure, each sample container will be labeled with the sample number and the parameter to be sampled.

All sampling procedures, measurements, and observations will be recorded on the COC forms, including the following information:

- Facility site name, sample point identification number, and other pertinent identifiers;
- Sample method (dedicated bailer or bladder pump, grab, composite, etc.);
- Type of sample and necessary treatment (e.g. filtering, if necessary);
- Sampler's identity and signature;
- Analytical requirements; and
- Other information required by Waste Management's sampling SOPs.

Upon receipt of the samples at the laboratory, the date and time of arrival will be noted on the COC forms. The laboratory receiver will verify that the seal is intact and custody has not been broken, and make note of sample bottle condition on the forms. These forms will be retained by the laboratory and returned with the results of the analysis.

5.4 Gas Monitoring

Explosive gas concentrations in gas monitoring probes will be conducted using a Q-RAE Plus multi-gas meter, or equivalent. The meter utilizes catalytic compensated hydrocarbon sensor and microprocessor electronics to analyze and display explosive gas concentrations. Explosive gas readings (percent methane measured as the lower explosive limit) will be recorded at each gas probe.

6. Laboratory Analysis Plan

This section describes the procedures for laboratory analysis.

In accordance with 6NYCRR Part 363-4.6(g)(4), WMNY will use an analytical laboratory that is certified by NYSDOH, ELAP to perform ASP laboratory services in the State of New York. The current analytical laboratory is Eurofins TestAmerica (ETA). ETA will maintain this certification through the analysis of performance samples and routine auditing by NYSDOH as required by ELAP. ETA-Buffalo laboratory has established SOPs relating to the receipt, analysis and reporting of samples. A copy of Eurofins TestAmerica's Laboratory Quality Manual is not included herein, but will be provided on request. In the event that WMNY changes analytical laboratory service providers, NYSDEC will be notified and will provide a copy of that laboratories quality assurance manual, if requested.

6.1 Program Quality Assurance/Quality Control Procedures

Trip blanks, equipment blanks, field (aka blind) duplicates and matrix spike samples provide quality assurance/quality control measures for the monitoring program.

6.1.1 Trip Blanks

Trip blanks are a required part of the field sampling QA/QC program. They are used to detect contamination that may be introduced in the field (either atmospheric or from sampling equipment), in transit, or in the bottle preparation, sample log-in, or sample storage stages at the laboratory. Laboratory method blanks are used during the analytical process to detect any laboratory introduced contamination that may occur during analysis.

Trip blanks are samples of organic-free water (e.g. deionized) prepared at the laboratory. They remain with the sample bottles while in transit to the site, during sampling, and during the return trip to the laboratory. Trip blank sample bottles must not be opened at any time during this process. Upon return to the laboratory, trip blanks will be analyzed using the same procedures and methods that are used for the collected field samples.

One (1) trip blank will be analyzed for each cooler containing samples to be analyzed for volatile organics. Coolers which do not contain samples for volatile organics analysis will not require a trip blank to be analyzed. The trip blanks will be prepared by the laboratory and placed in the coolers prior to sample collection.

6.1.2 Field Duplicates

Field Duplicate Samples are samples that are submitted from a split of the same sample media. Field duplicates will be used to assess the sampling and analytical reproducibility. Both samples are collected utilizing the same methods and are submitted for the same laboratory analysis however different sample identification numbers are used.

For Routine, Baseline or Expanded Parameter analysis, field duplicate samples will be collected at a frequency of one (1) per every 20 samples or one (1) per event, whichever is more frequent. These samples will be collected from a randomly selected location, which is known to produce sufficient volumes of water.

6.1.3 Matrix Spike/Duplicate

MS/MSD Samples are two (2) additional aliquots of the same sample submitted for the same parameters as the original sample. However, the additional aliquots are spiked with the compounds of concern. Matrix spikes provide information about the effect of the sample matrix on the measurement methodology.

For routine parameter analysis, one (1) matrix spike and one (1) matrix spike duplicate/laboratory duplicate sample will be analyzed per laboratory batch as required by the analytical methods.

For Baseline or Expanded Parameter analysis, one (1) matrix spike and matrix spike duplicate/laboratory duplicate will be collected at a frequency of one (1) per every 20 samples or one (1) per event, whichever is more frequent.

These samples will be collected from a randomly selected location. Groundwater sample locations will be collected from wells which are known to produce sufficient volumes of water.

6.2 Laboratory Quality Control Procedure

The laboratory quality control program has been audited, certified and approved by NYSDEC and describes the mechanisms the laboratory employs to ensure that all data reported meets or exceeds all applicable USEPA and NYSDEC requirements. It describes the laboratory's experience, its organizational structure, and procedures in place to ensure quality of the analytical data. The laboratory quality manual and laboratory SOPs outline the sampling, analysis, and reporting procedures used by the laboratory.

The laboratory has established specific procedures and checklists for the receipt, storage, and handling of environmental samples to assure their integrity and security. These procedures are discussed in detail in the laboratory SOPs and include detailed chain-of-custody records, secured

storage and laboratory areas, and the tracking of each sample from its receipt at the lab through data generation and reporting.

The acceptance criteria and frequency for both initial and continuing calibration of the analytical instruments used by the laboratory are documented in laboratory SOPs and are described in NYSDEC ASPs. The laboratory will complete internal data validation in case narratives for Routine Parameters in accordance with NYSDEC requirements.

DQR, or equivalent, are requests submitted to the laboratory to formally review results that differ from historical results, or that exceed certain permit requirements or quality control criteria. The laboratory prepares a formal written response to each DQR explaining the discrepancy. The DQR is the first line of investigation following any anomalous result.

Audits are an important component of the quality assurance program at the laboratory. Audits are conducted by the laboratory. Internal system and performance audits are conducted periodically to ensure adherence by all laboratory departments to the QAPP. External audits are conducted by accrediting agencies or states. These reports are transmitted to department managers for review and response. Corrective measures must be taken for any finding or deficiency found in an internal or external audit.

Corrective action will be necessary if precision or accuracy limits are outside the acceptable limits. In such an event, the following corrective actions may be employed, depending upon the particular situation.

- Calculations are rechecked.
- Sample handling, i.e., digestion, concentration, and/or extraction logs are checked for discrepancies in sample handling.
- Analyte concentration is reviewed to determine if it has severely influenced the reliability of the precision or recovery calculations.
- Instrument and method performance is verified by inspecting data on standard reference materials processed in the same data set.
- Quality control data on the other samples in the data set, including surrogate recovery, internal standards, etc., are reviewed to determine if the problem is method related or sample related.
- If original sample is available, the sample is assessed for homogeneity.
- If sample is unavailable and no explanation for poor quality control results can be determined, additional samples will be obtained. If additional sample is unavailable, the results are issued with a qualification as to their accuracy.

The laboratory has established procedures and responsibilities for corrective actions as well as a summary of probable sources and suggested corrective actions. These are presented in the laboratory SOPs.

6.3 Practical Quantitation Limits (PQL)

Laboratory results will utilize laboratory-specific PQLs as the reporting limits of applicable low detection analytes (especially organics). The USEPA developed the concept of the PQL to address the issue of analytical variability. The PQL concept was developed for compliance with the Safe Drinking Water Act (50 FR 46906, Nov. 13, 1985) where it is defined: "The PQL thus represents the lowest level achievable by good laboratories within specified limits during routine laboratory operating conditions."

The reporting limits (RLs) listed on Tables 2A through 2D are the PQLs for laboratory analytes, as established by USEPA.

6.4 Analytical Methodologies

The analytical methods, holding times and sample preservatives to be used for the analysis of each parameter are included in Table 3.

7. Data Quality Review, Reporting and Recordkeeping

Prior to submittal of a monitoring report to the NYSDEC, several data evaluation, reporting, and recordkeeping tasks will be implemented. The following sections describe the evaluation, reporting and recordkeeping procedures that are followed upon receipt of the analytical report.

7.1 Data Quality Review

Each analytical report received from the laboratory will undergo two (2) levels of quality management. These quality assessment procedures are described below.

7.1.1 Initial QA/QC Checks

Before the data are subjected to statistical analysis, WMNY will evaluate the data by examining the quality control information accompanying the data report from the laboratory. Relevant quality control data include measures of accuracy (percent recovery), precision (RPD), and sample contamination (blank determinations).

Data that fail any of these checks will be flagged for closer evaluation and a DQR. Results of the DQR will be submitted with the analytical data in the routine monitoring report. A brief summary of these relevant quality control data follows. A more complete description is contained in the laboratory QAPP.

Accuracy defines the relationship between the laboratory's measurements of a sample's concentration and the "true", but unknown concentration of the sample. Because the "true" concentration is unknown, accuracy must be measured indirectly by determining the percent recovery of a sample called the MS. The MS is analyzed under the same conditions as the groundwater sample and its concentration is determined. Because the MS has a known concentration it's percent recovery can be calculated. It is assumed that the groundwater sample behaves exactly like the MS and thus the "true" concentration of the submitted groundwater sample can be back-calculated. Control criteria for percent recovery are taken from regulatory method requirements.

Precision is the assessment of the variability that can be expected in data that result from the analytical procedures employed. It provides a measure of the reproducibility which is estimated through duplicate measurements of a MS. Two (2) matrix spike samples are prepared as described above, an MS and an MSD. Both spikes are analyzed along with the unknown sample and the RPD between the two (2) spikes is determined. Control criteria for RPD are taken from regulatory method requirements.

The potential for sample contamination is assessed by measurements of "blank" samples. Blanks are samples of ultra-pure laboratory water that are not spiked with any analytes and are carried through the field sampling and laboratory environments. These samples are known as "field," "lab," and "equipment" blanks. It is assumed that any analytes that occur in the field or laboratory which might add to the concentration of the analyte in the sample will be picked up by the blank samples and measured. If any of the analytes of interest are found in the blank samples it is an indication of potential contamination of the unknown sample.

7.1.2 Data Validation

Analytical data will be reviewed by a validator that is not associated with the laboratory that is experienced and qualified in NYSDEC validations.

Five percent (5%) of the analytical data generated for groundwater sampling events for which Baseline or Expanded Parameters are analyzed will be validated. NYSDEC Category B QA/QC criteria for five percent (5%) of the samples will be reviewed.

Data will be validated consistent with USEPA analytical methods used for sample analysis for the project. Qualifiers added to the data and the conditions for addition of the qualifiers are those specified in EPA guidance documents "National Functional Guidelines for Organic Data Review", dated October 1999, EPA-540/R-99/008, "National Functional Guidelines for Inorganic Data Review", dated February 1994, EPA-540/R-94-013.

7.1.3 Qualitative Data Evaluation

Following the initial QA/QC checks, all data will undergo a second level of review by graphing historical time trends and comparing new results with these historical trends to flag visual outliers or other anomalous data. If a clearly anomalous result is found, a DQR will be initiated with the laboratory to ascertain if laboratory error is involved. In addition, field information will be checked for anomalous occurrences or observations that might help to explain the outlier result.

7.2 Data Reporting Requirements

Data obtained from the environmental monitoring data will be reported to the NYSDEC within 90 days of concluding the last date of sample collection, unless more rapid reporting is required as a result of significant increases. The reporting of the sampling event and analytical data will be completed in accordance with 6NYCRR Part 363-4.6(f)(10).

The quarterly reports will include a review of site conditions, tables providing the data and comparisons to NYSDEC groundwater standards, the results of time series graphs and Piper, Stiff and Ternary diagrams as appropriate, groundwater elevation data, any data quality issues determined by the laboratory or the outside independent data validator for a baseline event and

conclusions regarding the presence/absence of significant increases. In addition, leachate quality data (semi-annual), underdrain water quality (for operating underdrains), surface water and sediment quality, ambient air monitoring, and noise monitoring will be submitted with each quarterly report.

Per Part 363-4.6(f)(10)(v), an annual report will also be submitted (included with the Fourth Quarter Report) which summarizes the data collected over the previous year, including discussions regarding observed changes in groundwater, surface water, leachate, etc. and will include potentiometric surface maps supporting evaluations of groundwater flow directions.

7.3 Data Record Keeping Requirements

All analytical data are maintained by the laboratory indefinitely. The laboratory ensures that, at each stage of a process where a permanent data record is required, security measures are in place to guarantee the integrity of the data. SOPs are in place for computer security, computer data storage and back-up. In addition, all raw chemical data provided by the laboratory will be available for review upon request.

8. References

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State of New York Codes, Rules and Regulations, Title 6 Department of Environmental Conservation, Chapter IV. Quality Services, Subchapter B. Solid Wastes, Part 363 Landfills, Effective Date November 4, 2017.

U.S. Environmental Protection Agency (EPA). 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. EPA 350/R-09-007. March

U.S. Environmental Protection Agency (EPA National Functional Guidelines for Organic Data Review. October 1999, EPA-540/R-99/008.

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Tables

Table 1. Detection and Hydraulic Monitoring Network
Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

Well Name (Client ID)	Hydraulic Monitoring	Detection Monitoring Well / Hydraulic Position to Landfill Areas	Hydrostratigraphic Unit
Closed Landfill Area			
MWR1BR		X / NA	Upper Silty Clay (perched water)
MW2R		X / NA	
MW7R		X / NA	
MW9R		X / NA	
MW11R		X / NA	
MW12B		X / NA	
MW24BR		X / NA	
MW80B		X / NA	
MWR1A	X	X / Up/Down	Upper Silty Sand and Gravel
MW10R	X	X / Down	
MW12A	X	X / Down	
MW13R	X	X / Up/Down	
MW14R	X	X / Down	
MW24AR	X	X / Up/Down	
MW80A	X	X / Down	
MW81	X	X / Down	
Western Landfill Area/Valley Fill			
MW32		X / NA	Upper Silty Clay (perched water)
MW16(S)		X / NA	
MWL(S)		X / NA	
MW18BR		X / NA	
MWM(S)		X / NA	
MWN(S)		X / NA	
MWO(S)		X / NA	
MWP(S)		X / NA	
MWQ(S)		X / NA	
MW50	X	X / Up	Upper Silty Sand and Gravel
MW17	X	X / Down	
MW30	X	X / Side	
MW16	X	X / Down	
MWL(I)	X	X / Down	
MWM(I)	X	X / Down	
MWN(I)	X	X / Down	
MWO(I)	X	X / Side	
MWP(I)	X	X / Down	
MWQ(I)	X	X / Down	
Area 7/8 Development			
MWSE-5(S)		1	Upper Silty Clay (perched water)
MWSE-1	X	X / Up/Down	Upper Silty Sand and Gravel
MWSE-2	X	X / Up/Down	
MWSE-3	X	X / Up/Down	
MWSE-4	X	X / Up	
MWSE-5(I)	X	X / Up/Down	
MWBA-1	X		
PZ02-19	X		
P3-03	X		

Notes:
(NA) Not applicable - No hydraulic gradient in perched zone as saturation is not laterally continuous.
Up/Down indicates groundwater flow direction is seasonally influenced.
See potentiometric surface maps for seasonal change in groundwater flow direction.

Table 2A. Expanded Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

EXPANDED SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	630-20-6	8260C	1	ug/L
1,1,1-Trichloroethane	71-55-6	8260C	1	ug/L
1,1,2,2-Tetrachloroethane	79-34-5	8260C	1	ug/L
1,1,2-Trichloroethane	79-00-5	8260C	1	ug/L
1,1-Dichloroethane	75-34-3	8260C	1	ug/L
1,1-Dichloroethene	75-35-4	8260C	1	ug/L
1,1-Dichloropropene	563-58-6	8260C	1	ug/L
1,2,3-Trichloropropane	96-18-4	8260C	1	ug/L
1,2-Dibromo-3-Chloropropane	96-12-8	8260C	1	ug/L
1,2-Dibromoethane	106-93-4	8260C	1	ug/L
1,2-Dichlorobenzene	95-50-1	8260C	1	ug/L
1,2-Dichloroethane	107-06-2	8260C	1	ug/L
1,2-Dichloroethene, Total	540-59-0	8260C	2	ug/L
1,2-Dichloropropane	78-87-5	8260C	1	ug/L
1,3-Dichlorobenzene	541-73-1	8260C	1	ug/L
1,3-Dichloropropane	142-28-9	8260C	1	ug/L
1,4-Dichlorobenzene	106-46-7	8260C	1	ug/L
2,2-Dichloropropane	594-20-7	8260C	1	ug/L
2-Butanone (MEK)	78-93-3	8260C	10	ug/L
2-Hexanone	591-78-6	8260C	5	ug/L
4-Methyl-2-pentanone (MIBK)	108-10-1	8260C	5	ug/L
Acetone	67-64-1	8260C	10	ug/L
Acetonitrile	75-05-8	8260C	15	ug/L
Acrolein	107-02-8	8260C	20	ug/L
Acrylonitrile	107-13-1	8260C	5	ug/L
Allyl chloride	107-05-1	8260C	1	ug/L
Benzene	71-43-2	8260C	1	ug/L
Bromodichloromethane	75-27-4	8260C	1	ug/L
Bromoform	75-25-2	8260C	1	ug/L
Bromomethane	74-83-9	8260C	1	ug/L
Carbon disulfide	75-15-0	8260C	1	ug/L
Carbon tetrachloride	56-23-5	8260C	1	ug/L
Chlorobenzene	108-90-7	8260C	1	ug/L
Chlorobromomethane	74-97-5	8260C	1	ug/L
Chloroethane	75-00-3	8260C	1	ug/L
Chloroform	67-66-3	8260C	1	ug/L
Chloromethane	74-87-3	8260C	1	ug/L
Chloroprene	126-99-8	8260C	1	ug/L
cis-1,2-Dichloroethene	156-59-2	8260C	1	ug/L
cis-1,3-Dichloropropene	10061-01-5	8260C	1	ug/L
Dibromochloromethane	124-48-1	8260C	1	ug/L
Dibromomethane	74-95-3	8260C	1	ug/L
Dichlorodifluoromethane	75-71-8	8260C	1	ug/L
Ethyl methacrylate	97-63-2	8260C	1	ug/L
Ethylbenzene	100-41-4	8260C	1	ug/L
Hexachlorobutadiene	87-68-3	8260C	2	ug/L
Iodomethane	74-88-4	8260C	1	ug/L
Isobutyl alcohol	78-83-1	8260C	25	ug/L
m,p-Xylene	179601-23-1	8260C	2	ug/L
Methacrylonitrile	126-98-7	8260C	5	ug/L
Methyl methacrylate	80-62-6	8260C	1	ug/L
Methylene Chloride	75-09-2	8260C	1	ug/L
Naphthalene	91-20-3	8260C	1	ug/L
o-Xylene	95-47-6	8260C	1	ug/L
Propionitrile	107-12-0	8260C	10	ug/L
Styrene	100-42-5	8260C	1	ug/L
Tetrachloroethene	127-18-4	8260C	1	ug/L
Toluene	108-88-3	8260C	1	ug/L
trans-1,2-Dichloroethene	156-60-5	8260C	1	ug/L
trans-1,3-Dichloropropene	10061-02-6	8260C	1	ug/L

Table 2A. Expanded Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

EXPANDED SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Volatile Organic Compounds (Continued)				
trans-1,4-Dichloro-2-butene	110-57-6	8260C	1	ug/L
Trichloroethene	79-01-6	8260C	1	ug/L
Trichlorofluoromethane	75-69-4	8260C	1	ug/L
Vinyl acetate	108-05-4	8260C	5	ug/L
Vinyl chloride	75-01-4	8260C	1	ug/L
Xylenes, Total	1330-20-7	8260C	2	ug/L
Semi-Volatile Organic Compounds				
1,4-Dioxane	123-91-1	8270D_SIM_MS_ID	0.2	ug/L
Thionazin	297-97-2	625.1_LL_PREC	1	ug/L
1,2,4,5-Tetrachlorobenzene	95-94-3	8270D	5	ug/L
1,2,4-Trichlorobenzene	120-82-1	8270D	10	ug/L
1,2-Dichlorobenzene	95-50-1	8270D	10	ug/L
1,3,5-Trinitrobenzene	99-35-4	8270D	10	ug/L
1,3-Dichlorobenzene	541-73-1	8270D	10	ug/L
1,3-Dinitrobenzene	99-65-0	8270D	20	ug/L
1,4-Dichlorobenzene	106-46-7	8270D	10	ug/L
1,4-Naphthoquinone	130-15-4	8270D	10	ug/L
1-Naphthylamine	134-32-7	8270D	10	ug/L
2,3,4,6-Tetrachlorophenol	58-90-2	8270D	5	ug/L
2,4,5-Trichlorophenol	95-95-4	8270D	5	ug/L
2,4,6-Trichlorophenol	88-06-2	8270D	5	ug/L
2,4-Dichlorophenol	120-83-2	8270D	5	ug/L
2,4-Dimethylphenol	105-67-9	8270D	5	ug/L
2,4-Dinitrophenol	51-28-5	8270D	10	ug/L
2,4-Dinitrotoluene	121-14-2	8270D	5	ug/L
2,6-Dichlorophenol	87-65-0	8270D	10	ug/L
2,6-Dinitrotoluene	606-20-2	8270D	5	ug/L
2-Acetylaminofluorene	53-96-3	8270D	10	ug/L
2-Chloronaphthalene	91-58-7	8270D	5	ug/L
2-Chlorophenol	95-57-8	8270D	5	ug/L
2-Methylnaphthalene	91-57-6	8270D	5	ug/L
2-Methylphenol	95-48-7	8270D	5	ug/L
2-Naphthylamine	91-59-8	8270D	10	ug/L
2-Nitroaniline	88-74-4	8270D	10	ug/L
2-Nitrophenol	88-75-5	8270D	5	ug/L
3,3'-Dichlorobenzidine	91-94-1	8270D	5	ug/L
3,3'-Dimethylbenzidine	119-93-7	8270D	40	ug/L
3-Methylcholanthrene	56-49-5	8270D	10	ug/L
3-Methylphenol	108-39-4	8270D	10	ug/L
3-Nitroaniline	99-09-2	8270D	10	ug/L
4,6-Dinitro-2-methylphenol	534-52-1	8270D	10	ug/L
4-Aminobiphenyl	92-67-1	8270D	10	ug/L
4-Bromophenyl phenyl ether	101-55-3	8270D	5	ug/L
4-Chloro-3-methylphenol	59-50-7	8270D	5	ug/L
4-Chlorophenyl phenyl ether	7005-72-3	8270D	5	ug/L
4-Methylphenol	106-44-5	8270D	10	ug/L
4-Nitroaniline	100-01-6	8270D	10	ug/L
4-Nitrophenol	100-02-7	8270D	10	ug/L
5-Nitro-o-toluidine	99-55-8	8270D	10	ug/L
7,12-Dimethylbenz(a)anthracene	57-97-6	8270D	10	ug/L
Acenaphthene	83-32-9	8270D	5	ug/L
Acenaphthylene	208-96-8	8270D	5	ug/L
Acetophenone	98-86-2	8270D	5	ug/L
Anthracene	120-12-7	8270D	5	ug/L
Benzo[a]anthracene	56-55-3	8270D	5	ug/L
Benzo[a]pyrene	50-32-8	8270D	5	ug/L
Benzo[b]fluoranthene	205-99-2	8270D	5	ug/L
Benzo[g,h,i]perylene	191-24-2	8270D	5	ug/L
Benzo[k]fluoranthene	207-08-9	8270D	5	ug/L

Table 2A. Expanded Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

EXPANDED SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Semi-Volatile Organic Compounds (Continued)				
Benzyl alcohol	100-51-6	8270D	20	ug/L
bis(2 chloro-1-methylethyl) ether	108-60-1	8270D	5	ug/L
Bis(2-chloroethoxy)methane	111-91-1	8270D	5	ug/L
Bis(2-chloroethyl)ether	111-44-4	8270D	5	ug/L
Bis(2-ethylhexyl) phthalate	117-81-7	8270D	5	ug/L
Butyl benzyl phthalate	85-68-7	8270D	5	ug/L
Chlorobenzilate	510-15-6	8270D	20	ug/L
Chrysene	218-01-9	8270D	5	ug/L
Diallate	2303-16-4	8270D	10	ug/L
Dibenz(a,h)anthracene	53-70-3	8270D	5	ug/L
Dibenzofuran	132-64-9	8270D	10	ug/L
Diethyl phthalate	84-66-2	8270D	5	ug/L
Dimethoate	60-51-5	8270D	10	ug/L
Dimethyl phthalate	131-11-3	8270D	5	ug/L
Di-n-butyl phthalate	84-74-2	8270D	5	ug/L
Di-n-octyl phthalate	117-84-0	8270D	5	ug/L
Dinoseb	88-85-7	8270D	10	ug/L
Diphenylamine	122-39-4	8270D	10	ug/L
Disulfoton	298-04-4	8270D	10	ug/L
Ethyl methanesulfonate	62-50-0	8270D	10	ug/L
Famphur	52-85-7	8270D	40	ug/L
Fluoranthene	206-44-0	8270D	5	ug/L
Fluorene	86-73-7	8270D	5	ug/L
Hexachlorobenzene	118-74-1	8270D	5	ug/L
Hexachlorobutadiene	87-68-3	8270D	5	ug/L
Hexachlorocyclopentadiene	77-47-4	8270D	5	ug/L
Hexachloroethane	67-72-1	8270D	5	ug/L
Hexachloropropene	1888-71-7	8270D	10	ug/L
Indeno[1,2,3-cd]pyrene	193-39-5	8270D	5	ug/L
Isodrin	465-73-6	8270D	10	ug/L
Isophorone	78-59-1	8270D	5	ug/L
Isosafrole	120-58-1	8270D	10	ug/L
Kepone	143-50-0	8270D	50	ug/L
Methapyrilene	91-80-5	8270D	50	ug/L
Methyl methanesulfonate	66-27-3	8270D	10	ug/L
Naphthalene	91-20-3	8270D	5	ug/L
Nitrobenzene	98-95-3	8270D	5	ug/L
N-Nitrosodiethylamine	55-18-5	8270D	10	ug/L
N-Nitrosodimethylamine	62-75-9	8270D	10	ug/L
N-Nitrosodi-n-butylamine	924-16-3	8270D	10	ug/L
N-Nitrosodiphenylamine	86-30-6	8270D	5	ug/L
N-Nitrosodipropylamine	621-64-7	8270D	5	ug/L
N-Nitrosomethylethylamine	10595-95-6	8270D	10	ug/L
N-Nitrosopiperidine	100-75-4	8270D	10	ug/L
N-Nitrosopyrrolidine	930-55-2	8270D	10	ug/L
o-Toluidine	95-53-4	8270D	10	ug/L
Parathion	56-38-2	8270D	10	ug/L
Parathion methyl	298-00-0	8270D	10	ug/L
p-Chloroaniline	106-47-8	8270D	5	ug/L
p-Dimethylamino azobenzene	60-11-7	8270D	10	ug/L
Pentachlorobenzene	608-93-5	8270D	10	ug/L
Pentachloronitrobenzene	82-68-8	8270D	10	ug/L
Pentachlorophenol	87-86-5	8270D	10	ug/L
Phenacetin	62-44-2	8270D	10	ug/L
Phenanthrene	85-01-8	8270D	5	ug/L
Phenol	108-95-2	8270D	5	ug/L
Phorate	298-02-2	8270D	10	ug/L
p-Phenylene diamine	106-50-3	8270D	800	ug/L

Table 2A. Expanded Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

EXPANDED SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Semi-Volatile Organic Compounds (Continued)				
Pronamide	23950-58-5	8270D	10	ug/L
Pyrene	129-00-0	8270D	5	ug/L
Safrole	94-59-7	8270D	10	ug/L
Thionazin	297-97-2	8270D	10	ug/L
Triethyl phosphorothioate	126-68-1	8270D	10	ug/L
Polychlorinated Biphenyls (PCBs)				
PCB-1016	12674-11-2	8082A	0.53	ug/L
PCB-1221	11104-28-2	8082A	0.53	ug/L
PCB-1232	11141-16-5	8082A	0.53	ug/L
PCB-1242	53469-21-9	8082A	0.53	ug/L
PCB-1248	12672-29-6	8082A	0.53	ug/L
PCB-1254	11097-69-1	8082A	0.53	ug/L
PCB-1260	11096-82-5	8082A	0.53	ug/L
Herbicides and Organochlorine Pesticides				
2,4,5-T	93-76-5	8151A	0.48	ug/L
2,4-D	94-75-7	8151A	0.48	ug/L
Silvex (2,4,5-TP)	93-72-1	8151A	0.48	ug/L
4,4'-DDD	72-54-8	8081B	0.05	ug/L
4,4'-DDE	72-55-9	8081B	0.05	ug/L
4,4'-DDT	50-29-3	8081B	0.05	ug/L
Aldrin	309-00-2	8081B	0.05	ug/L
alpha-BHC	319-84-6	8081B	0.05	ug/L
beta-BHC	319-85-7	8081B	0.05	ug/L
Chlordane (technical)	12789-03-6	8081B	0.5	ug/L
delta-BHC	319-86-8	8081B	0.05	ug/L
Dieldrin	60-57-1	8081B	0.05	ug/L
Endosulfan I	959-98-8	8081B	0.05	ug/L
Endosulfan II	33213-65-9	8081B	0.05	ug/L
Endosulfan sulfate	1031-07-8	8081B	0.05	ug/L
Endrin	72-20-8	8081B	0.05	ug/L
Endrin aldehyde	7421-93-4	8081B	0.05	ug/L
gamma-BHC (Lindane)	58-89-9	8081B	0.05	ug/L
Heptachlor	76-44-8	8081B	0.05	ug/L
Heptachlor epoxide	1024-57-3	8081B	0.05	ug/L
Methoxychlor	72-43-5	8081B	0.05	ug/L
Toxaphene	8001-35-2	8081B	0.5	ug/L
Fluorinated Alkyl Substances				
6:2 FTS	27619-97-2	PFC_IDA	19	ng/L
8:2 FTS	39108-34-4	PFC_IDA	19	ng/L
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	PFC_IDA	19	ng/L
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	PFC_IDA	19	ng/L
Perfluorobutanesulfonic acid (PFBS)	375-73-5	PFC_IDA	1.9	ng/L
Perfluorobutanoic acid (PFBA)	375-22-4	PFC_IDA	1.9	ng/L
Perfluorodecanesulfonic acid (PFDS)	335-77-3	PFC_IDA	1.9	ng/L
Perfluorodecanoic acid (PFDA)	335-76-2	PFC_IDA	1.9	ng/L
Perfluorododecanoic acid (PFDoA)	307-55-1	PFC_IDA	1.9	ng/L
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	PFC_IDA	1.9	ng/L
Perfluoroheptanoic acid (PFHpA)	375-85-9	PFC_IDA	1.9	ng/L
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFC_IDA	1.9	ng/L
Perfluorohexanoic acid (PFHxA)	307-24-4	PFC_IDA	1.9	ng/L
Perfluorononanoic acid (PFNA)	375-95-1	PFC_IDA	1.9	ng/L
Perfluorooctanesulfonamide (FOSA)	754-91-6	PFC_IDA	1.9	ng/L
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFC_IDA	1.9	ng/L
Perfluorooctanoic acid (PFOA)	335-67-1	PFC_IDA	1.9	ng/L
Perfluoropentanoic acid (PFPeA)	2706-90-3	PFC_IDA	1.9	ng/L
Perfluorotetradecanoic acid (PFTeA)	376-06-7	PFC_IDA	1.9	ng/L
Perfluorotridecanoic acid (PFTriA)	72629-94-8	PFC_IDA	1.9	ng/L
Perfluoroundecanoic acid (PFUnA)	2058-94-8	PFC_IDA	1.9	ng/L

Table 2A. Expanded Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

EXPANDED SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Leachate Indicators				
Alkalinity, Total	N/A	310.2	10	mg/L
Bromide	24959-67-9	300.0_28D	0.4	mg/L
Biochemical Oxygen Demand	N/A	5210B	2	mg/L
Chloride	16887-00-6	9251	1	mg/L
Chemical Oxygen Demand	N/A	410.4	5	mg/L
Color	N/A	2120B	5	Color Units
Ammonia (as N)	7664-41-7	350.1	0.02	mg/L as N
Nitrate	14797-55-8	Nitrate_Calc	0.05	mg/L as N
Total Kjeldahl Nitrogen	N/A	351.2	0.15	mg/L as N
Total Organic Carbon	7440-44-0	SM5310D	1	mg/L
Phenolics, Total Recoverable	N/A	9065	0.005	mg/L
Total Dissolved Solids	N/A	2540C_Calcd	10	mg/L
Sulfate	14808-79-8	9038	15	mg/L
Calcium and Magnesium Hardness	N/A	SM2340B	0.5	mg/L
Inorganic Parameters				
Aluminum	7429-90-5	6010C	0.2	mg/L
Antimony	7440-36-0	6010C	0.02	mg/L
Arsenic	7440-38-2	6010C	0.015	mg/L
Barium	7440-39-3	6010C	0.002	mg/L
Beryllium	7440-41-7	6010C	0.002	mg/L
Boron	7440-42-8	6010C	0.02	mg/L
Cadmium	7440-43-9	6010C	0.002	mg/L
Calcium	7440-70-2	6010C	0.5	mg/L
Chromium	7440-47-3	6010C	0.004	mg/L
Chromium, hexavalent	18540-29-9	7196A	0.01	mg/L
Cobalt	7440-48-4	6010C	0.004	mg/L
Copper	7440-50-8	6010C	0.01	mg/L
Cyanide, Total	57-12-5	9012B	0.01	mg/L
Iron	7439-89-6	6010C	0.05	mg/L
Lead	7439-92-1	6010C	0.01	mg/L
Magnesium	7439-95-4	6010C	0.2	mg/L
Manganese	7439-96-5	6010C	0.003	mg/L
Mercury	7439-97-6	7470A	0.0002	mg/L
Nickel	7440-02-0	6010C	0.01	mg/L
Potassium	7440-09-7	6010C	0.5	mg/L
Selenium	7782-49-2	6010C	0.025	mg/L
Silver	7440-22-4	6010C	0.006	mg/L
Sodium	7440-23-5	6010C	1	mg/L
Thallium	7440-28-0	6010C	0.02	mg/L
Tin	7440-31-5	6010C	0.01	mg/L
Vanadium	7440-62-2	6010C	0.005	mg/L
Zinc	7440-66-6	6010C	0.01	mg/L
Radiological				
Radium-226	7440-14-4	903	0.922	pCi/L
Radium-228	7440-14-4	904	0.922	pCi/L
Uranium	7440-61-1	908	0.161	pCi/L
Field Data				
Field pH	N/A	FieldSampling	N/A	SU
Oxidation Reduction Potential	N/A	FieldSampling	N/A	millivolts
Specific Conductance	N/A	FieldSampling	N/A	umhos/cm
Temperature	N/A	FieldSampling	N/A	Degrees C
Turbidity	N/A	FieldSampling	N/A	NTU

Table 2B. Baseline Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

BASELINE SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Volatile Organic Compounds				
1,1,1,2-Tetrachloroethane	630-20-6	8260C	1	ug/L
1,1,1-Trichloroethane	71-55-6	8260C	1	ug/L
1,1,2,2-Tetrachloroethane	79-34-5	8260C	1	ug/L
1,1,2-Trichloroethane	79-00-5	8260C	1	ug/L
1,1-Dichloroethane	75-34-3	8260C	1	ug/L
1,1-Dichloroethene	75-35-4	8260C	1	ug/L
1,1-Dichloropropene	563-58-6	8260C	1	ug/L
1,2,3-Trichloropropane	96-18-4	8260C	1	ug/L
1,2-Dibromo-3-Chloropropane	96-12-8	8260C	1	ug/L
1,2-Dibromoethane	106-93-4	8260C	1	ug/L
1,2-Dichlorobenzene	95-50-1	8260C	1	ug/L
1,2-Dichloroethane	107-06-2	8260C	1	ug/L
1,2-Dichloroethene, Total	540-59-0	8260C	2	ug/L
1,2-Dichloropropane	78-87-5	8260C	1	ug/L
1,3-Dichlorobenzene	541-73-1	8260C	1	ug/L
1,3-Dichloropropane	142-28-9	8260C	1	ug/L
1,4-Dichlorobenzene	106-46-7	8260C	1	ug/L
2,2-Dichloropropane	594-20-7	8260C	1	ug/L
2-Butanone (MEK)	78-93-3	8260C	10	ug/L
2-Hexanone	591-78-6	8260C	5	ug/L
4-Methyl-2-pentanone (MIBK)	108-10-1	8260C	5	ug/L
Acetone	67-64-1	8260C	10	ug/L
Acetonitrile	75-05-8	8260C	15	ug/L
Acrolein	107-02-8	8260C	20	ug/L
Acrylonitrile	107-13-1	8260C	5	ug/L
Allyl chloride	107-05-1	8260C	1	ug/L
Benzene	71-43-2	8260C	1	ug/L
Bromodichloromethane	75-27-4	8260C	1	ug/L
Bromoform	75-25-2	8260C	1	ug/L
Bromomethane	74-83-9	8260C	1	ug/L
Carbon disulfide	75-15-0	8260C	1	ug/L
Carbon tetrachloride	56-23-5	8260C	1	ug/L
Chlorobenzene	108-90-7	8260C	1	ug/L
Chlorobromomethane	74-97-5	8260C	1	ug/L
Chloroethane	75-00-3	8260C	1	ug/L
Chloroform	67-66-3	8260C	1	ug/L
Chloromethane	74-87-3	8260C	1	ug/L
Chloroprene	126-99-8	8260C	1	ug/L
cis-1,2-Dichloroethene	156-59-2	8260C	1	ug/L
cis-1,3-Dichloropropene	10061-01-5	8260C	1	ug/L
Dibromochloromethane	124-48-1	8260C	1	ug/L
Dibromomethane	74-95-3	8260C	1	ug/L
Dichlorodifluoromethane	75-71-8	8260C	1	ug/L
Ethyl methacrylate	97-63-2	8260C	1	ug/L
Ethylbenzene	100-41-4	8260C	1	ug/L
Hexachlorobutadiene	87-68-3	8260C	2	ug/L
Iodomethane	74-88-4	8260C	1	ug/L
Isobutyl alcohol	78-83-1	8260C	25	ug/L
m,p-Xylene	179601-23-1	8260C	2	ug/L
Methacrylonitrile	126-98-7	8260C	5	ug/L
Methyl methacrylate	80-62-6	8260C	1	ug/L
Methylene Chloride	75-09-2	8260C	1	ug/L
Naphthalene	91-20-3	8260C	1	ug/L
o-Xylene	95-47-6	8260C	1	ug/L
Propionitrile	107-12-0	8260C	10	ug/L
Styrene	100-42-5	8260C	1	ug/L
Tetrachloroethene	127-18-4	8260C	1	ug/L
Toluene	108-88-3	8260C	1	ug/L
trans-1,2-Dichloroethene	156-60-5	8260C	1	ug/L
trans-1,3-Dichloropropene	10061-02-6	8260C	1	ug/L

Table 2B. Baseline Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

BASELINE SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Volatile Organic Compounds (Continued)				
trans-1,4-Dichloro-2-butene	110-57-6	8260C	1	ug/L
Trichloroethene	79-01-6	8260C	1	ug/L
Trichlorofluoromethane	75-69-4	8260C	1	ug/L
Vinyl acetate	108-05-4	8260C	5	ug/L
Vinyl chloride	75-01-4	8260C	1	ug/L
Xylenes, Total	1330-20-7	8260C	2	ug/L
Leachate Indicators				
Alkalinity, Total	N/A	310.2	10	mg/L
Bromide	24959-67-9	300.0_28D	0.4	mg/L
Biochemical Oxygen Demand	N/A	5210B	2	mg/L
Chloride	16887-00-6	9251	1	mg/L
Chemical Oxygen Demand	N/A	410.4	5	mg/L
Color	N/A	2120B	5	Color Units
Ammonia (as N)	7664-41-7	350.1	0.02	mg/L as N
Nitrate	14797-55-8	Nitrate_Calc	0.05	mg/L as N
Total Kjeldahl Nitrogen	N/A	351.2	0.15	mg/L as N
Total Organic Carbon	7440-44-0	SM5310D	1	mg/L
Phenolics, Total Recoverable	N/A	9065	0.005	mg/L
Total Dissolved Solids	N/A	2540C_Calcd	10	mg/L
Sulfate	14808-79-8	9038	15	mg/L
Calcium and Magnesium Hardness	N/A	SM2340B	0.5	mg/L
Inorganic Parameters				
Aluminum	7429-90-5	6010C	0.2	mg/L
Antimony	7440-36-0	6010C	0.02	mg/L
Arsenic	7440-38-2	6010C	0.015	mg/L
Barium	7440-39-3	6010C	0.002	mg/L
Beryllium	7440-41-7	6010C	0.002	mg/L
Boron	7440-42-8	6010C	0.02	mg/L
Cadmium	7440-43-9	6010C	0.002	mg/L
Calcium	7440-70-2	6010C	0.5	mg/L
Chromium	7440-47-3	6010C	0.004	mg/L
Chromium, hexavalent	18540-29-9	7196A	0.01	mg/L
Cobalt	7440-48-4	6010C	0.004	mg/L
Copper	7440-50-8	6010C	0.01	mg/L
Cyanide, Total	57-12-5	9012B	0.01	mg/L
Iron	7439-89-6	6010C	0.05	mg/L
Lead	7439-92-1	6010C	0.01	mg/L
Magnesium	7439-95-4	6010C	0.2	mg/L
Manganese	7439-96-5	6010C	0.003	mg/L
Mercury	7439-97-6	7470A	0.0002	mg/L
Nickel	7440-02-0	6010C	0.01	mg/L
Potassium	7440-09-7	6010C	0.5	mg/L
Selenium	7782-49-2	6010C	0.025	mg/L
Silver	7440-22-4	6010C	0.006	mg/L
Sodium	7440-23-5	6010C	1	mg/L
Thallium	7440-28-0	6010C	0.02	mg/L
Vanadium	7440-62-2	6010C	0.005	mg/L
Zinc	7440-66-6	6010C	0.01	mg/L
Field Data				
Field pH	N/A	FieldSampling	N/A	SU
Oxidation Reduction Potential	N/A	FieldSampling	N/A	millivolts
Specific Conductance	N/A	FieldSampling	N/A	umhos/cm
Temperature	N/A	FieldSampling	N/A	Degrees C
Turbidity	N/A	FieldSampling	N/A	NTU

Table 2C. Routine Parameter List (6NYCRR Part 363-4.6(h)) with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

ROUTINE SAMPLING EVENTS				
Analyte	***CAS Number***	***Specific Method***	***Laboratory Reporting Limit***	***Units***
Leachate Indicators				
Alkalinity, Total	N/A	310.2	10	mg/L
Bromide	24959-67-9	300.0_28D	0.4	mg/L
Biochemical Oxygen Demand	N/A	5210B	2	mg/L
Chloride	16887-00-6	9251	1	mg/L
Chemical Oxygen Demand	N/A	410.4	5	mg/L
Ammonia (as N)	7664-41-7	350.1	0.02	mg/L as N
Nitrate	14797-55-8	Nitrate_Calc	0.05	mg/L as N
Total Kjeldahl Nitrogen	N/A	351.2	0.15	mg/L as N
Total Organic Carbon	7440-44-0	SM5310D	1	mg/L
Phenolics, Total Recoverable	N/A	9065	0.005	mg/L
Total Dissolved Solids	N/A	2540C_Calcd	10	mg/L
Sulfate	14808-79-8	9038	15	mg/L
Calcium and Magnesium Hardness	N/A	SM2340B	0.5	mg/L
Inorganic Parameters				
Cadmium	7440-43-9	6010C	0.002	mg/L
Calcium	7440-70-2	6010C	0.5	mg/L
Iron	7439-89-6	6010C	0.05	mg/L
Lead	7439-92-1	6010C	0.01	mg/L
Magnesium	7439-95-4	6010C	0.2	mg/L
Manganese	7439-96-5	6010C	0.003	mg/L
Potassium	7440-09-7	6010C	0.5	mg/L
Sodium	7440-23-5	6010C	1	mg/L
Field Data				
Field pH	N/A	FieldSampling	N/A	SU
Oxidation Reduction Potential	N/A	FieldSampling	N/A	millivolts
Specific Conductance	N/A	FieldSampling	N/A	umhos/cm
Temperature	N/A	FieldSampling	N/A	Degrees C
Turbidity	N/A	FieldSampling	N/A	NTU

Table 2D. Sediment Baseline Parameter List with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

Analyte	*CAS Number*	*Specific Method*	*Laboratory Reporting Limit*	*Units*
Inorganic Parameters				
Aluminum	7429-90-5	6010C	10.00	mg/Kg
Antimony	7440-36-0	6010C	15.00	mg/Kg
Arsenic	7440-38-2	6010C	2.00	mg/Kg
Barium	7440-39-3	6010C	0.50	mg/Kg
Beryllium	7440-41-7	6010C	0.20	mg/Kg
Cadmium	7440-43-9	6010C	0.20	mg/Kg
Calcium	7440-70-2	6010C	50.00	mg/Kg
Chromium	7440-47-3	6010C	0.50	mg/Kg
Chromium, hexavalent	18540-29-9	7196A	0.80	mg/Kg
Cobalt	7440-48-4	6010C	0.50	mg/Kg
Copper	7440-50-8	6010C	1.00	mg/Kg
Cyanide, Total	57-12-5	9012B	1.00	mg/Kg
Iron	7439-89-6	6010C	10.00	mg/Kg
Lead	7439-92-1	6010C	1.00	mg/Kg
Magnesium	7439-95-4	6010C	20.00	mg/Kg
Manganese	7439-96-5	6010C	0.20	mg/Kg
Mercury	7439-97-6	7471B	0.02	mg/Kg
Nickel	7440-02-0	6010C	5.00	mg/Kg
Potassium	7440-09-7	6010C	80.00	mg/Kg
Selenium	7782-49-2	6010C	4.00	mg/Kg
Silver	7440-22-4	6010C	0.60	mg/Kg
Sodium	7440-23-5	6010C	140.00	mg/Kg
Thallium	7440-28-0	6010C	6.00	mg/Kg
Vanadium	7440-62-2	6010C	0.50	mg/Kg
Zinc	7440-66-6	6010C	2	mg/Kg
Volatile Organic Compound (VOCs)				
1,1,1,2-Tetrachloroethane	630-20-6	8260C	5.00	ug/Kg
1,1,1-Trichloroethane	71-55-6	8260C	5.00	ug/Kg
1,1,2,2-Tetrachloroethane	79-34-5	8260C	5.00	ug/Kg
1,1,2-Trichloroethane	79-00-5	8260C	5.00	ug/Kg
1,1-Dichloroethane	75-34-3	8260C	5.00	ug/Kg
1,1-Dichloroethene	75-35-4	8260C	5.00	ug/Kg
1,2,3-Trichloropropane	96-18-4	8260C	5.00	ug/Kg
1,2-Dibromo-3-Chloropropane	96-12-8	8260C	5.00	ug/Kg
1,2-Dichlorobenzene	95-50-1	8260C	5.00	ug/Kg
1,2-Dichloroethane	107-06-2	8260C	5.00	ug/Kg
1,2-Dichloropropane	78-87-5	8260C	5.00	ug/Kg
1,4-Dichlorobenzene	106-46-7	8260C	5.00	ug/Kg
2-Hexanone	591-78-6	8260C	25.00	ug/Kg
Acetone	67-64-1	8260C	25.00	ug/Kg
Acrylonitrile	107-13-1	8260C	25.00	ug/Kg
Benzene	71-43-2	8260C	5.00	ug/Kg
Bromoform	75-25-2	8260C	5.00	ug/Kg
Bromomethane	74-83-9	8260C	5.00	ug/Kg
Carbon disulfide	75-15-0	8260C	5.00	ug/Kg

Table 2D. Sediment Baseline Parameter List with Maximum Laboratory Reporting Limits
Environmental Monitoring Plan
Chaffee Landfill Facility
Chaffee, New York

Analyte	*CAS Number*	*Specific Method*	*Laboratory Reporting Limit*	*Units*
Carbon tetrachloride	56-23-5	8260C	5.00	ug/Kg
Chlorobenzene	108-90-7	8260C	5.00	ug/Kg
Bromochloromethane	74-97-5	8260C	5.00	ug/Kg
Dibromochloromethane	124-48-1	8260C	5.00	ug/Kg
Chloroethane	75-00-3	8260C	5.00	ug/Kg
Chloroform	67-66-3	8260C	5.00	ug/Kg
Chloromethane	74-87-3	8260C	5.00	ug/Kg
cis-1,2-Dichloroethene	156-59-2	8260C	5.00	ug/Kg
cis-1,3-Dichloropropene	10061-01-5	8260C	5.00	ug/Kg
Dibromomethane	74-95-3	8260C	5.00	ug/Kg
Bromodichloromethane	75-27-4	8260C	5.00	ug/Kg
Ethylbenzene	100-41-4	8260C	5.00	ug/Kg
1,2-Dibromoethane	106-93-4	8260C	5.00	ug/Kg
2-Butanone	78-93-3	8260C	25.00	ug/Kg
4-Methyl-2-pentanone	108-10-1	8260C	25.00	ug/Kg
Methylene Chloride	75-09-2	8260C	5.00	ug/Kg
Styrene	100-42-5	8260C	5.00	ug/Kg
Tetrachloroethene	127-18-4	8260C	5.00	ug/Kg
Toluene	108-88-3	8260C	5.00	ug/Kg
trans-1,2-Dichloroethene	156-60-5	8260C	5.00	ug/Kg
trans-1,3-Dichloropropene	10061-02-6	8260C	5.00	ug/Kg
trans-1,4-Dichloro-2-butene	110-57-6	8260C	5.00	ug/Kg
Trichloroethene	79-01-6	8260C	5.00	ug/Kg
Trichlorofluoromethane	75-69-4	8260C	5.00	ug/Kg
Vinyl acetate	108-05-4	8260C	10.00	ug/Kg
Vinyl chloride	75-01-4	8260C	5.00	ug/Kg
Xylenes, Total	1330-20-7	8260C	10.00	ug/Kg

Notes:
Shading indicates Routine Parameters
CAS RN is the Chemical Abstract Number
Method is EPA method #
PQL is Practical Quantification Limit
ug/kg is micrograms per kilogram
mg/L is milligrams per kilogram

Table 3. Sampling and Analysis Plan
Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

PART 363 - BASELINE LIST PARAMETERS

PARAMETER[1]	METHOD	SAMPLE COLLECTION[2] AND CONTAINER	SAMPLE[3,4] PRESERVATION	RECOMMENDED[5] HOLDING TIME
Alkalinity	310.2	100 ml P,G, zero headspace	Cool, 4°C	14 days
Ammonia	350.1	125 ml P,G	Cool, 4°C	28 days
Biochemical Oxygen Demand, 5d-BOD5	405.1	500 ml P,G	Cool, 4°C	48 hours
Boron	6010	100 ml P	Preserve in lab	6 months
Bromide	300.0	125 ml P,G	Cool, 4°C	28 days
Chemical Oxygen Demand (COD)	410.4	125 ml P,G	Cool, 4°C H_2SO_4 to pH <2	28 days
Chloride	300.0	125 ml P,G	Cool, 4°C	28 days
Color	110.2	125 ml P,G	Cool, 4°C	48 hours
Cyanide (Total)	9010	125 ml P,G	Cool, 4°C NaOH to pH >12	14 days
Hardness	130.1	100 ml P,G	HNO_3 to pH <2	6 months
Kjeldahl Nitrogen, Total	351.1	125 ml P,G	Cool, 4°C H_2SO_4 to pH <2	28 days
Metals		500 ml P,G	HNO_3 to pH <2	6 months
Aluminum (Total)	6010			
Antimony (Total)	6010			
Arsenic (Total)	6010			
Barium (Total)	6010			
Beryllium (Total)	6010			
Chromium (Total)	6010			
Chromium (Hexa.)	7196A			
Calcium (Total)	6010			
Cadmium (Total)	6010			
Cobalt (Total)	6010			
Copper (Total)	6010			
Iron (Total)	6010			
Lead (Total)	6010			
Magnesium (Total)	6010			
Manganese (Total)	6010			
Mercury (Total)	7470			
Nickel (Total)	6010			
Potassium (Total)	6010			
Selenium (Total)	6010			

Table 3. Sampling and Analysis Plan
Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

PART 363 BASELINE LIST PARAMETERS (Continued)

PARAMETER[1]	METHOD	SAMPLE COLLECTION[2] AND CONTAINER	SAMPLE[3,4] PRESERVATION	RECOMMENDED[5] HOLDING TIME
Silver (Total)	6010			
Sodium (Total)	6010			
Thallium (Total)	6010			
Vanadium (Total)	6010			
Zinc (Total)	6010			
Nitrate	300.0	125 ml P,G	Cool, 4°C	48 hours
Phenols	9066	125 ml G only	Cool, 4°C H_2SO_4 to pH <2	28 days
Sulfate	300.0	125 ml P,G	Cool, 4°C	28 days
Total Dissolved Solids residue on evaporation (TDS/ROE) 180° C	160.1	500 ml P	Cool, 4°C	7 days
Total Organic Carbon (TOC)	9060	2-40 ml vial or 125 ml P	Cool, 4°C H_2SO_4 to pH <2	28 days
Volatile Organics	8260	2-40 ml vial w/septum caps	Cool, 4°C HCl to pH <2	14 days
Field Parameters				
Static water levels in wells		nearest 0.01 ft		
Specific Conductance	9050			
Temperature		nearest 0.5 ^{O} F		
Floaters and Sinkers (observation)				
pH	9040			
Eh				
Dissolved Oxygen				
Field Observations				
Turbidity	180.1			

Table 3. Sampling and Analysis Plan
Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

PART 363 EXPANDED LIST PARAMETERS

PARAMETER[1]	METHOD	SAMPLE COLLECTION[2] AND CONTAINER	SAMPLE[3,4] PRESERVATION	RECOMMENDED[5] HOLDING TIME
Alkalinity	310.2	100 ml P,G, zero headspace	Cool, 4°C	14 days
Ammonia	350.1	125 ml P,G	Cool, 4°C	28 days
Biochemical Oxygen Demand, 5d-BOD5	405.1	500 ml P,G	Cool, 4°C	48 hours
Boron	6010	100 ml P	Preserve in lab	6 months
Bromide	300.0	125 ml P,G	Cool, 4°C	28 days
Chemical Oxygen Demand (COD)	410.4	125 ml P,G	Cool, 4°C H_2SO_4 to pH <2	28 days
Chloride	300.0	125 ml P,G	Cool, 4°C	28 days
Color	110.2	125 ml P,G	Cool, 4°C	48 hours
Cyanide (Total)	9010	125 ml P,G	Cool, 4°C NaOH to pH >12	14 days
Hardness	130.1	100 ml P,G	HNO_3 to pH <2	6 months
Kjeldahl Nitrogen, Total	351.1	125 ml P,G	Cool, 4°C H_2SO_4 to pH <2	28 days
Metals		500 ml P,G	HNO_3 to pH <2	6 months
Aluminum (Total)	6010			
Antimony (Total)	6010			
Arsenic (Total)	6010			
Barium (Total)	6010			
Beryllium (Total)	6010			
Chromium (Total)	6010			
Chromium (Hexa.)	7196A			
Calcium (Total)	6010			
Cadmium (Total)	6010			
Cobalt (Total)	6010			
Copper (Total)	6010			
Iron (Total)	6010			
Lead (Total)	6010			
Magnesium (Total)	6010			
Manganese (Total)	6010			
Mercury (Total)	7470			
Nickel (Total)	6010			
Potassium (Total)	6010			
Selenium (Total)	6010			
Silver (Total)	6010			

Table 3. Sampling and Analysis Plan
Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

EXPANDED LIST PARAMETERS (Continued)

PARAMETER[1]	METHOD	SAMPLE COLLECTION[2] AND CONTAINER	SAMPLE[3,4] PRESERVATION	RECOMMENDED[5] HOLDING TIME
Sodium (Total)	6010			
Thallium (Total)	6010			
Tin (Total)	6010			
Vanadium (Total)	6010			
Zinc (Total)	6010			
Nitrate	300.0	125 ml P,G	Cool, 4°C	48 hours
Phenols	9066	125 ml G only	Cool, 4°C H_2SO_4 to pH <2	28 days
Sulfate	300.0	125 ml P,G	Cool, 4°C	28 days
Sulfide	9030	500 ml P,G	Cool, 4°C NaOH, ZnOAc to pH >9	7 days
Total Dissolved Solids residue on evaporation (TDS/ROE) 180° C	160.1	100 ml P	Cool, 4°C	7 days
Total Organic Carbon (TOC)	9060	2-40 ml vial or 125 ml P	Cool, 4°C H_2SO_4 to pH <2	28 days
Volatile Organics	8260	4-40 ml glass vial w/septum caps	Cool, 4°C HCl to pH <2	14 days
Acid Extractables	8270	1000 ml Glass only (Amber) w/Teflon liner	Cool, 4°C	Extract within 7 days; analyze within 40 days
Base/Neutral Extractables	8270	1000 ml Glass only (Amber) w/Teflon liner	Cool, 4°C	Extract within 7 days; analyze within 40 days
Herbicides	8151	1000 ml Glass only (Amber) w/Teflon liner	Cool, 4°C	Extract within 7 days; analyze within 40 days
PCB	8082	1000 ml Glass only (Amber) w/Teflon liner	Cool, 4°C	Extract within 7 days; analyze within 40 days
Radium-226	903.1	1000 ml Glass (Amber)	Cool, 4HNO3 or HCl to pH < 2	6 mos
Radium-228	904.0	1000 ml Glass (Amber)	Cool, 4HNO3 or HCl to pH < 2	6 mos
Total Uranium	908.0	1000 ml Glass (Amber)	Cool, 4HNO3 or HCl to pH < 2	6 mos.

Table 3. Sampling and Analysis Plan
Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

EXPANDED LIST PARAMETERS (Continued)

PARAMETER[1]	METHOD	SAMPLE COLLECTION[2] AND CONTAINER	SAMPLE[3,4] PRESERVATION	RECOMMENDED[5] HOLDING TIME
Pesticides	8081	1000 ml Glass only (Amber) w/Teflon liner	Cool, 4°C pH 5 - 9	Extract within 7 days; analyze within 40 days
Semi-volatile Organics	8270	1000 ml Glass only (Amber) w/Teflon liner	Cool, 4°C	Extract within 7 days; analyze within 40 days
Per- & polyfluoroalkyl Substances (PFAS)	537 MOD	P,G 250 mL	Trizma® at 5g/L	14 days
1,4-Dioxane	8270D SIM	1000 ml Glass only (Amber)	Cool, 4°C	Extract within 7 days; analyze within 40 days

Field Parameters

Static water levels nearest 0.01 ft in wells

Specific Conductance

Temperature nearest 0.5 ^{O} F

Floaters and Sinkers (observation)

pH 9040

Eh

Dissolved Oxygen

Field Observations

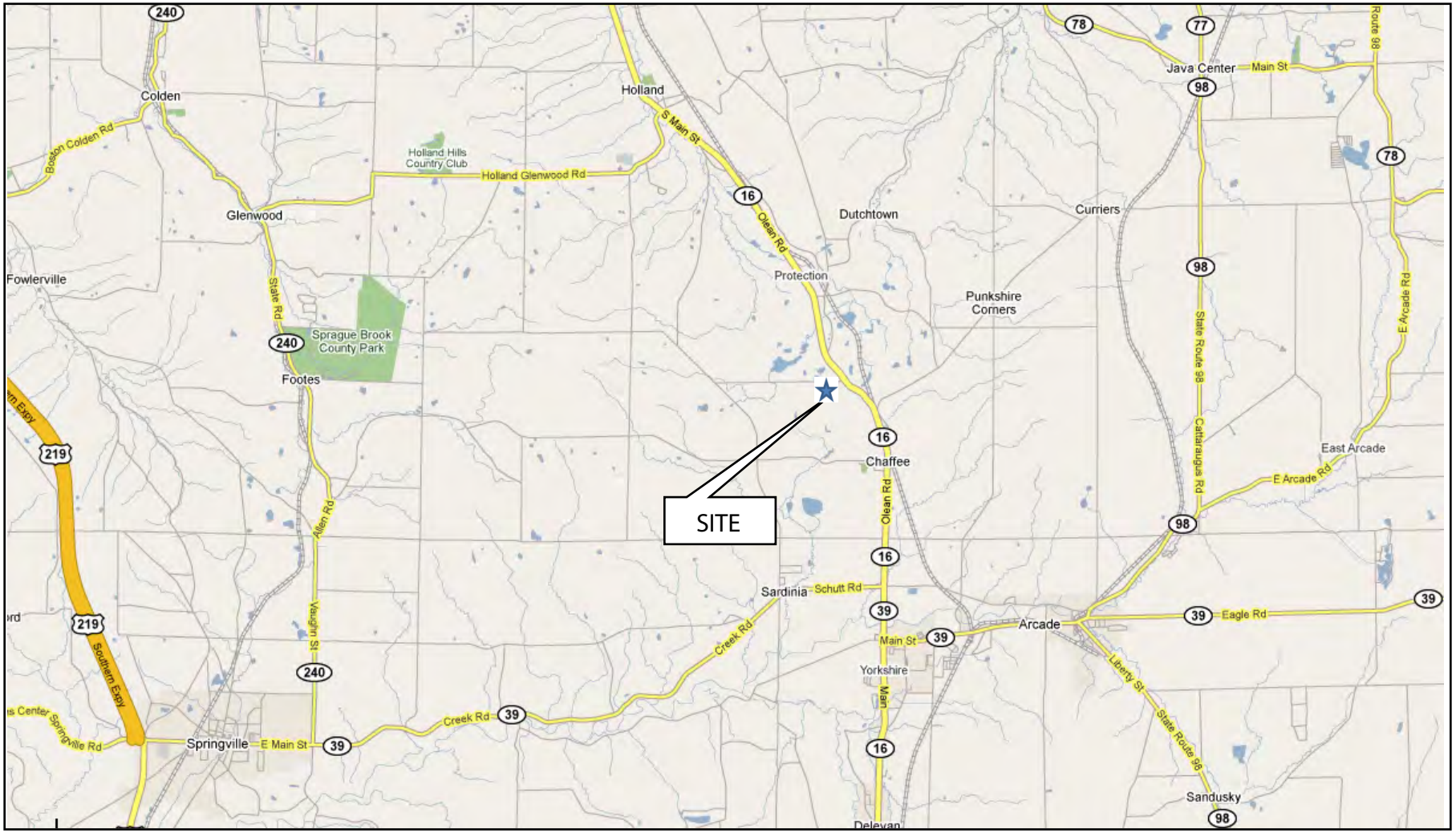
Turbidity 180.1

Notes

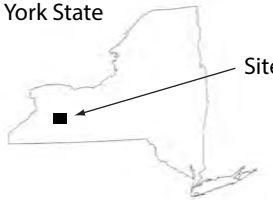
1. Table include Part 363-4 Baseline and Expanded list parameters and is inclusive of parameters on the Routine List..
2. Plastic (P) or Glass (G). For metals, polyethylene with a polypropylene cap (no liner) is preferred.
3. Sample preservation should be performed immediately upon sample collection. For composite samples, each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.
4. When any sample is to be shipped by common carrier or sent through the United States mail, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of Table 5-4, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCI) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HNO_3) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); Sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).
5. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of sample under study are stable for the longer time, and has received a variance from the Regional Administrator. Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.

   Note: Many tests can be combined in bottles. For example, Chloride, Fluoride, Nitrate, Nitrite, pH, Sulfate, TDS, TSS will be collected in a 1 liter plastic bottle.

Figures



New York State



N

0 2

Scale in Miles (approximate)

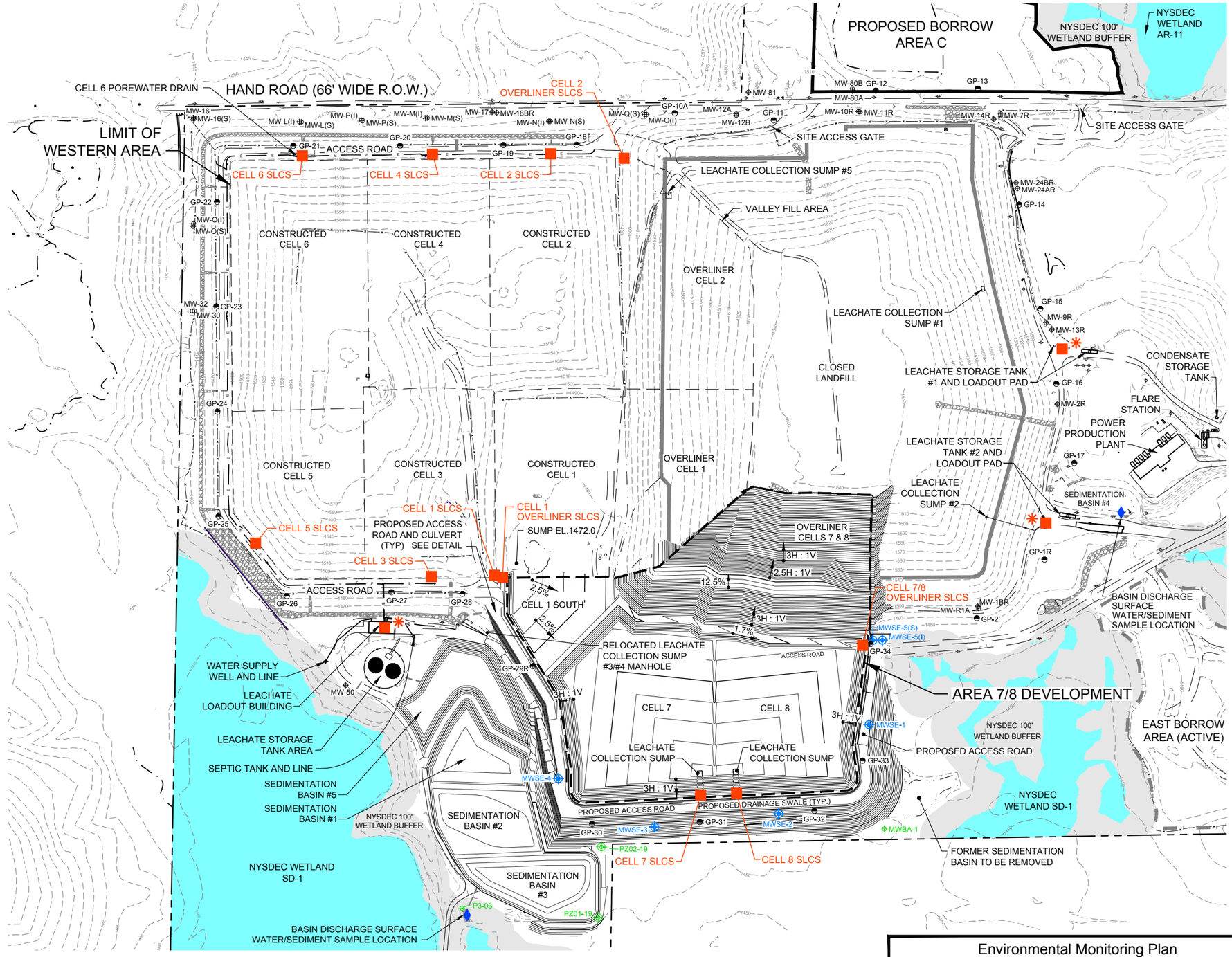
Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

Waste Management of New York, L.L.C.
Chaffee, New York

GEI Consultants

SITE LOCATION

Project 1900192 | April 2020 | Fig. 1



LEGEND

- CLOSED LANDFILL AREA
- EXISTING CONTOURS (1450)
- AREA 7/8 CONTOURS
- EXISTING STORMWATER BASIN
- EXISTING CULVERT
- EXISTING RIP-RAP
- PROPERTY LINE
- APPROXIMATE WESTERN AREA AND VALLEY FILL CELL BOUNDARIES
- APPROXIMATE BORROW AREA LIMIT
- 100' WETLAND BUFFER / DELINEATED WETLAND
- ⊕ MW-1BR — MONITORING WELL
- ◓ GP-28 — GAS PROBE
- AREA 7/8 DEVELOPMENT MONITORING WELL
- PIEZOMETER FOR WATER LEVELS ONLY
- SURFACE WATER SAMPLE LOCATION
- LEACHATE SAMPLING LOCATION
- DENOTES A SAMPLE THAT IS COMPOSITED TO REPRESENT FACILITY-WIDE PRIMARY LEACHATE

SOURCE:

PLAN BASED ON DRAWINGS PREPARED BY McMAHON & MANN, BUFFALO N.Y., OCTOBER 2018.

Environmental Monitoring Plan
Chaffee Landfill Facility
Town of Sardinia, New York

Waste Management of New York, L.L.C.
Chaffee, New York

GEI Consultants

GROUNDWATER MONITORING WELL NETWORK AND GAS PROBE LOCATIONS

Project 1900192 | April 2020 | Fig. 2

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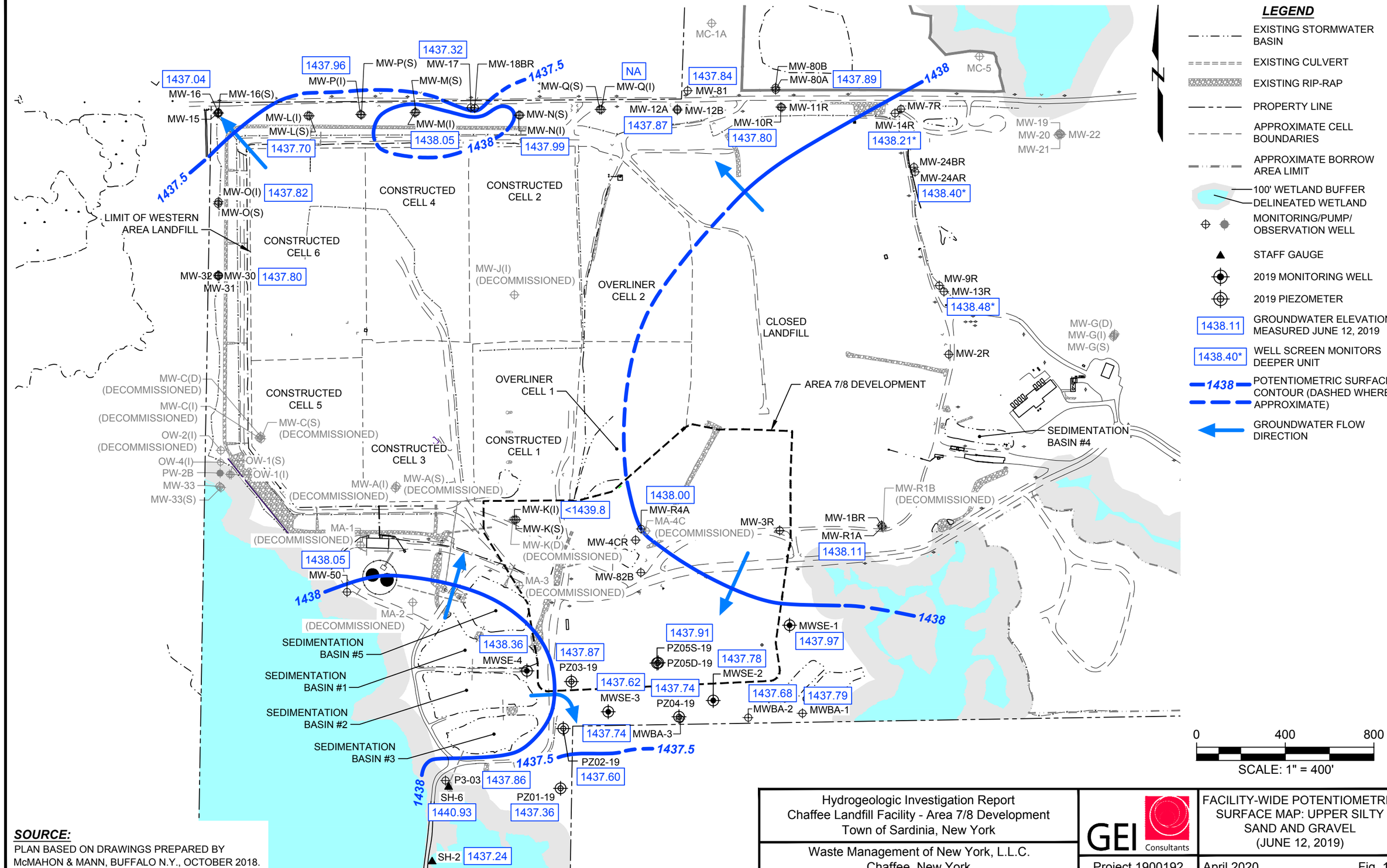
Appendix A

Potentiometric Surface Maps



SOURCE:
PLAN BASED ON DRAWINGS PREPARED BY McMAHON & MANN, BUFFALO N.Y., OCTOBER 2018.

Hydrogeologic Investigation Report Chaffee Landfill Facility - Area 7/8 Development Town of Sardinia, New York	GEI Consultants	FACILITY-WIDE POTENTIOMETRIC SURFACE MAP: UPPER SILTY SAND AND GRAVEL (JUNE 12, 2019)
Waste Management of New York, L.L.C. Chaffee, New York	Project 1900192	April 2020 Fig. 16

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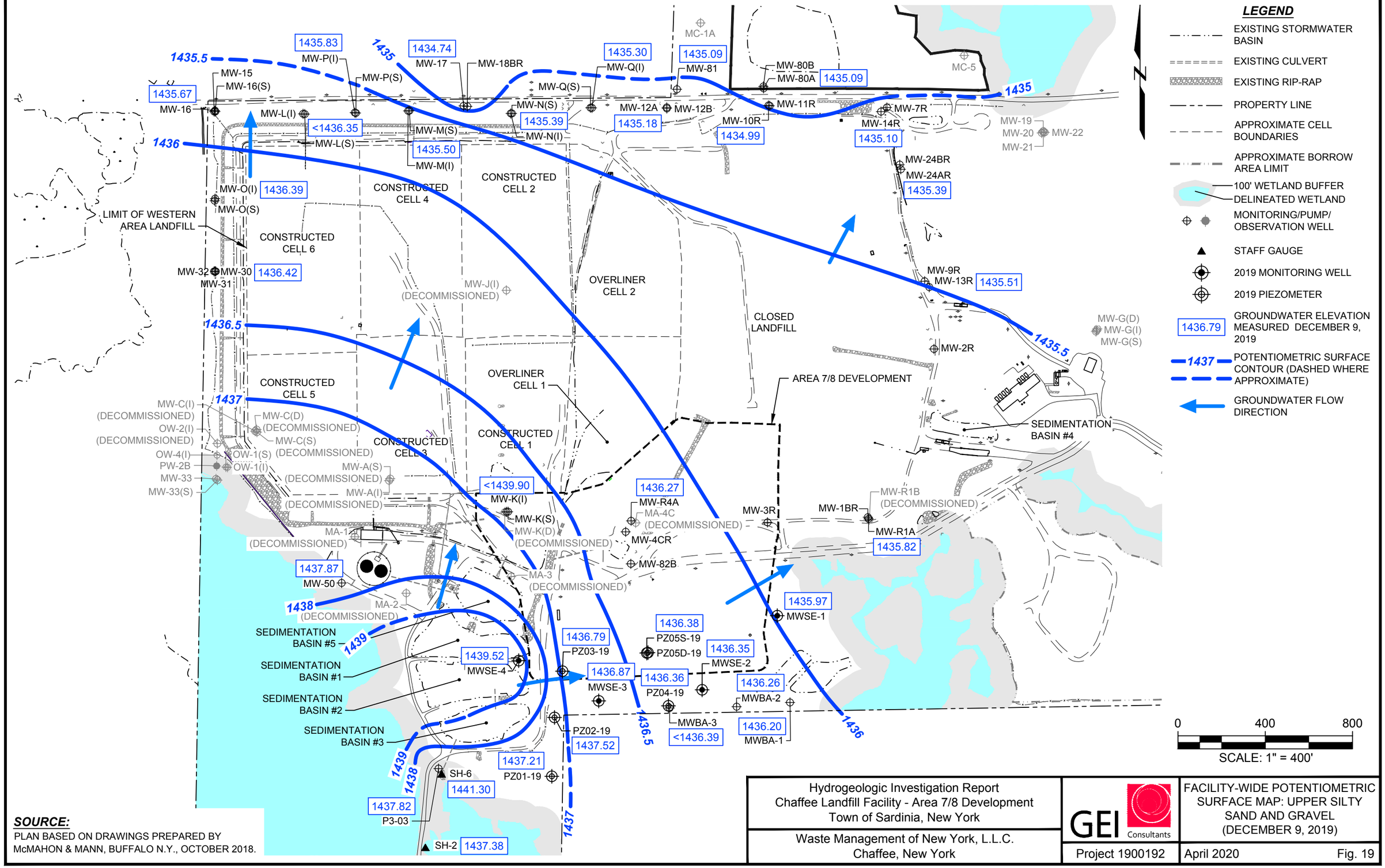

SOURCE:
PLAN BASED ON DRAWINGS PREPARED BY McMAHON & MANN, BUFFALO N.Y., OCTOBER 2018.

Hydrogeologic Investigation Report Chaffee Landfill Facility - Area 7/8 Development Town of Sardinia, New York	GEI Consultants	FACILITY-WIDE POTENTIOMETRIC SURFACE MAP: UPPER SILTY SAND AND GRAVEL (DECEMBER 9, 2019)
Waste Management of New York, L.L.C. Chaffee, New York	Project 1900192	April 2020 Fig. 19

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Appendix B

Borehole and Well Construction Logs

Closed Landfill Area Logs

EARTH DIMENSIONS, INC.

Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

NG WELL R-1

PROJECT Replacement of MW installation
Hand Road, Town of Sardinia

CLIENT CID Refuse Service

R1A 1485.0
SURF. ELEV. R1B 1484.3

LOCATION Near southeast corner of ~~proposed landfill expansion~~

DATE STARTED 9/7/83 COMPLETED 9/12/83

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION
	1	3					Slightly moist black silt loam (SANDY-SILT) topsoil, loose 0.3
			12			65	Slightly moist brown silt loam (SANDY-SILT), loose, blocky soil structure
				53			- - - - clear transition to - - 1.2
					83		Moist faintly mottled brown gravelly loam (SAND-SILT-CLAY) with 15 to 25% gravel of mixed lithology, hard, weak blocky soil structure
	2	21					- - - - grades downward to - - - 3.0
			24			47	Moist faintly mottled olive brown silt loam (CLAYEY-SILT) with 5 to 15% mostly fine size black shale gravel, thinly laminated with thin sand layers
				23			- - - - grades downward to - - - 4.0
					25		Moist distinctly mottled olive brown silty clay loam (CLAYEY-SILT) with 2 to 5% gravel, hard with nearly vertical gray desiccation cracks
	3	8					- - - - clear transition to - - 10.0
5			18				Extremely moist dark gray silty clay loam (CLAYEY-SILT) with 2 to 5% mostly fine size gravel, hard, weakly thinly laminated
				24		42	- - - - grades downward to - - - 14.0
					30		Extremely moist dark gray silty clay (CLAYEY-SILT) with 2 to 5% mostly fine size gravel, hard, weakly thinly laminated with very thin coarse silt lenses
	4	11					
			19				
				27		46	
					34		
	5	11					
			22				
				30		52	
10					41		
	6	12					
			22				
				24		46	
					32		
	7	11					
			15				
				16		31	
					27		
	8	6					
15			13				
				19		32	
					28		
	9	4					
			8				
				13		21	

WELL R-1A

Two inch inside diameter PVC pipe

Cement bentonite grout seal

WELL R-1B

2" inside diameter PVC pipe

Cement/bentonite grout

8.0

(2)

9.0

(1) #4 size sand

12

14.

(1) #10 slot PVC scre

(2) Bentonit seal

Continued on 2...

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb WT FALLING 30

EARTH DIMENSIONS, INC.
Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

TORING WELL R-1 continued SURF. ELEV. _____

9k PROJECT Replacement of MW installation Hand Road, Town of Sardinia LOCATION Near southeast corner of proposed landfill expansion

CLIENT CID Refuse Service DATE STARTED 9/7/83 COMPLETED 9/12/83

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL R-1A	WATER TABLE & REMARKS
	9				20		See previous sheet. clear transition to - 18.0 -		Coarse silty lake sediment to 1.2 feet over water sorted and deposited mostly sand and gravel with some silt and clay to 3.0 feet over silty lake sediment to 14.0 feet over clayey lake sediment to 18.0 feet over silty lake sediment to 28.0 feet over clayey lake sediment to 42.2 feet over water sorted and deposited mostly sand to 42.8 feet over water sorted and deposited mostly sand and gravel with mostly stone free sand interlayers to end of boring.
	10	6					Extremely moist dark gray silt loam (CLAYEY-SILT), very stiff, thinly laminated with very thin coarse silt lenses		
			11			25			
				14					
20					18				
	11	6					- - - - - clear transition to - 20.0 -		
			8				Extremely moist dark gray silty clay loam (CLAYEY-SILT) with 2 to 5% mostly fine size gravel, very stiff, thinly laminated with very thin coarse silt lenses		
				17		25			
					23				
	12	5							
			9			23			
				14					
					19				
	13	4							
25			7			22			
				15					
					20				
	14	5							
			9			23			
				14					
					21				
	15	5							
			11			31			
				20					
30					30				
	16	7							
			14			32			
				18					
					28				
	17	8							
			16			36			
				20					
					29				
	18	6							
35			12				Extremely moist dark gray silty clay (CLAYEY-SILT) with 2 to 5% mostly fine size gravel, hard, thinly laminated with very thin coarse silt lenses		

Two inch inside diameter PVC pipe

Cement/bentonite grout seal

Continued on 3.....

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

EARTH DIMENSIONS, INC.
Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

RING WELL R-1 continued

SURF. ELEV. _____

'9k PROJECT Replacement of MW installation
Hand Road, Town of Sardinia

LOCATION Near southeast corner of proposed landfill expansion

CLIENT CID Refuse Service

DATE STARTED 9/7/83 COMPLETED 9/12/8

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	18			18	24	30
	19	9		21		45
				24	36	
	20	8	17			39
40				22	33	
	21	7	13	18	28	31
	22	14	34	55	25	89
	23	20	44	50	32	94
	24	8	17	27	32	44
	25	7	17	17	19	34
50	26	1	16	27	53	43
	27	18				

DESCRIPTION & CLASSIFICATION

Extremely moist dark gray silty clay (CLAYEY-SILT) with 2 to 5% mostly fine size gravel, hard, thinly laminated with very thin coarse silt lenses

42.2

Moist distinctly mottled brown loamy sand (SAND) with 5 to 15% mostly rounded gravel, stratified, loose when disturbed

42.8

Moist distinctly mottled brown very gravelly loamy sand (SAND) with 40 to 50% mostly rounded and subrounded gravel & occasional cobble of mixed lithology, stratified, loose when disturbed

47.5

Extremely moist distinctly mottled brown fine sandy loam (SILTY-SAND) dense in place, thinly bedded 47.7

Moist distinctly mottled brown very gravelly loamy sand (SAND) with 40 to 50% mostly rounded and subrounded gravel & occasional cobble of mixed lithology, stratified, loose when disturbed

- - - - clear transition to - - 49.0

Wet faintly mottled grayish brown very gravelly loamy sand (SAND) with 40 to 50% mostly rounded and subrounded gravel & occasional cobble of mixed lithology, stratified, loose when disturbed

- - - - clear transition to - - 50.5

Wet grayish brown loamy sand (SAND) with 5 to 15% gravel, medium to coarse size sand, stratified

- - - - clear transition to - - 51.0

See next sheet

WELL R-1A

Two inch inside diameter PVC pipe

Cement/bentonite grout

Number 4 size sand

(1)

(2)

WATER TABLE & REMARKS

41.0

42.0

52.0

(1) Bentonite seal

(2) #10 slott PVC well screen

Continued on 4

N = NUMBER OF BLOWS TO DRIVE 2

EARTH DIMENSIONS, INC.

Test Borings and Logs
East Aurora, New York 14052 • (716) 688-1717

MONITORING WELL R-1 continued

SURF. ELEV. _____

79k PROJECT Replacement of MW installation
Hand Road, Town of Sardinia

LOCATION Near southeast corner of proposed landfill expansion

CLIENT CID Refuse Service

DATE STARTED 9/7/83 COMPLETED 9/12/83

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL (1)	WELL (2)	WATER TABLE & REMARK
	27		21			35	Wet grayish brown gravelly loamy sand (SAND) with 30 to 40% mostly subangular gravel & occasional cobble, stratified, loose when disturbed			(1) # 10 slotte PVC well sc
				14						(2) # 4 size gr
					17					
55							- - - - clear transition to - 53.3 - Wet gray very gravelly loamy sand (SAND) with 40 to 50% mostly fine size subrounded gravel, loose when disturbed, stratified with fine sand lenses which tend to liquefy when disturbed 54.0			54.0
							Boring completed at 54.0 feet.			

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

FIELD BORING LOG

DEPTH HOLE 36' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MWR-1BR
DEPTH SOIL DRILL 36' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 1 OF 3
DEPTH ROCK CORE N/A WEATHER RAIN DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1485.1
NO. DIST. N/A US. N/A TEMP. 36 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1520/12-11-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 0940/12-12-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
O.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	CLAY TILL UNIT Stiff to hard, gray, SILTY CLAY, trace to little fine to medium gravel, gravel sub-angular to sub-rounded, medium plasticity, thinly laminated, occasional wet silt and sand layers. (CL)						0	Auger with no sampling from 0 to 4' bgs. Auger with standard sampling 4' to 14' bgs. Auger with continuous sampling 14' to 36' bgs.
4		6	1		3 3 3 3	20"	4	4' to 5' bgs Med., stiff, brown, SILTY CLAY, trace fine m Gravel to medium gravel, mod-low plasticity, wet. (ML-CL)
5							5	5' to 5.7' bgs Loose, fine to medium, SAND, little clayey silt dilatancy quick, occasional fine gravel. (SM)
9		10	2		4 5 5 7	16"	9	Stiff, gray CLAYEY SILT, trace, f. to m. gravel thinly laminated, more pronounced at 10.5' - 11.0' bgs, med. plasticity (CL)
12							12	

FIELD BORING LOG

DEPTH HOLE 36' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MWR-1BR
DEPTH SOIL DRILL 36' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 2 OF 3
DEPTH ROCK CORE N/A WEATHER RAIN DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1485.1
NO. DIST. N/A US. N/A TEMP. 36 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1520/12-11-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 0940/12-12-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
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ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0-5%
"LITTLE" – 5-12%
"SOME" – 12-30%
"AND" – 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
13	CLAY TILL UNIT Stiff to hard, gray, SILTY CLAY, trace to little fine to medium gravel, gravel sub-angular to sub-rounded, medium plasticity, thinly laminated, occasional wet silt and sand layers. (CL)							
14		11	3		3 5 6 8	14"		Stiff, gray, CLAYEY SILT, little fine to med. gravel, thinly laminated, moist, moderate plasticity, gravel sub-angular to sub-rounded. (CL)
15								
16		8	4		2 3 5 7	23"		Stiff-mod stiff, gray SILTY CLAY, fine to medium gravel, moist, gravel sub-angular to sub-rounded (CL)
17								
18		10	5		4 4 6 6	16"		Stiff, gray, SILTY CLAY, little f-m, gravel thinly laminated, medium plasticity, moist. (CL)
19								
20		10	6		3 4 6 8	16"		Stiff, gray, SILTY CLAY, trace, f-m, gravel thinly laminated, medium plasticity, moist. gravel sub-rounded to sub-angular (CL)
21								
22		8	7		2 3 5 6	20"		Stiff, gray, SILTY CLAY, trace, f-m, gravel thinly laminated, medium plasticity, moist. (CL)
23								
24								

FIELD BORING LOG

DEPTH HOLE 36' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MWR-1BR
DEPTH SOIL DRILL 36' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 3 OF 3
DEPTH ROCK CORE N/A WEATHER RAIN DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1485.1
NO. DIST. N/A US. N/A TEMP. 36 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. DRY HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1520/12-11-02
TIME WL. 0810 HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 0940/12-12-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
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ABBREVIATIONS

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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

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"TRACE" - 0-5%
"LITTLE" - 5-12%
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"AND" - 30-50%

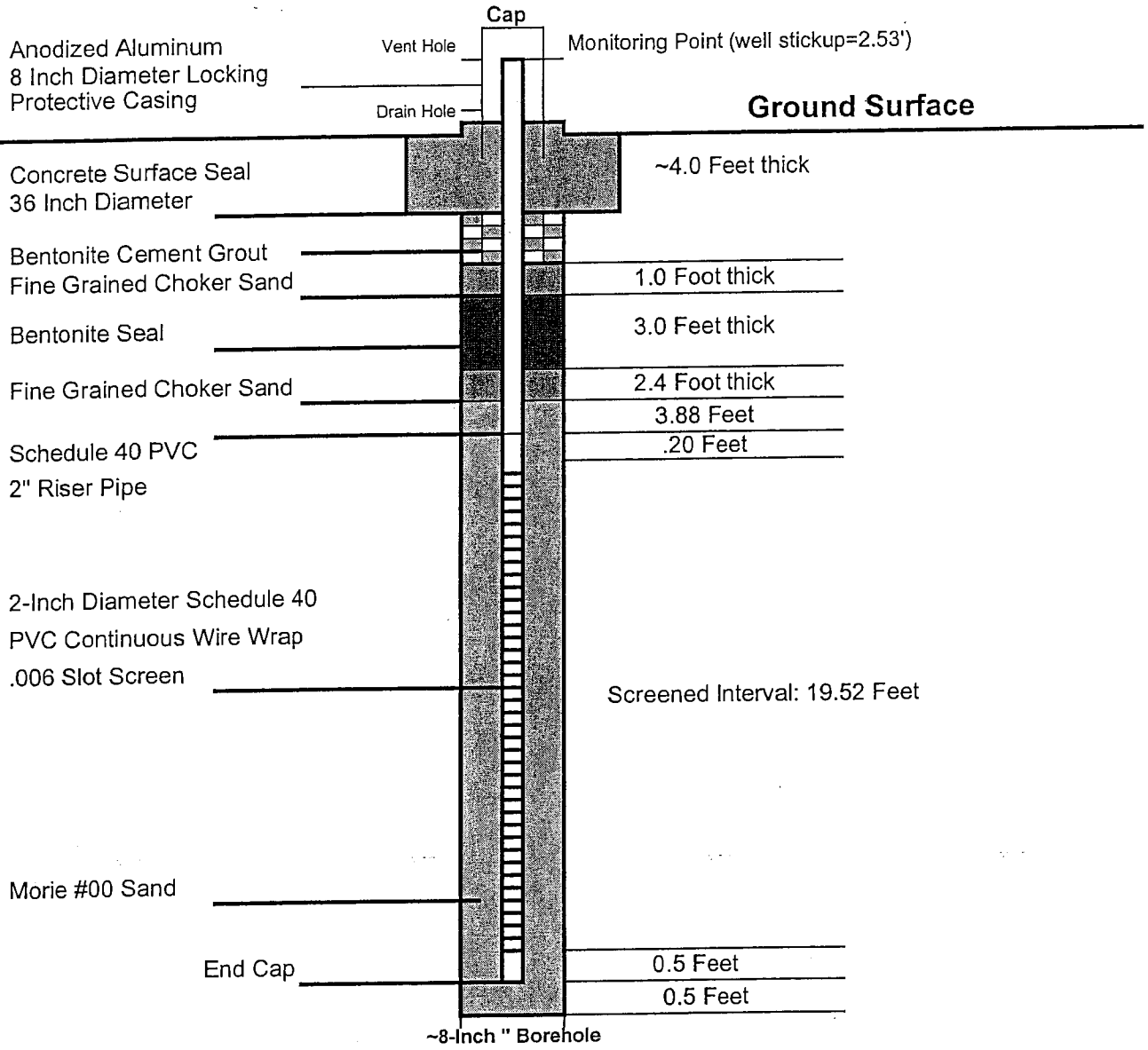
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
25	CLAY TILL UNIT Stiff to hard, gray, SILTY CLAY, trace to little fine to medium gravel, gravel sub-angular to sub-rounded, medium plasticity, thinly laminated, occasional wet silt and sand layers. (CL)	6	8		1 2 4 4	20"		Mod., stiff, gray, SILTY CLAY, trace, fine gravel, thinly laminated, gravel sub-angular to sub-rounded. (CL) Two fine SAND and SILT lenses @25.2' and 25.5' med.-quick dilatancy (saturated) (SM)
26								
27		9	9		2 3 6 8	17"		Stiff, gray, SILTY CLAY, trace, fine gravel, thinly laminated, mod. plasticity, moist, gravel sub-rounded to sub-angular, occ. med. gravel. (CL)
28								
29		12	10		3 5 7 9	21"		Stiff, gray, SILTY CLAY, little, f-m gravel, thinly laminated, gravel sub-angular to sub-rounded, moist. (CL)
30								
31		14	11		5 7 7 8	21"		Stiff, gray, SILTY CLAY, trace, fine gravel, gravel sub-rounded to sub-angular, moist, occ. m. gravel (CL)
32								
33		16	12		4 7 9 12	10"		Stiff, gray, SILTY CLAY, trace, fine gravel, occ. med. gravel, moist, med. plasticity. (CL)
34								
35		22	13		6 9 13 14	24"		Hard, gray, SILTY CLAY, trace, fine, gravel med. plasticity, moist. (CL)
36	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: 023-9340	Project: **Chaffee Landfill Well Inst.**	Well No.: **MWR-1BR**	Sheet 1 of 1
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1485.1	Water Depth: N/A
Weather: RAIN	Drilling Company: SJB Services	Riser Elev.: 1487.63	Date: 12/11-12/12/02
Temp: 18° F	Drill Rig: CME 550X	Time Started: 1520	Time Completed: 0940



Total depth of soil boring: 35' b.g.s. Thickness of sandpack: 24.6' Well Bottom: 34.5' b.g.s.

Golder Associates Inc. **Buffalo, N.Y.**	**CHAFFEE LANDFILL** **CHAFFEE, NEW YORK**	**MWR-1BR Monitoring Well Detail** **Clay Till Unit**		
Job No. 023-9340		Drawn by: AJN	Checked by: NKW	Date: 7/25/2003

EARTH DIMENSIONS, INC.
Soil and Hydrogeologic Investigations • Wetland Delineations
1091 Jamison Road • Elma, NY 14059
(716) 655-1717 • FAX (716) 655-2915

2A79an HOLE NO. MW-2R SURF. ELEVATION _

PROJECT Well #2 Replacement East Side of Chaffee Landfill, Town of Sardinia, Erie Co., NY LOCATION _

CLIENT McMahon & Mann Consulting Engineers, P.C. DATE STARTED 2/06/02 COMPLETED 2/06/02

DEPTH IN FT	SN	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL (1)	WATER TABLE AND REMARKS
	1	40	27	23	30	50		Extremely moist brown very gravelly (SAND) fill with 40 to 60% gravel, very fine to very coarse size sand, trace to little silt and clay, very dense, massive soil structure, (SW), (GW) tending toward (SM), (GM). 2.5		← 2.0' Sand and gravel fill with trace to little silt and clay to 2.5 feet over silty fill with little clay to 4.5 feet over sand fill with little gravel to 6.0 feet over silty soil fill with little clay to 10.0 feet over silty soil fill with little sand, gravel and clay to 12.0 feet over silty slack water sediment with little clay to end of boring.
	2	5	6	9	13	15		Moist olive gray (CLAYEY-SILT) fill with 5 to 10% mostly subangular gravel, little clay, stiff, massive soil structure, (ML-CL). 4.5		
5	3	6	8	10	10	18		Wet brown gravelly (SAND) fill with 15 to 20% mostly subrounded gravel, very fine to very coarse size sand, trace silt, compact, loose when disturbed, (SW). 6.0		← 7.0' ← 7.5'
	4	4	6	9	11	15		Extremely moist olive gray (CLAYEY-SILT) fill with 3 to 10% mostly subangular gravel, little to some clay, stiff, massive soil structure, (ML-CL). grades downward to 8.0		
10	5	5	7	9	10	16		Extremely moist olive gray (CLAYEY-SILT) with 5 to 10% mostly subangular gravel, trace sand, little clay, very stiff, thinly laminated with very thin coarse silt lenses, (ML-CL). grades downward to 10.0		← 10.5' ← 11.0'
	6	3	3	6	8	9		Extremely moist mixed olive gray and brown (SAND-SILT-CLAY) fill with 10 to 15% gravel, little sand and clay, very stiff, massive soil structure, (SC). grades downward to 12.0		← 13.0' (1) 6" LOCKING PROTECTIVE CASING INSTALLED IN AN 18" x 12" SONA TUBE WITH CONCRETE TO 2.0 FEET. (2) 00 MORIE SAND PACK (3) BENTONITE SEAL
	7	2	3	7	9	10		Wet olive gray (CLAYEY-SILT) with 3 to 5% mostly subangular gravel, little to some clay, stiff, thinly laminated with thin SILTY-SAND lenses, (ML-CL). 18.0		
15	8	4	3	6	10	9		Boring completed at 18.0 feet.		← 18.0'
	9	3	3	5	8	8				

WELL (1): 2" SCHEDULE 80 PVC RISER; .006 SLOT WIRE SCREEN; #00N MORIE SAND PACK (2); CEMENT BENTONITE GROUT (1); (3)

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian R. Bartron, Donald W. Owens, (dld) SHEET 1 OF 1

EARTH DIMENSIONS, INC.
Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

MONITORING WELL R-3

SURF. ELEV. 1493.8

PROJECT Monitoring well installation
2A79k Chaffee, New York

LOCATION South central of proposed landfill expansion

CLIENT Chaffee Landfill, Inc.

DATE STARTED 9/7/83 COMPLETED 9/7/83

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	1	6				
			12			42
				30		
					36	
	2	18				
			26			59
				33		
					34	
	3	5				
5			9			24
				15		
					20	
	4	9				
			19			49
				30		
					37	
	5	15				
			24			61
				37		
10					46	
	6	9				
			15			37
				22		
					24	
	7	7				
			12			31
				19		
					27	
	8	5				
15			12			30
				18		
					25	

DESCRIPTION & CLASSIFICATION	WELL R-3	WATER TABLE & REMARKS
Moist black silt loam (CLAYEY-SILT) topsoil, loose — 0.5		Silty lake sedimen to end of boring.
Slightly moist faintly mottled light brown silt loam (CLAYEY-SILT) with 2 to 5% mostly subangular gravel of mixed lithology, hard, blocky soil structure		(1) #10 slotted PVC screen.
- - - - clear transition to - - - 1.5		(2) Bentonite seal
Moist distinctly mottled olive brown silty clay loam (CLAYEY-SILT) with 2 to 5% mostly fine size gravel, hard, blocky soil structure		
- - - - grades downward to - - - 4.0		
Moist distinctly mottled olive brown silty clay loam (CLAYEY-SILT) with 2 to 5% mostly fine size gravel, very stiff with nearly vertical gray desiccation cracks		
- - - - grades downward to - - - 7.0	2 inch ID PVC pipe; Cement/bentonite grout	8.0
Extremely moist faintly mottled olive brown silty clay loam (CLAYEY-SILT) with 2 to 5% mostly fine size black shale gravel, hard, weakly thinly laminated with very thin coarse silt lenses	(2)	9.0
- - - - clear transition to - - - 10.2	#4 size sand	12.0
Extremely moist dark gray silty clay loam (CLAYEY-SILT) with 2 to 8% mostly fine size black shale gravel, hard, weakly thinly laminated	(1)	14.0
16.0		16.0
Boring completed at 16.0 feet.	No water at completion.	

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

EARTH DIMENSIONS, INC.

Test Borings and Logs
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MONITORING WELL R-4A

SURF. ELEV. 1478.0

PROJECT Replacement MW installation
2A79K-1 Hand Road, Town of Sardinia

LOCATION Near southwest corner of proposed landfill expansion

CLIENT CID Refuse Service

DATE STARTED 8/20/84 COMPLETED 8/21/84

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION
							Extremely moist distinctly mottled black mixed silty clay loam (CLAYEY-SILT) and silt loam (CLAYEY-SILT) topsoil, disturbed, firm 1.0
							Moist distinctly mottled olive brown silty clay loam (CLAYEY-SILT), hard, weak blocky soil structure
							- - - - grades downward to - - - - 2.0
							Moist faintly mottled olive brown silty clay loam (CLAYEY-SILT) with 2 to 5% gravel & occasional cobble of mixed lithology, weakly thinly laminated with nearly vertical gray desiccation cracks
5							
							- - - - - grades downward to - - - - 7.0
							Moist gray silty clay loam (CLAYEY-SILT) with 2 to 5% mostly black shale gravel & occasional cobble, hard, weakly thinly laminated
							- - - - clear transition to - - - 8.0
10							Moist distinctly mottled brownish gray silty clay loam (CLAYEY-SILT) with 2 to 5% fine size gravel and occasional cobble, hard, interlayered with extremely moist graysih brown coarse silt lenses 1/16-1 inch thick
							- - - - clear transition to - - - 10.0
	1	4					Extremely moist dark gray silt loam (CLAYEY-SILT) with 2 to 5% subangular black shale gravel, hard, weakly thinly laminated
15			25			62	
				37			
					50		
	2	10					
			23			62	
				39			

Description based on samples collected for replacement well R-4

WELL R-4A: Two inch inside diameter PVC pipe; Cement-bentonite grout; Soil backfill

WATER TABLE & REMARKS

Ground level at R-4A is approximately 1 foot higher than wel # R-4.

Silty lake sediment to 24.0 feet over water sorted and deposited fine sand and coarse silt to 27.0 feet ove silty lake sediment to 30.5 fee over shaly silty glacial drift to 36.5 feet over water sorted and deposited mostly sand and gravel to end of sampling.

Cont. on sheet 2...

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

George Moreau/Natural Resource Specialist

EARTH DIMENSIONS, INC.
Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

MONITORING WELL R-4A continued

SURF. ELEV. _____

PROJECT Replacement MW installation
2A79K-1 Hand Road, Town of Sardinia
CLIENT CID Refuse Service

LOCATION Near southwest corner of proposed landfill expansion
DATE STARTED 8/20/84 COMPLETED 8/21/84

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL R-4A	WATER TABLE & REMARKS
					50				
	3	10					Extremely moist dark gray silt loam (CLAYEY-SILT) with 2 to 5% subangular black shale gravel, hard, weakly thinly laminated		
			24			68			
				44					
20					49				
							- - - - - clear transition to - - - 20.0		
	4	8							
			24			65			
				41			Extremely moist dark gray silt loam (CLAYEY-SILT) with 2 to 5% subangular black shale gravel, hard, thinly laminated with coarse silt/fine sand lenses		
					59				
	5	14							
			27			67			
				40					
					48				
							- - - - - clear transition to - - - 24.0		
	6	17							
25			27			64	Wet olive silt loam (SILT) interbedded with wet gray loamy sand (SAND) fine to coarse size sand, very dense, thinly bedded with a slight tendency to liquefy when distrubed		
				37					
					36				
							- - - - - grades downward to - - - - 27.0		
	7	WR					Extremely moist gray silt loam (CLAYEY-SILT) with 2 to 10% subangular black shale gravel, hard, thinly laminated with fine sand/coarse silt lenses		WR - sampler penetration with weight of rods only.
			13			35			
				22					
	8	9							
30			16			29			
				13					
					6				
							- - - - - grades downward to - - - - 30.5		
	9	WR							
			8			24	Extremely moist to wet gray shaly silt loam (CLAYEY-SILT) with 15 to 25% subangular black shale gravel and occasional cobble, hard with occasional (SILTY-SAND)		
				16					
					24				
	10	7							
			26			76			
				50			- - - - - grades downward to - - - - 34.0		
35					80		See next sheet		

Two inch inside diameter PVC pipe
Soil backfill

Cont. on sheet 3....

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.
George Moreau/Natural Resource Specialist

EARTH DIMENSIONS, INC.

Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

MONITORING WELL R-4A continued

SURF. ELEV. _____

PROJECT Replacement MW installation
2A79K-1 Hand Road, Town of Sardinia
CLIENT CID Refuse Service

LOCATION Near southwest corner of proposed landfill expansion
DATE STARTED 8/20/84 COMPLETED 8/21/84

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION
	11	18					Extremely moist gray and olive gray shaly silt loam (CLAYEY-SILT) with 25 to 40% mostly subangular shale gravel and occasional cobble of mixed lithology, hard, massive soil structure
			27			64	
				37			
					100/4.5"		
	12	35					
			100/5"				
	13	42					
			100				
							- - - - clear transition to - - - 36.5
							Moist faintly mottled brown very gravelly sandy loam (SILTY-SAND) with 40 to 50% mostly subangular gravel and occasional boulder of mixed lithology, very dense, appears to be cemented, weakly stratified
40							
							- - - - grades downward to - - - 43.0
45	C O R E R U N # 1						Wet gray very gravelly sandy loam (SILTY-SAND) with 40 to 50% mostly subangular gravel and occasional boulder of mixed lithology, very dense, appears to be cemented, weakly stratified
50	C O R E R U N # 2						
55							Sampling completed to 55.0 feet.

WELL R-4A

Soil backfill — 40.0

Two inch inside diameter PVC pipe

Gravelly coring cuttings — 53.0

(1) — 55.0

WATER TABLE & REMARKS

(1) Two inch #10 slotted PVC screen.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

George Moreau/Natural Resource Specialist

FIELD BORING LOG

DEPTH HOLE 19' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MWR-4CR
DEPTH SOIL DRILL 19' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 1 OF 2
DEPTH ROCK CORE N/A WEATHER LT. RAIN DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1479.1
NO. DIST. N/A US. N/A TEMP. 35 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1600/12-12-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1400/12-13-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES MANM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
								Auger with no sampling from 0 to 4' bgs.
								Auger with standard sampling 4' to 9' bgs.
								Auger with continuous sampling 9' to 19' bgs.
4								
	FILL	3	1		4 2 1 1	6"		Soft, red–Brown to gray brown, SILTY CLAY trace, fine gravel, faint laminations (disturbed), med. plasticity, moist to wet. (CL)
5								
6								
	CLAY TILL UNIT							
7	Stiff to very stiff, gray-brown to gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub-angular to sub-rounded, medium to low plasticity, thinly laminated. (CL) (CL-ML)							
8								
9		14	2		4 7 7 10	14"		Stiff, gray–brown SILTY CLAY trace fine gravel, thinly laminated, gravel sub–rounded, med. plasticity, pushed c. gravel piece into sampler. (CL)
10								
11		11	3		3 5 6 10	14"		11'–11.5': Red–brown–gray, changing to gray Stiff SILTY CLAY to 13', med. plasticity. (CL)
12								@12': 0.05' thick layer of CLAYEY SILT slow–med. dilatancy, wet, trace fine gravel. (ML)
13		13	4		4 6 7 8	20"		Stiff, gray to brown–gray SILTY CLAY to CLAYEY SILT trace f–m gravel, moist, med. plasticity, thinly laminated. (CL)
14								Stiff, gray, SILTY CLAY, some, fine–med gravel, little m–c sand, laminations disturbed, moist. (ML)
15								

FIELD BORING LOG

DEPTH HOLE 36' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MWR-4CR
DEPTH SOIL DRILL 36' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 2 OF 2
DEPTH ROCK CORE N/A WEATHER LT. RAIN DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1479.1
NO. DIST. N/A US. N/A TEMP. 35 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1600/12-12-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1400/12-13-02

SAMPLE TYPES

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C.S.	CHUNK SAMPLE
O.D.	DRIVE OPEN
D.S.	DENISON SAMPLE
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BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
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"TRACE" – 0–5%
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LS	LOOSE	S	SOFT
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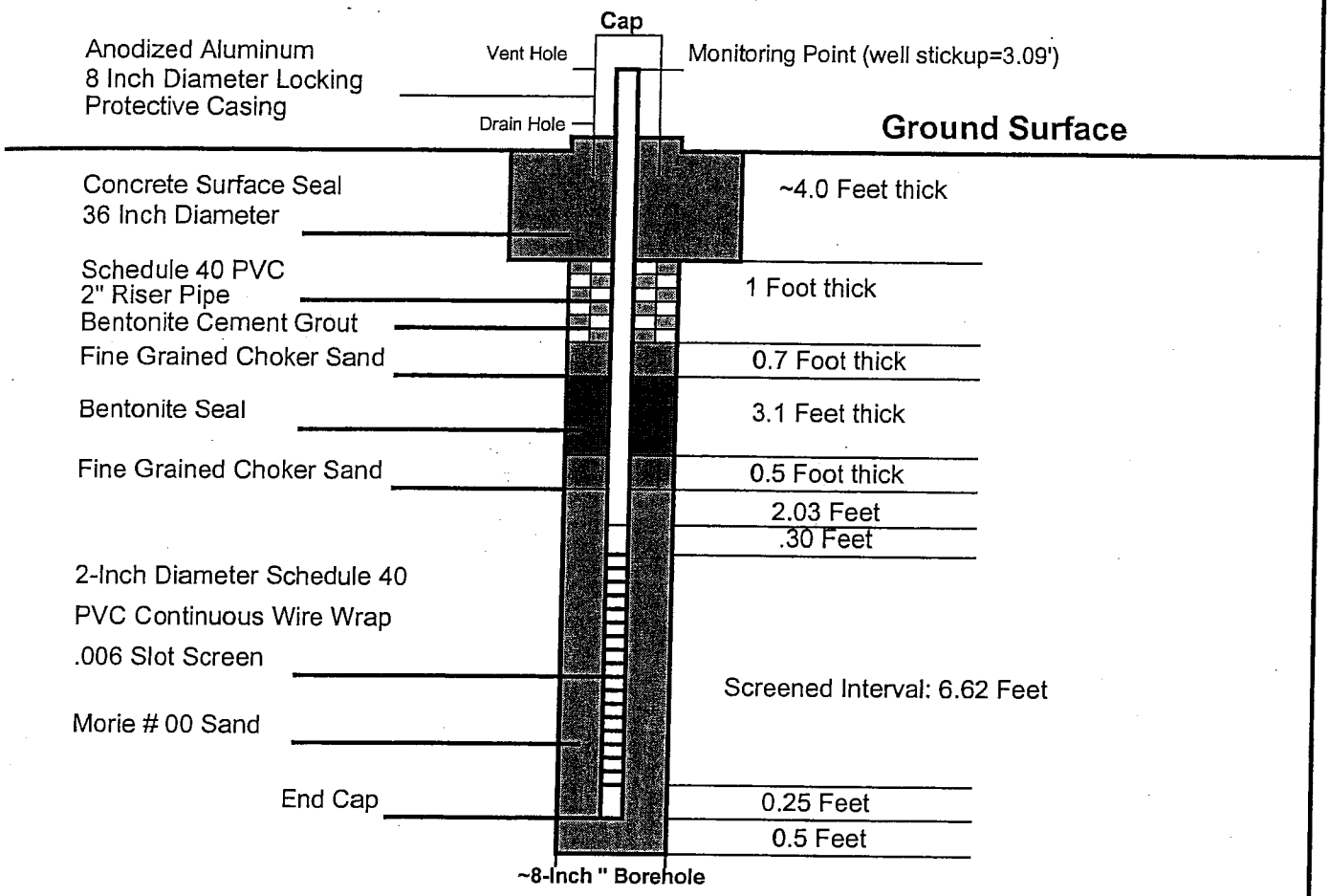
ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
16	CLAY TILL UNIT Stiff to very stiff, gray-brown to gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub-angular to sub-rounded, medium to low plasticity, thinly laminated. (CL) (CL-ML)	17	5		5 8 9 12	18"		Very stiff, gray SILTY CLAY to CLAYEY SILT some, f–m gravel, low plasticity, no dilatancy, moist, thin disturbed laminations. (CL)
17								
18		21	6		5 10 11 17	21"		Very stiff, gray CLAYEY SILT to SILTY CLAY little f–m gravel, moist, low plasticity, thinly laminated; slightly disturbed. (CL-ML)
19	END OF BORING							AUGERED TO 19' BORING DRY PRIOR TO WELL INSTALLATION

MONITORING WELL INSTALLATION DIAGRAM

b No.: 023-9340	Project: **Chaffee Landfill Well Inst.**	Well No.: **MWR-4CR**	Sheet **1** of **1**
\ Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1479.1	Water Depth: N/A
eather: LIGHT RAIN	Drilling Company: SJB Services	Riser Elev.: 1482.19	Date: 12/12-12/13/02
mp: 33° F	Drill Rig: CME 550X	Time Started: 1600	Time Completed: 1400



al depth of soil boring: 19' b.g.s. Thickness of sandpack: 9.7' Well Bottom: 18.5' b.g.s.

older Associates Inc. **Buffalo, N.Y.**	**CHAFFEE LANDFILL** **CHAFFEE, NEW YORK**	**MWR-4CR Monitoring Well Detail** **Clay Till Unit**		
		Drawn by:	Checked by:	Date:
Job No. 023-9340		AJN	NKW	7/25/2003

EARTH

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To | From
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Phone # | Phone #
Fax # | Fax #

MONITORING WELL 7R

PROJECT 2A79m Monitoring well installation, Town of Sardinia, New York

LOCATION Northeast corner of landfill (north) road side of berm, 45.0 ft from centerline of road

CLIENT CHAFFEE LANDFILL, INC.

DATE STARTED 5/12/86 COMPLETED 5/13/86

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL (1)	WATER TABLE & REMARKS
	1	3	6	4	4	10	Moist dark brown silt loam (SANDY-SILT) fill, little very fine-medium size sand, with abundant roots, (ML) 0.3	Two (2) inch inside diameter PVC pipe	Fill to 3.5 feet over likely coarse silty water or wind deposit sediment to 4.5 feet over water sorted and deposited sand with gravel and silt to 6.5 feet over silty lake sediment to 7.5 feet over water sorted and deposited mostly sand with some gravel and silt to 8.0 feet over clayey lake sediments to 30.5 feet over water sorted and deposited sand with some gravel and silt to 32.0 feet over silty lake sediments to 34.0 feet over coarse silty lake sediments to 36.0 feet over silty lake sediments to 50.0 feet over water sorted and deposited sand-silt-clay with some gravel
	2	3	4	4	6	8	Moist dark brown silt loam (SANDY-SILT) fill with 5 to 15% very fine to fine size gravel, little very fine-medium size sand, loose, few fine roots 3.5		
5	3	4	3	3	3	6	Moist faintly mottled olive brown loam (SANDY-SILT) with 5 to 15% mostly flat shale fragment, some very fine to coarse size sand, weak blocky soil structure, loose, (ML)		
	4	3	5	6	5	11	- - -grades downward to - 4.5 - Wet faintly mottled olive brown gravelly loam (SILTY-SAND) with 20 to 40% subangular and flat to subround gravel, very fine to coarse size sand, little silt, loose, weakly stratified, (SM)		
10	5	5	6	8	7	14	- - -clear transition to - 6.5 - Extremely moist faintly mottled olive brown silt loam (CLAYEY-SILT) with 5 to 15% subangular gravel, stiff, weak thinly bedded with very thin coarse silt lenses (ML) 7.5		
	6	4	7	5	11	12	Wet faintly mottled olive brown gravelly loam (SILTY-SAND) with 20 to 40% gravel, very fine to coarse size sand, little silt, loose, stratified, (SM) 8.0		
	7	3	6	7	12	13	Moist faintly mottled brownish gray silty clay loam (CLAYEY-SILT) with 3 to 5% mostly subangular fine size gravel, stiff, weak thinly bedded, with nearly vertical gray desiccation cracks, (CL)		
15	8	5	6	7	8	13	- - -grades downward to - 10.0		
	9	3	4	6		10			

Continued on sheet 2.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

Dale M. Gramza/Geologist

bs LOGGED BY Donald W. Owens/Soil Scientist

SHEET 1 OF 4

EARTH DIMENSIONS, INC.

Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

MONITORING WELL 7R continued

SURF. ELEV. 1493.48

PROJECT Monitoring well installation
2A79m Town of Sardinia, New York
CLIENT CHAFFEE LANDFILL, INC.

LOCATION Northeast corner of landfill, (north) road side of berm, 45.0 ft. from centerline of road
DATE STARTED ~~5/12/86~~ COMPLETED ~~5/13/86~~

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	9		5	Moist dark gray silty clay (CLAYEY-SILT) with <2% mostly subangular fine size gravel, stiff, weak thinly laminated with very thin coarse silt lenses, (CL)		to 56.5 feet over water sorted and deposited coarse silt with some gravel to 58.0 feet over shaly silty glacial till to end of boring.
	10	3				
		3	10			
		7				
20			7			
	11	3				
		4	9			
		5				
			8			
	12	3				
		4	12			
		8				
			10			
	13	3				
25		3	9			
		6				
			8			
	14	2				
		4	10			
		6				
			7			
	15	2				
		4	10			
		6				
30			6			
	16	4				
		24	67			
		43				
			40			
	17	3				
		8	19			
		11				
			16			
	18	4				
35		5	12			

- - - grades downward to - 16.0
Extremely moist dark gray silty clay (CLAYEY-SILT) with <2% mostly subangular fine size gravel, stiff, weak thinly laminated with very thin coarse silt lenses (CL)
- - - clear transition to - 30.5
Moist dark gray gravelly sandy loam (SILTY-SAND) with 20 to 40% very fine to coarse size subangular gravel, fine to coarse size sand, little silt, very dense in place, loose when disturbed, stratified, (SM)
- - -clear transition to - 32.0
Moist dark gray silty clay loam (CLAYEY-SILT) with <2% mostly subangular fine size shale gravel, thinly laminated with nearly vertical gray desiccation cracks, (CL)
- - -clear transition to - 34.0
Extremely moist dark gray silt loam (SANDY-SILT) with< 2% mostly subangular fine size gravel, compact, thinly bedded, (ML)

WELL: Two (2) inch inside diameter PVC pipe; Cement-bentonite grout; Bentonite pellets 28.5; #2 size sand 30.0

(1) Protective metal covering, 6 inch inside diameter.

Continued on sheet 3.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bs LOGGED BY Dale M. Gramza/Geologist
Donald W. Owens/Soil Scientist

EARTH DIMENSIONS, INC.

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East Aurora, New York 14052 • (716) 655-1717

MONITORING WELL 7R continued

SURF. ELEV. 1493.48

PROJECT Monitoring well installation
2A79m Town of Sardinia, New York
CLIENT CHAFFEE LANDFILL, INC.

LOCATION Northeast corner of landfill, (north) road side of berm. 45.0 ft from centerline of road
DATE STARTED 5/12/86 COMPLETED 5/12/86

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	18			7	10		Extremely moist dark gray silt loam (SANDY-SILT) with <2% mostly subangular fine size gravel, compact, thinly bedded, (ML)	Two (2) inch inside diameter PVC pipe	Water level at 28.0 feet below ground level at 9:00am on 5/13/86 after sampling and augering to 42.0 feet the previous day.
	19	5	6			15			
				9	10				
	20	3	4			11	Extremely moist dark gray silt loam (CLAYEY-SILT), stiff and very stiff, thinly laminated with very thin coarse silt lenses, (ML)		
40				7	10				
	21	5	8			20	- - - grades downward to - 40.5		
				12	14				
	22	8	8			23	Extremely moist dark gray silt loam (CLAYEY-SILT), very stiff, thinly laminated with very thin coarse silt lenses, (ML)		
				15	19				
	23	6	9			24			
45				15	19		- - - - - grades downward to- 46.0		
	24	7	10			27	Extremely moist dark gray silt loam (CLAYEY-SILT) with 5 to 15% mostly subangular shale gravel, very stiff, thinly laminated with two (2) wet gravelly silt loam (SANDY-SILT) interbeds ¼ to 2 inches thick, (ML)		
				17	19				
	25	9	17			31			
				14	12				
50	26	3	8			21	- - - clear transition to - 50.0 Wet dark gray shaly loam (SAND-SILT-CLAY) with 20 to 40% mostly subangular shale gravel, some fine to coarse size sand, compact, thickly bedded with one (1) wet gravelly sandy loam (SILTY-SAND) interbed 2" thick between 51.0 51.2 foot depth, (ML)	Number 2 size sand	Continued on sheet 4.
				13	9				
	27	8							

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

bs LOGGED BY Dale M. Gramza/Geologist
Donald W. Owens/Soil Scientist

SHEET 3 OF 4

EARTH DIMENSIONS, INC.

Test Borings and Logs
East Aurora, New York 14052 • (716) 655-1717

MONITORING WELL 7R continued

SURF. ELEV. 1493.48

PROJECT Monitoring well installation
279m Town of Sardinia, New York

LOCATION Northeast corner of landfill, (north) road side of berm, 45.0 ft from centerline of road.

CLIENT CHAFFEE LANDFILL, INC.

DATE STARTED 5/12/86 COMPLETED 5/12/86

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	27		14			41
				27		
					32	
	28	16				
55			19			
				27		46
					28	
	29	49				
			105			288
				183		
					97	
	30	20				
			40			
				58		98
60					27	
	31	10				
			14			32
				18		
					16	
	32	8				
			9			
				19		28
					15	
65						
70						

DESCRIPTION & CLASSIFICATION

Wet dark gray shaly loam (SAND-SILT-CLAY) with 20 to 40% mostly subangular shale gravel, some fine to coarse size sand, compact, thickly bedded with one (1) wet gravelly sandy loam (SILTY-SAND) interbed 2" thick between 51.0-51.2 foot depth, (ML) - grades downward to - 52.5

Wet dark gray shaly loam (SAND-SILT-CLAY) with 20 to 40% mostly subangular shale gravel, some fine to coarse size sand, thickly bedded, with one gravelly sandy loam (SILTY-SAND) interbed between 53.7 to 54.0 foot depth, (ML) - grades downward to - 56.5

Wet dark gray shaly silt loam (SANDY-SILT) with 20 to 40% mostly subangular shale gravel, little fine size sand, very dense in place, tends to liquify when disturbed, thickly bedded, (ML) - - - clear transition to -58.0

Extremely moist dark gray shaly silt loam (CLAYEY-SILT) with 20 to 40% mostly subangular shale gravel, little fine to coarse size sand, hard becoming very stiff below 62.0 feet, noticed one gravel interlayer between 59.0-59.3 foot depth, (ML) 64.0

Boring completed at 64.0 feet.

WELL

(2) #10 slotted PVC screen

Number 2 size sand

WATER TABLE & REMARKS

(2) Two inch inside diameter PVC pipe

54.0

59.0

64.0

No water at completion

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb WT. FALLING 30 " PER BLOW.

LOGGED BY Dale M. Gramza/Geologist
Donald W. Owens/Soil Scientist

SHEET 4 OF 4

FIELD BORING LOG

DEPTH HOLE 61'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-9R
DEPTH SOIL DRILL N/A	GA INSP. GOC	DRILLING METHOD 4.25" ID HSA			SHEET 1 OF 2
DEPTH ROCK CORE N/A	WEATHER SNOW	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1487.8
NO. DIST. N/A US. N/A	TEMP. 24 F	DRILL RIG CME 850	DRILLER J.T.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1430/12-2-02
TIME WL. N'A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1415/12-3-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
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R.C.	ROCK CORE
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CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0–5%
"LITTLE"	5–12%
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"AND"	30–50%

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LS	LOOSE	S	SOFT
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DN	DENSE	ST	STIFF
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ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
	CLAY TILL UNIT							B-9 WAS ABANDONED – MW-9R REDRILL WAS PLACED APPROX. 10' NW OF ORIGINAL LOCATION.
49	Stiff to very stiff, gray, SILTY CLAY to CLAYEY SILT, trace fine gravel, medium plasticity, thinly laminated. (CL) Grading to Sand and Gravel Unit.							AUGERED TO 49' bgs PRIOR TO SAMPLING See boring log B-9 for soil description for 0–49'
50		12	1A		1 4 8 11	24"		Stiff, gray, SILTY CLAY, trace fine gravel (CL) thinly laminated, med. plasticity, wet.
51								
52		17	2A		WR 7 10 16	15"		Stiff–med dense alternating layers of Gray SILTY CLAY to CLAYEY SILT, thinly laminated, trace fine gravel, (CL) grading to Gray, wet, f–m SAND, little fine gravel, trace clayey silt, gravel sub–angular. (SM)
53	SAND AND GRAVEL UNIT							53'–54' Dense, gray f–m–c SAND (SP–SW)
54	Dense, gray, fine to coarse SAND, some fine to medium sub–angular to angular gravel, saturated. (SP–GP)	30	3A		4 12 18 24	22"		at 54': 0.05' layer gray, CLAYEY SILT, wet (CL–ML) 54'–55' Gray f–m–c SAND, some f–m gravel, trace clayey silt, wet, gravel subangular to angular. (saturated) (SP–GP)
55								
56		30	4A		5 15 15 27	16"		Dense, gray f–m–c SAND, some f–m gravel, trace, clayey silt, (saturated) gravel subangular –– >angular (SP)
57								
58		17	5A		12 14 9 14	0"		(no recovery)
59								

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NO. DIST. N/A US. N/A	TEMP. -8 F	DRILL RIG CME 850	DRILLER J.T.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1430/12-2-02
TIME WL. N'A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1415/12-3-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
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D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

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CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

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"SOME" – 12–30%
"AND" – 30–50%

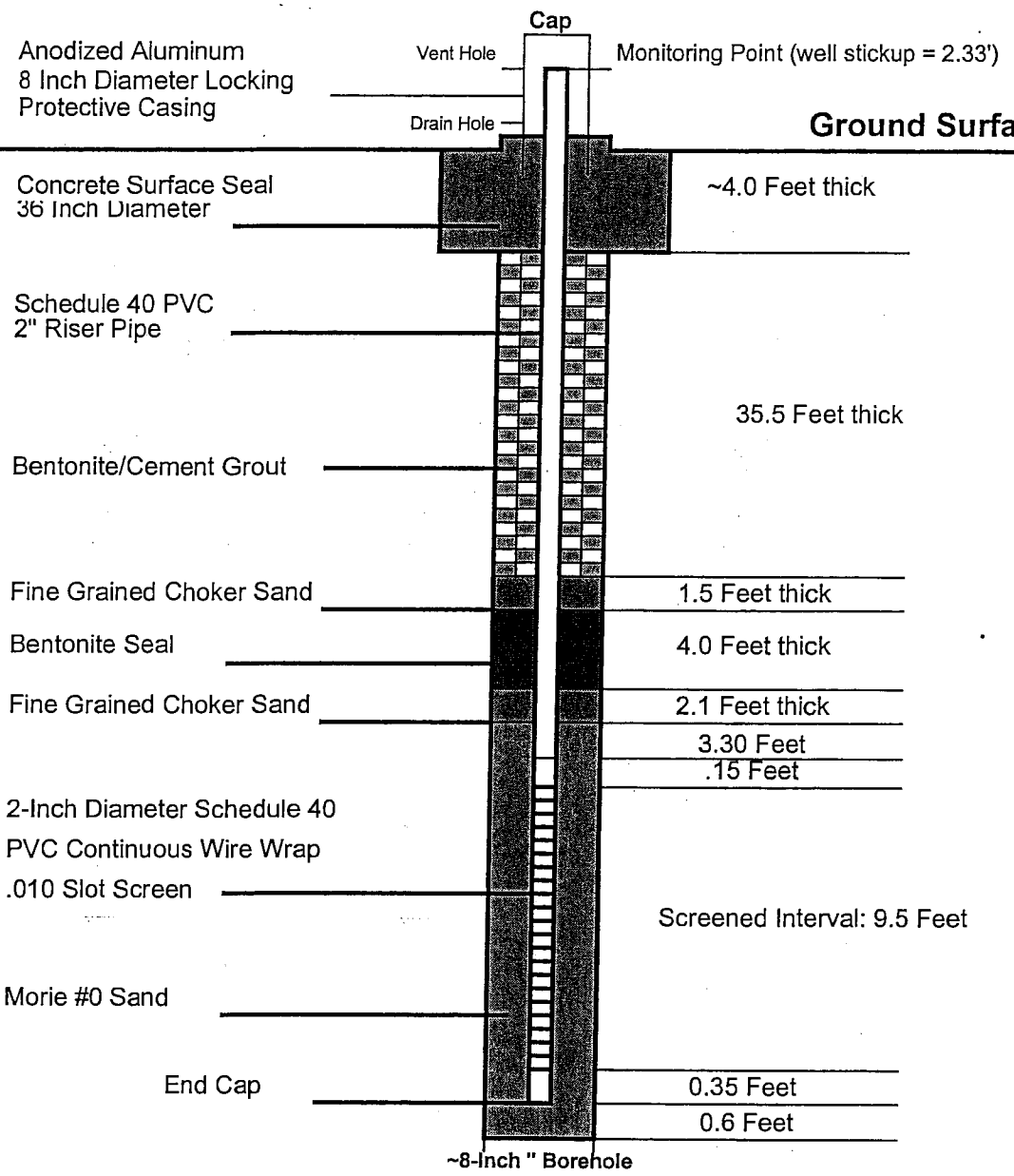
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
59	SAND AND GRAVEL UNIT				3			
					8			Very, stiff, brown–gray, CLAYEY SILT, trace f. sand, occ. f. gravel, thinly laminated,
60	Dense, gray, fine to coarse SAND, some fine to medium sub-angular to angular gravel, saturated. (SP-GP)	19	6A		11	14"		some silt and fine sand partings, med. dilatancy, saturated. (ML–CL)
					15			
61	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: **023-9340**	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-9R**	Sheet **1** of **1**
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1487.8	Water Depth: N/A
Weather: SNOW	Drilling Company: SJB Services	Riser Elev.: 1490.13	Date: 12/2-12/3/02
Temp: 24° F	Drill Rig: CME 850	Time Started: 1430	Time Completed: 1415



Total depth of soil boring: 61' b.g.s. Thickness of sandpack: 13.9' Well Bottom: 60.4' b.g.s.

Golder Associates Inc. **Buffalo, N.Y.**	**CHAFFEE LANDFILL** **CHAFFEE, NEW YORK**	**MW-9R Monitoring Well Detail** **Sand and Gravel Unit**		
		Drawn by:	Checked by:	Date:
Job No. 023-9340		AJN	NKW	7/25/2003

FIELD BORING LOG

DEPTH HOLE 98'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-10R
DEPTH SOIL DRILL 98'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 1 OF 8
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1513.3
NO. DIST. N/A US. N/A	TEMP. 45 F	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1248/12-16-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORGANIC	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GR	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
								Auger with no sampling from 0 to 4' bgs.
								Auger with standard sampling 4' to 49' bgs.
								Auger with continuous sampling 49' to 61' bgs.
								Auger with standard sampling 61' to 83' bgs.
								Auger with continuous sampling 83' to 98' bgs.
4	CLAY TILL UNIT							
	Stiff to very stiff, red-brown to gray, CLAYEY SILT to SILTY CLAY, trace fine to medium gravel, medium plasticity, thinly laminated, occassional silt and fine sand partings. (ML-CL) (CL)							Stiff, red-brown to gray-grown SILTY CLAY mottled, faint thin laminations, moist, low plasticity, trace m. gravel. (CL)
5		12	1		5 7 5 6	14"		
6								
7								
8								
9								Very stiff, gray, brown mottled slightly red-brown, CLAYEY SILT, trace, f-m sub-angular gravel, faint thin laminations, moist, occ. v.f. sand partings, very low plasticity. (CL-ML)
10		19	2		5 8 11 17	24"		
11								
12								
13								
14								14'-14.75': Stiff, brown, CLAYEY SILT, little, fine sand, occ. partings of fine sand, wet, dilatancy slow to mod. (ML)
		12	3		5 5 7 9	22"		14.75'-16': Stiff, gray, CLAYEY SILT, trace f gravel, thinly laminated, moist, distinct color change to gray @14.75' (CL)
15								

FIELD BORING LOG

DEPTH HOLE 98'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-10R
DEPTH SOIL DRILL 98'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 2 OF 8
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1513.3
NO. DIST. N/A US. N/A	TEMP. 45 F	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1248/12-16-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PN	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
16	CLAY TILL UNIT							
17	Stiff to very stiff, red-brown to gray, CLAYEY SILT to SILTY CLAY, trace fine to medium gravel, medium plasticity, thinly laminated, occassional silt and fine sand partings. (ML-CL) (CL)							
18								
19								
20		5	4		1 2 3 5	20"		Stiff, gray, SILTY CLAY, trace f–m gravel, thinly laminated, med. plasticity, wet. (CL)
21								
22								
23								
24		9	5		4 3 6 6	19"		Stiff, gray, SILTY CLAY, trace f gravel, med. plasticity, thinly laminated, (CL)
25								Layer of gray f SAND, little silt dilatancy quick from 25.6'–25.9' saturated (SP-SM)
26								
27								

FIELD BORING LOG

DEPTH HOLE 98' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-10R
DEPTH SOIL DRILL 98' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 3 OF 8
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1513.3
NO. DIST. N/A US. N/A TEMP. 45 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1248/12-16-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
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W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
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CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

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"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
28	CLAY TILL UNIT Stiff to very stiff, red-brown to gray, CLAYEY SILT to SILTY CLAY, trace fine to medium gravel, medium plasticity, thinly laminated, occassional silt and fine sand partings. (ML-CL) (CL)							
29		16	6		4 7 9 9	24"		Very stiff, gray SILTY CLAY, trace f gravel, thinly laminated, med. plasticity, gravel sub-rounded, moist, occ. silt and f sand partings. (CL)
30								
31								
32								
33								
34		11	7		2 4 7 9	24"		Very stiff, gray SILTY CLAY, trace f gravel, thinly laminated, med. plasticity, occ. clayey silt to silt parting. moist. (CL)
35								
36								
37								
38								
39								

FIELD BORING LOG

DEPTH HOLE 98'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-10R
DEPTH SOIL DRILL 98'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 4 OF 8
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1513.3
NO. DIST. N/A US. N/A	TEMP. 45 F	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1248/12-16-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
O.S.	OSMISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

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BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

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"AND"	30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT.	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
40	CLAY TILL UNIT	20	8		9 8 12 16	24"		Very stiff, gray SILTY CLAY to CLAYEY SILT, acc. Silt, little f Sand partings, med. plasticity, thinly laminated trace f gravel, moist. (CL)
41	Stiff to very stiff, red-brown to gray, CLAYEY SILT to SILTY CLAY, trace fine to medium gravel, medium plasticity, thinly laminated, occassional silt and fine sand partings. (ML-CL) (CL)							
42								
43								
44								
45		17	9		4 7 10 12	21"		Very stiff, gray SILTY CLAY, trace f–m gravel, thinly laminated, med. plasticity, moist. (CL)
46								
47								
48								
49								
50		16	10		6 8 8 11	24"		Very stiff, gray SILTY CLAY, trace fine gravel, med. plasticity, moist. (CL) @49.3': 0.05' thick silt & vf sand lens. @50': 0.05' thick silt & vf sand lens. wet, dilatancy slow–med. (ML)
51								

20 FIELD BORING LOG

DEPTH HOLE 98' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-10R
DEPTH SOIL DRILL 98' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 5 OF 8
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1513.3
NO. DIST. N/A US. N/A TEMP. 45 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1248/12-16-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
O.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
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R.C.	ROCK CORE
S.T.	SLOTTED TUBE
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ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

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CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
52	CLAY TILL UNIT Stiff to very stiff, red-brown to gray, CLAYEY SILT to SILTY CLAY, trace fine to medium gravel, medium plasticity, thinly laminated, occassional silt and fine sand partings. (ML-CL) (CL)	13	11		4 6 7 9	24"		Stiff, gray SILTY CLAY, trace f gravel (CL) occ. silt and v fine sand partings, med. plasticity, moist.
53								
54		10	12		2 3 7 9	24"		Stiff, gray SILTY CLAY, trace f gravel occ. silt and v fine sand partings, vf sand & silt partings more frequent, med. plasticity, moist. (CL)
55								
56		20	13		10 8 12 14	23"		Very Stiff Gray CLAYEY SILT to SILTY CLAY, 55'-56': frequent partings of vf Sand and Silt. 56.5': thin lens of fc SAND trace fm gravel, (CL) 56'-57': becomes more CLAYEY SILT to SILT. (ML-CL)
57								
58		31	14		15 15 16 25	18"		Hard, gray SILTY CLAY to CLAYEY SILT, occ. f gravel, low plasticity. (CL) Gray mc SAND and fm GRAVEL in end of spoon.
59	SAND AND GRAVEL UNIT Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel. 65.7'-79' and 95.4'-97.6' (CL-ML) Dense to very dense, gray, fine to medium, GRAVEL and medium to coarse SAND, trace clayey silt, wet. 79'-95.4' (GP)							
60		>50	15		50 50/.4'	10"		Very dense, gray c-f SAND and f-m gravel trace, clayey silt, gravel sub-angular to sub-rounded, dry to moist. (GP-GM)
61								
62								
63								

FIELD BORING LOG

DEPTH HOLE 98'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-10R
DEPTH SOIL DRILL 98'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 6 OF 8
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1513.3
NO. DIST. N/A US. N/A	TEMP. 45 F	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1248/12-16-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
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R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

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"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

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CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
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ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
64	SAND AND GRAVEL UNIT							
	Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM)	44	16		18 24 20 14	14"		Very dense, gray c-f SAND and f-m GRAVEL, trace clayey silt, Gravel sub-angular to sub-rounded (GP-GM)
65								
	Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel. 65.7'-79' and 95.4'-97.6' (CL-ML)							65.7'-66': Gray, SILTY CLAY trace f gravel. moist (CL)
66								
67	Dense to very dense, gray, fine to medium, GRAVEL and medium to coarse SAND, trace clayey silt, wet. 79'-95.4' (GP)							
68								
69								
		20	17		6 9 11 13	24"		Very stiff, gray SILTY CLAY to CLAYEY SILT, little, f gravel, slow dilatancy, low plasticity, moist, gravel mostly sub-rounded. (CL->ML)
70								
71								
72								
73								
74								
		23	18		8 10 13 14	21"		Very stiff, gray CLAYEY SILT to SILT, trace f gravel sub-angular, (CL->ML) thin laminae, dilatancy slow occ. layer of silt and very fine sand with slow-med. dilatancy, wet.
75								75.6'-76': Gray, SILT and fine SAND, med-quick dilatancy, saturated. (ML to SM)

FIELD BORING LOG

DEPTH HOLE 98'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-10R
DEPTH SOIL DRILL 98'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 7 OF 8
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1513.3
NO. DIST. N/A US. N/A	TEMP. 45 F	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1248/12-16-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
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BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
76	SAND AND GRAVEL UNIT							
	Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM)	20	19		3 9 11 12	17"		Very Stiff, gray CLAYEY SILT, trace, f–m gravel, gravel sub–angular, slow–med. dilatancy, wet. (ML)
77								occ. layers of SILT and fine SAND med.–quick dilatancy wet (ML–SM)
78	Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel. 65.7'–79' and 95.4'–97.6' (CL–ML)	36	20		5 16 20 15	16"		Dense Gray Clayey Silt to Silt little, fine Sand slow to med. dilatancy, moist (ML)
79	Dense to very dense, gray, fine to medium, GRAVEL and medium to coarse SAND, trace clayey silt, wet. 79'–95.4' (GP)							DISTINCT TRANSITITON AT 79' Gray c–f SAND and f–m GRAVEL. (SP)
								Glacial erratics (schist in sample) minerals: garnet, pyrite, chlorite?
80								
81								
82								
								(augers extremely tight – had to add 20 gallons of water to free the auger plug 12–18–02)
83								Dense to very dense, gray f–m GRAVEL, trace, clayey silt trace, m–c sand, wet. (GP)
84		48	21		17 23 25 29	14"		Gravel angular to sub–angular=shale fragments sub–rounded=crystalline rock
85								
86								
87								

FIELD BORING LOG

DEPTH HOLE 98' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-10R
DEPTH SOIL DRILL 98' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 8 OF 8
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1513.3
NO. DIST. N/A US. N/A TEMP. 45 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1248/12-16-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1150/12-18-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OO	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

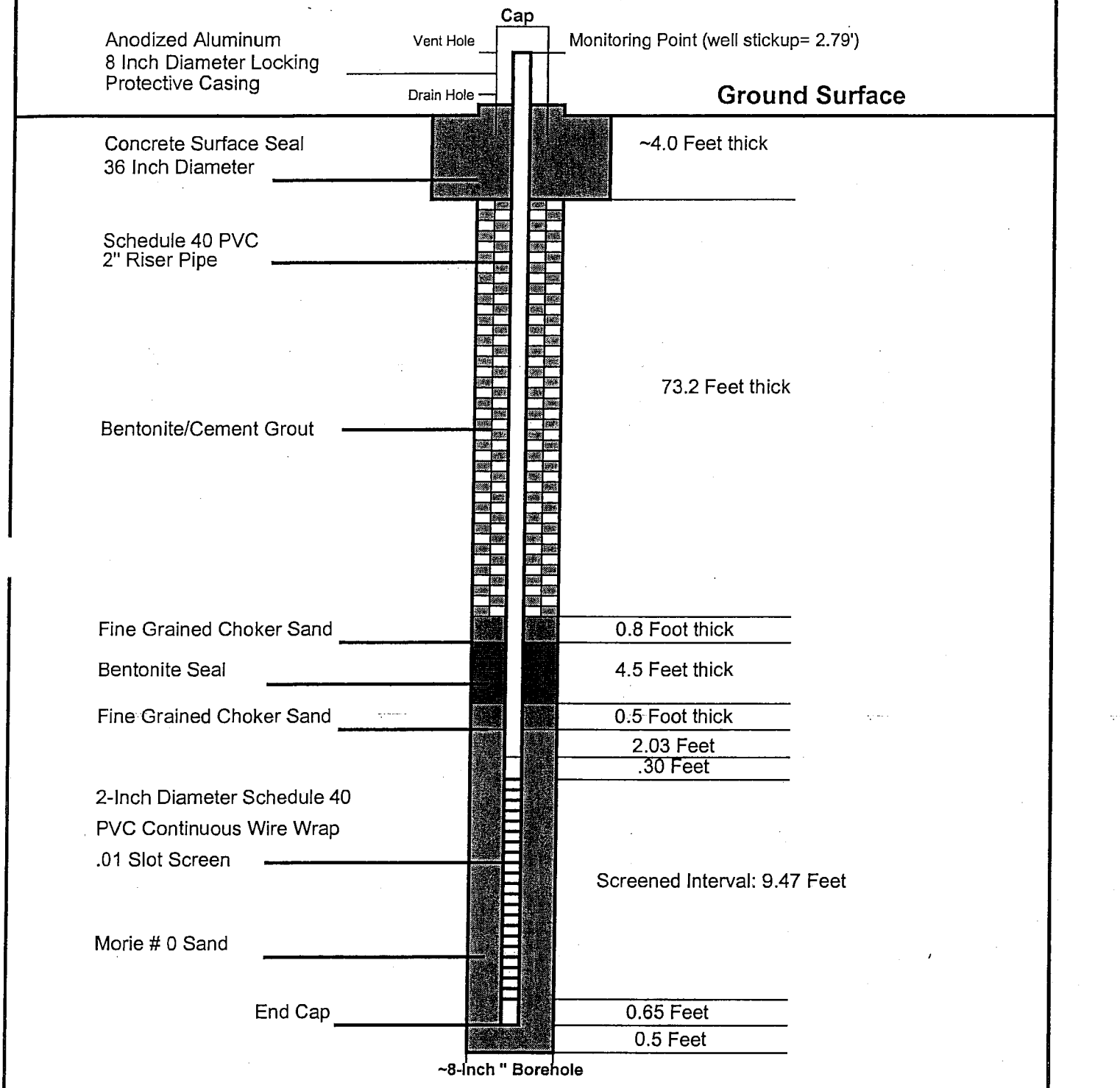
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
88	SAND AND GRAVEL UNIT Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel. 65.7'-79' and 95.4'-97.6' (CL-ML) Dense to very dense, gray, fine to medium, GRAVEL and medium to coarse SAND, trace clayey silt, wet. 79'-95.4' (GP)							
89		48	22		17 23 25 29	13"		Dense, gray f-c GRAVEL, some m-c sand, trace clayey silt, high percent of gravel in a sand & f gravel matrix, wet. (GP) (hard drilling - gravelly)
90								
91		61	23		36 33 31 30	0		(slop in spoon - looks similar to 88'-90' interval)
92								
93		35	24		32 16 19 18	10"		Dense, gray m-f GRAVEL and c SAND, trace, clayey silt, wet. (GP)
94								
95		31	25		11 15 16 12	15"		Dense, gray f-m GRAVEL, some m-c-f sand, (GP) @95.4': Gray Clayey Silt little, fm(-) Gravel low plasticity, slow dilatancy. (ML)
96								
97		25	26		7 9 16 19	21"		Very stiff, SILTY CLAY, little, f-m gravel, low plasticity (CL)
98	END OF BORING							@97.6': Gray m-c SAND, little f-m gravel, wet (SP) SET WELL @95.5' per MARY McINTOSH

MONITORING WELL INSTALLATION DIAGRAM

Job No.: 023-9340	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-10R**	Sheet 1 of 1
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1513.3	Water Depth: N/A
Weather: CLOUDY	Drilling Company: SJB Services	Riser Elev.: 1516.09	Date: 12/16-12/18/02
emp: 45° F	Drill Rig: CME 550X	Time Started: 1248	Time Completed: 1150



Total depth of soil boring: 96' b.g.s. Thickness of sandpack: 13.0' Well Bottom: 95.5' b.g.s.

Golder Associates Inc. **Buffalo, N.Y.**	**CHAFFEE LANDFILL** **CHAFFEE, NEW YORK**	**MW-10R Monitoring Well Detail** **Sand and Gravel Unit**		
		Drawn by:	Checked by:	Date:
Job No. 023-9340		AJN	NKW	7/25/2003

FIELD BORING LOG

DEPTH HOLE 15'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.	BORING NO. MW-11R
DEPTH SOIL DRILL 15'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA	SHEET 1 OF 1
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.	SURFACE EL. 1513.9
NO. DIST. N/A US. N/A	TEMP. 45 F	DRILL RIG CME 550X DRILLER D.M.	DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO)	STARTED 1525/12-19-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A DROP N/A	COMPLETED 1630/12-19-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

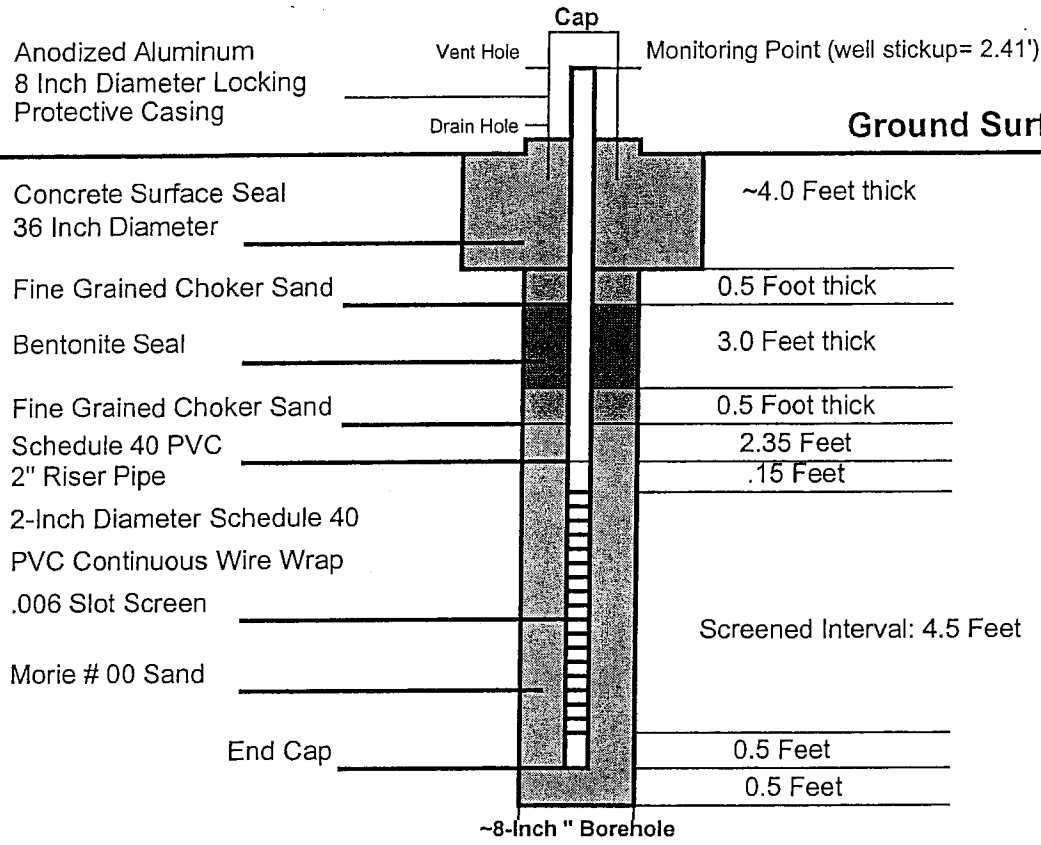
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
4	FILL							AUGERED WITH NO SAMPLING 0'–4'
5		14	1		3 6 8 8	13"		Stiff, brown–olive brown to yellow brown, mottled, CLAYEY SILT, trace to little f–m gravel, (sub–angular), disturbed, no laminae moist, some roots. (ML–CL)
6								@5.8': Becomes brown to gray grown, mottled CLAYEY SILT to SILTY CLAY, distinctly thinly laminated, moist, trace f sub–rounded gravel, low plasticity. (CL)
7	CLAY TILL UNIT Stiff to very stiff, gray–brown to gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub–angular to sub–rounded, medium to low plasticity, thinly laminated. (CL) (CL–ML)							
8								
9								
10		29	2		7 12 17 19	19"		Very stiff to hard, gray–brown CLAYEY SILT, trace, fm Gravel, thinly laminated, moist–dry occ. parting of silt and fine sand occ. parting of fm Gravel (wet) slightly softer at bottom of spoon (CL)
11								
12		21	3		5 10 11 17	12"		Sample appears to be Gray Brown to Olive Brown SILTY CLAY, moist some, f–m gravel trace f sand. (CL) (Sample was disturbed in spoon as if a piece of gravel was driven up inside)
13								appears slightly more sandy and wet at bottom (ML)
14		21	4		8 9 12 12	24"		13'–14': Stiff, gray–brown to yellow–brown, mottled, SILTY CLAY, thinly laminated, moist (CL) 14'–15': Stiff, gray, SILTY CLAY,
15	END OF BORING							Layers of f–m GRAVEL, some, c Sand, little Silt & clay at 13.5', 13.75', 14.3' and 14.65' layers wet

MONITORING WELL INSTALLATION DIAGRAM

Job No.: **023-9340**	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-11R**	Sheet 1 of 1
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1513.9	Water Depth: N/A
Weather: CLOUDY	Drilling Company: SJB Services	Riser Elev.: 1516.31	Date: 12/19/02
Temp: 45° F	Drill Rig: CME 550X	Time Started: 1525	Time Completed: 1630



Total depth of soil boring: 15.5' b.g.s. Thickness of sandpack: 7.5' Well Bottom: 15' b.g.s.

Golder Associates Inc. **Buffalo, N.Y.**	**CHAFFEE LANDFILL** **CHAFFEE, NEW YORK**	**MW-11R Monitoring Well Detail** **Clay Till Unit**		
Job No. 023-9340		Drawn by: AJN	Checked by: NKW	Date: 2/6/2003

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

MONITORING WELL HOLE NO. 12A-91 SURF. ELV. _____

PROJECT Monitoring Well Installation LOCATION 500 feet west of MW #10-88

2A79x Adjacent parcel to CID Inc., Hand Road

CLIENT CID LANDFILL, INC. DATE STARTED 1/8/91 COMPLETED 1/15/91

TOWN OF SARDINIA, NEW YORK

DEPTH FEET	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	1	9				
			3			7
				4		
					5	
	2	1				
			4			7
				3		
					3	
	3	1				
5			2			5
				3		
					6	
	4	5				
			10			23
				13		
					14	
	5	7				
			14			28
				14		
10					18	
	6	13				
			13			29
				16		
					17	
	7	4				
			7			17
				10		
					15	
	8	6				
15			9			20
				11		
					16	
	9	5				
			7			29
				12		
					14	
	10	4				
			8			20
				12		
20					16	

DESCRIPTION & CLASSIFICATION

Extremely moist brownish gray silty clay loam (CLAYEY-SILT) fill with 3 to 5% mostly fine size gravel, firm 0.8

Extremely moist dark brown silt loam (SANDY-SILT) original topsoil with 5 to 15% gravel, little very fine to fine size sand, loose 1.3

Moist to extremely moist faintly mottled brown silty clay loam (CLAYEY-SILT) fill with 1 to 3% gravel, some fine size roots, firm 1.7

Extremely moist faintly mottled dark brown gravelly loam (SAND-SILT-CLAY) fill with 15 to 30% mostly fine size gravel, little very fine to medium size sand, trace to little clay, firm 2.5

- - - - clear transition to - - - -

Wet faintly mottled becoming distinctly mottled below 8.0 feet grayish brown very fine sandy loam (SILTY-SAND) with little silt, loose soil material has a tendency to liquefy when disturbed, thinly bedded 9.0

Extremely moist faintly mottled brownish gray gravelly sandy loam (SILTY-SAND) with 15 to 30% mostly very fine to fine size gravel, very fine to very coarse size sand, little silt compact, weakly stratified 9.8

Moist to extremely moist gray silt loam (CLAYEY-SILT) with 1 to 3% mostly fine size gravel, very stiff, thinly laminated with very thin coarse silt lenses, noticed one wet gray very fine sandy loam (SILTY-SAND) lens between 11.1 to 11.2 foot depth 12.0

- - - - grades downward to - - - -

See next sheet.

WELL

2" I.D. PVC Riser Pipe

Cement Bentonite Grout

WATER TABLE & REMARKS

Clayey soil fill to 0.8 feet over original topsoil to 1.3 feet over clayey soil fill to 1.7 feet over loamy soil fill with little gravel and sand to 2.5 feet over water sorted and deposited sand with little silt to 9.0 feet over water sorted and deposited sand with little gravel and silt to 9.8 feet over silty lake sediment to 12.0 feet over clayey lake sedi- to 25.0 feet over coarse silty lake sedi ment to 26.0 feet over clayey lake sediment to 39.1 feet over silty lake sediment to 45.0 feet over water sorted and deposited sand and gravel and little silt to 52.0 feet over silty lake sediment to 61.5 feet over water sorted and deposited sand with little silt to 62.5 feet over silty lake sediment to 66.0 feet over water sorted and deposited coarse silt with little sand to

Continued on sheet 2.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

eal LOGGED BY Dale M. Gramza/Geologist SHEET 1 OF 5

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

MONITORING WELL
HOLE NO. 12A-91 continued.

SURF. ELV. _____

PROJECT Monitoring Well Installation

LOCATION 500 feet west of MW #10-88

2A79x Adjacent parcel to CID Inc., Hand Road

DATE STARTED 1/8/91 COMPLETED 1/15/91

CLIENT CID LANDFILL, INC.
TOWN OF SARDINIA, NEW YORK

DEPTH FEET	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24 N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	11	3 5 7 9 12	Moist to extremely moist gray silty clay loam (CLAYEY-SILT) with < 2% fine size gravel, some clay, very stiff, thinly laminated with very thin coarse silt lenses		66.5 feet over apparent loamy glacial till to 67.5 feet over water sorted and deposited sand and gravel with little silt to 72.5 feet over water sorted and deposited sand with trace to little silt to 74.0 feet over water sorted and deposited sand and gravel with trace silt to 82.0 feet over water sorted and deposited sand and gravel with little silt to 85.0 feet over water sorted and deposited sand with trace silt to 86.5 feet over coarse silty lake sediment to end of boring.
	12	↑ Shelby Tube Sampler ↓ 1.7' REC	- - - - grades downward to 20.0		
	13	3 10 12 22	Extremely moist to wet gray silty clay loam (CLAYEY-SILT) with < 2% mostly fine size gravel, some clay, stiff thinly laminated with very thin coarse silt lenses		
25			- - - - clear transition to 25.0		
	14	3 6 6 12	Wet gray silt loam (SILT) with trace very fine size sand, compact, soil material tends to liquefy when disturbed, thinly bedded		
			- - - - clear transition to 26.0		
	15	3 6 8 14			
30					
	16	4 7 9 16	Extremely moist to wet gray silty clay loam (CLAYEY-SILT) with < 2% fine size gravel, some clay, stiff to very stiff, thinly laminated with very thin coarse silt lenses, noticed one wet gray gravelly sandy loam (SILTY-SAND) lens between 39.0 to 39.1 feet		Note: Water level at 13.2 feet below ground surface at 8:30 a.m. with 6-5/8 inch augers at 30.0 feet.
	17	6 7 15 22			
	18	5 14 15 29			
35					
	19	6 12 15 27			
	20	8 14 16 30	Extremely moist to wet olive gray silt loam (CLAYEY-SILT) tending toward silt loam (SILT) with < 2% fine size gravel, very stiff becoming hard below 40.0 feet, weakly thinly laminated		
40					

39.1

2" I.D. PVC Riser Pipe

Cement-bentonite grout

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Dale M. Gramza/Geologist

SHEET 2 OF 5

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

MONITORING WELL HOLE NO. 12A-91 continued

SURF. ELV. _____

PROJECT Monitoring Well Installation
Adjacent parcel to CID Inc.,
2A79x Hand Road

LOCATION 500 feet west of MW #10-88

CLIENT CID LANDFILL, INC.
TOWN OF SARDINIA, NEW YORK

DATE STARTED 1/8/91 COMPLETED 1/15/91

DEPTH FEET	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	21	8					Extremely moist to wet olive gray silt loam (CLAYEY-SILT) tending toward silt loam (SILT) with <2% fine size gravel, very stiff becoming hard below 40.0 feet, weakly thinly laminated	2" I.D. PVC Riser Pipe	
			20			43			
				23					
					31				
	22	8							
			22			47			
				25					
					33				
	23	20							
45			27			70			
				43					
					29				
	24	12							
			9			20			
				11					
					13				
	25	5							
			12			23			
				11					
50					13				
	26	7							
			14			35			
				21					
					23				
	27	8							
			16			33			
				17					
					19				
	28	9					Extremely moist to wet gray silt loam (SILT)tending toward silt loam (CLAYEY-SILT) with 1 to 3% fine size gravel hard and very stiff, thinly laminated		
55			14			30			
				16					
					24				
	29	8							
			13			27			
				14					
					17				
	30	8							
			15			33			
				18					
60					23				

42.0 — grades downward to

45.0

52.0

Cement-bentonite grout

Water level at 49.8 feet below ground surface at 8:30 a.m. with 6-5/8 inch augers at 60.0 feet.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

eal LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

MONITORING WELL
HOLE NO. 12A-91 continued

SURF. ELV. _____

PROJECT Monitoring Well Installation
2A79x Adjacent parcel to CID Inc., Hand Road

LOCATION 500 feet west of MW #10-88

CLIENT CID LANDFILL, INC.
TOWN OF SARDINIA, NEW YORK

DATE STARTED 1/8/91 COMPLETED 1/15/91

DEPTH FEET	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION
	31	6	11	15	17	26	Extremely moist to wet gray silt loam (SILT) tending toward silt loam (CLAYEY-SILT) with 1 to 3% fine size gravel hard and very stiff, thinly laminated
							- - - - clear transition to - - - 61.5
	32	6	12	12	12	24	Wet gray sandy loam (SILTY-SAND) with very fine to fine size sand, little silt, compact in place, tends to liquefy when disturbed, thinly bedded with occasional thin 1/16 to 1/8 inch thick (CLAYEY-SILT) lenses 62.5
65	33	12	14	12	14	26	
	34	9	15	26	21	41	Extremely moist gray silt loam (CLAYEY-SILT) with 1 to 3% mostly fine size subrounded gravel, little clay, very stiff, thinly laminated with very thin coarse silt lenses
							- - - - grades downward to - - - - 66.0
	35	6	12	10	14	22	Extremely moist olive gray silt loam (SANDY-SILT) with 1 to 3% mostly fine size subangular gravel, little very fine size sand, compact, thinly bedded 66.5
70	36	28	18	18	16	36	
	37	7	9	10	12	19	Extremely moist olive gray gravelly loam (SAND-SILT-CLAY) with 15 to 25% mostly subangular to subrounded gravel with very fine size sand, trace to little clay, hard, massive soil structure
							- - - clear transition to - - - 67.5
75	38	8	8	12	13	20	Extremely moist to wet faintly mottled gray gravelly sandy loam (SILTY-SAND) with 20 to 40% mostly subangular to subrounded gravel, very fine to medium size sand, little silt, dense in place, loose when disturbed, stratified
	39	10	13	15	13	28	
							- - - - grades downward to - - - - 68.0
	40	11	12	16	* 27	28	
80							

See next sheet.

WELL: 2" I.D. PVC Riser Pipe; Cement bentonite grout; Bentonite Pellet Seal; #1 Size Sand; (1); (2)

WATER TABLE & REMARKS

(1) 2" I.D. PVC Screen .006 slot
(2) 550 fine size sand

*3" split spoon with plastic inner tube for vertical K values

70.7
75.5
76.0
77.5

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

eal LOGGED BY Dale M. Gramza/Geologist

SHEET 4 OF 5

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

MONITORING WELL
HOLE NO. 12A-91 continued

SURF. ELV. _____

PROJECT Monitoring Well Installation
Adjacent parcel to CID Inc.
2A79x Hand Road

LOCATION 500 feet west of MW #10-88

CLIENT CID LANDFILL, INC.
TOWN OF SARDINIA, NEW YORK

DATE STARTED 1/8/91 COMPLETED 1/15/91

DEPTH FEET	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	41	3	8	14	14	22	Wet gray very gravelly sandy loam (SILTY-SAND) with 40 to 60% mostly subangular to subrounded gravel, very fine to coarse size sand, little silt, compact to dense in place, loose when disturbed, stratified	2.0" I.D. PVC Screen .006 slot #1 size asand	
	42	5	9	12	15	21	└ - - - grades downward to - - - - 72.5 Wet gray sandy loam (SILTY-SAND) with very fine to coarse size sand, trace to little silt, compact in place, loose when disturbed, thinly bedded		
85	43	7	12	14	21	26	└ - - - clear transition to - - - 74.0 Wet gray gravelly loamy sand (SAND) with 20 to 40% mostly subrounded gravel with very fine to coarse size sand, trace silt, compact in place, loose when disturbed, stratified		87.5
	44	13	13	15	21	28	└ - - - grades downward to - - - 82.0 Wet gray gravelly sandy loam (SILTY-SAND) with 20 to 40% mostly subangular to subrounded gravel, very fine to coarse size sand, little silt, compact in place, loose when disturbed, stratified		88.0
90							└ - - - clear transition to - - - 85.0 Wet gray very fine loamy sand (SAND) with trace silt, compact, readily liquefies when disturbed, thinly bedded		
95							└ - - - grades downward to - - - - 86.5 Wet gray silt loam (SILT) with trace very fine size sand, compact in place, tends to liquefy when disturbed, thinly bedded with thin 1/16 to 1/8 inch thick (CLAYEY-SILT) lenses 88.0		
100							Boring completed at 88.0 feet.		

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

eal LOGGED BY Dale M. Gramza/Geologist

SHEET 5 OF 5

EARTH DIMENSIONS, INC.

Soil Investigations and Monitoring Well Installations

1091 Jamison Road • Elma, NY 14059 • (716) 655-1717

MONITORING WELL

HOLE NO. 12B-91

SURF. ELV. _____

PROJECT Monitoring Well Installation, Adjacent parcel to CID INC., Hand Road 2A79x

LOCATION 500 feet west of MW #10-88, 6.0 feet south of MW #12A-91

CLIENT CID LANDFILL, INC. TOWN OF SARDINIA, NEW YORK

DATE STARTED 1/7/91 COMPLETED 1/8/91

DEPTH FEET	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	1	3				
			5			10
				5		
					4	
	2	2				
			3			7
				4		
					5	
	3	2				
5			6			12
				6		
					10	
	4	5				
			6			12
				6		
					7	
	5	3				
			5			11
				6		
10					7	
		*				
15						
20						

DESCRIPTION & CLASSIFICATION

Extremely moist faintly mottled olive brown silt loam (SANDY-SILT) fill with 5 to 10% subrounded gravel, little very fine to medium size sand

- - - - clear transition to - - - - 2.5

Wet brown sandy loam (SILTY-SAND) with fine to medium size sand, little to some silt, loose, thinly bedded

- - - - grades downward to - - - - 8.5

Wet gray sandy loam (SILTY-SAND) with 5 to 15% very fine to fine size gravel medium to coarse size sand, trace silt, compact, thinly bedded

- - - - clear transition to - - - - 9.3

Moist to extremely moist brown silt loam (SANDY-SILT) tending towards silt loam (SILT) with 5 to 10% fine size subrounded gravel, trace fine size sand, compact, weakly thinly bedded

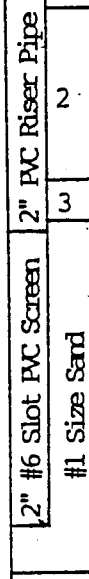
- - - - clear transition to - - - - 9.7

Moist gray silt loam (CLAYEY-SILT) with 5 to 15% fine size subrounded gravel, stiff, thinly laminated 10.0

Augered to 10.3 feet 10.3

Boring completed at 10.3 feet.

WELL



1.1
4.1
4.6
9.7
10.3

WATER TABLE & REMARKS

Coarse silty soil fill with trace gravel, little sand to 2.5 feet over water sorted and deposited sand with little to some silt to 8.5 feet over water sorted and deposited sand with little gravel, trace silt to 9.3 feet over coarse silty lake sediment with trace sand to 9.7 feet over silty lake sediment to end of boring.

Drilled with 6-5/8 inch hollow stem auger.

(1) Cement bentonite grout
(2) Bentonite pellet seal
(3) 550 size sand

Water level at 4.6 feet below ground surface at 9:00 a.m., 1/8/91.

* Advanced augers 0.3 feet without sampling.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

eal LOGGED BY Greg H. Gill/Geologist

SHEET 1 OF 1

FIELD BORING LOG

DEPTH HOLE 99'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-13R
DEPTH SOIL DRILL 99'	GA INSP. GQC	DRILLING METHOD 4.25" ID HSA			SHEET 1 OF 9
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1491.5
NO. DIST. N/A US. N/A	TEMP. 20 F	DRILL RIG CME 850	DRILLER D MATTHIES		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1500/12-5-02
TIME WL. N'A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
G	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0–5%
"LITTLE"	5–12%
"SOME"	12–30%
"AND"	30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
								MW-13 orig. location elevation 1491.5'
								Per WMI request, the location was moved ~5' to the east.
								Auger with no sampling from 0 to 4' bgs.
								Auger with standard sampling 4' to 54' bgs.
								Auger with continuous sampling 54' to 62' bgs.
								Auger with standard sampling 62' to 85' bgs.
								Auger with continuous sampling 85' to 99' bgs.
	FILL	11	1		3 6 5 7	15"		Stiff, brown to olive brown, mottled red-brown, SILTY CLAY, little, fine sand trace, f gravel, occ. m gravel, moist. (CL-ML) Gravel sub-angular
	CLAY TILL UNIT Stiff to very stiff, gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub-angular to sub-rounded, medium to low plasticity, thinly laminated, (CL) (CL-ML), occassional SILT layers (ML).	14	2		7 6 8 10	0		Stiff, gray, CLAYEY SILT to SILTY CLAY, trace f-m sub-rounded gravel, thinly laminated, med. plasticity, moist, 5-7% f(+) m(-) Gravel (CL) (no recovery : log of auger cuttings)

FIELD BORING LOG

DEPTH HOLE 99'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-13R
DEPTH SOIL DRILL 99'	GA INSP. GOC	DRILLING METHOD 4.25" ID HSA			SHEET 2 OF 9
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1491.5
NO. DIST. N/A US. N/A	TEMP. 20 F	DRILL RIG CME 850	DRILLER D. MATTHIES		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1500/12-5-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
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BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

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"LITTLE" - 5-12%
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"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
13	CLAY TILL UNIT Stiff to very stiff, gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub-angular to sub-rounded, medium to low plasticity, thinly laminated, (CL) (CL-ML), occassional SILT layers (ML).							
14		11	3		3 4 7 10	19"		Stiff, brown-gray to gray, CLAYEY SILT to SILTY CLAY, trace f gravel, occ. silt partings, faint laminations grade to more prominent laminations, med. plasticity, moist. (CL)
15								
16								
17								
18								
19								
20		14	4		4 5 9 10	22"		Stiff, gray, SILTY CLAY, trace f (sub-rounded), gravel, thinly laminated, occ. silt partings occ. m. sub-angular gravel, med. plasticity, moist (CL)
21								
22								
23								
24								

FIELD BORING LOG

DEPTH HOLE 99' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-13R
DEPTH SOIL DRILL 99' GA INSP. GOC DRILLING METHOD 4.25" ID HSA SHEET 3 OF 9
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1491.5
NO. DIST. N/A US. N/A TEMP. 20 F DRILL RIG CME 850 DRILLER D MATTHIES DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1500/12-5-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
25	CLAY TILL UNIT Stiff to very stiff, gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub-angular to sub-rounded, medium to low plasticity, thinly laminated, (CL) (CL-ML), occassional SILT layers (ML).		5		2 3 7 8	19"		24'-25': Stiff, gray, SILTY CLAY, with occ. silt layers, thinly laminated, moist. (CL) 25'-26': Gray, SILT to CLAYEY SILT, mod. dilatancy, trace f. sand, faint laminations, wet. (ML)
26								
27								
28								
29								Stiff Gray Silt to Clayey Silt mod. dilatancy, wet. (ML)
30		12	6		4 4 8 7	18"		liquifies when disturbed interbedded with occ. layers of stiff Silt & Clay to Clay & Silt
31								
32								
33								
34								Stiff, gray, CLAYEY SILT to SILTY CLAY, thinly laminated, slow dilatancy occ. Silt partings, med. dilatancy, moist to wet. (CL-ML)
35		11	7		2 5 6 9	14"		
36								

FIELD BORING LOG

DEPTH HOLE 99'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-13R
DEPTH SOIL DRILL 99'	GA INSP. GOC	DRILLING METHOD 4.25" ID HSA			SHEET 4 OF 9
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1491.5
NO. DIST. N/A US. N/A	TEMP. 20 F	DRILL RIG CME 850	DRILLER D MATTHIES		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1500/12-5-02
TIME WL. N'A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
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CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
37	CLAY TILL UNIT Stiff to very stiff, gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub-angular to sub-rounded, medium to low plasticity, thinly laminated, (CL) (CL-ML), occassional SILT layers (ML).							
38								
39								
40		16	8		5 6 10 12	24"		Stiff, gray, SILTY CLAY, trace fine gravel, thinly laminated, med. plasticity, moist. (CL)
41								
42								
43								
44								
45		20	9		6 8 12 14	24"		Very stiff, gray, CLAYEY SILT, trace f gravel, thinly laminated, wet, occ. m gravel, low–med. plasticity, slow dilatancy. (ML)
46								
47								
48								

FIELD BORING LOG

DEPTH HOLE 99' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-13R
DEPTH SOIL DRILL 99' GA INSP. GOC DRILLING METHOD 4.25" ID HSA SHEET 5 OF 9
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1491.5
NO. DIST. N/A US. N/A TEMP. 20 F DRILL RIG CME 850 DRILLER D MATTHIES DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1500/12-5-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
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T.O.	THIN-WALLED, OPEN
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ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.		SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
49	CLAY TILL UNIT Stiff to very stiff, gray, SILTY CLAY to CLAYEY SILT, trace to some fine to medium gravel, gravel sub-angular to sub-rounded, medium to low plasticity, thinly laminated, (CL) (CL-ML), occassional SILT layers (ML).								
50		20		10		9 9 11 13	0		Sampler may have pushed a piece of coarse gravel – sampler basket intact (no recovery)
51									
52									
53									
54									
55		11		11		WH 4 7 22	18"		Stiff, gray, CLAYEY SILT to SILTY CLAY, trace f, gravel, thinly laminated, wet, slow dilatancy. (ML–CL) (hit piece of coarse Gravel @55.5')
56									
57		14		12		4 6 8 13	15"		Stiff, SILTY CLAY to CLAYEY SILT, some f–c sand, little f–m gravel, med. dilatancy, laminae disturbed, saturated. Gravel sub-rounded to sub-angular. (CL)
58									
59		24		13		5 14 10 14	24"		Very stiff, gray, CLAYEY SILT, interbedded partings of fine sand and silt occ. thin layers of med f sand, saturated looks disturbed, faint laminae in silt & clay, interbedded silts & fine sand little f m gravel med.–fast dilatancy (ML)
60	transition								

FIELD BORING LOG

DEPTH HOLE 99' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-13R
DEPTH SOIL DRILL 99' GA INSP. GOC DRILLING METHOD 4.25" ID HSA SHEET 6 OF 9
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1491.5
NO. DIST. N/A US. N/A TEMP. 20 F DRILL RIG CME 850 DRILLER D MATTHIES DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1500/12-5-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
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ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

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ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
61	SAND AND GRAVEL UNIT Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) to dense, gray, f-m-c SAND, little f-m gravel (SP). Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel, glaciolacustrine. (CL-ML)	34	14		4 14 20 16	15"		Dense, f–m GRAVEL, some, c–f sand, little, clayey silt, saturated. (GM)
62								
63								
64								
65								Dense, gray, f–m–c SAND, little f–m gravel, occ. layer of above mixed with clayey silt, saturated (SP)
66		27	15		9 14 13 19	18"		
67								
68								
69								
70								Very stiff, gray, SILTY CLAY, trace f–m gravel, thinly laminated, med. plasticity (CL)
71		26	16		6 9 17 25	18"		
72								

FIELD BORING LOG

DEPTH HOLE 99' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-13R
DEPTH SOIL DRILL 99' GA INSP. GOC DRILLING METHOD 4.25" ID HSA SHEET 7 OF 9
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1491.5
NO. DIST. N/A US. N/A TEMP. 20 F DRILL RIG CME 850 DRILLER D MATTHIES DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1500/12-5-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE		
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED		
C	COARSE	MOT	MOTTLED	SD	SAND		
CA	CASING	NP	NON-PLASTIC	SI	SILT		
CL	CLAY	OR	ORANGE	SIY	SILTY		
CLY	CLAYEY	ORG	ORGANIC	SM	SOME		
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE		
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL		
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER		
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS		
U	LITTLE	RX	ROCK	Y	YELLOW		

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
73	SAND AND GRAVEL UNIT Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) to dense, gray, f-m-c SAND, little f-m gravel (SP). Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel, glaciolacustrine. (CL-ML)							
74								
75								Very stiff, gray, CLAYEY SILT to SILTY CLAY, trace f. gravel, thinly laminated, med–high plasticity, moist. (CL)
76		18	17		7 8 10 14	21"		
77								
78								
79								
80								Very stiff–hard, gray, SILTY CLAY, with occ. layers of fm SAND occ. mf Gravel (CL)
81		37	18		11 15 22 23	24"		layers of fm Sand @ 80.5'–80.6' (SP) 81.5'–81.6' and 81.8'–82' saturated
82								
83								
84								

FIELD BORING LOG

DEPTH HOLE 99'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-13R
DEPTH SOIL DRILL 99'	GA INSP. GOC	DRILLING METHOD 4.25" ID HSA			SHEET 8 OF 9
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1491.5
NO. DIST. N/A US. N/A	TEMP. 20 F	DRILL RIG CME 850	DRILLER D MATTHIES		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1500/12-5-02
TIME WL. N'A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
85	SAND AND GRAVEL UNIT Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) to dense, gray, f-m-c SAND, little f-m gravel (SP). Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel, glaciolacustrine. (CL-ML)							
86		24	19		8 11 13 36	24"		85'–85.8': Very stiff, gray, SILTY CLAY to CLAYEY SILT, thinly bedded, saturated, mod. dilatancy, low plasticity. (CL) 85.8'–86.6': Gray, CLAYEY SILT to SILTY CLAY, v. stiff, thinly bedded, no dilatancy, med. plasticity, moist. (CL) 86.6'–87': Gray, CLAYEY SILT, trace f–m Gravel med. dilatancy, low plasticity, saturated. (ML)
87								
88		>50	20		11 20 62/6"	14"		87'–87.5': Very stiff, gray, CLAYEY SILT, thinly bedded with Clayey Silt partings slow dilatancy, saturated (ML) 87.5'–89': Gray f–m GRAVEL, some m–c sand, trace clayey silt, saturated. (GP)
89								
90		41	21		16 19 22 23	19"		89'–89.5': Stiff, gray, CLAYEY SILT, trace f–m GRAVEL, thinly laminated, wet. (CL–ML) 89.5'–91': Dense, gray, c–m SAND and f–m GRAVEL, prob. occ. c gravel with occ. layer gray, saturated, silt & clay Gravel sub–angular (SP–GP)
91								
92		37	22		17 17 20 22	17"		Dense, gray f–mc SAND, some f–m gravel, saturated Gravel sub–angular (SP)
93								
94		65	23		20 26 39 49	17"		Very hard, f SAND, occ. f–m gravel, quick dilatancy, saturated (SP)
95								
96		84	24		16 44 40 39	14"		Very dense, gray, SILT and fine SAND, quick dilatancy, saturated (ML)

FIELD BORING LOG

DEPTH HOLE 99' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-13R
DEPTH SOIL DRILL 99' GA INSP. GOC DRILLING METHOD 4.25" ID HSA SHEET 9 OF 9
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1491.5
NO. DIST. N/A US. N/A TEMP. 20 F DRILL RIG CME 850 DRILLER D MATTHIES DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1500/12-5-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1445/12-9-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0–5%
"LITTLE"	5–12%
"SOME"	12–30%
"AND"	30–50%

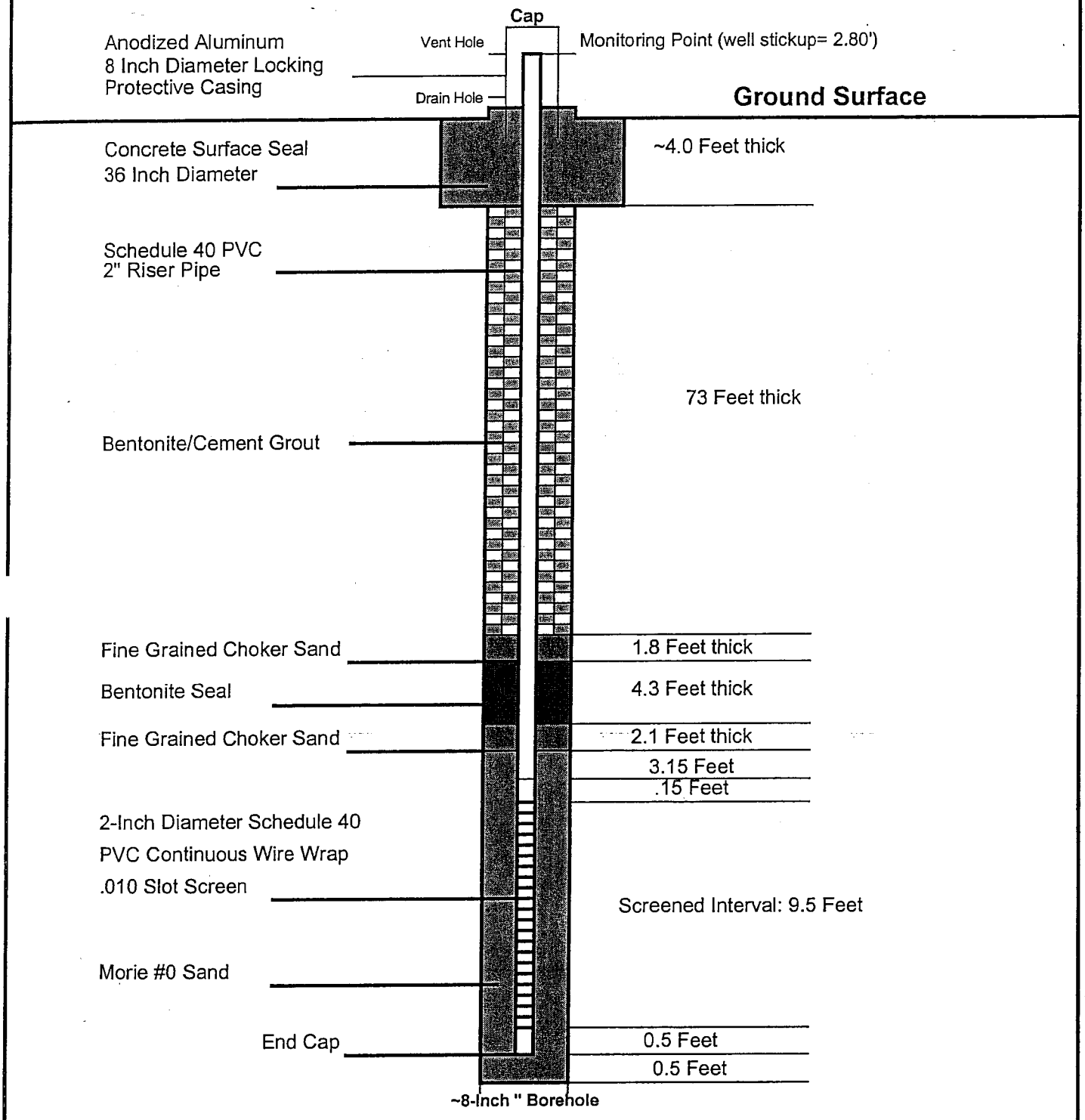
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
97	SAND AND GRAVEL UNIT Dense to very dense, gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) to dense, gray, f-m-c SAND, little f-m gravel (SP). Very stiff, gray, SILTY CLAY to CLAYEY SILT to SILT, trace fine gravel, glaciolacustrine. (CL-ML)							(bottom 0.2' of spoon fm GRAVEL and Silt/fine Sand) (GM) Very dense, fm GRAVEL, some clayey silt, trace f sand, (ML-GM) Gravel angular to sub-angular in a Clayey Silt matrix saturated, dilatancy very slow to none.
98		>50	25		20 50/0.4	24"		
99	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: 023-9340	Project: Chaffee Landfill Well Inst.	Well No.: MW-13R	Sheet 1 of 1
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1491.5	Water Depth: N/A
Weather: CLOUDY	Drilling Company: SJB Services	Riser Elev.: 1494.30	Date: 12/5-12/9/02
Temp: 20° F	Drill Rig: CME 850	Time Started: 1500	Time Completed: 1445



Total depth of soil boring: 99' b.g.s. Thickness of sandpack: 13.8' Well Bottom: 98.5' b.g.s.

Golder Associates Inc. Buffalo, N.Y.	**CHAFFEE LANDFILL CHAFFEE, NEW YORK**	**MW-13R Monitoring Well Detail Sand and Gravel Unit**		
		Drawn by: AJN	Checked by: NKW	Date: 7/25/2003
Job No. 023-9340				

DATE:			
STARTED	11/6/96	HOLE NO.	MW-14R
FINISHED	11/8/96	SURF. ELEV	1500.01
SHEET 1 OF 3		G.W. DEPTH	See Notes

SJB SERVICES, INC.
SUBSURFACE LOG

PROJECT: CID- Replacement Well LOCATION: CID- Chaffee Landfill

PROJ. NO.: D-867

DEPTH FT	SMPL NO	BLOWS ON SAMPLER 0-6	6-12	12-18	N	REC. (FT.)	SOIL OR ROCK CLASSIFICATION	NOTES
	1	3	3		6	1.3	Brn. & Gray Clayey SILT, little f-c Sand, tr. wood,	
		5	7				tr. gravel (moist, FILL)	
	2	5	7		14	0.2		Poor Rec. sample #2
		7	6					
5	3	1	2		3	0.6		
		1	3					
	4	3	8		24	1.1	Contains tr. boulder fragments, tr. organics	
		16	26					
	5	13	14		26	1.0	Brn. f-c SAND, little- some Silt, tr. gravel, tr. boulder	
10		12	10				fragments (moist, FILL)	
	6	1	7		14	0.5		Perched H2O encountered
		7	6					@ 12' - 14' spoon
	7	2	3		8	1.6	Orange- Brn. Clayey SILT, tr.- little f-m Sand, tr. gravel	
		5	7				(moist, medium, ML)	
15	8	1	5		10	1.1	Becomes brn., contains tr. sand	
		5	6					
	9	5	8		16	0.0		No Rec. sample#9
		8	10					
	10	X	4		9	1.1	Brn.- Gray Silty CLAY, tr. sand, tr. gravel	X- dropped rods first [illegible]
20		5	9				(moist, medium, CL)	
	11	2	2		6	1.4		
		4	5					
	12	7	8		15	1.9		
		3	10					
25	13	3	3		6	1.6		
		3	6					
	14	3	5		13	2.0	Becomes slightly laminated, contains numerous silt	
		8	8				partings and seams	
	15	1	3		6	1.5		
30		3	7					
	16	2	3		7	2.0		
		4	7					
	17	4	8		17	2.0	stiff	
		9	9					
	[illegible]	[illegible]	3		5	[illegible]	medium	
		[illegible]	[illegible]					
	[illegible]	[illegible]	8		[illegible]	[illegible]	hard	Shale boulder [illegible]
		35	22					at approx. 37.5 - [illegible]
	20	3	6		15	1.3	Brn. Clayey SILT, tr. sand, tr. gravel (moist, medium, ML)	
40		9	11					

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW CLASSIFICATION VISUAL BY GEOLOGIST

DRILLER: K. Fuller DRILL RIG TYPE: CME-85

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE:
STARTED 11/6/96
FINISHED 11/8/96

SHEET 2 OF 3

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. MW-14R
SURF. ELEV 1500.01
G.W. DEPTH See Notes

PROJECT: CID Replacement Well
LOCATION: Chaffee Landfill
PROJ. NO.: D-857

DEPTH FT	SMPL NO	BLOWS ON SAMPLER 0-6	6-12	12-18	N	REC. (FT.)	SOIL OR ROCK CLASSIFICATION	NOTES
	21	2	4		11	1.3		
		7	9					
	22	5	7		18	1.0	(stiff)	
		11	16					
45	23	3	4		11	1.2	Contains little f-c Sand, little f-c Gravel, tr. boulder	
		7	14				fragments (medium)	
	24	7	7		18	1.4	Grades to gray-brn., contains tr.-little f-c Sand	0.2' Sand and Gravel lenses
		11	17				tr. gravel (stiff)	noted @ approx. 47.0'
	25	2	5		11	1.6	(medium)	
50		6	9					
	26	4	7		17	1.7	(stiff)	
		10	10					
	27	5	10		24	1.5		
		14	16					
55	28	2	3		10	1.3	(medium)	
		7	10					
	29	8	14		28	2.0	(hard)	
		14	20					
58	30	2	5		16	0.6	Brn.-Gray f-c SAND, some-and Silt, tr. gravel, tr. clay	
60		11	11				(moist, firm, SM-SC)	
	31	2	4		12	1.4	Olive-Brn. Clayey SILT, little f-c Sand, tr. gravel	
		8	12				(moist, medium, ML)	
	32	12	31		45	1.4	(hard)	
		15	18					
	33	6	8		14	1.8	Contains little f-c Gravel (medium)	
		8	11					
	34	3	5		13	1.2		
		8	12					
	35	8	9		27	1.4		Poor Rec. same as [illegible]
70		18	47					due to boulders
	36	2	4		12	1.7	Gray-Brn f-c GRAVEL and f-c Sand, little Silt	
		8	8				(wet, firm, GW)	
	37	18	21		55	1.1	Contains occasional Clayey Silt Seams (wet,	
		34	31				very compact)	
			8		27	1.8	Contains little Silt (compact, GW-GM)	
	39	22	22		78	2.1	Gray Silt, tr. sand, tr. gravel, occasional cobble	
		38	28				fragments (wet, very compact, ML)	
	40	4	13		39	1.2	Gray f-c GRAVEL and f-c Sand, tr.-little Silt, occasional	"Running Gravel"
80		16	17				Silt Seams (wet, firm, GW)	encountered at 78'

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW CLASSIFICATION

DRILLER: K. Fuller
DRILL RIG TYPE: CME-65
VISUAL BY GEOLOGIST

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS

DATE:
STARTED 11/6/96
FINISHED 11/8/96

SHEET 3 OF 3

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. MW-14R
SURF. ELEV 1500.01

G.W. DEPTH See Notes

PROJECT: CID Replacement Well
LOCATION: CID Chaffee Landfill
PROJ. NO.: D-667

DEPTH FT	SMPL NO	BLOWS ON SAMPLER 0-6	6/12	12/18	N	REC. (FT.)	SOIL OR ROCK CLASSIFICATION	NOTES
	41	5	8		18	1.0	Gray f-c SAND, some f-c Gravel, tr.- little silt	
		10	10				(wet, firm, SW-SM)	
	42	10	16		43	1.7	(compact)	Contains occasional fine Gravel Lenses
		30	25					
85	43	4	6		19	1.5	Gray f-m SAND, tr.- little silt, tr. gravel, contains occ.	
		13	12				f-c Sand & f-c Gravel Lenses (wet, firm, SP-SM)	
	44	5	4		11	1.2	Gray f-c SAND, tr.- little silt, tr.- little f-c gravel	
		7	6				(wet, firm, SW)	
	45	6	13		45	1.0	Gray f-c GRAVEL and f-c Sand, tr.- little silt (wet,	
90		32	39				compact, GW)	
	46	8	10		21	0.8		
		11	16					
	47	30	30		35	1.6		
		32	35					
95							Boring Complete at 94.0'	2" PVC Monitoring Well installed at completion. Refer to installation log for details.
100								
105								
110								

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW CLASSIFICATION:

DRILLER: K. Fuller
DRILL RIG TYPE: CME-85
VISUAL BY GEOLOGIST

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD

Well Number: MW- 14P

Project: CID-. Replacement Well

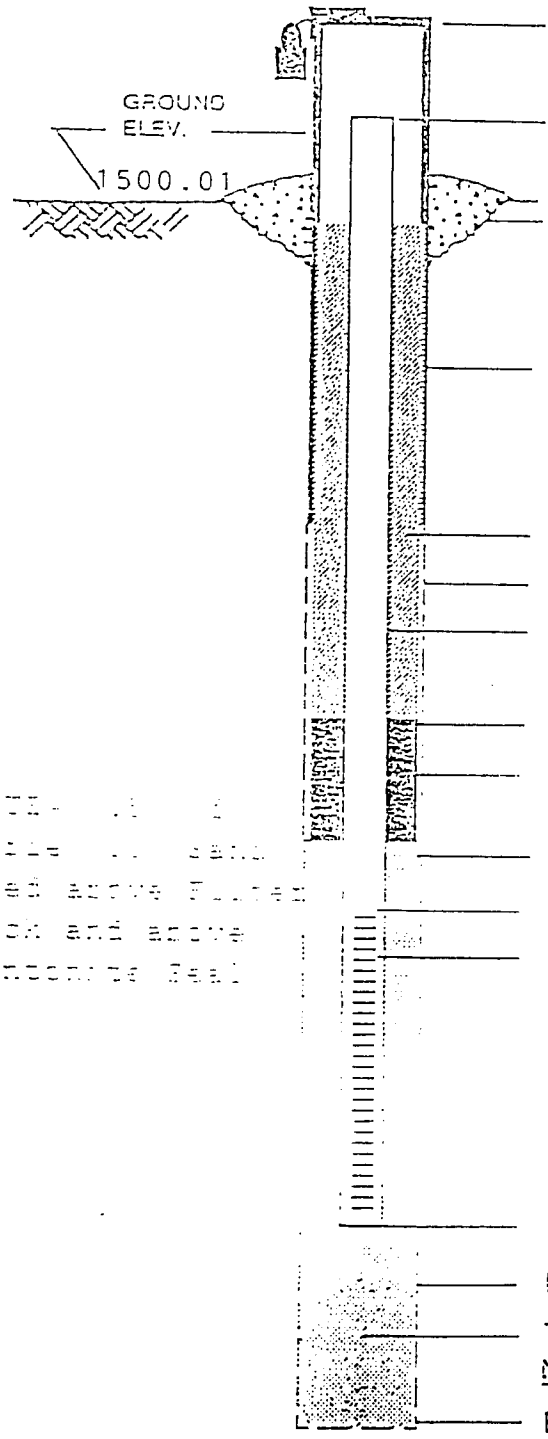
Project Number: D-867

Driller: K. Fuller

Drilling Method: ASTM D1586 Using Hollow Stem Auger.

Geologist: F. Minnolera

Installation Date(s): November 8, 1996/ November 11, 1996



Elevations/Top of Surface Casing: _____

Stick-Up/Top of Surface Casing: _____

Elevation/Top of Riser Pipe: _____

Stick-Up/Top of Riser Pipe: _____

Type of Surface Seal: Concrete Pad (3'X3')

I.D. of Surface Casing: 4" Square

Type of Surface Casing: Lockable Galvanized

Type of Backfill: Cement/Bentonite Grout

Borehole Diameter: +/- 10"

I.D. of Riser Pipe: 2.0

Type of Riser Pipe: PVC- Flush Joint Threaded

Depth of Seal: 74.0

Type of Seal: Bentonite Chips

Depth of Sand Pack: [illegible]

Depth Top of Screen: 80.0

Type of Screen: PVC - Continuous Slot

Slot Size x Length: .010 x 10.0'

I.D. of Screen: 2.0"

Type of Sand Pack: [illegible] Filter Sand

Depth Bottom of Screen: 90.0

Depth Bottom of Sand Pack: 94.0

Type of Backfill Below Observation Well: Morie 'O' Filter Sand

Elevation/Depth of Hole: 94.0

Note: [illegible] used above Filter Pack and above Bentonite Seal

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-24AR
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 1 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1482.1
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 850	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/3-17-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

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"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
1	CLAY TILL UNIT							AUGERED WITH NO SAMPLING 0'–3'
2	Stiff, brown-gray, SILT and very fine SAND, with occassional partings of clayey silt, (ML) to stiff, brown, SILTY CLAY to CLAYEY SILT, trace fine gravel. (CL-ML)							Auger with standard sampling 3' to 82' bgs.
3								Auger with continuous sampling 82' to 94' bgs.
								Top 2" Soft, gray, SILTY CLAY (CL)
4		4	1		3 2 2 2	14"		V. loose, brown & gray, mottled, f–m GRAVEL, some c–f sand, little clay & silt, wet, no plasticity, shale pieces. (GM–ML)
5								
6								
7								
8								
		9	2		3 4 5 4	17"		Stiff, brown–gray, SILT and v fine SAND to med. SAND with occ. partings of clayey silt, (ML) saturated, quick dilatancy, no plasticity, trace f gravel. (ML–SM)
9								
10								
11								@11'–12' bgs: harder drilling – Gravel?
12								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.	BORING NO. MW-24AR
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA	SHEET 2 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.	SURFACE EL. 1482.1
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 850 DRILLER D.M.	DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO)	STARTED 1330/3-17-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A DROP N/A	COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
O.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
12	CLAY TILL UNIT							
13	Stiff, brown-gray, SILT and very fine SAND, with occassional partings of clayey silt, (ML) to stiff, brown, SILTY CLAY to CLAYEY SILT, trace fine gravel. (CL-ML)	16	3		10 9 7 9	20"		Loose, brown-gray, c-f SAND and f-m GRAVEL, ~13'-13.6' bgs: wet 13.6'-15' bgs: Stiff, gray v fine SAND and SILT, trace f gravel, gravel sub-rounded, moist, faint laminae. (SM-ML)
14								
15								
16								
17								
18		11	4		8 4 7 12	22"		Stiff, Brown-Gray, SILTY CLAY to CLAYEY SILT, trace fine gravel, moist thinly laminated – not distinct, but present very low to no plasticity gravel sub-angular very slow dilatancy (ML)
19								
20								
21								
22								
23		16	5		7-8 8-12	1"		Stiff, brown-gray, fine-med SAND, and CLAYEY SILT, little f gravel, wet, (SM-ML) slow to med. dilatancy.
24								

FIELD BORING LOG

DEPTH HOLE 94' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-24AR
DEPTH SOIL DRILL 94' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 3 OF 8
DEPTH ROCK CORE N/A WEATHER N/A DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1482.1
NO. DIST. N/A US. N/A TEMP. N/A DRILL RIG CME 850 DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1330/3-17-03
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
O.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
24								See previous page
	CLAY TILL UNIT		5		7-8 8-12	1"		
25	Stiff, brown-gray, SILT and very fine SAND, with occassional partings of clayey silt, (ML) to stiff, brown, SILTY CLAY to CLAYEY SILT, trace fine gravel. (CL-ML)							
26								
27								
28								Med. stiff, brown-gray to gray CLAYEY SILT to SILT, some vf sand, occ. f gravel, moist, thinly laminated, slow dilatancy. (ML-SM)
		7	6		2 3 4 6	23"		
29								
30								
31								
32								
33								Stiff, olive brown-gray, CLAYEY SILT to SILTY CLAY, trace vf sand, occ. f gravel, moist, thinly laminated, low plasticity. (ML)
		11	7		4 4 7 7	24"		
34								
35								
36								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-24AR
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 4 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1482.1
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 850	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/3-17-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0-5%
"LITTLE" – 5-12%
"SOME" – 12-30%
"AND" – 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
36	CLAY TILL UNIT							
37	Stiff, brown-gray, SILT and very fine SAND, with occassional partings of clayey silt, (ML) to stiff, brown, SILTY CLAY to CLAYEY SILT, trace fine gravel. (CL-ML)							
38								Stiff, olive brown-gray, CLAYEY SILT to SILTY CLAY, occ. f gravel, low plasticity, wet. (ML-CL)
39		15	8		3 6 9 9	24"		
40								
41								
42								
43								
44		13	9		4 5 8 9	24"		Stiff, olive brown-gray CLAYEY SILT to SILTY CLAY, thinly laminated, moist, very slow dilatancy, low plasticity. (ML) (outside of spoon wet)
45								
46								
47								
48								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-24AR
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 5 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1482.1
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 850	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/3-17-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
48	CLAY TILL UNIT Stiff, brown-gray, SILT and very fine SAND, with occassional partings of clayey silt, (ML) to stiff, brown, SILTY CLAY to CLAYEY SILT, trace fine gravel. (CL-ML)	65	10		36 33 32 29	12"		Very dense, gray-brown to green, f-m GRAVEL, little, c-f Sand trace Clayey Silt, sub-angular to angular, wet. (GP-GM)
49								HARD – slow drilling
50		54	11		30 27 27 27	16"		Very dense, gray, c-f SAND and f-m GRAVEL, trace clayey silt, sub-angular to sub-rounded, wet. (SP-GP)
51								faintly stratified in sandy layers
52								HARD drilling
53								Drillers notice harder and softer layers
54								Augered to 55' bgs.
55		35	12		18 18 17 14	15"		Dense Gray cm-f SAND and f-m GRAVEL, appears stratified
56								Gravel sub-rounded, wet. (SP-GP)
57								
58								
59								
60								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-24AR
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 6 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1482.1
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 850	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/3-17-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
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CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
60								60'–61': Dense, Gray f–m GRAVEL and cf SAND, wet, sub–angular mostly, some sub–rounded (ss and shale clasts) (GP–SP)
61	CLAY TILL UNIT Stiff , brown-gray, SILT and very fine SAND, with occassional partings of clayey silt, (ML) to stiff, brown, SILTY CLAY to CLAYEY SILT, trace fine gravel. (CL–ML)	35	13		24 24 11 10	18"		Stiff, olive brown–gray CLAYEY SILT to SILT, occ. f gravel, moist, very slow dilatancy, very low plasticity. (ML)
62								
63								
64								
65								Stiff, olive brown–gray CLAYEY SILT, trace f Gravel, Very slow dilatancy, thin laminae, wet. (ML)
66		27	14		13 15 12 16	22"		66'–66.7': Layer of gray f–m–c SAND trace f gravel, wet (SP) 66.7'–67': Olive brown–gray SILT to CLAYEY SILT, trace vf sand, med. dilatancy, thin laminae, wet
67								
68								
69								
70								Very stiff, olive brown–gray CLAYEY SILT, trace f gravel, very low plasticity, thinly laminated, moist. (ML) to (CL)
71		29	15		8 13 16 19	24"		Glaciolacustrine
72								

FIELD BORING LOG

DEPTH HOLE 94' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-24AR
DEPTH SOIL DRILL 94' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 7 OF 8
DEPTH ROCK CORE N/A WEATHER N/A DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1482.1
NO. DIST. N/A US. N/A TEMP. N/A DRILL RIG CME 850 DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1330/3-17-03
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
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T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE		
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED		
C	COARSE	MOT	MOTTLED	SD	SAND		
CA	CASING	NP	NON-PLASTIC	SI	SILT		
CL	CLAY	OG	ORANGE	SIY	SILTY		
CLY	CLAYEY	ORG	ORGANIC	SM	SOME		
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE		
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL		
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER		
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS		
LI	LITTLE	RX	ROCK	Y	YELLOW		

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"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
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ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
72	CLAY TILL UNIT							
73	Stiff, brown-gray, SILT and very fine SAND, with occassional partings of clayey silt, (ML) to stiff, brown, SILTY CLAY to CLAYEY SILT, trace fine gravel. (CL-ML)							
74								
75								Hard olive brown–gray SILT and CLAY, occ. f gravel, low plasticity, moist–wet. (CL) thinly laminated
76		57	16		9 25 32 50/3"	20"		76.3'–77': Very dense gray f–m GRAVEL, some, cf sand, trace silt, wet. (GM–SM) Gravel sub–rounded
77								
78		>50	17		36 50/5"	8"		Very hard olive brown & gray f–m GRAVEL, some cf sand, wet. (GP–SP)
79	SAND AND GRAVEL UNIT							
80	Dense to very dense, gray-brown to gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) Dense to very dense, gray, very fine, SAND. (SP)							
81								
82								82'–83': Hard, gray, CLAYEY SILT to SILT, thin laminae, slow to med. dilatancy. (ML)
83		42	18		9 24 18 24	17"		83'–83.5': M. dense gray f SAND, cross bedding, quick dilatancy, wet. (SP) 83.5'–84': Hard gray CLAYEY SILT, thin laminae (ML)
84								

FIELD BORING LOG

DEPTH HOLE 94' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-24AR
DEPTH SOIL DRILL 94' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 8 OF 8
DEPTH ROCK CORE N/A WEATHER N/A DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1482.1
NO. DIST. N/A US. N/A TEMP. N/A DRILL RIG CME 850 DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1330/3-17-03
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 0850/3-19-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
O.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
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CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

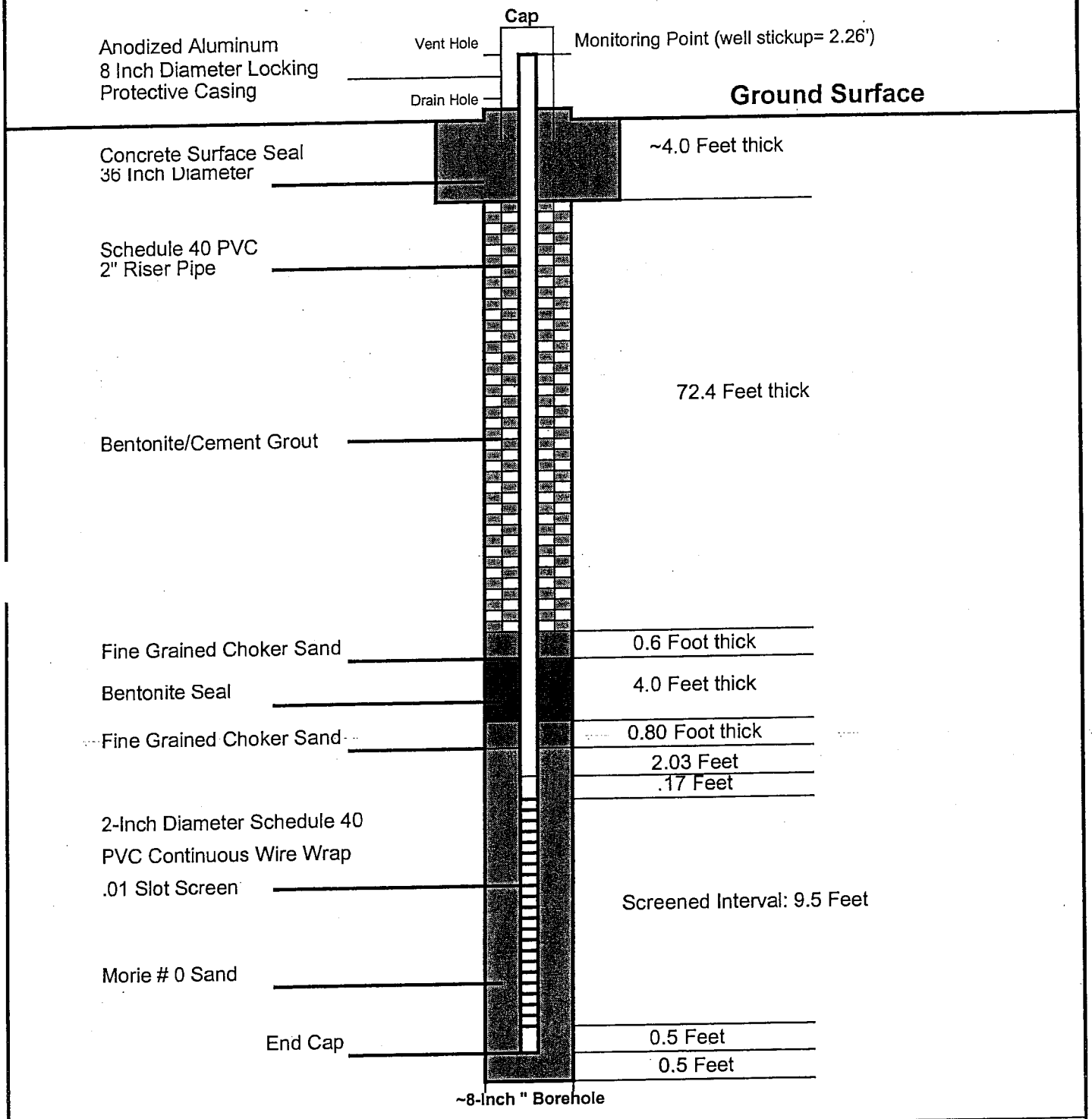
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
84	SAND AND GRAVEL UNIT Dense to very dense, gray-brown to gray, coarse to fine SAND and fine to medium GRAVEL (GP-GM) Dense to very dense, gray, very fine, SAND. (SP)	76	19		12 34 42 32	14"		84'-85': Hard, olive, brown-gray, interbedded CLAYEY SILT and fine SAND, wet (ML-SM)
85								85'-86': Layer gray to brown-gray fine SAND, trace silt, saturated. (SP)
86		57	20		12 22 35 31	18"		Very dense gray f GRAVEL, and m-c SAND, saturated (GP-SP) Gravel sub-rounded to sub-angular
87								
88		75	21		28 40 35 37	19"		88'-89': Very dense, gray, f GRAVEL and m-c SAND, saturated, gravel sub-rounded.(GP-SP)
89								89'-90': Very dense, gray, fine SAND, trace Silt, saturated. (SP)
90		34	22		14 15 19 28	16"		Dense, gray, vf to fine SAND, trace Silt, cross bedded. (SP)
91								91.5'-91.8': Gray, f-m, SAND, more silty @92', quick dilatancy, saturated. (SP)
92		42	18		9 24 18 24	17"		Very dense, gray f-m GRAVEL, little cf sand trace clayey silt, moist. (GP-GM)
93								
94	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: 023-9340	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-24AR**	Sheet 1 of 1
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1482.1	Water Depth: N/A
Weather: partly cloudy	Drilling Company: SJB Services	Riser Elev.: 1484.36	Date: 3/19/03-3/20/03
Temp: 30° F	Drill Rig: CME 550X	Time Started: 1310	Time Completed: 1230



Total depth of soil boring: 94.5' b.g.s. Thickness of sandpack: 12.70' Well Bottom: 94.5' b.g.s.

Golder Associates Inc. Buffalo, N.Y.	**CHAFFEE LANDFILL CHAFFEE, NEW YORK**	**MW-24AR Monitoring Well Detail Sand and Gravel Unit**		
Job No. 023-9340		Drawn by: AJN	Checked by: NKW	Date: 6/18/2003

FIELD BORING LOG

DEPTH HOLE 16'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-24BR
DEPTH SOIL DRILL 15'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 1 OF 2
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1483.1
NO. DIST. N/A US. N/A	TEMP. 35 F	DRILL RIG CME 850	DRILLER D.MATTHIES		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30"		STARTED 1000/3-21-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1050/3-21-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0–5%
"LITTLE"	5–12%
"SOME"	12–30%
"AND"	30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
1	CLAY TILL UNIT Medium dense, olive-brown, fine to medium GRAVEL, little medium to coarse sand (GP) to stiff, gray, SILT and fine SAND, trace fine gravel (ML).							AUGERED WITH NO SAMPLING 0'–3'
2								
3								
4		12	1		8 6 6 5	0"		NO RECOVERY
5								
6								AUGERED WITH NO SAMPLING 5'–8'
7								
8								
9		13	2		5 6 7 8	14"		Med. dense, olive-brown to gray f–m GRAVEL, little m–c Sand, trace clayey silt, gravel sub-angular to sub-rounded, gravel mostly shale, wet. (GP–GM)
10								10'–10.5': Med. dense gray to olive-brown f–m GRAVEL little, m–c Sand, trace clayey silt, wet (GP)
11		13	3		5 7 6 7	14"		10.5'–12': Stiff gray SILT and, fine SAND, trace f gravel, moist, gravel sub-rounded, faintly laminated (thin laminae), slow dilatancy. (ML–SM)
12								

FIELD BORING LOG

DEPTH HOLE 16' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-24BR
DEPTH SOIL DRILL 15' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 2 OF 2
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1483.1
NO. DIST. N/A US. N/A TEMP. 35 F DRILL RIG CME 850 DRILLER D.MATTHIES DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" STARTED 1000/3-21-03
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1050/3-21-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SW	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

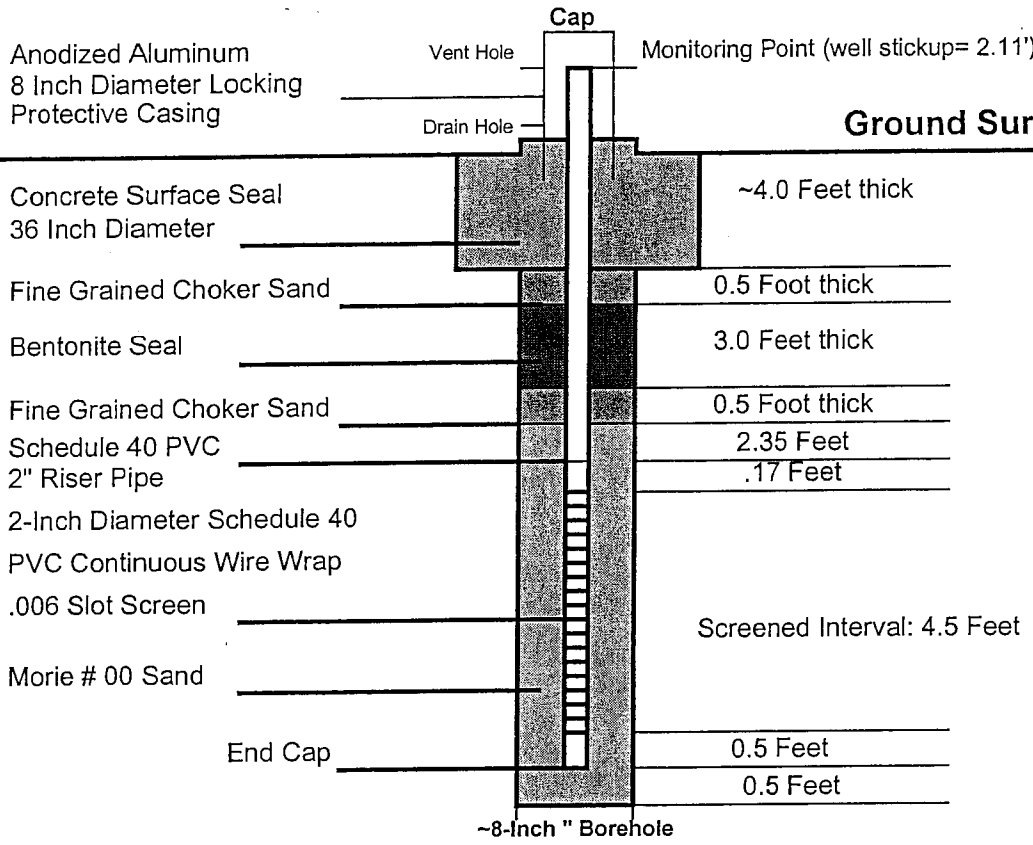
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
12	CLAY TILL UNIT Medium dense, olive-brown, fine to medium GRAVEL, little medium to coarse sand (GP) to stiff, gray, SILT and fine SAND, trace fine gravel (ML).	23	4		9 11 12 15	2"		Stiff to v. stiff, olive-brown to gray SILT and, f SAND, little f-m gravel, wet. (ML) Water in boring. Very little recovery. Pushed large gravel piece.
13								
14		13	5		2 5 8 8	15"		Med. dense, gray f-m SAND, some f-m gravel, little, silt, saturated, quick-med. dilatancy, gravel sub-angular. (SP-SM) Sampled to 16' bgs. Drilled to 15.5' bgs.
15								
16	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: **023-9340**	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-24BR**	Sheet **1** of **1**
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1483.1	Water Depth: N/A
Weather: lt. Rain	Drilling Company: SJB Services	Riser Elev.: 1485.21	Date: 3/21/03
Temp: 45° F	Drill Rig: CME 550X	Time Started: 1100	Time Completed: 1320



Total depth of soil boring: 15.5' b.g.s. Thickness of sandpack: 7.5' Well Bottom: 15' b.g.s.

Golder Associates Inc. Buffalo, N.Y.	**CHAFFEE LANDFILL CHAFFEE, NEW YORK**	**MW-24BR Monitoring Well Detail Clay Till Unit**		
Job No. 023-9340		Drawn by: AJN	Checked by: NKW	Date: 6/18/2003

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-80A
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 1 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1504.0
NO. DIST. N/A	US. N/A	TEMP. N/A	DRILL RIG CME 550X	DRILLER D.M.	DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/12-20-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0–5%
"LITTLE"	5–12%
"SOME"	12–30%
"AND"	30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.		SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	grass and roots, 0'–0.7'								Soft, brown to olive brown, mottled, CLAYEY SILT to SILTY CLAY, little fm gravel, wet. (CL)
1	CLAY TILL UNIT	3		1		1 1 2 5	18"		1'–2': Stiff; becomes more distinctly laminated
2	Stiff to very stiff, olive-brown to gray-brown to gray, SILTY CLAY to CLAYEY SILT to SILT, trace to some fine to medium gravel, thinly laminated, low plasticity, occassional silt and sand layers. (CL-ML)								1.5'–2': Gravel increases
3		11		2		4 5 6 7	18"		Stiff, olive–brown, mottled, SILTY CLAY to CLAYEY SILT, trace f gravel, moist, occ. m Gravel, thinly laminated, very low plasticity (CL)
4									
5		7		3		4 3 4 5	22"		Stiff, olive brown red–brown, mottled, SILTY CLAY to CLAYEY SILT, very moist, occ. f Gravel (CL to ML), thinly laminated, very slow dilatancy
6									
7		14		4		4 5 9 14	22"		Stiff, olive brown red yellow brown, mottled, CLAYEY SILT, trace f gravel, moist, thinly laminated, occ. f Sand and Silt partings, occ. m Gravel, very low plasticity (CL-ML)
8									
9		17		5		3 6 11 15	24"		Very stiff, olive brown to gray–brown to gray, mottled, CLAYEY SILT, trace f gravel, moist, thinly laminated, very low plasticity, (CL-ML) 9.5': becomes distinctly gray
10									
11		19		6		5 8 11 9	23"		Very stiff, olive brown to gray brown to gray, mottled, CLAYEY SILT, occ. f gravel, moist, occ. yellow–brown silt partings, occ. silt & vf sand partings, thinly laminated, very low to no plasticity. (CL-ML)
12									11.7'–12': Gray, vf SAND & SILT, med. dilatancy wet

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-80A
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 2 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1504.0
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/12-20-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

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"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
13	CLAY TILL UNIT Stiff to very stiff, olive-brown to gray-brown to gray, SILTY CLAY to CLAYEY SILT to SILT, trace to some fine to medium gravel, thinly laminated, low plasticity, occassional silt and sand layers. (CL-ML)	13	7		4 5 8 6	18"		Stiff, gray, CLAYEY SILT to SILT, occ. f Gravel, no plasticity thinly laminated, very slow dilatancy, no plasticity (CL-ML)
14		11	8		3 5 6 7	22"		V. stiff, gray, CLAYEY SILT, occ. f gravel, thinly laminated, very low plasticity, very slow dilatancy (CL-ML)
16		9	9		3 4 5 7	24"		V. stiff, gray, CLAYEY SILT to SILT, trace, f sand occ. f gravel, slow dilatancy, thinly laminated (CL to ML) 16'-16.5': frequent partings of Silt and f Sand med. dilatancy, wet 17.5'-18': More Clayey (silt & clay) moist
18		7	10		2 2 5 9	16"		18'-18.5': Stiff, gray, SILT, little vf sand, med. dilatancy, wet (ML) 18.5'-19': Gray, CLAYEY SILT, trace f sand, (CL-ML) 19'-20': Gray, CLAYEY SILT, thinly laminated occ. f Gravel (CL) low-med. plasticity
20		13	11		3 6 7 9	22"		Stiff, gray, CLAYEY SILT to SILTY CLAY, thinly laminated, med. plasticity. (CL) several layers (~0.1' thick) Silt and vf Sand med. to quick dilatancy wet @20.5', 20.9' and 21.3' (ML) laminations disturbed around Sand and Silt layers
22		6	12		2 2 4 6	24"		Med. stiff, gray, SILTY CLAY, thinly laminated, occ. f gravel, med. plasticity, (CL) occ. Silt and vf Sand partings. distinct color change to gray @24' bgs
24								

FIELD BORING LOG

DEPTH HOLE 94' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-80A
DEPTH SOIL DRILL 94' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 3 OF 8
DEPTH ROCK CORE N/A WEATHER N/A DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1504.0
NO. DIST. N/A US. N/A TEMP. N/A DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1330/12-20-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
O.D.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
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ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

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CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
25	CLAY TILL UNIT Stiff to very stiff, olive-brown to gray-brown to gray, SILTY CLAY to CLAYEY SILT to SILT, trace to some fine to medium gravel, thinly laminated, low plasticity, occassional silt and sand layers. (CL-ML)	5	13		1 3 2 4	18"		Med. stiff, gray, vf SAND to f SAND and SILT, faintly laminated, quick dilatancy, saturated. (SM-ML)
26		9	14		4 4 5 9	21"		Stiff, Gray, f SAND and SILT, (ML-SP) quick dilatancy, saturated, grades to gray SILT little(–) f sand, (ML) grades to Gray Silt (to 28') (ML) slow dilatancy all thinly laminated
27								
28		15	15		3 5 10 12	18"		Stiff, gray CLAYEY SILT to SILT, little fine sand, saturated. 29'–30': stiffer than above; thinly laminated mod. dilatancy (ML)
29								
30		15	16		4 8 7 11	17"		Stiff, gray, SILT to CLAYEY SILT, little vf sand, thinly laminated, moist, mod. dilatancy. (ML)
31								
32		12	17		5 5 7 11	17"		Stiff, gray, SILT to CLAYEY SILT, little v fine sand, thinly laminated, slow dilatancy, moist. (ML)
33								
34		15	18		4 6 9 9	18"		Stiff, gray, SILT to CLAYEY SILT, little vf sand, moist, occ. f gravel, (ML) slow to moderate dilatancy.
35								
36								

FIELD BORING LOG

DEPTH HOLE 94' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-80A
DEPTH SOIL DRILL 94' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 4 OF 8
DEPTH ROCK CORE N/A WEATHER N/A DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1504.0
NO. DIST. N/A US. N/A TEMP. N/A DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 1330/12-20-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
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R.C.	ROCK CORE
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FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
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DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
37	CLAY TILL UNIT Stiff to very stiff, olive-brown to gray-brown to gray, SILTY CLAY to CLAYEY SILT to SILT, trace to some fine to medium gravel, thinly laminated, low plasticity, occassional silt and sand layers. (CL-ML)	13	19		3 5 8 11	17"		Stiff, gray, CLAYEY SILT to SILT, little f sand trace f gravel, wet thinly laminated, slow-mod. dilatancy. (ML) 37.5'-38': more f Sand quick dilatancy saturated (SM-SP)
38								
39		15	20		6 8 7 12	12"		Stiff, gray, CLAYEY SILT some(-) f sand, occ. fm gravel, moist, (ML) mod. dilatancy. sample disturbed from pushing piece of gravel
40								
41		21	21		4 7 14 15	13"		Med. dense, gray, fine SAND some clayey silt, quick dilatancy, saturated, (ML-SP) grades to Clayey Silt trace f Sand (ML)
42								
43		17	22		6 7 10 12	20"		Very stiff, gray, SILT, little vf sand, thinly laminated, occ. f Gravel, slow-mod. dilatancy, moist. (ML)
44								
45		15	23		5 6 9 11	18"		Stiff, gray, SILT to CLAYEY SILT, little fm gravel trace vf sand, slow dilatancy, moist. (ML)
46								
47		13	24		4 5 8 12	22"		Stiff, gray, SILT and CLAY, some f-m gravel, trace vf sand, thinly laminated, med. plasticity, moist, no dilatancy. (CL)
48								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.	BORING NO. MW-80A
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA	SHEET 5 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.	SURFACE EL. 1504.0
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 550X DRILLER D.M.	DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO)	STARTED 1330/12-20-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A DROP N/A	COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
U	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
49	CLAY TILL UNIT Stiff to very stiff, olive-brown to gray-brown to gray, SILTY CLAY to CLAYEY SILT to SILT, trace to some fine to medium gravel, thinly laminated, low plasticity, occassional silt and sand layers. (CL-ML)	13	25		2 4 9 9	22"		Stiff, gray, CLAYEY SILT, occ. f gravel, moist, thinly laminated, med. plasticity. (CL)
50								
51		14	26		4 6 8 8	23"		Stiff, gray, SILTY CLAY, trace f gravel, thinly laminated, moist, mod. plasticity (CL)
52								
53		18	27		9 9 9 11	21"		52'–52.75': V Stiff, gray, SILTY CLAY. (CL) 52.75'–53.2': Gray, f SAND, occ. f gravel. (SP) 53.2'–54': interbedded gray, f SAND and SILT & CLAY, little fm gravel, mod. dilatancy (CL-ML)
54								
55		22	28		6 9 13 21	24"		Very stiff, gray, SILT, little f–m gravel, slow dilatancy, moist. (ML)
56								
57		21	29		5 8 13 16	24"		Very stiff, gray, SILT to CLAYEY SILT, occ. f Gravel, thinly laminated. (ML)
58								
59	Sand/Gravel	36	30		5 7 29 24	21"		Stiff, gray, SILT to CLAYEY SILT, occ. f gravel, slow dilatancy, thin laminae, moist. (ML) Gray, mf GRAVEL, some cf sand, moist. (GP)
60								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL, WELL INST. & DECOMM.			BORING NO. MW-80A
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 6 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1504.0
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/12-20-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0-5%
"LITTLE"	5-12%
"SOME"	12-30%
"AND"	30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
61	SAND AND GRAVEL UNIT Dense, gray, fine to medium, GRAVEL and medium to coarse SAND (GP-GM), to very dense fine to coarse SAND, little fine to medium gravel (SP), to very stiff, gray, SILT to CLAYEY SILT, little fine to medium gravel, trace very fine sand (ML-CL).	37	31		6 14 23 21	16"		Dense, gray, fm GRAVEL and mc SAND, little clayey Silt, moist–wet Gravel sub–angular (GP-GM)
62								
63		33	32		7 17 16 16	14"		Dense, gray, f–m GRAVEL and m–c SAND, trace(–) silt, wet Gravel sub–angular to sub–rounded (GP)
64								
65		26	33		6 9 17 18	24"		Dense, gray, mc SAND, little fm gravel, occ. partings of clayey silt, wet Gravel sub–rounded (SP)
66								
67		47	34		5 10 37 53	18"		Very dense, f–m–c SAND, little f–m gravel, trace(–), silt, wet Gravel sub–rounded (SP)
68								
69		28	35		26 15 13 10	16"		Very dense, f–m–c SAND, little f–m gravel, trace(–), Silt wet Gravel sub–rounded (SP)
70								
71		22	36		7 10 12 11	16"		Dense, gray, f–m–c SAND and f–m GRAVEL, wet (SP-GP) @71.5': Gray Clayey Silt to Silt trace(+) f Gravel v. slow dilatancy moist to wet (CL-ML)
72								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-80A
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 7 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1504.0
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/12-20-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
O.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
73	SAND AND GRAVEL UNIT Dense, gray, fine to medium, GRAVEL and medium to coarse SAND (GP-GM), to very dense fine to coarse SAND, little fine to medium gravel (SP), to very stiff, gray, SILT to CLAYEY SILT, little fine to medium gravel, trace very fine sand (ML-CL).	23	37		9 9 14 17	19"		Very Stiff, brown gray, CLAYEY SILT to SILT, trace(–) f gravel, occ. f Sand partings, thinly laminated, gravel sub-rounded, very slow dilatancy, moist–wet (CL–ML)
74								
75		23	38		6 9 14 18	22"		Very stiff, gray, CLAYEY SILT to SILT, trace, f–m gravel, thinly laminated, moist–wet, gravel sub-rounded, (CL–ML) slow dilatancy
76								
77		30	39		7 12 18 27	19"		Very stiff, gray SILT to CLAYEY SILT little, fm gravel trace vf sand, thinly laminated, occ. partings of Clayey Silt, moist–wet, Gravel sub-rounded, slow–med. dilatancy. (ML–CL)
78								(sampler possibly hit cobble @~77.6')
79		49	40		12 20 29 23	12"		Hard, gray, SILT to CLAYEY SILT, little fm gravel, thinly laminated, moist–wet, somewhat disturbed slow–med. dilatancy (ML) more Gravel at bottom of sampler
80								
81		36	41		13 18 18 19	0		NO RECOVERY (SP)
82								
83		76	42		24 52 24 25	6"		Very dense, gray, m–f GRAVEL, trace sand, wet. (GP) VERY LITTLE RECOVERY DRILLER SAYS IT FEELS "GRAVELLY"
84								

FIELD BORING LOG

DEPTH HOLE 94'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-80A
DEPTH SOIL DRILL 94'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 8 OF 8
DEPTH ROCK CORE N/A	WEATHER N/A	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1504.0
NO. DIST. N/A US. N/A	TEMP. N/A	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 1330/12-20-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1230/12-24-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

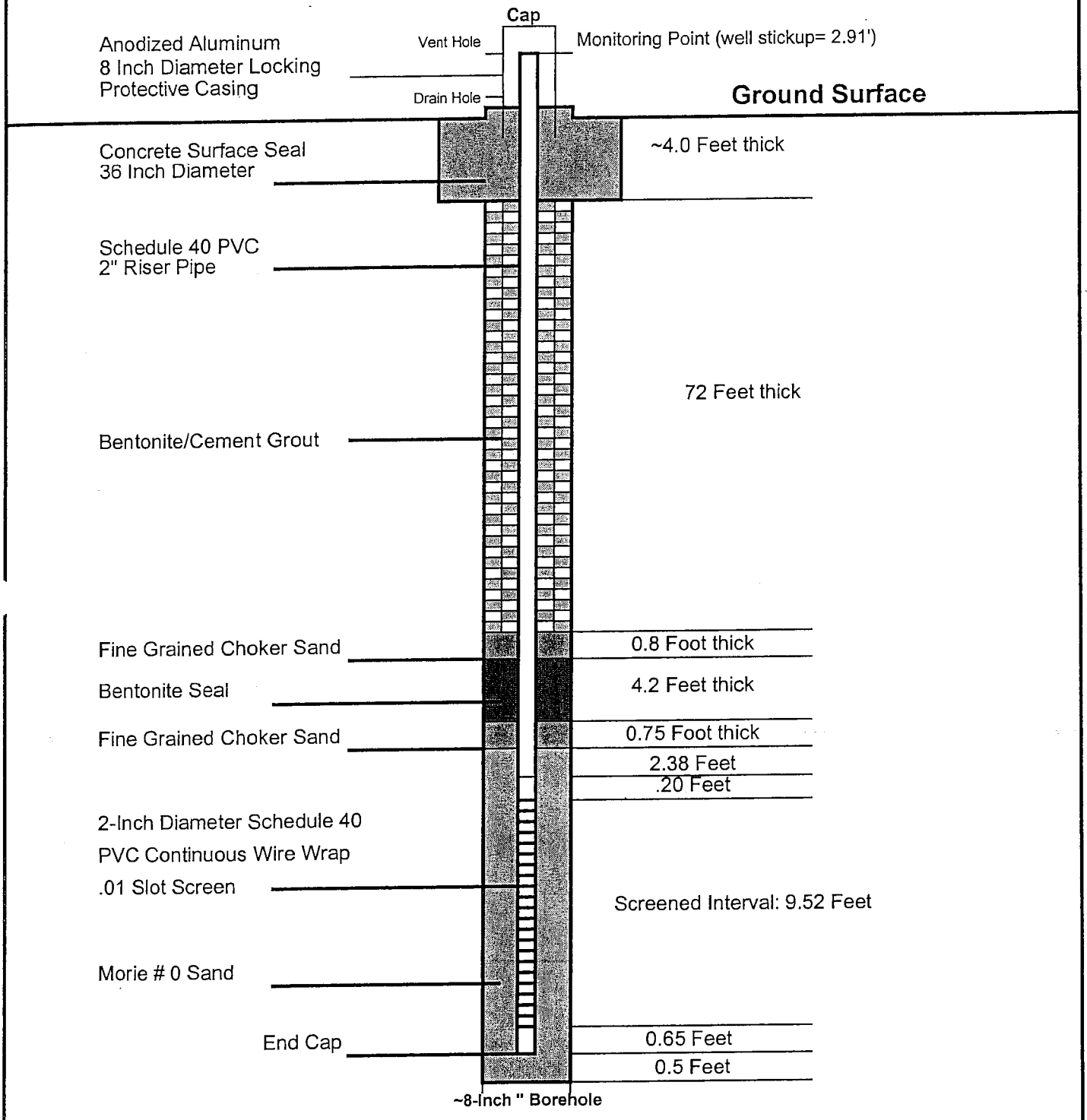
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
85	SAND AND GRAVEL UNIT Dense, gray, fine to medium, GRAVEL and medium to coarse SAND (GP-GM), to very dense fine to coarse SAND, little fine to medium gravel (SP), to very stiff, gray, SILT to CLAYEY SILT, little fine to medium gravel, trace very fine sand (ML-CL).	46	43		28 29 17 15	12"		V. dense, gray, f–m GRAVEL and cf SAND, wet. (GP-SP)
86								
87		34	44		18 19 15 15	12"		Dense, gray, fm GRAVEL, some c–f sand, trace clayey silt, wet. (GP-SP)
88								
89		29	45		21 14 15 22	1"		Very little recovery pushed c Gravel piece – stuck in spoon Sand & Gravel?
90								
91		29	46		12 18 11 17	9"		Dense, gray, c–f SAND and f–m GRAVEL, wet (SP-GP)
92								
93		15	47		1 6 9 29	12"		Dense, gray, cf SAND little fm gravel. wet VERY SANDY (SP)
94	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: 023-9340	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-80A**	Sheet **1** of **1**
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1504.0	Water Depth: N/A
Weather: N/A	Drilling Company: SJB Services	Riser Elev.: 1506.91	Date: 12/20-12/24/02
Temp: N/A	Drill Rig: CME 550X	Time Started: 1330	Time Completed: 1230



Total depth of soil boring: 94.5' b.g.s. Thickness of sandpack: 12.75' Well Bottom: 94' b.g.s.

Golder Associates Inc. **Buffalo, N.Y.**	**CHAFFEE LANDFILL** **CHAFFEE, NEW YORK**	**MW-80A Monitoring Well Detail** **Sand and Gravel Unit**		
Job No. 023-9340		Drawn by: AJN	Checked by: NKW	Date: 7/25/2003

FIELD BORING LOG

DEPTH HOLE 15' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-80B
DEPTH SOIL DRILL 15' GA INSP. GOC DRILLING METHOD 4.25" ID HSA SHEET 1 OF 1
DEPTH ROCK CORE N/A WEATHER LT SNOW DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1503.5
NO. DIST. N/A US. N/A TEMP. 20 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED /12-27-02
TIME WL. N'A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1500/12-27-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
O.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM
BR	BROWN	MIC	MICACEOUS
C	COARSE	MOT	MOTTLED
CA	CASING	NP	NON-PLASTIC
CL	CLAY	OG	ORANGE
CLY	CLAYEY	ORG	ORGANIC
F	FINE	PH	PRESSURE-HYDRAULIC
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL
GL	GRAVEL	R	RED
LYD	LAYERED	RES	RESIDUAL
LI	LITTLE	RX	ROCK
SA	SAMPLE
SAT	SATURATED
SD	SAND
SI	SILT
SLY	SILTY
SM	SOME
TR	TRACE
WL	WATER LEVEL
WH	WEIGHT OF HAMMER
WR	WEIGHT OF RODS
Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0-5%
"LITTLE" – 5-12%
"SOME" – 12-30%
"AND" – 30-50%

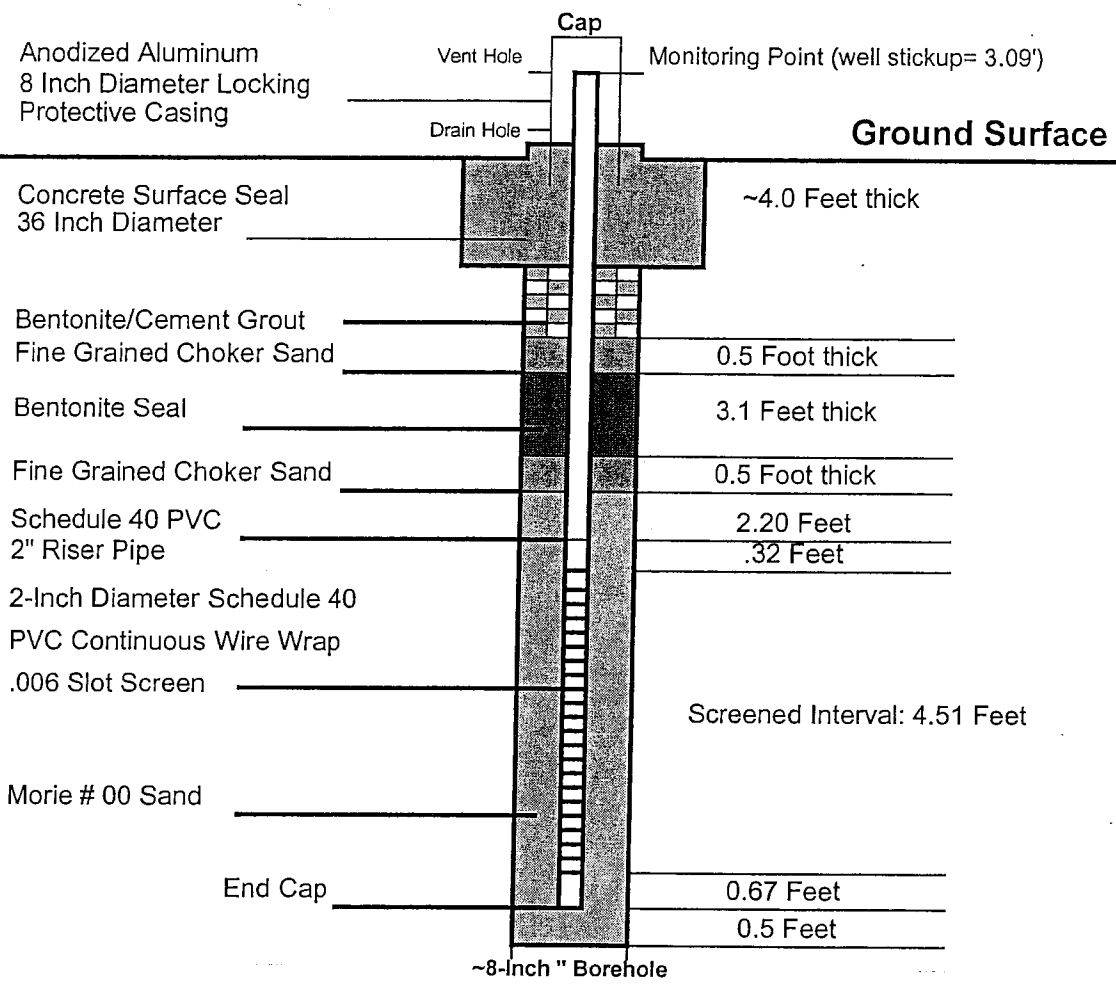
CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
4	MUST HAVE PUSHED COBBLE FOR FIRST ~5"							Stiff, olive-brown, SILT, trace fm gravel, thinly laminated and mottled, moist-wet
5	CLAY TILL UNIT	13	1		27 7 6 7	14"		some Red-Brown Gravel sub-angular slow-med. dilatancy (ML)
6	Stiff, gray-brown mottled olive-brown to gray, SILT to CLAYEY SILT, trace fine gravel, thinly laminated, slow-mod. dilatancy, occassional very fine sand partings. (ML, ML-CL)							
7								Auger with no sampling 3' to 9' bgs.
8								
9								
10		15	2		5 7 8 12	21"		Stiff, gray-brown, mottled, olive brown SILT to CLAYEY SILT, occ. f Gravel, thinly laminated Gravel sub-rounded to sub-angular slow dilatancy (ML-CL)
11								
12		19	3		5 8 11 10	22"		Very stiff, brown-gray SILT, becoming more distinctly gray @12' @11.25': thick fine sand lens mottled thinly laminated (ML) slow-mod. dilatancy moist occ. v fine Sand partings occ. f Gravel (more distinctly gray)
13								
14		13	4		2 6 7 10	23"		Stiff, gray, SILT, thinly laminated occ. f gravel, slow-med. dilatancy, occ. vf Sand partings. (ML)
15	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: 023-9340	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-80B**	Sheet 1 of 1
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1503.5	Water Depth: N/A
Weather: LIGHT SNOW	Drilling Company: SJB Services	Riser Elev.: 1506.59	Date: 12/27/02
Temp: 20 °F	Drill Rig: CME 550X	Time Started: N/A	Time Completed: 1500



Total depth of soil boring: 15.8' b.g.s. Thickness of sandpack: 7.7' Well Bottom: 15.3' b.g.s.

Golder Associates Inc. Buffalo, N.Y.	**CHAFFEE LANDFILL CHAFFEE, NEW YORK**	**MW-80B Monitoring Well Detail Clay Till Unit**		
Job No. 023-9340		Drawn by: AJN	Checked by: NKW	Date: 7/25/2003

DEPTH HOLE 92' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-81
DEPTH SOIL DRILL 92' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 1 OF 8
DEPTH ROCK CORE N/A WEATHER P CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1495.6
NO. DIST. N/A US. N/A TEMP. 24 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 0920/12-30-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
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ABBREVIATIONS

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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	CLAY TILL UNIT 0-4' Cery loose to loose, brown-olive brown with red-brown mottling, fine SAND to coarse to fine SAND and SILT, some fine gravel. (SM, SM-SP) 4'-8' Loose to dense, brown, fine to medium, GRAVEL, little coarse to fine sand, trace to some clayey silt. (GM) 8'-51' Stiff to very stiff, brown gray to gray, SILTY CLAY TO CLAYEY SILT, trace fine gravel, medium plasticity, thinly laminated, occassional layers of silt and fine sand and fine gravel. (CL, CL-ML)	2	1		1 1 1 1	16"		Very loose, brown-olive brown with red brown mottling, f SAND and SILT, moist (SM)
2		7	2		4 4 3 3	9"		Loose, brown to olive brown with red-brown, mottling, f SAND, and silt some f gravel, moist (SM-SP)
4		10	3		4 5 5 6	7"		Loose f gravel, little cf SAND, trace clayey silt, wet, quick dilatancy. (GM)
6		14	4		4 6 8 9	7"		M. dense brown f-m GRAVEL little, c-f sand, some clayey silt, wet no structure (GM)
8		16	5		4 6 10 12	14"		Stiff, brown-gray CLAYEY SILT to SILTY CLAY, little f-m gravel to 9.75', thinly laminated moist. (CL) 9.75'-10': f-m GRAVEL, little cf sand, trace clayey silt, wet (GM)
10		22	6		8 9 12 12	20"		Very stiff, gray, SILT and v fine SAND, occ. fine gravel, thinly laminated med.-quick dilatancy, moist (ML)
12								

FIELD BORING LOG

DEPTH HOLE 92' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-81
DEPTH SOIL DRILL 92' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 2 OF 8
DEPTH ROCK CORE N/A WEATHER P CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1495.6
NO. DIST. N/A US. N/A TEMP. 24 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 0920/12-30-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GR	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.		SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
13	CLAY TILL UNIT 0–4' Cery loose to loose, brown-olive brown with red-brown mottling, fine SAND to coarse to fine SAND and SILT, some fine gravel. (SM, SM-SP) 4'–8' Loose to dense, brown, fine to medium, GRAVEL, little coarse to fine sand, trace to some clayey silt. (GM) 8'–51' Stiff to very stiff, brown gray to gray, SILTY CLAY TO CLAYEY SILT, trace fine gravel, medium plasticity, thinly laminated, occassional layers of silt and fine sand and fine gravel. (CL, CL-ML)	16		7		4 6 10 11	17"		Stiff, gray, CLAYEY SILT, trace, f–m gravel, thinly laminated, moist Gravel sub–angular very low plasticity. (CL)
14		19		8		5 7 12 12	18"		Very stiff, gray, CLAYEY SILT to SILTY CLAY, trace f–m gravel, low plasticity, moist, thinly laminated. (CL)
16		14		9		3 6 8 11	21"		Stiff, gray, CLAYEY SILT to SILT, moist, thinly laminated, occ. fm Gravel, very low to no plasticity. (CL)
18		7		10		3 2 5 8	20"		Stiff, gray, SILTY CLAY to CLAYEY SILT, trace (–) fm Gravel med.–low plasticity (CL) thinly laminated @18.5': pocket of fm Gravel some, Silt & Clay wet (GM)
20		9		11		3 3 6 10	22"		Stiff, gray, SILTY CLAY to CLAYEY SILT, t. f gravel, low plasticity, thinly laminated, moist (CL)
22		8		12		3 3 5 8	18"		M. stiff, gray CLAYEY SILT, moist–wet occ. f Gravel med–low plasticity thinly laminated (CL to ML) v. slow dilatancy
24									

FIELD BORING LOG

DEPTH HOLE 92' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-81
DEPTH SOIL DRILL 92' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 3 OF 8
DEPTH ROCK CORE N/A WEATHER P CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1495.6
NO. DIST. N/A US. N/A TEMP. 24 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 0920/12-30-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
25	CLAY TILL UNIT 0-4' Cery loose to loose, brown-olive brown with red-brown mottling, fine SAND to coarse to fine SAND and SILT, some fine gravel. (SM, SM-SP) 4'-8' Loose to dense, brown, fine to medium, GRAVEL, little coarse to fine sand, trace to some clayey silt. (GM) 8'-51' Stiff to very stiff, brown gray to gray, SILTY CLAY TO CLAYEY SILT, trace fine gravel, medium plasticity, thinly laminated, occassional layers of silt and fine sand and fine gravel. (CL, CL-ML)	8	13		3 4 4 6	24"		M. stiff, gray, SILTY CLAY, moist occ. fm Gravel thinly laminated med. plasticity (CL) no dilatancy
26								
27		7	14		1 3 4 5	24"		M. stiff, gray, SILTY CLAY to CLAYEY SILT, moist occ. f Gravel thinly laminated med plasticity (CL)
28								
29		7	15		1 2 5 5	20"		Same as above with trace(–) f Gravel
30								
31		11	16		2 4 7 8	24"		Stiff, gray, SILTY CLAY to CLAYEY SILT, moist occ. f Gravel med. plasticity (CL) thinly laminated @31' & 31.4': 1/2" thick layer of Silt and vf Sand quick dilatancy wet (ML)
32								
33		11	17		5 6 5 7	17"		Stiff, gray, SILT and, vf to fine SAND, WET trace clayey silt interbedded with occ. layers of clayey silt quick dilatancy (SM) occ. f Gravel
34								
35		13	18		5 6 7 8	24"		34'-35': Stiff, gray, SILT and fine SAND interbedded with frequent partings of Silt & Clay to Clayey Silt wet (ML) 35'-36': Gray, SILTY CLAY with occ. partings fine Sand and Silt occ. f Gravel moist (CL)
36								

FIELD BORING LOG

DEPTH HOLE 92' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-81
DEPTH SOIL DRILL 92' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 4 OF 8
DEPTH ROCK CORE N/A WEATHER P CLOUDY DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1495.6
NO. DIST. N/A US. N/A TEMP. 24 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 0920/12-30-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0-5%
"LITTLE" – 5-12%
"SOME" – 12-30%
"AND" – 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
37	CLAY TILL UNIT 0-4' Cery loose to loose, brown-olive brown with red-brown mottling, fine SAND to coarse to fine SAND and SILT, some fine gravel. (SM, SM-SP) 4'-8' Loose to dense, brown, fine to medium, GRAVEL, little coarse to fine sand, trace to some clayey silt. (GM) 8'-51' Stiff to very stiff, brown gray to gray, SILTY CLAY TO CLAYEY SILT, trace fine gravel, medium plasticity, thinly laminated, occassional layers of silt and fine sand and fine gravel. (CL, CL-ML)	9	19		2 4 5 8	24"		Stiff, gray, SILTY CLAY to CLAYEY SILT, med. plasticity thinly laminated moist occ. f Gravel (CL) occ. partings of f to vf SAND
38								
39		8	20		1 3 5 7	23"		M. stiff, gray, SILTY CLAY to CLAYEY SILT, moist trace(–) f Gravel med plasticity thinly laminated (CL)
40								
41		15	21		4 6 9 12	18"		Stiff, gray, SILTY CLAY to CLAYEY SILT, trace(–), f Gravel occ. m Gravel moist (CL) med. plasticity thinly laminated
42								
43		12	22		1 5 7 9	24"		Stiff, gray, SILTY CLAY, occ. to trace(–) f Gravel thinly laminated moist (CL) med. plasticity
44								
45		13	23		3 5 8 14	24"		Stiff, gray, SILTY CLAY, occ. to trace(–) fine Gravel thinly laminated med. plasticity wet (CL) @45.8': alternating layers of Silt and fine Sand & Clayey Silt mod.– quick dilatancy moist (ML)
46								
47		14	24		5 6 8 9	24"		Stiff, gray, SILT to CLAYEY SILT, trace f–m gravel, med. dilatancy, occ. partings of fine Sand and Silt moist (ML)
48								

FIELD BORING LOG

DEPTH HOLE 92'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-81
DEPTH SOIL DRILL 92'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 5 OF 8
DEPTH ROCK CORE N/A	WEATHER RAIN	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1495.6
NO. DIST. N/A US. N/A	TEMP. 34 F	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 0920/12-30-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0–5%
"LITTLE"	5–12%
"SOME"	12–30%
"AND"	30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
49	CLAY TILL UNIT 8'–51' Stiff to very stiff, brown gray to gray, SILTY CLAY TO CLAYEY SILT, trace fine gravel, medium plasticity, thinly laminated, occassional layers of silt and fine sand and fine gravel. (CL, CL-ML)	19	25		4 8 11 14	0		NO RECOVERY
50		47	26		7 16 31 18	15"		Dense, gray/V. stiff, gray CLAYEY SILT to ~51' moist (CL) Very distinct change to fm gravel, (pushed piece of C Gravel) Gravel, angular shale fragments
51	SAND AND GRAVEL UNIT 51'–58' Dense, gray, coarse to fine SAND, little to some fine to medium gravel. (SM) 58'–71' Very stiff, gray, SILT to CLAYEY SILT, some fine to medium gravel, trace fine sand. (ML) 71'–92' Dense to very dense, gray, fine to medium GRAVEL, some clayey silt, trace coarse to fine sand, to gray, fine to coarse, SAND, little fine gravel. (GM, GM-SM)							
52		29	27		10 18 11 12	17"		Dense, gray, cf SAND, some f–m gravel, wet
53								
54		23	28		8 11 12 16	2"		M. dense, gray fc SAND, some fm gravel, wet
55								
56		13	29		3 2 11 12	18"		V loose, cf SAND, little fm gravel, wet
57								
58		15	30		7 7 8 11	22"		same as above to 58.25' 58.25'–60': Brown, gray SILT to CLAYEY SILT, interbedded with thin silts and f Sand partings (ML)
59								
60								

FIELD BORING LOG

DEPTH HOLE 92' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-81
DEPTH SOIL DRILL 92' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 6 OF 8
DEPTH ROCK CORE N/A WEATHER LT RAIN DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1495.6
NO. DIST. N/A US. N/A TEMP. 45 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 0920/12-30-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
61	SAND AND GRAVEL UNIT 51'–58' Dense, gray, coarse to fine SAND, little to some fine to medium gravel. (SM) 58'–71' Very stiff, gray, SILT to CLAYEY SILT, some fine to medium gravel, trace fine sand. (ML) 71'–92' Dense to very dense, gray, fine to medium GRAVEL, some clayey silt, trace coarse to fine sand, to gray, fine to coarse, SAND, little fine gravel. (GM, GM-SM)	14	31		5 6 8 14	18"		Very stiff, gray, SILT to CLAYEY SILT, some f–m gravel, gravel sub–rounded, (ML–CL)
62		22	32		5 8 14 16	18"		Very stiff, gray, SILT to CLAYEY SILT, some f–m gravel, gravel sub–rounded, moist (ML–CL)
63								
64		23	33		6 8 18 21	15"		Very stiff, gray, SILT to CLAYEY SILT, some f–m gravel, gravel sub–rounded, moist slow to med. dilatancy (ML–CL) (drilling is difficult) increase of Gravel 65.75'–66'
65								
66		32	34		5 9 23 18	17"		Hard Gray Silt to Clayey Silt some(+) fm Gravel trace(+) f Sand (ML) Gravelly Silt slow to med. dilatancy
67								
68		38	35		8 17 21 15	2"		Hard, gray, SILT to CLAYEY SILT, some fm gravel, trace f sand, slow to med. dilatancy (ML) (may be 2" of slop in sampler)
69								
70		30	36		4 11 19 26	14"		same as above Distinct Change @71' Gray, fm GRAVEL, trace clayey silt, little cf sand Gravel is sub–angular to angular shale (mostly) Black petroliferous shale – natural oily odor
71								
72								

FIELD BORING LOG

DEPTH HOLE 92'	JOB NO. 023-9340	PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM.			BORING NO. MW-81
DEPTH SOIL DRILL 92'	GA INSP. GC	DRILLING METHOD 4.25" ID HSA			SHEET 7 OF 8
DEPTH ROCK CORE N/A	WEATHER LT RAIN	DRILLING CO. SJB SERVICES, INC.			SURFACE EL. 1495.6
NO. DIST. N/A US. N/A	TEMP. 45 F	DRILL RIG CME 550X	DRILLER D.M.		DATUM N/A
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 LB.	DROP 30" (AUTO)		STARTED 0920/12-30-02
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.D.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE		
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED		
C	COARSE	MOT	MOTTLED	SD	SAND		
CA	CASING	NP	NON-PLASTIC	SI	SILT		
CL	CLAY	OG	ORANGE	SIY	SILTY		
CLY	CLAYEY	ORG	ORGANIC	SM	SOME		
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE		
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL		
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER		
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS		
LI	LITTLE	RX	ROCK	Y	YELLOW		

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
73	SAND AND GRAVEL UNIT 51'–58' Dense, gray, coarse to fine SAND, little to some fine to medium gravel. (SM) 58'–71' Very stiff, gray, SILT to CLAYEY SILT, some fine to medium gravel, trace fine sand. (ML) 71'–92' Dense to very dense, gray, fine to medium GRAVEL, some clayey silt, trace coarse to fine sand, to gray, fine to coarse, SAND, little fine gravel. (GM, GM-SM)	65	37		29 28 37 34	4"		Very dense, gray, fm GRAVEL, some clayey silt, trace, cf sand, moist (GM) very little recovery
74								
75		34	38		20 19 15 17	13"		Dense, gray, cf SAND, some fm gravel, trace clayey silt, wet (SM-GM) bottom 0.2' of spoon: cf SAND; appears stratified wet (SP)
76								
77		18	39		11 9 9 12	11"		M. dense, gray, fm GRAVEL, some, cf sand trace clayey silt, wet (GM)
78								77.8'–78': layer of Gray Silt and vf Sand (ML) med. quick dilatancy wet
79		30	40		5 8 22 26	2"		
80								79.2'–80': Gray f SAND some silt wet (SM)
81		24	41		3 7 17 26	13"		M. dense, gray, fm GRAVEL, little clayey silt, trace fc sand, (GM-ML)
82								81.5'–81.8': f SAND, trace Silt (SP-SM) quick dilatancy wet
83		53	42		15 26 27 21	14"		Very Dense Gray fm GRAVEL and fc sand, trace clayey silt wet (GM) V. Dense Clayey Silt appears to act as a cementing agent
84								

FIELD BORING LOG

DEPTH HOLE 92' JOB NO. 023-9340 PROJECT CHAFFEE LANDFILL WELL INST. & DECOMM. BORING NO. MW-81
DEPTH SOIL DRILL 92' GA INSP. GC DRILLING METHOD 4.25" ID HSA SHEET 8 OF 8
DEPTH ROCK CORE N/A WEATHER LT RAIN DRILLING CO. SJB SERVICES, INC. SURFACE EL. 1495.6
NO. DIST. N/A US. N/A TEMP. 45 F DRILL RIG CME 550X DRILLER D.M. DATUM N/A
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 LB. DROP 30" (AUTO) STARTED 0920/12-30-02
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1530/12-31-02

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

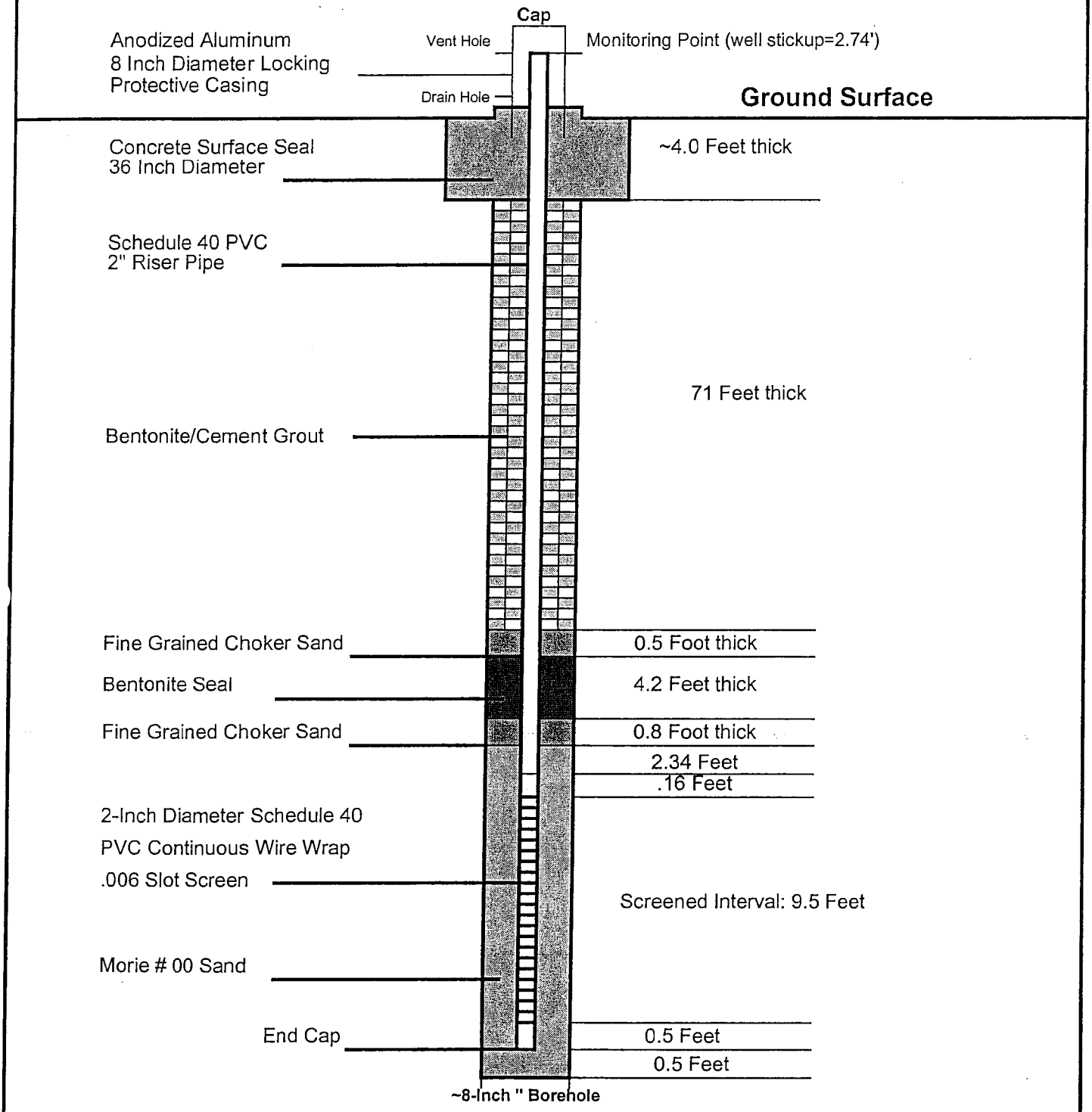
CONSISTENCY

LS	LOOSE	S	SOFT
CO	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
85	SAND AND GRAVEL UNIT 51'-58' Dense, gray, coarse to fine SAND, little to some fine to medium gravel. (SM) 58'-71' Very stiff, gray, SILT to CLAYEY SILT, some fine to medium gravel, trace fine sand. (ML) 71'-92' Dense to very dense, gray, fine to medium GRAVEL, some clayey silt, trace coarse to fine sand, to gray, fine to coarse, SAND, little fine gravel. (GM, GM-SM)	41	43		19 19 22 23	14"		Dense, gray, fm GRAVEL and fc SAND, trace(-) clayey silt, wet (GM) Gravel mostly sub-angular to sub-rounded
86								
87		31	44		17 19 12 11	16"		same as above to 87' 87'-87.5': Gray fc SAND, little(-) f Gravel wet (SP) 87.5'-88': interbedded SILT and v fine SAND lenses wet (ML-SM) quick dilatancy
88								
89		32	45		12 16 16 20	3"		Dense, fm GRAVEL and cf SAND, little silt to clayey silt, wet (GM-SM) very little recovery
90								
91		23	46		6 6 17 16	16"		M. dense, cf SAND, little fm gravel, trace clayey silt, (SM-SP) 91'-92': fairly clean f SAND, wet (SP)
92	END OF BORING							

MONITORING WELL INSTALLATION DIAGRAM

Job No.: 023-9340	Project: **Chaffee Landfill Well Inst.**	Well No.: **MW-81**	Sheet 1 of 1
GA Insp.: GOC	Drilling Method: 4.25" I.D. H.S.A.	Ground Elev.: 1495.6	Water Depth: N/A
Weather: P. CLOUDY	Drilling Company: SJB Services	Riser Elev.: 1498.34	Date: 12/30-12/31/02
Temp: 24° F	Drill Rig: CME 550X	Time Started: 0920	Time Completed: 1530



Total depth of soil boring: 93' b.g.s. Thickness of sandpack: 12.5' Well Bottom: 92.5' b.g.s.

Golder Associates Inc. **Buffalo, N.Y.**	**CHAFFEE LANDFILL** **CHAFFEE, NEW YORK**	**MW-81 Monitoring Well Detail** **Sand and Gravel Unit**		
		Drawn by:	Checked by:	Date:
Job No. 023-9340		AJN	NKW	7/25/2003

FIELD BORING LOG

DEPTH HOLE 20'	JOB NO. 033-9347	PROJECT WMNY/Chaffee Design-CQA/NY			BORING NO. MW-82B
DEPTH SOIL DRILL 20'	GA INSP. G.COMBES	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 1 of 1
DEPTH ROCK CORE N/A	WEATHER OVERCAST	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1478.4
NO. DIST. N/A US. N/A	TEMP. 45°F	DRILL RIG Diedrich D-50	DRILLER S. Fuller		DATUM SITE
DEPTH WL. 30.9	HRS. PROD. N/A	WT. SAMPLER HAMMER 140-LB.	DROP 30"		STARTED 1400/11-6-03
TIME WL. 0930/10-14-03	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1600/11-6-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
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C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	**CLAY TILL UNIT** **0-20'** Very soft to firm, brown to gray-brown to gray, CLAYEY SILT to SILTY CLAY to SILT, trace fine gravel, thinly laminated, slow dilatancy, occassional fine sand partings. (CL-ML) Compact, brown, coarse to fine SAND @ 2' to 6'. Compact, brown-gray to gray, SILT, trace fine sand, little fine gravel @ 7' to 8' and 17' to 18'. (SM-ML)	3	1	DO	1-2 1-4	8"/24"		SA-1 Very soft, brown, with some orange-yellow and gray mottling, CLAYEY SILT, trace (-) fine gravel, no structure, moist to wet. (CL-ML) Potentially fill material.
2		14	2	DO	5-7 7-8	17"/24"		SA-2 Compact, brown with gray and black mottling, c-f SAND, little fine gravel, trace (+), clayey silt, moist. (SM) Potentially fill material.
4		11	3	DO	3-5 6-5	14"/24"		SA-3 Compact, brown with red-brown mottling, c-f SAND, some (-) fine gravel, little clayey silt, moist. (SM) Potentially fill material, bottom 2" of sample appears natural.
6		16	4	DO	4-6 10-13	19"/24"		SA-4 6'-7' Firm, gray-brown with red-yellow mottling, faint thin laminations, SILT and CLAY, trace (+) fine gravel, moist to wet. (CL-ML) 7'-8' Compact, brown-gray, SILT, some fine sand, little (-) fine gravel, occasional thin silt and sand lens. (SM-ML)
8		13	5	DO	3-6 7-9	21"/24"		SA-5 Firm, gray-brown to orange-red, gray mottling, CLAYEY SILT to SILT and CLAY, trace fine gravel, thinly laminated, moist. (CL-ML)
10		21	6	DO	4-8 13-15	20"/24"		SA-6 Firm, gray-brown to brown-gray, CLAYEY SILT to SILT and CLAY, trace (-), f(+)m(-) gravel, thinly laminated, moist. (CL-ML)
12		25	7	TO	5-10 15-18	21"/24"		SA-7 Firm, gray, CLAYEY SILT, trace (-), fine gravel/coarse sand, occasional medium gravel, slow dilatancy, thinly laminated, gravel subangular (some shale, petroliferous shale/odor), moist. (CL-ML)
14		21	8	DO	6-8 13-18	20"/24"		SA-8 Firm, gray, CLAYEY SILT to SILT, trace (-) fine gravel/coarse sand, slow dilantancy, thinly laminated (less distinct), moist, occasional very fine sand partings. (CL-ML)
16		32	9	DO	7-14 18-17	23"/24"		SA-9 16'-17' Stiff, gray, CLAYEY SILT to SILT, trace fine gravel, thinly laminated, moist to wet. (CL-ML) 17'-18' Compact, gray, SILT, with occasional fine sand lenses, 0.1' thick quick dilatancy layer present, wet. (ML)
18		22	10	DO	4-9 13-15	23"/24"		SA-10 Firm, gray, CLAYEY SILT, little(-) fine gravel, thinly laminated (less distinct), moderate dilatancy, wet, occasional fine sand partings. (CL-ML)
20	END OF BORING							Groundwater monitoring well installed in borehole. See well installation log for MW-82B.

MONITORING WELL INSTALLATION LOG

JOB NO. 023-9340 PROJECT WMNY/WELL INSTALLATION/NY WELL NO. MW-82B SHEET 1 of 1

GA INSP. GOC DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1479.10 FT. WATER DEPTH 17.61 FT. BTOR

WEATHER OVERCAST DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1481.43 FT. DATE/TIME 12/02/03 1600

TEMP. 45° F DRILL RIG DIETRICH D-50 DRILLER S. FULLER STARTED 0800/11-7-03 (TIME / DATE) COMPLETED 1200/11-7-03 (TIME / DATE)

LOCATION / COORDINATES N7864.69, E6696.65

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 14.0 l.f. WELL SCREEN 2.0 in. dia. 7.0 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

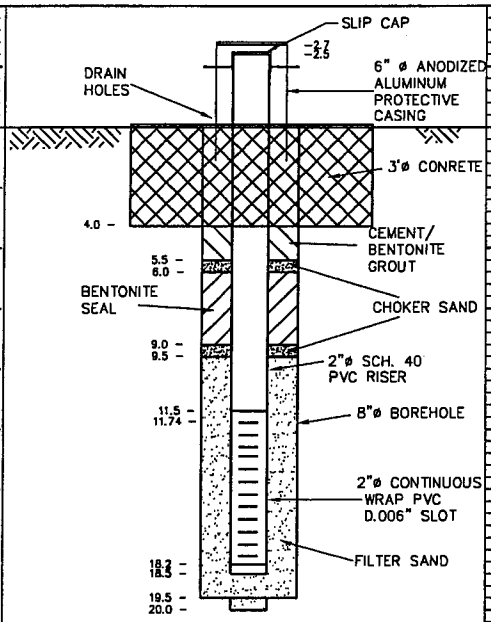
JOINT TYPE FLUSH THREADED SLOT SIZE 0.006" FILTER PACK QTY. 3 BAGS

GROUT QUANTITY ——— CENTRALIZERS NOT USED FILTER PACK TYPE QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1479.10	GROUND SURFACE
0.0	**CLAY TILL UNIT** **0–20'** Very soft to firm, brown to gray-brown to gray, CLAYEY SILT to SILTY CLAY to SILT, trace fine gravel, tinly laminated, slow dilatancy, occassional fine sand partings. (CL-ML) Compact, brown, coorse to fine SAND @ 2' to 6'. Compact, brown-gray to gray, SILT, trace fine sand, little fine gravel @ 7'-8' and 17' to 18'. (SM-ML)
20.0	EOB @ 20.0'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 19.5 FT. BELOW GROUND SURFACE (BGS). SAMPLED TO 20.0 FT BGS. SAND POURED THROUGH AUGERS 18.5'–19.5' FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 7 FT. OF WELL SCREEN, END CAP, 15 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 22.0 FT. WELL MATERIALS PLACED TO 18.5 FT. BGS WITH 2.3 FT. STICKUP. SAND POURED THROUGH AUGERS 9.5 – 18.5 FT. BGS WHILE REMOVING AUGERS AT 0.5 – 1.0 FT. INCREMENTS. CHOKER SAND PLACED 9.0 – 9.5 FT BGS. BENTONITE CHIP SEAL PLACED 6.0 – 9.0 FT. BGS. CHOKER SAND PLACED 5.5 – 6.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 4.0 – 5.5 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC ON-SITE DURING INSTALLATION AND CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 12-10-03 TO 12-11.03

DEVELOPMENT METHOD: STAINLESS STEEL BAILER

VOLUME PURGED: 3.15 GALS.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

Western Expansion Area Logs

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELLS
HOLE NO. 15-88 & 16-88

#15 1454.06
#16 SURF. ELEV. 1454.26

PROJECT Monitoring well installation
2A790 Adjacent parcel to CID, Inc. Hand Road
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 19 feet E and 33 feet S of NW property corner

DATE STARTED 5/20/88 COMPLETED 5/23/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24 N	DESCRIPTION & CLASSIFICATION	WELL 15-88	WATER TABLE & REMARKS	WELL 16-
	1	1 3 3 8 6	Extremely moist dark brown silt loam (SANDY-SILT) topsoil with little very fine size sand, loose with abundant fine size roots 1.0	Two (2) inch inside diameter PVC riser pipe	Topsoil to 1.0 feet over coarse silty lake sediment to 1.5 feet over silty lake sediment to 2.0 feet over clayey lake sediment to 4.0 feet over silty lake sediment to 8.0 feet over coarse silty lake sediment to 10.0 feet over silty lake sediment to 12.0 feet over clayey lake sediment to 14.5 feet over water sorted and deposited coarse silt with trace gravel, little sand to 17.7 feet over water sorted and deposited sand and gravel to 21.0 feet over water sorted and deposited sand with little silt to 22.0 feet over	Two (2) inch inside diameter PVC riser pipe
	2	5 9 10 11 19	Extremely moist faintly mottled brown silt loam (SANDY-SILT) with 1 to 3% mostly fine size gravel, trace very fine size sand, loose, weak blocky soil structure 1.5			
5	3	4 4 6 6 10	Moist distinctly mottled light brown silt loam (CLAYEY-SILT) with 3 to 5% mostly shale gravel, firm, weak blocky soil structure			
	4	3 3 4 7 7	- - - - grades downward to - - 2.0			
			Extremely moist distinctly mottled olive brown silty clay loam (CLAYEY-SILT), very stiff, weak blocky soil structure with nearly vertical gray desiccation cracks			
	5	3 7 9 8 16	- - - - grades downward to - - 4.0			
10	6	2 2 5 5 7	Extremely moist distinctly mottled brown silt loam (CLAYEY-SILT), stiff, weak thinly laminated with nearly vertical gray desiccation cracks			
	7	4 10 9 14 19	- - - - clear transition to - - 6.0			
	8	3 2 4 4 6	Extremely moist faintly mottled brown silt loam (CLAYEY-SILT) with 1 to 3% mostly fine size subangular gravel, firm, weak thinly laminated with occasional nearly vertical gray desiccation cracks			
15	9	2 7 11 22 18	- - - - grades downward to - - 8.0			
			Extremely moist to wet brown silt loam (SANDY-SILT) with 1 to 3% mostly very fine size gravel, little very fine size sand, compact, has a tendency to liquify when disturbed, weak thinly bedded			
	10	10 9 7 6 16	- - - - grades downward to - - 10.0		Continued on sheet 2B.	
20						

See next sheet.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 15-88 & 16-88 continued

#15 1454.06
#16 SURF. ELEV. 1454.26

PROJECT Monitoring well installation
2A790 Adjacent parcel to CID, Inc. Hand Rd.
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 19 feet E and 33 feet S of NW property corner

DATE STARTED 5/20/88 COMPLETED 5/23/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24 N	DESCRIPTION & CLASSIFICATION	WELL 15	WATER TABLE & REMARKS	WELL 16
	11	3 5 7 12 12	Extremely moist faintly mottled brown silt loam (CLAYEY-SILT) with 1 to 3% mostly subangular gravel, firm, weak thinly laminated		(1) Bentonite pellet seal (20.0 to 22.5 foot depth).	(2) (1
			└ - - - clear transition to - - 12.0		22.5	
	12	6 12 17 22 29	Extremely moist faintly mottled grayish brown silty clay loam (CLAYEY-SILT) with 1 to 3% mostly very fine size gravel, very stiff, weak thinly laminated with very thin coarse silt lenses		23.0	2 inch slotted (#10) PVC screen
			└ - - - grades downward to - - 14.5		(2) Two inch inside diameter PVC riser pipe.	
25	13	8 9 8 14 17	Extremely moist to wet brown silt loam (SANDY-SILT) with 5 to 15% mostly subrounded gravel, little very fine size sand, loose, thinly bedded		(3) Bentonite pellet seal.	#2 size sand
			└ - - - clear transition to - - 17.7		28.0	
	14	7 15 13 18 28	Wet distinctly mottled brownish gray very gravelly loamy sand (SAND) with 40 to 60% mostly subangular to subrounded gravel, fine to coarse size sand, compact in place, loose when disturbed, stratified, noticed rust color stain between 17.7 to 18.3 foot depth, no odor		30.0	
30	15	16 20 23 24 43	└ - - - grades downward to - - 21.0	Two (2) inch inside diameter PVC riser pipe		
			Wet faintly mottled grayish brown sandy loam (SILTY-SAND) with very fine to fine size sand, little silt, compact in place, readily liquifies when disturbed, bedded			
	16	15 21 25 25 46	└ - - - clear transition to - - 22.0			
	17	6 13 18 39 31	Extremely moist gray gravelly silt loam (SANDY-SILT) with 15 to 25% mostly subangular gravel, little very fine size sand, compact, massive soil structure			
35	18	9 19 23 24 42	└ - - - grades downward to - - 24.5			
	19	8 16 21 28 37	See next sheet.			
	20	7 8 15 21 27				
40						

Cement-bentonite grout

(3)

2 inch slotted (#10) PVC screen

#2 size sand

31.8
33.8
34.0
39.0
40.0

loamy glacial till to 24.5 feet over water sorted and deposited alternating sand and gravel to 25.0 feet over loamy glacial till to 27.(feet over water sorted and deposited sand and gravel to 28.0 feet over water sorted and deposited sand and gravel with little silt to 31.0 feet over water sorted and deposited

Continued on sheet 2

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus. 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 15-88 continued

#15-88 SURF. ELEV. 1454.06

PROJECT Monitoring well installation
2A79o Adjacent parcel to CID, Inc., Hand Rd.
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 19 feet E and 33 feet S of NW property corner

DATE STARTED 5/20/88 COMPLETED 5/23/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24	N	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	11	3 5 7 12	12	Wet gray alternating loamy sand (SAND) with very fine to fine size sand, and gravelly loamy sand (SAND) with 15 to 40% mostly subangular to subrounded gravel, fine to coarse size sand, compact in place, loose when disturbed, stratified	coarse silt with little to some sand to 32.0 feet over silty glacial till to 34.0 feet over water sorted and deposited sand to 36.0 feet over water sorted and deposited sand and gravel to end of boring.
	12	6 12 17 22	29		
25	13	8 9 8 14	17	- - - - grades downward to - - - - - 25.0 Extremely moist gray gravelly silt loam (SANDY-SILT) with 15 to 25% mostly subangular gravel, little very fine size sand, compact, massive soil structure	
	14	7 15 13 18	28	- - - - clear transition to - - - - 27.0	
	15	16 20 23 24	43	Wet gray very gravelly loamy sand (SAND) with 40 to 60% mostly subangular to subrounded gravel, fine to coarse size sand, compact in place, loose when disturbed, stratified	
30	16	15 21 25 25	46	- - - - grades downward to - - - - - 28.0 Wet gray very gravelly sandy loam (SILTY-SAND) with 40 to 60% mostly subangular to subrounded gravel, very fine to coarse size sand, little silt, dense in place, loose when disturbed, stratified	
	17	6 13 18 39	31	- - - - grades downward to - - - - - 31.0 Extremely moist gray silt loam (SANDY-SILT) with 1 to 3% mostly fine size subrounded gravel, little to some very fine size sand, dense, thinly bedded	
35	18	9 19 23 24	42	- - - - grades downward to - - - - - 32.0 Extremely moist gray silt loam (CLAYEY-SILT) with 5 to 15% mostly subangular gravel, hard, massive soil structure	
	19	8 16 21 28	37	- - - - clear transition to - - - - 34.0	
	20	7 8 19 21	27	See next sheet.	Continued on sheet 2B.
40					

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

SHEET 2A OF 2B

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 15-88 continued

#15 1454.06
#16 SURF. ELEV. ~~1454.26~~

PROJECT Monitoring well installation
2A79o Adjacent parcel to CID, Inc. Hand Rd.
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 19 feet E and 33 feet S of NW property corner
DATE STARTED 5/20/88 COMPLETED 5/23/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER (0 / 6 / 12 / 18 / 24)	DESCRIPTION & CLASSIFICATION	WATER TABLE & REMARKS
	11	3 5 7 12		
	12	6 12 17 22		
25	13	8 9 8 14		
	14	7 15 13 18	Wet gray loamy sand (SAND) with fine to medium size sand, dense in place, loose when disturbed	
30	15	16 20 23 24		
	16	15 21 25 25	- - - grades downward to - - -	36.0
	17	6 13 18 39	Wet gray very gravelly loamy sand (SAND) with 40 to 60% mostly sub-angular to subrounded gravel, fine to coarse size sand, dense in place, loose when disturbed, stratified	
35	18	9 19 23 24		
	19	8 16 21 28		40.0
40	20	7 8 19 21	Boring completed at 40.0 feet.	Water level at 13.1 feet below ground surface at 7:30 am 5/23/88 after auge ing to 40.0 feet the previ ous friday.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

SHEET 2B OF 2B

EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations
1091 Jamison Road • Elma, NY 14059
(716) 655-1717 • FAX (716) 655-2915

2A79ad HOLE NO. MW 16S-01 SURF. ELEVATION 1453.50

PROJECT MW Installation- Chaffee Landfill LOCATION

Town of Sardinia, Erie County, New York

CLIENT McMahon & Mann Consulting Engineers DATE STARTED 04/16/01 COMPLETED 04/15/01

DEPTH IN FT	SN	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL (1)	WATER TABLE AND REMARKS
	1	1								(1) 4"x 5' steel protective casing.
			1			3		Extremely moist dark brown (SANDY-SILT) topsoil with little sand, very loose, common fine size roots, granular soil structure, (ML).		
				2				0.9		
					8					(2) #6 SLOT WIRE WRAPPED 2" PVC SCREEN
	2	8						Extremely moist faintly mottled brown (SANDY-SILT) with little sand, loose, weak blocky soil structure, (ML).		
			11			23				(3) CEMENT BENTONITE GROUT
				12				grades downward to 2.0		
					16					(4) #4000 SAND PACK
	3	5						Extremely moist distinctly mottled olive brown (CLAYEY-SILT) with 3 to 5% fine size gravel, little clay, very stiff and stiff, with nearly vertical gray desiccation cracks, (ML-CL).		
5			5			12				(3) CEMENT BENTONITE GROUT
				7						
					10					(4) #4000 SAND PACK
	4	1								
			4			8		grades downward to 6.0		
				4						
					4			Extremely moist distinctly mottled olive brown (SILT) with 3 to 5% fine size gravel, trace sand and clay, loose becoming very loose below 8.0 feet, weak thinly bedded, (ML).		
	5	1								
			1			3				← 8.5'
				2						Coarse silty topsoil with little sand to 0.9 feet over coarse silty slack water sediment with little sand to 2.0 feet over silty slack water sediment with little clay to 6.0 feet over silty slack water sediment to 11.0 feet over silty slack water sediment with little clay to end of boring.
10					2					
	6	2								
			2			9		grades downward to 11.0		
				7						
					12			Extremely moist distinctly mottled olive gray (CLAYEY-SILT) with 3 to 5% fine size gravel, little clay, very stiff, weak thinly laminated with nearly vertical gray desiccation cracks, (ML-CL).		
	7	8								
			8			17				
				9						
					12			14.0		← 13.5'
								Boring completed at 14.0 feet.		← 14.0'
										No water at completion.
15										
20										

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Donald W. Owens, Senior Soil Scientist (bvy) SHEET 1 OF 1

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 17-88

SURF. ELEV. 1459.66

PROJECT Monitoring well installation
2A79n Adjacent parcel to CID, Inc. Hand Rd.
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 17 feet south of edge of pavemen Hand Road

DATE STARTED 5/24/88 COMPLETED 5/25/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER (0-6 / 6-12 / 12-18 / 18-24)	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	1	1 3 6 7	Extremely moist dark brown silt loam (SANDY-SILT) topsoil with little very fine size sand, loose 0.5	Two (2) inch inside diameter PVC riser pipe / Cement-bentonite grout	Topsoil to 0.5 feet over clayey lake sediment to 3.0 feet over water sorted and deposited coarse silt with some sand to 3.5 feet over clayey lake sediment to 6.0 feet over water sorted and deposited sand with some silt to 6.5 fee over silty lake sedi ment to 15.0 feet over water sorted an deposited sand and gravel with little t some silt to 16.0 feet over coarse sil ty lake sediment to 18.0 feet over silty lake sediment to 28. feet over clayey lak sediment to 28.5 feet over coarse silty lake sedimen with little sand to 29.5 feet over water sorted and deposited sand and gravel with little to some silt to 37.0 feet over water sorted and deposited sand and gra vel to end of boring
	2	4 5 7 11	Moist to extremely moist distinctly mottled brown silty clay loam (CLAYEY-SILT) with 1 to 3% gravel, stiff, weak blocky soil structure with nearly vertical gray desiccation cracks
	3	5 7 8	- - - grades downward to - - - 2.0
5			Extremely moist faintly mottled dark brown silty clay loam (CLAYEY-SILT) with 1 to 3% mostly fine size gravel, stiff, weak blocky soil structure with occasional nearly vertical gray desiccation cracks
	4	2 4 6 10	- - - clear transition to - - - 3.0
	5	4 7 9 11	Extremely moist to wet distinctly mottled brown silt loam (SANDY-SILT) with 3 to 5% gravel, some very fine to fine size sand, compact, loose when disturbed, weakly bedded
10			- - - grades downward to - - - 3.5
	6	2 5 8 10	Extremely moist faintly mottled grayish brown silty clay loam (CLAYEY-SILT), stiff, weak thinly laminated with occasional nearly vertical gray desiccation cracks
	7	2 5 6 10	- - - clear transition to - - - 4.0
	8	2 5 13 12	Extremely moist distinctly mottled olive brown silty clay (CLAYEY-SILT) with 1 to 3% mostly fine size gravel, stiff, thinly laminated with nearly vertical gray desiccation cracks and occasional very thin coarse silt lenses
15			- - - clear transition to - - - 6.0
	9	6 6 10 13	
	10	5 7 9 14	
20			

See next sheet.

Continued on sheet 1A

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

SHEET 1 OF 2A

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 17-88 continued

SURF. ELEV. 1459.66

PROJECT Monitoring well installation
2A79n Adjacent parcel to CID, Inc. Hand Rd.
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 17 feet south of edge of pavemen Hand Road

DATE STARTED 5/24/88 COMPLETED 5/25/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24				DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	1	1	3	6	7	9	Wet faintly mottled brown sandy loam (SILTY-SAND) with very fine to fine size sand, some silt, loose and compact, tends to liquify when disturbed, bedded	Two (2) inch inside diameter PVC riser pipe Cement-bentonite grout	
	2	4	5	7	11	12	- - - - clear transition to - - 6.5 - - Extremely moist faintly mottled brown silt loam (CLAYEY-SILT) with 1 to 3% mostly fine size gravel, stiff, weak thinly laminated		
5	3	5	7	8	8	15	- - - - grades downward to - - 8.0 - - Extremely moist faintly mottled olive brown silty clay loam (CLAYEY-SILT) with 1 to 3% mostly fine size gravel, very stiff, weak thinly laminated with occasional very thin coarse silt lenses		
	4	2	4	6	10	10			
	5	4	7	9	10	16	- - - - grades downward to - - 9.5 - - Extremely moist gray silty clay loam (CLAYEY-SILT) with 1 to 3% mostly fine size gravel, stiff, thinly laminated with very thin coarse silt lenses		
10	6	2	5	8	10	13			
	7	2	5	6	10	11	- - - - clear transition to - 15.0 - - Extremely moist to wet gray gravelly sandy loam (SILTY-SAND) with 15 to 30% mostly subangular gravel with very fine to coarse size sand, little to some silt, compact, stratified, noticed one (1) wet silt loam (SANDY-SILT) layer between 15.5 to 15.7 foot depth		
	8	2	5	13	12	18			
15	9	6	6	10	13	16	- - - - grades downward to - - 16.0 - - Extremely moist to wet gray silt loam (SANDY-SILT) with 1 to3% gravel, little very fine size sand, compact, thinly bedded		
	10	5	7	9	14	16	- - - - grades downward to - - 18.0 See next sheet.		
20									Continued on sheet 2.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

SHEET 1A OF 2A

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 17-88 continued

SURF. ELEV. 1459.66

PROJECT Monitoring well installation
2A79n Adjacent parcel to CID, Inc. Hand Rd.
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 17 feet south of edge of paveme[nt]
Hand Road

DATE STARTED 5/24/88 COMPLETED 5/25/88

SAMPLE NO.	BLOWS ON SAMPLER 0–6	6–12	12–18	18–24	N
11	3	7	10	13	17
12	3	7	12	16	19
13	4	11	11	13	22
14	4	8	10	16	18
15	8	24	29	49	53
16	26	37	41	46	78
17	59	71	46	43	117
18	30	39	46	47	85
19	11	75/0			
20	28	23	31	96	54

DEPTH (feet): 25, 30, 35, 40

DESCRIPTION & CLASSIFICATION

Extremely moist faintly mottled gray silt loam (CLAYEY-SILT) with 1 to 3% mostly fine size gravel, very stiff, thinly laminated

26.0 ---- grades downward to ----

Extremely moist faintly mottled olive gray silt loam (CLAYEY-SILT) with 3 to 5% mostly fine size gravel, very stiff, thinly laminated

28.0 ---- grades downward to ----

Extremely moist faintly mottled olive gray silty clay loam (CLAYEY-SILT), very stiff, thinly laminated

28.5 ---- clear transition to ----

Extremely moist to wet faintly mottled olive gray silt loam (SANDY-SILT) with 5 to 15% mostly subangular to subrounded gravel, little very fine size sand, very dense, weakly stratified

29.5 ---- grades downward to ----

Wet gray very gravelly sandy loam (SILTY-SAND) with 30 to 60% mostly subangular to sugrounded gravel, very fine to coarse size sand, little to some silt, very dense, loose when disturbed, stratified, occasional wet brown very fine sandy loam (SILTY-SAND) lenses ¼ to 1 inch thick

34.0 ---- grades downward to ----

Wet gray very gravelly sandy loam (SILTY-SAND) with 40 to 60% mostly subangular to subrounded gravel, occasional cobbles, noticed boulder at 36.5 to 37.0 foot depth, very fine to coarse size sand, little to some silt, very dense, stratified

37.0 ~~---- grades downward to ----~~

See next sheet.

WELL

- Two (2) inch inside diameter PVC riser pipe; Cement-bentonite grout to 30.5
- Bentonite-Pellet Seal 30.5 to 33.7
- Two (2) inch PVC #10 slotted screen; #2 size sand 34.8 to 39.8

WATER TABLE & REMARKS

Water level at 7.[illegible] feet below ground surface at 9:00 a[m] 5/25/88 with auge[r] at 30.0 foot dept[h]

Water level at 9.[illegible] feet below ground surface with auge[r] at 40.0 foot dept[h] before well insta[l]lation.

Continued on sheet

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mm LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 17-88 continued

SURF. ELEV. 1459.66

PROJECT Monitoring well installation
2A79n Adjacent parcel to CID, Inc. Hand Rd.
E883
CLIENT CID LANDFILL INC.
Town of Sardinia

LOCATION 17 feet south of edge of paveme
Hand Road

DATE STARTED 5/24/88 COMPLETED 5/25/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24 N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	11	3 7 10 13 — 17			
	12	3 7 12 16 — 19			
25	13	4 11 11 13 — 22	See previous sheet.		
	14	4 8 10 16 — 18			
30	15	8 24 29 49 — 53			
	16	26 37 41 46 — 78			
	17	59 71 46 43 — 117			
35	18	30 39 46 47 — 85			
	19	11 75/0			
	20	28 23 31 96 — 54			
40			37.0 - - - - grades downward to - - - -	Two (2) inch inside diameter PVC riser pipe	
			Wet gray very gravelly sandy loam (SILTY-SAND) with 40 to 60% mostly angular to subrounded gravel, very fine to coarse size sand, very dense in place, loose when disturbed, stratified	Cement bentonite grout	30.5
				Bentonite pellet seal	33.7
				#2 size sand	34.8
			40.0	Two (2) inch PVC #10 slotted screen	
			Boring completed at 40.0 feet.		39.8 / 40.0

Water level at 9.3 fe
below ground surface
40.0 feet, before wel
installation.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mm LOGGED BY Dale M. Gramza/Geologist

SHEET 2A OF 2A

FIELD BORING LOG

DEPTH HOLE 26'	JOB NO. 033-9347	PROJECT WMNY/Chaffee Design-CQA/NY			BORING NO. MW-18BR
DEPTH SOIL DRILL 26'	GA INSP. G.COMBES	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 1 of 2
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1461.37
NO. DIST. 7	US. N/A	TEMP. 58F	DRILL RIG Diedrich D-50	DRILLER S. Fuller	DATUM SITE
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140-LB.	DROP 30"		STARTED 1000/11-5-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1215/11-5-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
	CLAY TILL UNIT **0–26'** Firm, olive brown to dark gray, CLAYEY SILT to SILT, trace coarse sand, trace fine to coarse gravel, thinly laminated, slow dilatancy, occassional sand or silt partings. (CL-ML) Coarse to fine SAND and fine GRAVEL at 19.0' to 19.1' and at 23.3' to 23.5'. (SP-GP)							Augered with Standard Sampling 0' to 18' bgs.
2								
		18	1	DO	5–9 9–14	18"/24"		SA–1 Firm, olive brown, CLAYEY SILT, some mottled gray-brown, yellow-brown, moist, with occasional fm gravel subrounded faintly laminated, fairly consistent (ML-CL)
4								
6								
8		12	2	DO	3–5 7–13	24"/24"		SA–2 Firm, brown, SILT trace, vf sand, wet slow to moderate dilatancy. (ML) 9.8'-10' Slight color change to gray-brown CLAYEY SILT, faintly laminated, moist, occasional m-c sand. (ML-CL)
10								
12								
		17	3	DO	3–7 10–13	18"/24"		SA–3 Firm, gray, CLAYEY SILT, alternating with occasional thin lenses of fine sand or silt (wet), slow dilatancy, thinly laminated, moist to wet. (CL-ML)
14								
16								
18		15	4	DO	4–6 9–14	20"/24"		SA–4 Firm, gray, CLAYEY SILT to SILT, wet, medium to slow dilatancy, thinly laminated (CL-ML) 19.0'-19.1' Gray, c-f SAND and f GRAVEL (wet), little, clayey silt, occasional f. gravel subrounded, occasional wet silt lenses (thin). (SP-GP)
20								
		13	5	DO	1–4 9–11	20"/24"		SA–5 Firm, brown-gray, CLAYEY SILT to SILT, thinly laminated, slow dilatancy, moist to wet. (CL-ML) occasional f. gravel or c. sand
22								
								Continued on next page.

FIELD BORING LOG

DEPTH HOLE 26'	JOB NO. 033-9347	PROJECT WMNY/Choffee Design-CQA/NY			BORING NO. MW-18BR
DEPTH SOIL DRILL 26'	GA INSP. G.COMBES	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 2 of 2
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1461.37
NO. DIST. 7 US. N/A	TEMP. 58°F	DRILL RIG Diedrich D-50	DRILLER S. Fuller		DATUM SITE
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140-LB.	DROP 30"		STARTED 1000/11-5-03
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1215/11-5-03

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0-5%
"LITTLE" – 5-12%
"SOME" – 12-30%
"AND" – 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
22		20	6	DO	5-7 13-16	20"/24"		SA-6 Firm, gray, CLAYEY SILT to SILT, slow dilatancy, thinly laminated, occasional c. sand or f. gravel. (CL-ML) 23.3'-23.5' Gray c+f SAND, little f. gravel (wet) (SP) gravel subangular to subrounded.
24		22	7	DO	3-10 12-18	20"/24"		SA-7 Firm, dark gray, CLAYEY SILT trace, f gravel, moist, thinly laminated, slow-moderate dilatancy (CL-ML) occasional thin, v fine sand lens (SM) gravel subrounded
26	END OF BORING							Groundwater monitoring well installed in borehole. See well installation log for MW-18BR.
28								
30								
32								
34								
36								
38								
40								
42								
44								

MONITORING WELL INSTALLATION LOG

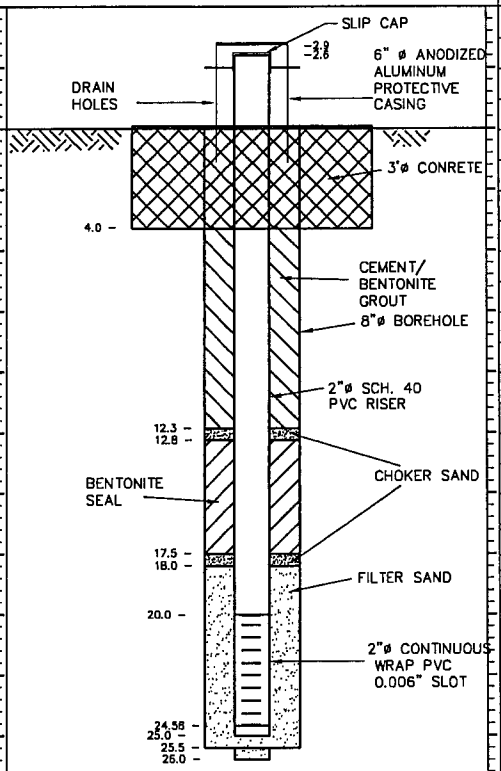
JOB NO. 023-9340 PROJECT WMNY/WELL INSTALLATION/NY WELL NO. MW-18BR SHEET 1 of 1
GA INSP. GOC DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1461.37 WATER DEPTH 6.06 FT. BTOR
WEATHER CLOUDY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1463.48 DATE/TIME 11-10-03/0720
TEMP. 58° F DRILL RIG DIETRICH D-50 DRILLER S. FULLER STARTED 1300/11-5-03 (TIME / DATE) COMPLETED 1600/11-5-03 (TIME / DATE)
LOCATION / COORDINATES N9966.71, E5964.00

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 23.0 l.f. WELL SCREEN 2.0 in. dia. 5.0 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS
CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS
JOINT TYPE FLUSH THREADED SLOT SIZE 0.006" FILTER PACK QTY. 2.5 BAGS
GROUT QUANTITY ——— CENTRALIZERS NOT USED FILTER PACK TYPE QUARTZ SAND
GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1461.37	GROUND SURFACE
0.0	**CLAY TILL UNIT** **0-26'** Firm, olive brown to dark gray, CLAYEY SILT to SILT, trace coarse sand, trace fine to coarse gravel, thinly laminated, slow dilatancy, occassional sand or silt partings. (CL-ML) Coarse to fine SAND and fine GRAVEL at 19.0' to 19.1' and at 23.3' to 23.5'. (SP-GP)
26.0	EOB @ 26.0'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 25.5 FT. BELOW GROUND SURFACE (BGS). SAMPLED TO 26.0 FT BGS. SAND POURED THROUGH AUGERS 25.0'-25.5' FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 5 FT. OF WELL SCREEN, END CAP, 23 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 27.6 FT. WELL MATERIALS PLACED TO 25.0 FT. BGS WITH 2.2 FT. STICKUP. SAND POURED THROUGH AUGERS 18.0 - 25.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 - 1.0 FT. INCREMENTS. CHOKER SAND PLACED 17.5 - 18.0 FT BGS. BENTONITE CHIP SEAL PLACED 12.8 - 17.5 FT. BGS. CHOKER SAND PLACED 12.3 - 12.8 FT. BGS. CEMENT/BENTONITE GROUT ADDED 4.0 - 12.3 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING.

WELL DEVELOPMENT NOTES

DATE DEVELOPED:11-7-03 THROUGH 12-10-03
DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: 9.85 GALS.
FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 30-88

SURF. ELEV. _____

PROJECT 2A790 E883 — Monitoring well installation Adjacent parcel to CID, Inc.

LOCATION Along western boundary of adjacent parcel

CLIENT CID LANDFILL INC. Town of Sardinia

DATE STARTED 6/15/88 COMPLETED 6/16/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	1	2	4	5	10	9	Moist dark brown silt loam (SANDY-SILT) topsoil with little very fine size sand, loose, abundant fine size roots 0.4	Two (2) inch inside diameter PVC riser pipe; Cement-bentonite grout	Topsoil to 0.4 feet over coarse silty lake sediment to 1.5 feet over clayey lake sediment to 12.0 feet over coarse silty lake sediment with little very fine size sand to 15.5 feet over coarse silty lake sediment with trace to some very fine size sand to 28.0 feet over water sorted and deposited sand with little silt to 29.0 feet over water sorted and deposited coarse silt with little to some sand to 30.5 feet over water sorted and deposited coarse silt and gravel with little sand to 31.5 feet over water sorted and deposited coarse silt with little sand to 34.5 feet over water sorted and deposited sand and gravel to 40.5 feet over water sorted and deposited sand to 42.5 feet over water sorted and deposited sand and gravel with little silt end of boring.
	2	3	4	6	7	10	Moist distinctly mottled brown silt loam (SANDY-SILT) with little very fine size sand, loose, weak blocky soil structure with nearly vertical gray desiccation cracks 1.5		
5	3	3	4	6	7	10	- - - - grades downward to - - -		
	4	4	5	8	12	13	Moist faintly mottled brown silty clay loam (CLAYEY-SILT) with 5 to 15% mostly subangular gravel, stiff, weak blocky soil structure with very thin coarse silt lenses and occasional extremely moist brown silt loam (SANDY-SILT) lenses 1/16 to 1/8 inch thick below 2.0 foot depth, and nearly vertical gray desiccation cracks 8.0		
10	5	5	9	15	16	24	- - - - grades downward to - - -		
	6	3	9	15	17	24	Extremely moist faintly mottled brown silty clay loam (CLAYEY-SILT) with 3 to 5% mostly fine size subsangular gravel, very stiff, weak thinly laminated 12.0		
	7	4	9	12	14	21	- - - - grades downward to - - -		
15	8	4	11	13	14	24	Extremely moist faintly mottled brown silt loam (SANDY-SILT) with 1 to 3% mostly fine size subangular gravel, little very fine size sand, compact, thinly bedded with occasional sandy loam (SILTY-SAND) lenses 15.5		
	9	3	8	11	12	19	Extremely moist faintly mottled gray silt loam (SILT) with 3 to 5% mostly fine size subangular gravel, trace to little very fine size sand, compact, thinly bedded		
	10	6	8	12	12	20			
20									

Continued on sheet 2.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.
Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 30-88 continued

SURF. ELEV. 1471.21

PROJECT Monitoring well installation
2A790 Adjacent parcel to CID Inc.
E883

LOCATION Along western boundary of adjacent parcel

CLIENT CID LANDFILL INC.
Town of Sardinia

DATE STARTED 6/15/88 COMPLETED 6/16/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24 N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	11	5 6 8 11 14	Extremely moist faintly mottled gray silt loam (SILT) with 3 to 5% mostly fine size subangular gravel, trace to little very fine size sand, compact, thinly bedded		water sorted and deposited sand to 42.5 feet over water sorted and deposited sand and gravel with little silt to end of boring.
	12	3 6 8 9 14	- - - - grades downward to - - - 27.0 Wet gray silt loam (SANDY-SILT) with little to some very fine size sand, compact, tends to liquify when disturbed, thinly bedded		
25	13	4 6 8 11 14	- - - - grades downward to - - - 28.0 Extremely moist distinctly mottled brown sandy loam (SILTY-SAND) with very fine to fine size sand, little silt, compact, loose when disturbed, bedded		
	14	4 5 11 100/5" 16	- - - - clear transition to - - - 29.0	Cement-bentonite grout	
	15	7 11 17 19 28	Extremely moist gray silt loam (SANDY-SILT) with 3 to 5% mostly subangular gravel, little to some very fine size sand, compact, thinly bedded		
30	16	6 21 30 9 51	- - - - clear transition to - - - 30.5		30.0
	17	3 10 14 51 24	Extremely moist gray gravelly silt loam (SANDY-SILT) with 15 to 30% mostly subangular gravel, little very fine size sand, very dense, loose when disturbed, stratified	Two (2) inch inside diameter PVC riser pipe	bentonite pellet seal
			31.5		33.1
	18	30 28 26 16 54	Extremley moist gray silt loam (SANDY-SILT) with 1 to 3% mostly fine size subangular gravel, little very fine size sand, compact, thinly bedded		34.0
35	19	5 10 14 15 24	34.5 Wet distinctly mottled dark brown very gravelly loamy sand (SAND) with 40 to 60% mostly subangular to subrounded gravel, very fine to coarse size sand, very dense in place, loose when disturbed, stratified	2" slotted screen (#10)	# 2 size sand
	20	11 21 24 24 45	- - - - grades downward to - - - 36.0		
40					Continued on sheet 3.

See next sheet.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

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Soil Investigations and Natural Resource Assessments
Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 30-88 continued SURF. ELEV. 1471.21

PROJECT Monitoring well installation LOCATION Along western boundary of
2A790 Adjacent parcel to CID, Inc. adjacent parcel
E883
CLIENT CID LANDFILL INC. DATE STARTED 6/15/88 COMPLETED 6/16/88
Town of Sardinia

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	21	4	11	9	11	20	Wet gray very gravelly loamy sand (SAND) with 40 to 60% mostly subangular to subrounded gravel, occasional cobble, very fine to coarse size sand, compact to dense in place, loose when disturbed, stratified	2" slotted (#10) PVC screen; #2 size sand	
	22	3	15	18	23	33	40.5		44.0
45							Wet gray very fine loamy sand (SAND) compact in place, tends to liquify when disturbed, bedded 42.5 - - - - clear transition to - - - - Wet gray very gravelly sandy loam (SILTY-SAND) with 40 to 60% mostly subangular to subrounded gravel, very fine to coarse size sand, little silt, dense in place, loose when disturbed, stratified 44.0		
50							Boring completed at 44.0 feet.		
55									
60									

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist SHEET 3 OF 3

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

Roycroft Campus. 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 32-88

SURF. ELEV. 1470.40

PROJECT 2A790 E883 Monitoring well installation
Adjacent parcel to CID, Inc.

LOCATION Within MW cluster 30-88 & 31-88 along western boundary of adjacent parc

CLIENT CID LANDFILL INC.
Town of Sardinia

DATE STARTED 6/16/88 COMPLETED 6/16/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	1	2	3	6	7	9	Moist brown silt loam (SANDY-SILT) topsoil with little very fine size sand, loose with fine size roots 0.5	(1) (2)	Topsoil to 0.5 fee over coarse silty lake sediment with little sand to 1.5 feet over clayey lake sediment to end of boring.
	2	4	5	6	7	11	Moist distinctly mottled brown silt loam (SANDY-SILT) with little very fine size sand, loose, weak blocky soil structure 1.5	2.5 (3) 4.5	
5							- - - - clear transition to - - - Moist distinctly mottled brown silty clay loam (CLAYEY-SILT) with 1 to 3% mostly fine size subangular gravel, stiff, weak blocky soil structure, with nearly vertical gray desiccation cracks 2.0	6.0	
	3	5	8	13	19	21	- - - - grades downward to - - - Moist faintly mottled brown silt loam (CLAYEY-SILT) with 3 to 5% mostly subangular gravel, stiff, weak thinly laminated with nearly vertical gray desiccation cracks 7.0	Two (2) inch PVC slotted screen (#10) # 2 size sand 11.0	
10	4	6	13	15	17	28	- - - - grades downward to - - - Moist faintly mottled brown silty clay loam (CLAYEY-SILT), very stiff, weak thinly laminated 10.5		
							- - - - grades downward to - - - Moist gray silty clay loam (CLAYEY-SILT), very stiff, weak thinly laminated 11.0		
15							Boring completed at 11.0 feet.		No water at completion.
									(1) Two (2) inch inside diameter PVC riser pipe.
									(2) Cement-bentonite gr
									(3) Bentonite pellet se
20									

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

SHEET 1 OF 1

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 50-88 SURF. ELEV. 1459.85

PROJECT Monitoring well installation
2A790 Adjacent parcel to CID Inc.
E883
CLIENT CID LANDFILL INC.

LOCATION 285 feet WNW of gully, along western boundary line, approximately 250 ft. south of Hand Road.
DATE STARTED 6/7/88 COMPLETED 6/8/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	1	2	2	2	10	4	Moist faintly mottled dark brown silt loam (SANDY-SILT) topsoil with little very fine size sand, loose, with numerous fine to coarse size roots 0.6	Two (2) inch inside diameter PVC riser pipe	Topsoil to 0.6 fe over water sorted and deposited coa silt with little some sand to 3.0 feet over water sorted and deposi ed coarse silt an gravel with littl sand and some cla to 4.0 feet over water sorted and posited coarse si and gravel with s sand to 8.0 feet over water sorted and deposited coa silt with little sand to 9.0 feet over water sorted and deposited san and gravel with little to some si to 10.5 feet over clayey lake sedi- ment to 12.5 feet over water sorted and deposited san and gravel with little to some si to 15.0 feet over water sorted and deposited sand an gravel with littl silt to 22.0 feet over water sorted and deposited coa silt and gravel w
	2	7	12	11	8	23	Moist faintly mottled brown loam (SANDY-SILT) with 5 to 15% mostly fine size subangular gravel, little to some very fine size sand, loose, weak thinly bedded with occasional thin very fine to fine size sand lenses ¼ inch thick		
5	3	3	4	5	5	9	- - - - clear transition to - - 3.0		
	4	3	3	2	2	5	Moist to extremely moist distinctly mottled dark brown gravelly loam (SAND-SILT-CLAY) with 15 to 25% mostly subangular gravel, little very fine size sand, some clay, compact, weak blocky soil structure		
10	5	2	2	2	2	4	- - - - grades downward to - - - 4.0	Cement-bentonite grout	
	6	3	3	6	9	9	Extremely moist faintly mottled dark brown gravelly silt loam (SANDY-SILT) with 15 to 30% mostly subangular gravel, some very fine to medium size sand, loose, weakly stratified, with occasional thin seams that have a high sand content		11.0
	7	4	14	20	11	34	- - - - clear transition to - - 8.0	Bentonite pellet seal	14.0
15	8	7	5	4	5	9	Extremely moist faintly mottled brown silt loam (SANDY-SILT) with 3 to 5% mostly fine size subangular gravel, little very fine size sand, stiff, thinly bedded		14.5
	9	3	2	2	4	4	- - - - clear transition to - - 9.0	#2 size sand	
	10	3	3	3	8	6	Wet faintly mottled brown gravelly sandy loam (SILTY-SAND) with 20 to 40% mostly subangular to subrounded gravel, very fine to coarse size sand, little to some silt, loose, stratified	2" PVC #10 slotted screen	
20							- - - - clear transition to - - 10.5		

Continued on shee
See next sheet.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

Roycroft Campus, 31 S. Grove St. • East Aurora, NY 14052 • (716) 655-1717

MONITORING WELL
HOLE NO. 50-88 continued

SURF. ELEV. 1459.85

PROJECT Monitoring well installation
2A790 Adjacent parcel to CID Inc.
E883
CLIENT CID LANDFILL, INC.

LOCATION 285 feet WNW of gully, along western boundary line, approximately 250 ft. south of Hand Road.
DATE STARTED 6/7/88 COMPLETED 6/8/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	11	2				
			2			4
				2		
					5	
	12	4				
			8			17
				9		
					10	
	13	3				
25			6			17
				11		
					11	
	14	4				
			5			12
				7		
					9	
	15	3				
			5			15
				10		
30					13	
	16	4				
			9			25
				16		
					19	
	17	5				
			13			35
				22		
					26	
	18	6				
35			7			19
				12		
					14	
	19	5				
			9			25
				16		
					18	
	20	8				
			11			29
				18		
40					20	

DESCRIPTION & CLASSIFICATION

Extremely moist faintly mottled brown silty clay loam (CLAYEY-SILT) with 3 to 5% mostly fine size subangular gravel, stiff, weak thinly laminated with very thin coarse silt lenses, noticed thin very gravelly sandy loam (SILTY-SAND) lens between 11.0 to 11.2 foot depth
- - - - clear transition to - - 12.5

Extremely moist distinctly mottled dark brown very gravelly sandy loam (SILTY-SAND) with 40 to 60% mostly subangular gravel, occasional cobble, very fine to coarse size sand, little to some silt, dense in place, loose when disturbed, stratified
- - - - grades downward to - - 15.0

Wet faintly mottled dark brown very gravelly sandy loam (SILTY-SAND) with 40 to 60% mostly subangular to subrounded gravel, very fine to coarse size sand, little silt, loose becoming very loose below 16.0 foot depth, stratified
- - - - clear transition to - - 22.0

Extremely moist to wet highly mottled dark brown gravelly silt loam (SANDY-SILT) with 15 to 30% mostly subangular gravel, some very fine to coarse size sand, compact in place, loose when disturbed, stratified 22.5

Extremely moist olive brown silt loam (CLAYEY-SILT) with 1 to 3% mostly fine size subangular gravel, stiff, thinly laminated
- - - - clear transition to - - 23.0

See next sheet.

WELL

2" PVC #10 slotted screen
#2 size sand
24.5

(1)
26.0

Enviro plug to 26.0 feet.

WATER TABLE & REMARKS

some sand to 22. feet over silty lake sediment to 23.0 feet over coarse silty lake sediment t 24.0 feet over silty lake sediment to 28.0 fee over clayey lake sediment to end of boring.

(1) Bentonite pellet seal.

Continued on sheet 2A

40.0

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

EARTH DIMENSIONS, INC.

Soil Investigations and Natural Resource Assessments

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MONITORING WELL
HOLE NO. 50-88 continued

SURF. ELEV. 1459.85

PROJECT Monitoring well installation
2A79o Adjacent parcel to CID Inc.
E883
CLIENT CID LANDFILL, INC.

LOCATION 285 feet WNW of gully, along wes
ern boundary line, approximatel
250 ft. south of Hand Road.

DATE STARTED 6/7/88 COMPLETED 6/8/88

DEPTH feet	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	DESCRIPTION & CLASSIFICATION	WELL	WATER TABLE & REMARKS
	11	2					Extremely moist to wet gray silt loam (SILT) with 1 to 3% mostly fine size subangular gravel, compact, has a tendency to liquify when disturbed, thinly bedded	2" PVC #10 slotted screen	
			2			4			
				2					
					5				
	12	4						#2 size sand	
			8			17			
				9					
					10				
	13	3							24.5
25			6			17	Extremely moist gray silt loam (CLAYEY-SILT) with 1 to 3% mostly fine size subangular gravel, very stiff becoming stiff below 26.0 foot depth	(1)	(1) Bentonite pellet sea
				11					
					11				26.0
	14	4							
			5			12			
				7					
					9				
	15	3							
			5			15			
				10					
30					13				
	16	4							
			9			25			
				16					
					19				
	17	5							
			13			35			
				22					
					26				
	18	6							
35			7			17	Extremely moist brownish gray silty clay (CLAYEY-SILT), very stiff, thinly laminated with very thin coarse silt lenses, noticed one (1) ½ inch extremely moist gray fine loamy sand (SAND) lens below 35.5 foot depth		
				12					
					14				
	19	5							
			9			25			
				16					
					18				
	20	8							
			11			29			
				18					
40					20		Boring completed at 40.0 feet.		

Enviro plug to 26.0 feet.

N = NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW.

mn LOGGED BY Dale M. Gramza/Geologist

SHEET 2A OF 2A

EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations
1091 Jamison Road • Elma, NY 14059
(716) 655-1717 • FAX (716) 655-2915

2A79ad HOLE NO. MW K-S-01 SURF. ELEVATION 1496.60

PROJECT MW Installation - Chaffee Landfill LOCATION See map
Town of Sardinia, Erie County, New York

CLIENT McMahon & Mann Consulting Engineers, P.C. DATE STARTED 04/18/01 COMPLETED 04/18/01

DEPTH IN FT	SN	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL (1)	WATER TABLE AND REMARKS
								Augered to 30.0 feet with 4 1/4" I.D. hollow stem augers without split spoon sampling.	(1) 2" PVC RISER; CEMENT BENTONITE GROUT	(1) 4" x 5' STEEL PROTECTIVE CASING
5										
10										
15										
20										

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Donald W. Owens, Senior Soil Scientist (bvy)

EARTH DIMENSIONS, INC.

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(716) 655-1717 • FAX (716) 655-2915

2A79ad HOLE NO. MW K-S-01 SURF. ELEVATION 1496.60

PROJECT MW Installation - Chaffee Landfill LOCATION See map
Town of Sardinia, Erie County, New York

CLIENT McMahon & Mann Consulting Engineers, P.C. DATE STARTED 04/18/01 COMPLETED 04/18/01

DEPTH IN FT	SN	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
								Augered to 30.0 feet with 4 1/4" I.D. hollow stem augers without split spoon sampling.		
30								30.0		
	1	8						Extremely moist olive gray (CLAYEY-SILT) with 3 to 5% gravel, some clay, very stiff, weak thinly laminated with very thin coarse silt lenses, (CL).		
			12			27				
				15						
					16					
	2	3						grades downward to 32.0		
			6			14		Extremely moist olive gray (SILT), trace clay, compact, thinly bedded, (ML).		
				8						
					11					
	3	6						grades downward to 33.0		
35			12			22		Extremely moist olive gray (CLAYEY-SILT) with 3 to 5% gravel, little clay, very stiff, thinly laminated with very thin coarse silt lenses, (ML-CL).		
				10						
					12					
	4	5						grades downward to 34.0		
			7			16				
				9						
					15					
	5	6						Extremely moist olive gray (SILT), trace clay, compact, thinly bedded with very fine sand lenses, (ML).		
			10			25				
				15						
40					17					

WELL: 2" PVC RISER; CEMENT BENTONITE GROUT; 2" PVC SCREEN; MORIE O SAND; (1); (2); (3)

WATER TABLE AND REMARKS:
(1) #4000 SAND PACK
← 32.0'
← 32.5'
(2) BENTONITE PELLETS
← 35.5'
← 36.0'
← 36.5'
(3) 2" 20 SLOT CONTINUOUS WRAP

N=NUMBER OF BLOWS TO DRIVE 2" SPOON 12" WITH 140 lb. WT. FALLING 30" PER BLOW

LOGGED BY Donald W. Owens, Senior Soil Scientist (bvy)

EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations
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2A79ad HOLE NO. MW K-S-01 SURF. ELEVATION 1496.60

PROJECT MW Installation - Chaffee Landfill LOCATION See map
Town of Sardinia, Erie County, New York

CLIENT McMahon & Mann Consulting Engineers, P.C. DATE STARTED 04/18/01 COMPLETED 04/18/01

DEPTH IN FT	SN	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
	6	6				26		Extremely moist olive gray (SILT), trace clay, compact, thinly bedded with very fine sand lenses, (ML).		(1) 2" 20 SLOT CONTINUOUS WRAP PVC SCREEN
			13							← 41.5'
				13						
					15			42.0		← 42.0
								Boring completed at 42.0 feet.		
45										
50										
55										
60										

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Donald W. Owens, Senior Soil Scientist (bvy)

EARTH DIMENSIONS, INC.

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(716) 655-1717 • FAX (716) 655-2915

2A79ad HOLE NO. MW K-I-01 SURF. ELEVATION 1496.70

PROJECT MW Installation – Chaffee Landfill LOCATION See map
Town of Sardinia, Erie County, New York

CLIENT McMahon & Mann Consulting Engineers, P.C. DATE STARTED 04/17/01 COMPLETED 04/18/01

DEPTH IN FT | BLOWS ON SAMPLER

SN	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL (1)	WATER TABLE AND REMARKS
							Augered to 49.0 feet with 4 1/4" I.D. hollow stem augers without split spoon sampling.	2" PVC RISER; CEMENT/BENTONITE SEAL	(1) 4" x 5' STEEL PROTECTIVE CASING.

5
10
15
20

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Donald W. Owens, Senior Soil Scientist (bvy)

EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations
1091 Jamison Road • Elma, NY 14059
(716) 655-1717 • FAX (716) 655-2915

2A79ad HOLE NO. MW K-1-01 SURF. ELEVATION 1496.70

PROJECT MW Installation - Chaffee Landfill LOCATION See map

Town of Sardinia, Erie County, New York

CLIENT McMahon & Mann Consulting Engineers, P.C. DATE STARTED 04/17/01 COMPLETED 04/18/01

DEPTH IN FT	SN	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
								Augered to 49.0 feet with 4 1/4" I.D. hollow stem augers without split spoon sampling.	2" PVC RISER; CEMENT/BENTONITE SEAL	

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Donald W. Owens, Senior Soil Scientist (bvy)

EARTH DIMENSIONS, INC.

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(716) 655-1717 • FAX (716) 655-2915

2A79ad HOLE NO. MW K-I-01 SURF. ELEVATION 1496.70

PROJECT MW Installation – Chaffee Landfill LOCATION See map

Town of Sardinia, Erie County, New York

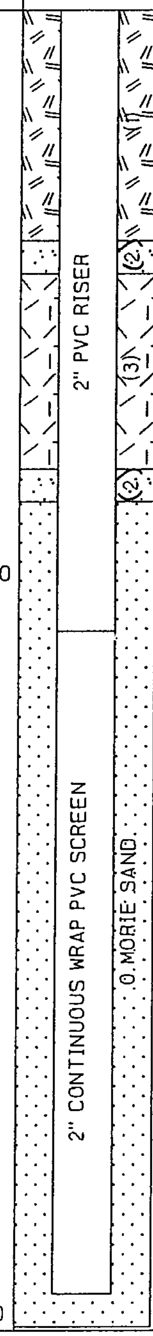
CLIENT McMahon & Mann Consulting Engineers, P.C. DATE STARTED 04/17/01 COMPLETED 04/18/01

DEPTH IN FT / BLOWS ON SAMPLER

SN	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION
							Augered to 49.0 feet with 4 1/4" I.D. hollow stem augers without split spoon sampling.
							49.0
1	31	48	50	44	98		Extremely moist distinctly mottled olive brown very gravelly (SILTY-SAND) with 40 to 60% mostly subrounded gravel and cobbles, very fine to very coarse size sand, little silt, very dense, stratified, (SM), (GM).
2	100/3"						
3	16	29	25	23	54		60.0

Depth marks: 45, 50, 55, 60

WELL / WATER TABLE AND REMARKS



(2) #4000 SAND PACK
← 43.5'
← 44.0'
(3) BENTONITE PELLETS
← 47.0'
← 47.5'
← 49.5'
← 59.5'

Boring completed at 60.0 feet.

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Donald W. Owens, Senior Soil Scientist (bvy) SHEET 3 OF 3

FIELD BORING LOG

DEPTH HOLE 25.5'	JOB NO. 053-9443	PROJECT WMNY/ Western Expansion Well Installation	BORING NO. MW-L(S)
DEPTH SOIL DRILL 25.5'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers	SHEET 1 of 1
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.	SURFACE EL. 1464.59
NO. DIST. N/A US. N/A	TEMP. 75° to 85° F	DRILL RIG CME-550 DRILLER S. Currie	DATUM SITE
DEPTH WL.	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb. DROP 30"	STARTED 1040/5-29-05
TIME WL.	HRS. DELAYED N/A	WT. CASING HAMMER N/A DROP N/A	COMPLETED 1135/5-29-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK
BR	BROWN
C	COARSE
CA	CASING
CL	CLAY
CLY	CLAYEY
F	FINE
FRAG	FRAGMENTS
GL	GRAVEL
LYD	LAYERED
U	LITTLE
M	MEDIUM
MIC	MICACEOUS
MOT	MOTTLED
NP	NON-PLASTIC
O	ORANGE
ORG	ORGANIC
PH	PRESSURE-HYDRAULIC
PM	PRESSURE-MANUAL
R	RED
RES	RESIDUAL
RX	ROCK
SA	SAMPLE
SAT	SATURATED
SND	SAND
SI	SILT
SLY	SILTY
SOM	SOME
TR	TRACE
WL	WATER LEVEL
WH	WEIGHT OF HAMMER
WR	WEIGHT OF RODS
Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE"	0–5%
"LITTLE"	5–12%
"SOME"	12–30%
"AND"	30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/ FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
								0.0-15.0 ft. Augered with no sampling.
2	SEE SOIL BORING LOG FOR MW-L (I).							
4								
15		8	1	DO	2-4-4-6	22"/24"		SA-1 15.0-17.0 ft. Firm, dark brown to gray-brown, CLAYEY SILT to SILTY CLAY, little fine to medium gravel, slightly laminated, slight liquefaction, very moist. (ML-CL) High amount of clay.
17		8	2	DO	2-4-4-5	18"/24"		SA-2 17.0-19.0 ft. Firm to soft, olive green to brown, CLAYEY SILT, slightly laminated, very moist. (ML) Large piece of sub-rounded gravel/rock @17.5 ft. bgs. Firm, olive gray SILTY wet zone from 17.5-17.7 ft. bgs.
19		8	3	DO	1-3-5-7	23"/24"		SA-3 19.0-21.0 ft. Same as above; olive brown mottling throughout; little fine to medium sub-rounded gravel; slightly laminated. (ML) Soft, wet zones @ 20.6 and 20.8 ft. bgs.
21		10	4	DO	4-4-6-10	24"/24"		SA-4 21.0-23.0 ft. Same as above; little fine sub-rounded gravel; very moist to slightly wet; laminations present; slight liquefaction. (ML) Gray to dark gray, sandy silt lens from 22.3 to 22.4 ft. bgs.
23		24	5	DO	3-6-18-33	24"/24"		SA-5 23.0-24.2 ft. Same as above; soft to firm; very moist. (ML) 24.2-25.0 ft. Loose, brown to dark brown, SILTY SAND, little to some f. to c. gravel, moist to v. moist. Zones of mottled red-brown sandy silt and fine to medium brown sand. (SM)
25	Color change; lithology change.							
	25.5 FT. END OF BOREHOLE							

MONITORING WELL INSTALLATION LOG

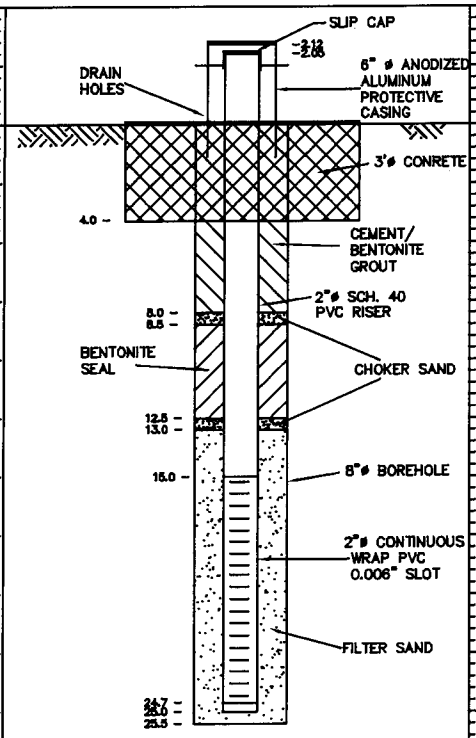
JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-L (S) SHEET 1 of 1
GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1464.59 Ft. WATER DEPTH -DRY-
WEATHER P. SUNNY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1466.64 Ft. DATE/TIME 7-7-05/705
TEMP. 75-85° F DRILL RIG CME-550 DRILLER S. CURRIE STARTED 1205/6-29-05 (TIME / DATE) COMPLETED 1345/6-29-05 (TIME / DATE)
LOCATION / COORDINATES N9937.06, E5216.97

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 17.5 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS
CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS
JOINT TYPE FLUSH THREADED SLOT SIZE 0.006" FILTER PACK QTY. 2.5 BAGS
GROUT QUANTITY —— CENTRALIZERS NOT USED FILTER PACK TYPE #00-SIZE QUARTZ SAND
GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1464.59	GROUND SURFACE
0.0	CLAY TILL UNIT 0-25' SEE SOIL BORING LOG FOR MW-L (I).
10.0	
15.0	
20.0	
25.0	
25.5	EOB @ 25.5'

WELL SKETCH



INSTALLATION NOTES
AUGERED WITH 4 1/4 I.D. HOLLOW
STEM AUGER TO 25.5 FT. BELOW
GROUND SURFACE (BGS). SAMPLED
15.0 TO 25.0 FT BGS. SAND
POURED THROUGH AUGERS
25.5-25.0 FT BGS. WELL
MATERIALS PLACED IN BOREHOLE
USING 10 FT. OF WELL SCREEN, END
CAP, 17.05 FT. OF WELL RISER AND
SLIP TOP CAP FOR OVERALL LENGTH
OF 27.05 FT. WELL MATERIALS
PLACED TO 25.0 FT. BGS WITH 2.05
FT. STICKUP. SAND POURED
THROUGH AUGERS 25.0 - 13.0 FT.
BGS WHILE REMOVING AUGERS AT
0.5 - 1.0 FT. INCREMENTS.
CHOKER SAND PLACED 13.0 - 12.5
FT BGS. BENTONITE CHIP SEAL
PLACED 12.5 - 8.5 FT. BGS.
CHOKER SAND PLACED 8.5 - 8.0
FT. BGS. CEMENT/BENTONITE
GROUT ADDED 8.0 - 4.0 FT. BGS.
REMAINING AUGERS REMOVED.
6-INCH DIAMETER ANODIZED
ALUMINUM CASING PLACED IN 3-FT.
DIAMETER BY 4 FT. DEEP CONCRETE
PAD. DRAINHOLES DRILLED INTO
PROTECTIVE CASING.
NYSDEC CONCURRED WITH THE
LOCATION OF THE SCREENED
INTERVAL.

WELL DEVELOPMENT NOTES
DATE DEVELOPED: TO
DEVELOPMENT METHOD:
STAINLESS STEEL BAILER
VOLUME PURGED: -- GALS.
FOR FURTHER DETAILS SEE
ACCOMPANYING WELL DEVELOPMENT
FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 42'	JOB NO. 053-9443	PROJECT WMNY/Western Expansion Well Installation		BORING NO. MW-L(I)	
DEPTH SOIL DRILL 40.5'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers		SHEET 1 of 2	
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.		SURFACE EL. 1464.18	
NO. DIST. N/A US. N/A	TEMP. 96° F	DRILL RIG CME-550	DRILLER A. Morris	DATUM SITE	
DEPTH WL 30.15'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"	STARTED 1325/6-27-05	
TIME WL 1135	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A	COMPLETED 1200/6-28-05	

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE"	0-5%
"LITTLE"	5-12%
"SOME"	12-30%
"AND"	30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
2	CLAY TILL UNIT 0-31.7' Firm to stiff, light brown-dark brown to olive gray to dark gray-gray, CLAYEY SILT to SILTY CLAY, slightly moist to very moist, slightly to prominantely laminated, slight liquefaction, little to some, fine to coarse, sub-rounded to rounded gravel, occasional desiccation cracks, occasional olive brown mottling, occasional thin silt and sand lenses. (ML-CL) Zones of loose, dark brown to red brown, fine to medium SAND @ 2.6' to 2.8', 4.7' to 5.5' (SM) Zones of compact, tan-brown to gray-black, very moist to wet SILT and fine SAND @26.0' to 26.4' (SM)	6	1	DO	2-3- 3-4	24" 24"		SA-1 0.0-2.0 ft. Firm, brown to light brown, CLAYEY SILT, slightly moist, plant roots throughout. Bottom half light gray to tan-brown. (ML) TOPSOIL
4		14	2	DO	5-7- 7-7	24" 24"		SA-2 2.0-2.6 ft. Stiff, lt. gray to olive brown, CLAYEY SILT, little coarse sub-rounded gravel, slightly moist to moist. Zone of dark brown to red-brown fine sand to 2.8 ft bgs. 2.8-4.0 ft. Stiff, dark brown to gray-brown, CLAYEY SILT, little coarse gravel, slightly moist to moist. (ML)
6		16	3	DO	4-7- 9-9	24" 24"		SA-3 4.0-6.0 ft. Firm to stiff, brown to dark brown, CLAYEY SILT, little coarse gravel, occasional black shale fragments, moist. (ML) 4.7-5.5 ft. Loose, dark brown fine to medium SAND, little fine to medium gravel, little medium sand. (SP)
8		14	4	DO	4-6- 8-9	24" 24"		SA-4 6.0-8.0 ft. Firm, brown, CLAYEY SILT, little fine to medium gravel, little silt, little tan, very fine sand, moist. Thin layer of very moist, loose, brown, CLAYEY SILT from 6.7-6.9 ft. bgs. (ML)
10		18	5	DO	5-8- 10-12	18" 24"		SA-5 8.0-10.0 ft. Firm to soft, brown, CLAYEY SILT to SILTY CLAY, occasional angular shale fragments, slight liquefaction, slightly laminated, moist to very moist. (ML-CL) Small cobble @9.8 ft. bgs.
12	12.0 ft bgs-Color change.	17	6	DO	4-7- 10-13	24" 24"		SA-6 10.0-12.0 ft. Same as above. Occasional desiccation cracks; occasional medium sub-rounded gravel, moist to very moist. (ML-CL)
14		11	7	DO	3-5- 6-9	22" 24"		SA-7 12.0-14.0 ft. Firm, olive gray, CLAYEY SILT to SILTY CLAY, very moist. Slightly laminated. (ML-CL)
16		8	8	DO	3-3- 5-8	20" 24"		SA-8 14.0-16.0 ft. Same as above. Moist to very moist. Slightly wet from 14.8-15.2 ft.bgs. (ML-CL)
18		12	9	DO	3-5- 7-10	24" 24"		SA-9 16.0 to 18.0 ft. Firm, olive-gray to brown, CLAYEY SILT, little medium gravel, olive-brown mottling throughout, slightly laminated, very moist. Slightly wet from 17.3 to 18.0 ft. bgs. (ML)
20	20.0 ft. bgs-Color change.	8	10	DO	2-3- 5-6	24" 24"		SA-10 18.0 to 20.0 ft. Same as above. Little fine to medium gravel, slightly laminated. (ML) Wet zones at 18.4-18.5 ft., 19.2-19.4 ft. and 19.8-20.0 ft.
22		10	11	DO	2-4- 6-8	24" 24"		SA-11 20.0-22.0 ft. Firm to stiff, gray to dark gray, CLAYEY SILT, little fine to coarse gravel, slightly laminated, very moist to slightly wet. (ML)
24		11	12	DO	3-5- 6-9	24" 24"		SA-12 22.0-24.0 ft. Firm to stiff, gray to dark gray, CLAYEY SILT, little to some fine to medium gravel, very moist to wet. (ML)

Continued on next page.

FIELD BORING LOG

DEPTH HOLE 42'	JOB NO. 053-9443	PROJECT WMNY/Western Expansion Well Installation			BORING NO. MW-L(I)
DEPTH SOIL DRILL 40.5'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 2 of 2
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1464.18
NO. DIST. N/A US. N/A	TEMP. 96° F	DRILL RIG CME-550	DRILLER A. Morris		DATUM SITE
DEPTH WL. 30.15'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"		STARTED 1325/6-27-05
TIME WL. 1135	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1200/6-28-05

SAMPLE TYPES

A.S.	AUGER SAMPLE	D.O.	DRIVE OPEN
C.S.	CHUNK SAMPLE	D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE	T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON	W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
26	25.0 ft. bgs-Color/lithology change.	6	13	DO	3–6–21–20	24"/24"		SA–13 24.0-25.1 ft. Same as above, little sub-rounded gravel, very moist. (ML) 25.1-26.0 ft. Loose, dark brown to brown, SILTY SAND, moist to very moist. (SP)
28	26.4 ft. bgs-Color/lithology change.	14	14	DO	6–7–7–10	20"/24"		SA–14 26.0-26.4 ft. Compact, tan-br. to gray-bl., SILT and f-SAND, very moist to wet. (SM) 26.4-28.0 ft. Stiff, ol. br. to gray, CLAYEY SILT. Sl. liquefaction. Med. clay content. Laminations. (ML-CL) Zone of cp., sandy silt @ 26.1-26.3 ft bgs.
30		10	15	DO	2–3–7–10	19"/24"		SA–15 28.0-30.0 ft. Firm to stiff, gray, SILTY CLAY, little rounded to sub-rounded coarse gravel, slight olive-brown mottling, very moist. Laminations present. (CL)
32		13	16	DO	3–6–7–10	24"/24"		SA–16 30.0-32.0 ft. Same as above; occasional olive-brown mottling; little sub-rounded, fine to coarse gravel; wet. (CL) Layer of silt and fine gravel from 31.7-31.9 ft. bgs.
34	31.7 ft. bgs. Lithology change. **SAND & GRAVEL UNIT** 31.7–42.0' Compact to loose, very moist to saturated, fine to coarse GRAVEL and SAND, some silt, occasional thin sandy silt zones, occasional fractured rock fragments. (SM-GM) Compact, brown, very moist, SILT and fine SAND, some fine gravel, some fine to medium sand @ 37.7' to 38.0' (SM). Zone of soft to stiff, olive brown to gray brown, very moist to slightly wet CLAYEY SILT @ 35.7' to 37.7' (ML).	47	17	DO	11–18–29–22	12"/24"		SA–17 32.0-34.0 ft. Loose, gray-brown, sub-angular to sub-rounded, fine to coarse GRAVEL, some silt, wet. (GM) Few fractured rock fragments near bottom.
36		26	18	DO	12–13–13–20	12"/24"		SA–18 34.0-35.7 ft. Compact, gray, coarse GRAVEL and medium SAND, some silt, saturated. (GM) 35.7-36.0 ft. Soft, CLAYEY SILT, some medium to coarse sand, some fine gravel. (CL)
38		22	19	DO	7–9–13–17	22"/24"		SA–19 36.0-37.7 ft. Stiff to firm, olive brown to gray-brown, CLAYEY SILT, tr. to little c. gravel, slight laminations, slight liquefaction, very moist to slightly wet. (ML) 37.7-38.0 ft. Compact, brown, SILT and f. SAND, some f. gravel, some f.-m. sand, v. moist. (SM)
40		24	20	DO	3–10–14–20	20"/24"		SA–20 38.0-40.0 ft. Loose, brown, coarse SAND and fine to coarse GRAVEL, saturated. (GW)
42		27	21	DO	7–12–15–20	18"/24"		SA–21 40.0-42.0 ft. Loose, brown, fine GRAVEL and coarse SAND, saturated. (GW)
	42.0 FT. END OF BOREHOLE							

MONITORING WELL INSTALLATION LOG

JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-L (I) SHEET 1 of 2

GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1464.18 Ft. WATER DEPTH 26.44 FT. BGS

WEATHER SUNNY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1466.61 Ft. DATE/TIME 7-7-05/707

TEMP. 96° F DRILL RIG CME-550 DRILLER A. MORRIS STARTED 1250/6-28-05 (TIME / DATE) COMPLETED 1010/6-29-05 (TIME / DATE)

LOCATION / COORDINATES N9938.04, E5211.36

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 32.5 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

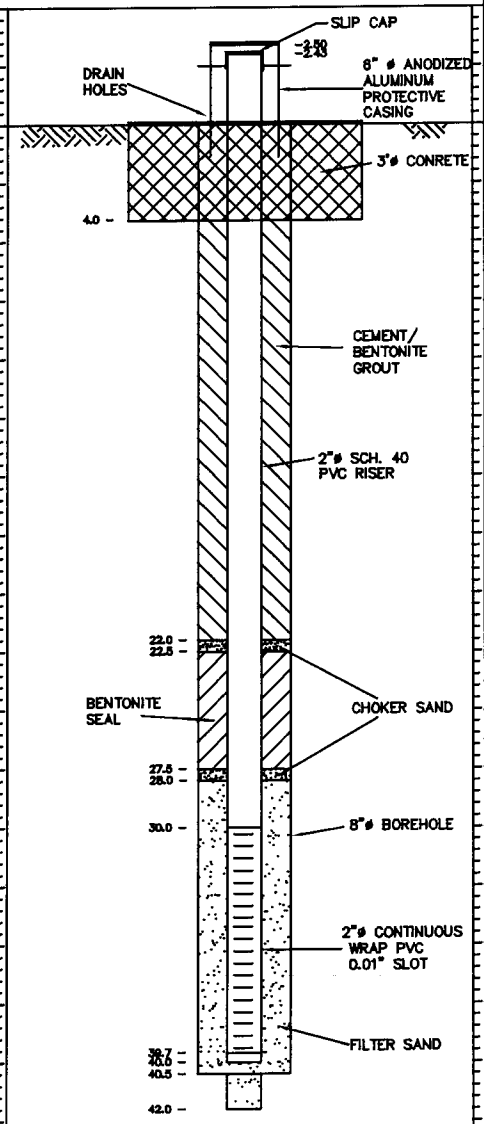
JOINT TYPE FLUSH THREADED SLOT SIZE 0.01" FILTER PACK QTY. 3.0 BAGS

GROUT QUANTITY — CENTRALIZERS NOT USED FILTER PACK TYPE #00N-SIZE QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1464.18	GROUND SURFACE
0.0	**CLAY TILL UNIT** 0–31.7' Firm to stiff, light brown–dark brown to olive gray to dark gray–gray, CLAYEY SILT to SILTY CLAY, slightly moist to very moist, slightly to prominantely laminated, slight liquefaction, little to some, fine to coarse, sub–rounded to rounded gravel, occasional desiccation cracks, occasional olive brown mottling, occasional thin silt and sand lenses. (ML–CL) Zones of loose, dark brown to red brown, fine to medium SAND @ 2.6' to 2.8', 4.7' to 5.5' (SM) Zones of compact, tan–brown to gray–black, very moist to wet SILT and fine SAND @26.0' to 26.4' (SM)
10.0	
15.0	
20.0	
	SAND & GRAVEL UNIT 31.7–42.0' Compact to loose, very moist to saturated, fine to coarse GRAVEL and SAND, some silt, occasional thin sandy silt zones, occasional fractured rock fragments. (SM–GM) Compact, brown, very moist, SILT and fine SAND, some fine gravel, some fine to medium sand @ 37.7' to 38.0' (SM). Zone of soft to stiff, olive brown to gray brown, very moist to slightly wet CLAYEY SILT @ 35.7' to 37.7' (ML).
30.0	
40.0	
	EOB @ 42.0'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 40.5 FT. BELOW GROUND SURFACE (BGS). SAMPLED 0 TO 42.0 FT BGS. SAND POURED THROUGH AUGERS 40.5–40.0 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 32.43 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 42.43 FT. WELL MATERIALS PLACED TO 40.0 FT. BGS WITH 2.43 FT. STICKUP. SAND POURED THROUGH AUGERS 40.0 – 28.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 – 1.0 FT. INCREMENTS. CHOKER SAND PLACED 28.0 – 27.5 FT BGS. BENTONITE CHIP SEAL PLACED 27.5 – 22.5 FT. BGS. CHOKER SAND PLACED 22.5 – 22.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 22.0 – 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6–INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3–FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC ON–SITE DURING INSTALLATION AND CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/15 TO 7/25/05

DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: 77 GALS.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 22.5'	JOB NO. 053-9443	PROJECT WMNY/Well Installation – Western Expansion		BORING NO. MW-M(S)	
DEPTH SOIL DRILL 22.0'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers		SHEET 1 of 1	
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.		SURFACE EL. 1458.81	
NO. DIST. N/A US. N/A	TEMP. 70° F	DRILL RIG CME-550	DRILLER A. Morris	DATUM SITE	
DEPTH WL. 16.1'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"	STARTED 0800/7-7-05	
TIME WL. 0945/7-7-05	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A	COMPLETED 940/7-7-05	

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
2	SEE SOIL BORING LOG FOR MW-M (I).							0.0-12.0 ft. Augered with no sampling.
4								
12		10	1	DO	3–4–6–10	24"/24"		SA–1 12.0-14.0 ft. Stiff to firm, olive-gray, CLAYEY SILT, trace very fine gravel, very weakly laminated, very moist with occasional thin, slightly wet zones. (ML)
14		15	2	DO	3–6–9–12	20"/24"		SA–2 14.0-16.0 ft. Very stiff to stiff, olive-gray, CLAYEY SILT, occasional sub-rounded coarse stone, very weakly laminated, very moist to moist. (ML) Very thin medium to coarse sand lens @14.6 ft. bgs.
16		14	3	DO	6–4–10–11	18"/24"		SA–3 16.0-17.4 ft. Loose to compact, SILTY SAND, trace fine gravel, wet. (SM) 17.4-18.0 ft. Loose, silty, GRAVELLY SAND, wet. Small cobble @17.6 ft. bgs. (GP)
18		19	4	DO	3–6–13–16	9"/24"		SA–4 18.0-20.0 ft. Loose, GRAVELLY SAND, little silt, rounded to sub-rounded gravel, wet. (GP-GM)
20		18	5	DO	4–8–10–10	19"/24"		SA–5 20.0-20.9 ft. Loose, very fine to coarse GRAVELLY SAND, trace silt, sub-angular to rounded gravel, wet. (GP-GM) 20.8 ft. Loose, SILTY GRAVELLY SAND, wet. (GP) 20.9-21.1 ft. Loose, dark gray to olive gray, SILT, wet.
22	22.5 FT. END OF BOREHOLE							21.1-22.0 ft. Stiff to very stiff, CLAYEY SILT, trace coarse sand, very moist. (ML) 22.0-22.5 ft. Augered with no sampling.

Golder Associates

MONITORING WELL INSTALLATION LOG

JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION WELL NO. MW-M (S) SHEET 1 of 1

GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1458.81 Ft. WATER DEPTH 16.1 FT. BGS

WEATHER P. SUNNY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1461.29 Ft. DATE/TIME 7-7-05/945

TEMP. 75-85° F DRILL RIG CME-550 DRILLER A. MORRIS STARTED 950/7-7-05 (TIME / DATE) COMPLETED 1150/7-7-05 (TIME / DATE)

LOCATION / COORDINATES N9949.09, E5698.72

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 14.5 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

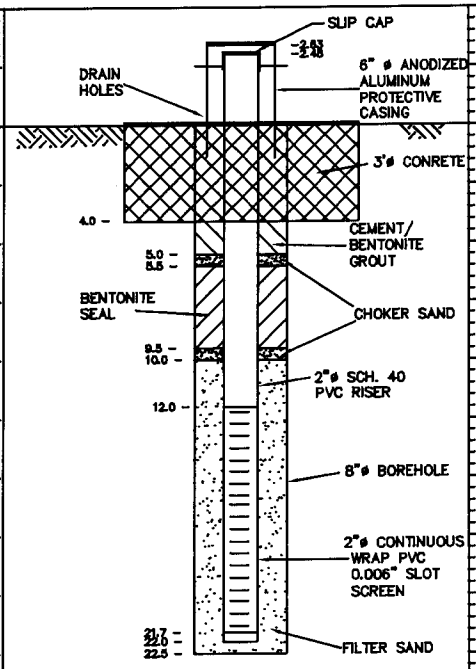
JOINT TYPE FLUSH THREADED SLOT SIZE 0.006" FILTER PACK QTY. 2.5 BAGS

GROUT QUANTITY — CENTRALIZERS NOT USED FILTER PACK TYPE #00-SIZE QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1458.81	GROUND SURFACE
0.0	CLAY TILL UNIT 0-22' SEE SOIL BORING LOG FOR MW-M (1).
10.0	
15.0	
20.0	
22.5	EOB @ 22.5'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 22.5 FT. BELOW GROUND SURFACE (BGS). SAMPLED 12.0 TO 22.0 FT BGS. SAND POURED THROUGH AUGERS 22.5-22.0 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 14.48 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 22.48 FT. WELL MATERIALS PLACED TO 22.0 FT. BGS WITH 2.48 FT. STICKUP. SAND POURED THROUGH AUGERS 22.0 - 10.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 - 1.0 FT. INCREMENTS. CHOKER SAND PLACED 10.0 - 9.5 FT BGS. BENTONITE CHIP SEAL PLACED 9.5 - 5.5 FT. BGS. CHOKER SAND PLACED 5.5 - 5.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 5.0 - 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC ON-SITE DURING INSTALLATION AND CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/15 TO 7/29/05

DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: 72 GALS.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 40.5'	JOB NO. 053-9443	PROJECT WMNY/Western Expansion Well Installation			BORING NO. MW-M(I)
DEPTH SOIL DRILL 40.5'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 1 of 2
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1459.09
NO. DIST. N/A US. N/A	TEMP. 89° F	DRILL RIG CME-550	DRILLER A. Morris		DATUM SITE
DEPTH WL. 25.79'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"		STARTED 1220/7-5-05
TIME WL. 0752/7-7-05	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1140/7-6-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE		
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED		
C	COARSE	MOT	MOTTLED	SD	SAND		
CA	CASING	NP	NON-PLASTIC	SI	SILT		
CL	CLAY	OG	ORANGE	SLY	SILTY		
CLY	CLAYEY	ORG	ORGANIC	SM	SOME		
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE		
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL		
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER		
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS		
LI	LITTLE	RX	ROCK	Y	YELLOW		

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	**CLAY TILL UNIT** **0–29.5'** Firm to stiff to very stiff, dark brown-brown to olive gray to dark gray-olive brown, SILTY CLAY to CLAYEY SILT, moist to very moist, weakly to moderately laminated, slight to moderate liquefaction, trace to little, fine to coarse sand, little fine to coarse, sub-rounded to rounded gravel, occasional thin silt, sand and sandy silt lenses. (CL-ML) Zones of loose to compact, dark brown to olive gray, SANDY SILT @ 12.6-13.0', 14.7-15.5' and 25.6-28.0' (SM) Zones of loose, wet, f. to c. GRAVEL @ 17.5-18.6' and 19.4-20.0' (SM)	6	1	DO	2–3– 3–6	24"/24"		SA–1 0.0-1.2 ft. Stiff to very stiff, dark brown to tan-brown, SANDY SILT, moist. TOPSOIL. 1.2-2.0 ft. Stiff, tan-brown, SANDY SILT, slight red-brown mottling, trace medium gravel, moist. (ML) Plant roots at top.
2		14	2	DO	7–7– 7–12	24"/24"		SA–2 2.0-2.4 ft. Same as above. 2.4-4.0 ft. Very stiff, olive brown, SILTY CLAY, olive gray to tan-brown mottling, trace medium gravel, slightly laminated, moist. (ML) Some desiccation cracks with plant roots.
4		14	3	DO	2–7– 7–14	24"/24"		SA–3 4.0-5.6 ft. Same as above; laminations present. 5.6-6.0 ft. Compact, SILTY SAND, some rounded medium to coarse gravel, very moist. (SM)
6		13	4	DO	4–5– 8–14	24"/24"		SA–4 6.0-8.0 ft. Very stiff, olive-brown, SILTY CLAY, little medium to fine gravel, moist to very moist. (CL) Tan to red-brown staining/discoloration surrounding gravel.
8		14	5	DO	5–6– 8–9	22"/24"		SA–5 8.0-9.1 ft. As above; trace fine to medium gravel; laminations present. 9.1-10.0 ft. Stiff, dark gray, CLAYEY SILT, trace sub-rounded fine gravel, weakly laminated, very moist. Occasional desiccation cracks. (ML)
	9.1 ft. bgs. - Color change.							
10		5	6	DO	1–2– 3–4	22"/24"		SA–6 10.0-12.0 ft. Firm to stiff, dark gray, CLAYEY SILT, weakly laminated, very moist to wet. (ML) 12.0-12.6 ft. Firm/soft, CLAYEY SILT to SILTY CLAY,
12		9	7	DO	1–4– 5–6	24"/24"		SA–7 very moist. (ML-CL) 12.6-13.0 ft. Loose, SANDY SILT, some sub-rounded medium gravel, very moist. (SM) 13.0-14.0 ft. Firm, ol.-brown, CLAYEY SILT, tr. c.-gravel, mod. laminated, v. sl. liquefaction, v. moist.(ML)
14		9	8	DO	1–2– 7–8	21"/24"		SA–8 14.0-14.7 ft. Same as above, very moist. 14.7-15.5 ft. Loose, dark brown, SANDY SILT, little fine gravel, very moist to wet. (SM) 15.5-16.0 ft. Loose, dark brown, CLAYEY SILT, little course gravel. (ML)
16	16.0 ft. bgs. - Lithology change.	26	9	DO	4–10– 16–22	17"/24"		SA–9 16.0-17.5 ft. Thin layer of wet, fine to coarse, SILTY GRAVEL and SILTY CLAY, then compact, SILTY SAND, little fine gravel, wet. (CL-SM) 17.5-18.0 ft. Loose, fine to coarse rounded to sub-rounded SILTY GRAVEL, trace silt, wet. (GM)
18		26	10	DO	9–13– 13–19	21"/24"		SA–10 18.0-18.6 ft. Loose, silty f. to c. GRAVEL, wet. (GM) 18.6-19.4 ft. Loose, SILTY SAND, little fine to coarse gravel, wet. (SM) 19.4-20.0 ft. Loose, fine to coarse GRAVEL, trace to little silt, wet. (GM)
20	20.0 ft. bgs. - Lithology change.	20	11	DO	7–10– 10–19	18"/24"		SA–11 20.0-22.0 ft. Compact, olive-gray, CLAYEY SILT, little gravel, weakly laminated, very moist. Some fractured black shale fragments. (ML)
22		22	12	DO	4–10– 12–16	24"/24"		SA–12 22.0-23.5 ft. Compact, olive-brown, CLAYEY SILT, little rounded, medium gravel, trace fine sand, weakly laminated, very moist. (ML) 23.5-24.0 ft. Compact, ol.-brown, SILT AND SAND,sl. laminated, sl. liquefaction, v. moist. (SM)
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Continued on next page.

FIELD BORING LOG

DEPTH HOLE 40.5'	JOB NO. 053-9443	PROJECT WMNY/Western Expansion Well Installation			BORING NO. MW-M(I)
DEPTH SOIL DRILL 40.5'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 2 of 2
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1459.09
NO. DIST. N/A US. N/A	TEMP. 89° F	DRILL RIG CME-550	DRILLER A. Morris		DATUM SITE
DEPTH WL 25.79'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"		STARTED 1220/7-5-05
TIME WL 0752/7-7-05	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1140/7-8-05

SAMPLE TYPES

A.S.	AUGER SAMPLE	D.O.	DRIVE OPEN
C.S.	CHUNK SAMPLE	D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE	T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON	W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SOM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GR	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CO	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
26		18	13	DO	5–7–11–15	23"/24"		SA–13 24.0-25.6 ft. Compact, olive-brown, CLAYEY SILT, trace very fine sand, trace rounded fine gravel, weakly laminated, very moist. (ML) 25.6-26.0 ft. Compact, SANDY SILT, little very fine sand, trace very fine gravel, wet. (SM)
		24	14	DO	7–11–13–31	24"/24"		SA–14 26.0-28.0 ft. Compact, olive-gray, SANDY SILT, some clay, trace to little medium to coarse gravel, weakly laminated, very moist. (SM) Thin silty sand lens @ 27.3 ft. bgs. Large rock in bottom of spoon.
28		27	15	DO	7–12–15–20	21"/24"		SA–15 28.0-29.5 ft. Compact to dense, CLAYEY SILT, little fine sand, weakly laminated, very moist. (ML) 29.5-30.0 ft. Loose, GRAVELLY fine SAND, trace silt, wet. (SW) 28.9-29.0 ft. Lens of SANDY SILT, slightly lam.
30	29.5 ft. bgs. -Lithology change. SAND & GRAVEL UNIT 29.5–40.5' Compact to very loose, wet to saturated, GRAVEL and SAND to SILTY GRAVEL, little to some silt, occasional large rockstone. (SW-GW) Compact to loose, saturated, fine to medium SAND, trace to little silt, little course gravel from 36.8-38.0' and 38.5-40.5'. (SW)	47	16	DO	4–17–30–27	16"/24"		SA–16 30.0-30.8 ft. Loose, GRAVEL and SILT, wet to saturated. Occasional large rock/stone. (GM) 30.8-32.0 ft. Loose, SILTY GRAVEL, wet to saturated. (GM) Rounded, hard, red-black granite rock @ 31.3 ft.
32		34	17	DO	11–15–19–30	15"/24"		SA–17 32.0-34.0 ft. Loose to very loose, SAND and fine to coarse GRAVEL, some silt, wet to saturated. Occasional large rock/stone. (GM)
34		23	18	DO	2–4–19–23	17"/24"		SA–18 34.0-36.0 ft. Same as above. Increasing gravel content.
36		47	19	DO	16–16–31–35	16"/24"		SA–19 36.0-36.8 ft. Same as above; wet. 36.8-38.0 ft. Compact to loose, olive-brown, fine to medium SAND, trace to little silt, little rounded to sub-rounded coarse gravel, saturated. (SW)
38								38.0-38.5 ft. Augered with no sampling.
		49	20	DO	30–27–22–22	16"/24"		SA–20 38.5-40.5 ft. Compact to loose, olive-brown, fine to medium SAND, trace to little silt, little rounded to sub-rounded coarse gravel, saturated. Occasional large rock/stone. (SW)
40	40.5 FT. END OF BOREHOLE							

MONITORING WELL INSTALLATION LOG

JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION WELL NO. MW-M (I) SHEET 1 of 1

GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1459.09 Ft. WATER DEPTH 14.37 FT. BGS

WEATHER OVERCAST DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1461.28 Ft. DATE/TIME 7-7-05/752

TEMP. 70-75° F DRILL RIG CME-550 DRILLER A. MORRIS STARTED 1145/7-6-05 (TIME / DATE) COMPLETED 1525/7-6-05 (TIME / DATE)

LOCATION / COORDINATES N9948.24, E5692.55

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 32.5 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

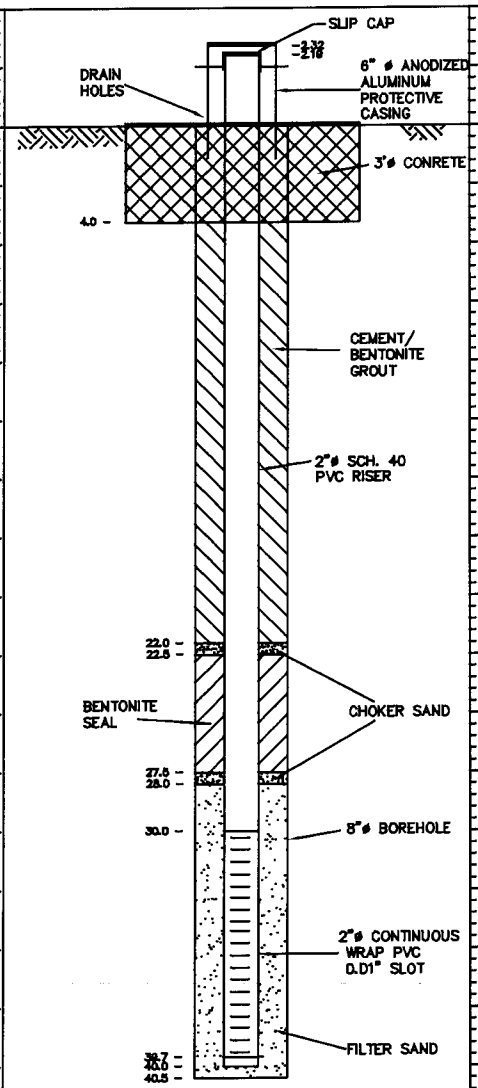
JOINT TYPE FLUSH THREADED SLOT SIZE 0.01" FILTER PACK QTY. 3.0 BAGS

GROUT QUANTITY ——— CENTRALIZERS NOT USED FILTER PACK TYPE #00N-SIZE QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1459.09	GROUND SURFACE
0.0	**CLAY TILL UNIT** 0–29.5' Firm to stiff to very stiff, dark brown–br. to olive gray to dark gr.–olive br., SILTY CLAY to CLAYEY SILT, moist to v. moist, weakly to moderately laminated, slight to moderate liquefaction, trace to little, f. to c. sand, little f. to c., sub–rounded to rounded gravel, occasional thin silt, sand and sandy silt lenses. (CL–ML) Zones of loose to compact, dark brown to olive gray, SANDY SILT@ 12.6–13.0', 14.7–15.5' and 25.6–28.0' (SM) Zones of loose, wet, f. to c. GRAVEL @ 17.5–18.6' and 19.4–20.0' (SM)
10.0	
15.0	
20.0	**SAND & GRAVEL UNIT** 29.5–40.5' Compact to very loose, wet to saturated, GRAVEL and SAND to SILTY GRAVEL, little to some silt, occasional large rockstone. (SW–GW) Compact to loose, saturated, fine to medium SAND, trace to little silt, little course gravel from 36.8–38.0' and 38.5–40.5'. (SW)
30.0	
40.0	EOB @ 40.5'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 40.5 FT. BELOW GROUND SURFACE (BGS). SAMPLED 0 TO 40.5 FT BGS. SAND POURED THROUGH AUGERS 40.5–40.0 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 32.19 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 42.19 FT. WELL MATERIALS PLACED TO 40.0 FT. BGS WITH 2.19 FT. STICKUP. SAND POURED THROUGH AUGERS 28.0 – 40.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 – 1.0 FT. INCREMENTS. CHOKER SAND PLACED 28.0 – 27.5 FT BGS. BENTONITE CHIP SEAL PLACED 27.5 – 22.5 FT. BGS. CHOKER SAND PLACED 22.5 – 22.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 22.0 – 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6–INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3–FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/15 TO 7/29/05

DEVELOPMENT METHOD: STAINLESS STEEL BAILER

VOLUME PURGED: 54 GALS.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 26.0' JOB NO. 053-9443 PROJECT WMNY/Well Installation – Western Expansion BORING NO. MW-N(S)
DEPTH SOIL DRILL 25.5' GA INSP. RJM DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 1 of 1
DEPTH ROCK CORE N/A WEATHER SUNNY DRILLING CO. Earth Dimensions, Inc. SURFACE EL. 1474.25
NO. DIST. N/A US. N/A TEMP. 75°-90° F DRILL RIG CME-550 DRILLER A. Morris DATUM SITE
DEPTH WL. HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0920/7-11-05
TIME WL. HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1125/7-11-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	SEE SOIL BORING LOG FOR MW-N(I).							0.0-12.0 ft. Augered with no sampling.
12		14	1	DO	3-6-8-13	24"/24"		SA-1 12.0-14.0 ft. Firm, dark gray, CLAYEY SILT to SILTY CLAY, trace medium to coarse sub-rounded gravel, occasional thin silt and sand lenses, slight liquefaction, weakly laminated, very moist. (ML-CL)
14		16	2	DO	4-7-9-10	23"/24"		SA-2 14.0-14.3 ft. Firm to stiff, dark gray, SILTY CLAY, very moist. (CL) 14.3-16.0 ft. Firm, olive brown, CLAYEY SILT, trace medium to coarse angular to sub-rounded gravel, occasional thin silt lenses, very moist. (ML)
16		14	3	DO	2-6-8-10	23"/24"		SA-3 16.0-18.0 ft. Firm, CLAYEY SILT, trace angular medium gravel, some fractured shale fragments, occasional thin silt and fine sand lenses, slight liquefaction, weakly laminated, very moist. (ML)
18		17	4	DO	3-7-10-14	24"/24"		SA-4 18.0-20.0 ft. Firm to stiff, olive brown, CLAYEY SILT, trace medium to coarse gravel, weakly laminated, very moist. Gravel content increases toward bottom. (ML)
20		16	5	DO	3-6-10-12	22"/24"		SA-5 20.0-22.0 ft. Firm to stiff, olive brown to olive gray, CLAYEY SILT, trace sub-rounded coarse gravel, olive brown mottling, weakly laminated, very moist. Thin SANDY SILT lens @21.0 ft. bgs. (ML)
22		16	6	DO	6-7-9-13	24"/24"		SA-6 22.0-24.0 ft. Firm to stiff, olive gray to dark gray, CLAYEY SILT to SILTY CLAY, trace sub-angular to sub-rounded coarse gravel, slight liquefaction, weakly laminated, very moist. (ML-CL)
24		13	7	DO	3-6-7-12	24"/24"		SA-7 24.0-26.0 ft. Firm to stiff, olive gray to dark gray, CLAYEY SILT, slight liquefaction, weakly to moderately laminated, very moist to wet. (ML)
26	26.0 FT. END OF COREHOLE							

MONITORING WELL INSTALLATION LOG

JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-N (S) SHEET 1 of 1

GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1474.25 Ft. WATER DEPTH -DRY-

WEATHER SUNNY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1476.39 Ft. DATE/TIME 7-11-05/1210

TEMP. 70-90° F DRILL RIG CME-550 DRILLER A. MORRIS STARTED 1215/7-11-05 (TIME / DATE) COMPLETED 1410/7-11-05 (TIME / DATE)

LOCATION / COORDINATES N9932.47, E6168.01

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 17.5 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

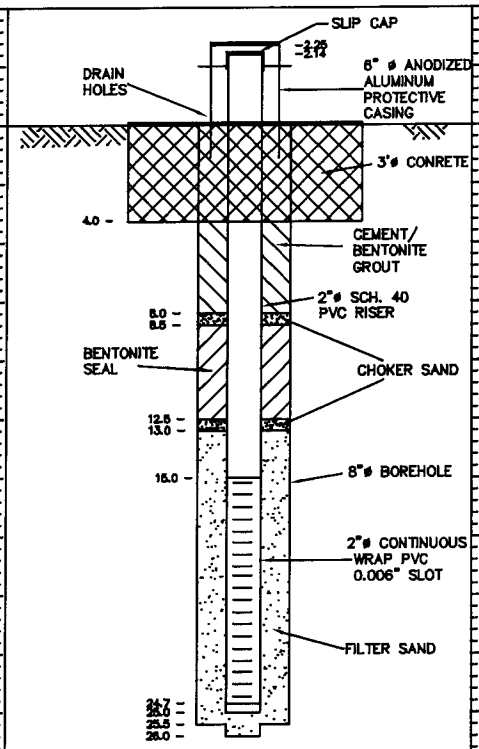
JOINT TYPE FLUSH THREADED SLOT SIZE 0.006" FILTER PACK QTY. 3 BAGS

GROUT QUANTITY —— CENTRALIZERS NOT USED FILTER PACK TYPE #00-SIZE QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1474.25	GROUND SURFACE
0.0	CLAY TILL UNIT 0-25' SEE SOIL BORING LOG FOR MW-N (I).
10.0	
15.0	
20.0	
25.0	
	EOB @ 26.0'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 25.5 FT. BELOW GROUND SURFACE (BGS). SAMPLED 12.0 TO 26.0 FT BGS. SAND POURED THROUGH AUGERS 25.5-20.0 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 17.14 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 27.14 FT. WELL MATERIALS PLACED TO 25.0 FT. BGS WITH 2.14 FT. STICKUP. SAND POURED THROUGH AUGERS 25.0 - 13.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 - 1.0 FT. INCREMENTS. CHOKER SAND PLACED 13.0 - 12.5 FT BGS. BENTONITE CHIP SEAL PLACED 12.5 - 8.5 FT. BGS. CHOKER SAND PLACED 8.5 - 8.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 8.0 - 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED:

DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: -- GALS.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 46'	JOB NO. 053-9443	PROJECT WMNY/ Western Expansion Well Installation			BORING NO. MW-N(1)
DEPTH SOIL DRILL 46'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 1 of 2
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1473.95
NO. DIST. N/A US. N/A	TEMP. 80° F	DRILL RIG CME-550	DRILLER A. Morris		DATUM SITE
DEPTH WL. 37.11'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"		STARTED 1255/7-7-05
TIME WL. 0730/7-11-05	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1210/7-8-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/ FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
2		12	1	DO	2-4- 8-12	24"/24"		SA-1 0.0-0.8 ft. Stiff, dark brown, SILT, moist. (FILL) 0.8-2.0 ft. Very dense, olive-brown to olive gray, CLAYEY SILT, some fine sand, trace fine to coarse sub-rounded gravel, tan mottling, moist. (ML-CL) Plant roots near top.
	2.4 ft. bgs. - Color change.	22	2	DO	8-10- 12-12	24"/24"		SA-2 2.0-2.4 ft. Same as above; very stiff to stiff. 2.4-4.0 ft. Firm, dark gray, CLAYEY SILT, trace medium to coarse gravel, occasional black shale fragments, weakly laminated, moist to very moist. (ML)
4	**CLAY TILL UNIT** 0–34.3' Soft to firm to stiff, light brown-brown to olive gray to dark gray-olive gray, CLAYEY SILT to SILTY CLAY, moist to very moist, weakly to moderately laminated, slight to moderate liquefaction, trace to little, medium to coarse sand, little fine to coarse, sub-rounded to rounded gravel, occasional thin silt and sand lenses. (ML-CL) Zone of red brown to brown, SANDY SILT @ 30.7' to 30.9' (SM) Zone of loose to compact, dark brown, GRAVELLY SILTY SAND @30.9' to 32.0' (SM)	35	3	DO	4-5- 30-14	21"/24"		SA-3 4.0-5.4 ft. Firm to stiff, dark gray, CLAYEY SILT, tr. m.to c. gravel, moist to very moist. Pea-gravel sized deposit of "salt and pepper" sand layer near 4.4 ft. bgs. 5.4-6.0 ft. Firm, gray, SILT, very moist to wet. Some fractured shale fragments at 5.3 to 5.4 ft. bgs.(ML)
6		8	4	DO	3-4- 4-6	23"/24"		SA-4 6.0-8.0 ft. Firm, dark gray, CLAYEY SILT, occasional thin silt lenses, slight liquefaction, weakly laminated, very moist. (ML)
8		14	5	DO	4-6- 8-10	20"/24"		SA-5 8.0-10.0 ft. Firm to stiff, dark gray, SILTY CLAY, trace sub-rounded medium to coarse gravel, occasional thin silt lenses, weakly to moderately laminated, very moist. (CL)
10		9	6	DO	2-3- 6-9	22"/24"		SA-6 10.0-12.0 ft. Firm, dark gray to olive gray, SILTY CLAY to CLAYEY SILT, trace coarse gravel, occasional large sub-rounded dropstone, moderately laminated, very moist. (CL-ML)
12		12	7	DO	4-6- 6-9	24"/24"		SA-7 12.0-14.0 ft. Soft to firm, CLAYEY SILT to SILTY CLAY, trace medium gravel, occasional thin silt lenses, weakly laminated, very moist. (ML-CL)
14		11	8	DO	3-4- 7-9	24"/24"		SA-8 14.0-16.0 ft. Firm to stiff, dark gray to olive gray, SILTY CLAY, laminations present, very moist. (CL) Thin fine sand lens @14.4 ft. bgs. Thin silt lens @15.3 ft. bgs.
16	16.9 ft. bgs. - Color change.	12	9	DO	3-5- 7-10	24"/24"		SA-9 16.0-16.9 ft. Same as above. 16.9-18.0 ft. Firm, olive-brown, CLAYEY SILT, little fine to coarse gravel, very moist. (ML) Silt and sand lenses @16.9 ft., 17.3 ft. and 17.5 ft. bgs.
18		14	10	DO	5-6- 8-13	22"/24"		SA-10 18.0 to 20.0 ft. Firm to stiff, CLAYEY SILT, little rounded medium to coarse gravel, weakly to moderately laminated, moist to very moist. (ML) Course gravel increases towards bottom of interval. Thin, silt & f.-sand zone at top of interval.
20		17	11	DO	2-4- 13-16	23"/24"		SA-11 20.0-22.0 ft. Firm to stiff, olive-gray to dark gray, CLAYEY SILT, little medium to coarse sub-rounded gravel, very weakly laminated, very moist to moist. (CL)
22		14	12	DO	5-6- 8-9	24"/24"		SA-12 22.0-24.0 ft. Stiff to firm, olive gray to dark gray, CLAYEY SILT to SILTY CLAY, trace sub-angular to sub-rounded gravel, very slight liquefaction, weakly laminated, very moist. (ML-CL)
24								Continued on next page.

FIELD BORING LOG

DEPTH HOLE 46' JOB NO. 053-9443 PROJECT WMNY/ Western Expansion Well Installation BORING NO. MW-N(I)
DEPTH SOIL DRILL 46' GA INSP. RJM DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 2 of 2
DEPTH ROCK CORE N/A WEATHER SUNNY DRILLING CO. Earth Dimensions, Inc. SURFACE EL. 1473.95
NO. DIST. N/A US. N/A TEMP. 80° F DRILL RIG CME-550 DRILLER A. Morris DATUM SITE
DEPTH WL. 37.11' HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 1255/7-7-05
TIME WL. 0730/7-11-05 HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1210/7-8-05

SAMPLE TYPES

A.S. AUGER SAMPLE
C.S. CHUNK SAMPLE
D.O. DRIVE OPEN
D.S. DENISON SAMPLE
P.S. PITCHER SAMPLE
R.C. ROCK CORE
S.T. SLOTTED TUBE
T.O. THIN-WALLED, OPEN
T.P. THIN-WALLED, PISTON
W.S. WASH SAMPLE

ABBREVIATIONS

BL BLACK
BR BROWN
C COARSE
CA CASING
CL CLAY
CLY CLAYEY
F FINE
FRAG FRAGMENTS
GL GRAVEL
LYD LAYERED
LI LITTLE
M MEDIUM
MIC MICACEOUS
MOT MOTTLED
NP NON-PLASTIC
OG ORANGE
ORG ORGANIC
PH PRESSURE-HYDRAULIC
PM PRESSURE-MANUAL
R RED
RES RESIDUAL
RX ROCK
SA SAMPLE
SAT SATURATED
SD SAND
SI SILT
SLY SILTY
SM SOME
TR TRACE
WL WATER LEVEL
WH WEIGHT OF HAMMER
WR WEIGHT OF RODS
Y YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS LOOSE
CP COMPACT
DN DENSE
V VERY
S SOFT
FM FIRM
ST STIFF
H HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/ FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
26		8	13	DO	3-3-5-8	24"/24"		SA-13 24.0-26.0 ft. Firm, olive gray to dark gray, CLAYEY SILT, trace medium gravel, weakly laminated, very slight liquefaction, very moist. (ML-CL)
28		10	14	DO	3-4-6-9	24"/24"		SA-14 26.0-28.0 ft. Soft to firm, olive gray to dark gray, CLAYEY SILT, trace medium gravel, weakly laminated, very slight liquefaction, very moist. (CL)
		14	15	DO	2-5-9-12	20"/24"		SA-15 28.0-30.0 ft. Soft to firm, CLAYEY SILT, trace fine to medium sub-rounded gravel, weakly laminated, very slight liquefaction, very moist. (ML) Little clay content.
30								
	30.7 ft. bgs. - Color/lithology change.	23	16	DO	3-7-16-16	22"/24"		SA-16 30.0-30.7 ft. Same as above. 30.7-30.9 ft. Red brown to brown, SANDY SILT. 30.9-32.0 ft. Loose to compact, dark brown, GRAVELLY SILTY SAND, occasional black shale fragments, very moist to wet. (SM)
32	32.0 ft. bgs. - Lithology change.	17	17	DO	3-8-9-16	22"/24"		SA-17 32.0-34.0 ft. Firm, dark gray to olive gray, CLAYEY SILT, little sub-rounded fine to medium gravel, weakly laminated, very moist to slightly wet. (ML-CL) Little to some clay content.
34	34.3 ft. bgs. - Lithology change	71	18	DO	5-23-48-45	19"/24"		SA-18 34.0-34.3 ft. Same as above. 34.3-36.0 ft. Loose to compact, GRAVELLY SAND, trace silt, moist. (SW-GW) Angular to sub-rounded gravel and rock/shale fragments.
36	SAND & GRAVEL UNIT 34.3-46' Compact to very loose, very moist to wet, SANDY GRAVEL to GRAVELLY SAND, trace to little silt, occasional thin sandy silt zones, occasional fractured black shale fragments and cobbles. (SW-GW)	109	19	DO	44-66-43-40	19"/24"		SA-19 36.0-36.5 ft. Loose to compact, GRAVELLY SAND, very moist. Large dolomite fragments. (SW-GW) 36.5-36.7 ft. Fractured, hard, red SANDSTONE. 36.7-38.0 ft. Loose, SANDY GRAVEL, little silt, v.f. to c. angular to sub-angular gravel, occasional cobbles, v. moist. (GP)
38		51	20	DO	10-25-26-26	15"/24"		SA-20 38.0-40.0 ft. Loose, very gravelly, SAND, trace silt, occasional cobbles, some fractured red sandstone and black shale fragments, wet. (SW-GW)
40	Loose, wet, very gravelly SAND, trace silt, some fractured red sandstone and black shale fragments @ 38.0' to 40.0' and 44.0' to 46.0' (SW) Zone of SANDY SILT @ 43.7' to 43.9' (SM)	46	21	DO	16-23-23-23	16"/24"		SA-21 40.0-42.0 ft. Very loose to loose, very GRAVELLY SAND, fine to coarse sub-rounded gravel, occasional rounded cobble, slight liquefaction, wet. (SW-GW)
42		46	22	DO	8-18-28-42	11"/24"		SA-22 42.0-44.0 ft. Loose, GRAVELLY SAND, trace silt, wet. (SW-GW) Fine to coarse sub-rounded to rounded gravel. Sandy silt zone from 43.7-43.9 ft. bgs., then fractured black shale to 44.0 ft. bgs.
44		118	23	DO	8-55-63-67	11"/24"		SA-23 44.0-46.0 ft. Loose, very GRAVELLY SAND, trace silt, occasional large rock fragments, wet. (SW-GW)
46	46.0 FT. END OF BOREHOLE							

Golder Associates

MONITORING WELL INSTALLATION LOG

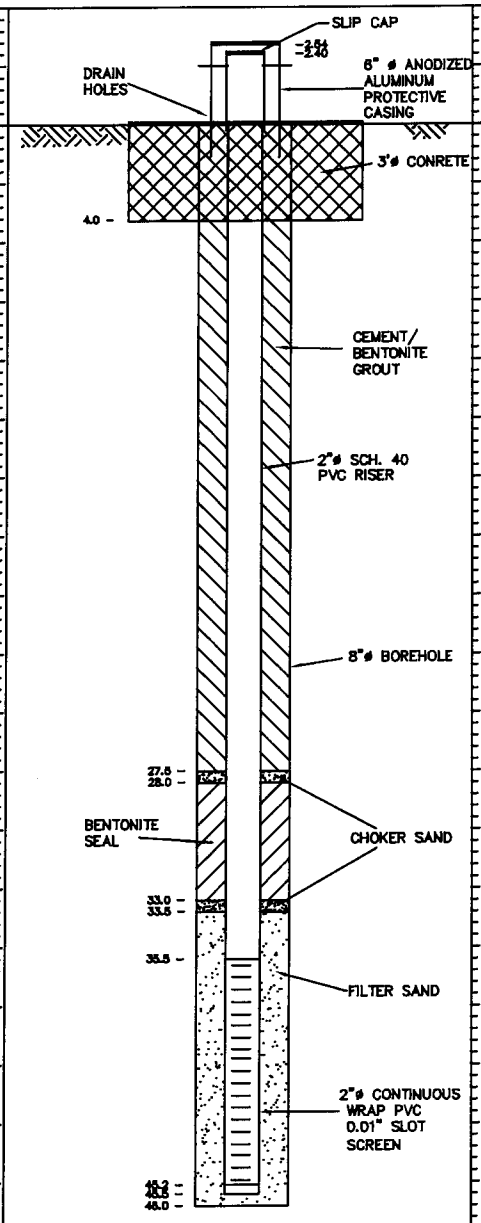
JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-N (I) SHEET 1 of 1
GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1473.95 Ft. WATER DEPTH 37.11 FT. BGS
WEATHER OVERCAST DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1476.35 Ft. DATE/TIME 7-11-05/730
TEMP. 70°-75° F DRILL RIG CME-550 DRILLER A. MORRIS STARTED 1250/7-8-05 (TIME / DATE) COMPLETED 840/7-11-05 (TIME / DATE)
LOCATION / COORDINATES N9932.64, E6162.63

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 38.0 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS
CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS
JOINT TYPE FLUSH THREADED SLOT SIZE 0.01" FILTER PACK QTY. 2.5 BAGS
GROUT QUANTITY — CENTRALIZERS NOT USED FILTER PACK TYPE #00N-SIZE QUARTZ SAND
GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1473.95	GROUND SURFACE
0.0	**CLAY TILL UNIT** 0–34.3' — Soft to firm to stiff, light brown–brown to olive gray to dark gray–olive gray, CLAYEY SILT to SILTY CLAY, moist to very moist, weakly to moderately laminated, slight to moderate liquefaction, trace to little, medium to coarse sand, little fine to coarse, sub–rounded to rounded gravel, occasional thin silt and sand lenses. (ML–CL) Zone of red brown to brown, SANDY SILT @ 30.7' to 30.9' (SM) Zone of loose to compact, dark brown, GRAVELLY SILTY SAND @30.9' to 32.0' (SM)
10.0	
15.0	
20.0	
	SAND & GRAVEL UNIT 34.3–46' — Compact to very loose, very moist to wet, SANDY GRAVEL to GRAVELLY SAND, trace to little silt, occasional thin sandy silt zones, occasional fractured black shale fragments and cobbles. (SW–GW) Loose, wet, very gravelly SAND, trace silt, some fractured red sandstone and black shale fragments @ 38.0' to 40.0' and 44.0' to 46.0' (SW) Zone of SANDY SILT @ 43.7' to 43.9' (SM)
30.0	
40.0	
45.0	
	EOB @ 46.0'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 46.0 FT. BELOW GROUND SURFACE (BGS). SAMPLED 0 TO 46.0 FT BGS. SAND POURED THROUGH AUGERS 46.0–45.5 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 37.9 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 47.9 FT. WELL MATERIALS PLACED TO 45.5 FT. BGS WITH 2.4 FT. STICKUP. SAND POURED THROUGH AUGERS 45.5 – 33.5 FT. BGS WHILE REMOVING AUGERS AT 0.5 – 1.0 FT. INCREMENTS. CHOKER SAND PLACED 33.5 – 33.0 FT BGS. BENTONITE CHIP SEAL PLACED 33.0 – 28.0 FT. BGS. CHOKER SAND PLACED 28.0 – 27.5 FT. BGS. CEMENT/BENTONITE GROUT ADDED 27.5 – 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6–INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3–FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC ON–SITE DURING INSTALLATION AND CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/15 TO 7/25/05

DEVELOPMENT METHOD: STAINLESS STEEL BAILER

VOLUME PURGED: 24 GALS.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 20' JOB NO. 053-9443 PROJECT WMNY/Western Expansion Well Installation BORING NO. MW-O(S)
DEPTH SOIL DRILL 20.5' GA INSP. RJM DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 1 of 1
DEPTH ROCK CORE N/A WEATHER SUNNY DRILLING CO. Earth Dimensions, Inc. SURFACE EL. 1478.34
NO. DIST. N/A US. N/A TEMP. 90° to 92° F DRILL RIG Dietrich D-50 DRILLER A. Morris DATUM SITE
DEPTH WL. 19.3' HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 1135/6-24-05
TIME WL. 705 HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1350/6-24-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
	SEE SOIL BORING LOG FOR MW-O(I).							0.0-10.0 ft. Augered with no sampling.
2								
10		20	1	DO	9-9-11-14	24"/24"		SA-1 10.0-12.0 ft. Firm to soft, olive brown to gray, CLAYEY SILT, little to some sub-rounded to sub-angular fine to coarse gravel, moist to very moist. (CL)
12		10	2	DO	4-5-5-7	24"/24"		SA-2 12.0-14.0 ft. Compact, gray-brown, CLAYEY SILT, little angular to sub-angular gravel/rock fragments, very moist. (CL-ML) Very moist and soft from 13.2 to 14.0 ft. bgs.
14		9	3	DO	4-4-5-5	22"/24"		SA-3 14.0-16.0 ft. Same as above, with occasional sub-rounded medium to coarse gravel, very moist to slightly wet. Slight liquefaction when disturbed. (ML)
16		9	4	DO	3-4-5-6	24"/24"		SA-4 16.0-18.0 ft. Same as above, very moist to slightly wet, slight liquefaction when disturbed. (ML)
18		10	5	DO	2-4-6-6	21"/24"		SA-5 18.0-20.0 ft. Same as above.
20								20.0-20.5 ft. Augered with no sampling.
	20.5 FT. END OF BOREHOLE							

MONITORING WELL INSTALLATION LOG

JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-O (S) SHEET 1 of 1

GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1478.34 Ft. WATER DEPTH 19.3 FT. BGS

WEATHER SUNNY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1480.61 Ft. DATE/TIME 8-27-05/0745

TEMP. 90° F DRILL RIG CME-550 DRILLER A. MORRIS STARTED 905/8-27-05 TIME / DATE COMPLETED 1035/8-27-05 TIME / DATE

LOCATION / COORDINATES N9543.19, E4803.29

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 17.5 l.f. WELL SCREEN 2.0 in. dia. 5.0 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

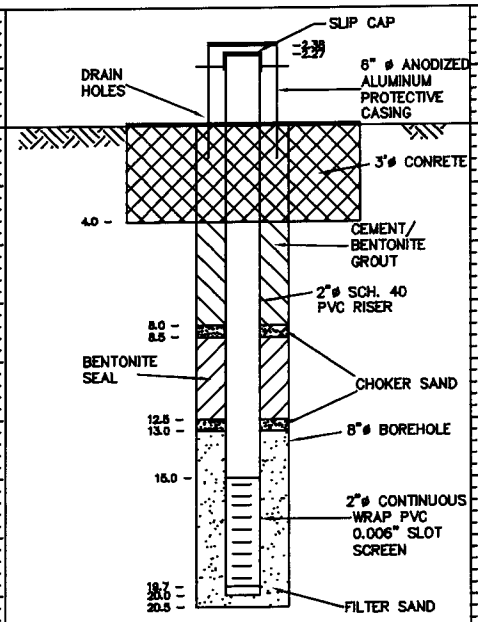
JOINT TYPE FLUSH THREADED SLOT SIZE 0.006" FILTER PACK QTY. 3 BAGS

GROUT QUANTITY — CENTRALIZERS NOT USED FILTER PACK TYPE #00-SIZE QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1478.34	GROUND SURFACE
0.0	CLAY TILL UNIT 0-20' SEE SOIL BORING LOG FOR MW-O (I)
10.0	
15.0	
20.0	
	EOB @ 20.5'

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 20.5 FT. BELOW GROUND SURFACE (BGS). SAMPLED 10.0 TO 20.0 FT BGS. SAND POURED THROUGH AUGERS 25.5'-20.0' FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 5 FT. OF WELL SCREEN, END CAP, 17.27 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 22.27 FT. WELL MATERIALS PLACED TO 20.0 FT. BGS WITH 2.27 FT. STICKUP. SAND POURED THROUGH AUGERS 20.0 - 13.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 - 1.0 FT. INCREMENTS. CHOKER SAND PLACED 13.0 - 12.5 FT BGS. BENTONITE CHIP SEAL PLACED 12.5 - 8.5 FT. BGS. CHOKER SAND PLACED 8.5 - 8.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 8.0 - 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC ON-SITE DURING INSTALLATION AND CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/15 TO 7/21/05

DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: 2.4 GALS.
FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 54'	JOB NO. 053-9443	PROJECT WMNY/ Western Expansion Well Installation			BORING NO. MW-O(1)
DEPTH SOIL DRILL 52.7'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 1 of 3
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1478.34
NO. DIST. N/A US. N/A	TEMP. 65°-75° F	DRILL RIG DIETRICH D-50	DRILLER A. Morris		DATUM SITE
DEPTH WL. 44.0'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"		STARTED 0845/6-23-05
TIME WL. 0700	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1515/6-23-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	CLAY TILL UNIT 0-32.0' Stiff to firm,brown-dark brown to mottled brown-gray to gray, CLAYEY SILT to SILTY CLAY, slightly moist to very moist, slightly to thinly laminated, slight liquefaction, little fine to coarse, sub-rounded to rounded gravel, little to some fine to medium sand, occasional desiccation cracks, occasional fractured shale fragments, occasional thin silt and sand lenses. (ML-CL) Intervals of loose, brown-gray, moist to wet, GRAVEL and med. to c. SAND from 26.0' to 30.0' (GW-GM) Intervals of firm, gray to mottled gray, moist to slightly wet SANDY SILT, little fine gravel, with occasional thin silt lenses from 12.5'-26.0' (SM).	10	1	DO	3-4- 6-10	22" 24"		SA-1 0.0-2.0 ft. Compact, tan-brown to brown, CLAYEY SILT, little to some clay, moist to slightly moist. (ML) Granular structure. Some plant roots and desiccation cracks.
2		30	2	DO	14-13- 17-16	24" 24"		SA-2 2.0-4.0 ft. Stiff, brown, CLAY, little sand, little silt, moist. (CL) Weakly laminated from 3.0-3.5 ft. bgs.
4		14	3	DO	6-7- 7-11	24" 24"		SA-3 4.0-6.0 ft. Firm, dark brown to brown, CLAYEY SILT to SILTY CLAY, little fine sub-rounded gravel, very moist. (ML-CL)
6		26	4	DO	11-9- 17-24	10" 24"		SA-4 6.0-8.0 ft. As above; little fine sand, occasional sub-rounded rock/stone, moist. (ML-CL)
8		26	5	DO	8-13- 13-18	18" 24"		SA-5 8.0-8.5 ft. Firm, brown, SILTY CLAY, moist. 8.5-10.0 ft. Firm, gray, CLAY, occasional silt lens, moist. (CL)
10		17	6	DO	4-6- 11-17	24" 24"		SA-6 10.0-12.0 ft. Firm, tan-brown to gray, mottled, SILTY CLAY, little fine sand, little coarse sub-rounded gravel, very moist to moist. (ML-CL)
12	12.5 ft bgs-Color change.	17	7	DO	8-8- 9-9	24" 24"		SA-7 12.0-12.5 ft. Same as above. 12.5-14.0 ft. Firm, mottled brown-gray, SANDY SILT, occasional brown silt lens, moist to very moist. (ML)
14		19	8	DO	11-11- 8-11	20" 24"		SA-8 14.0-16.0 ft. Same as above; occasional rounded coarse gravel. (ML)
16		11	9	DO	4-4- 7-8	18" 24"		SA-9 16.0 to 18.0 ft. Firm, gray, SANDY SILT, moist to very moist. (ML)
18		12	10	DO	2-5- 7-7	18" 24"		SA-10 18.0 to 20.0 ft. Same as above. Sample slightly wet at 18.0-18.5 ft. bgs. (ML)
20		11	11	DO	1-5- 6-9	20" 24"		SA-11 20.0-21.0 ft. As above. wet to very moist zone at 20.5 ft. bgs. 21.0-22.0 ft. SILTY CLAY transition with little sub-rounded fine gravel. (ML-CL)
22		10	12	DO	4-4- 6-8	20" 24"		SA-12 22.0-24.0 ft. Firm to soft, gray, SANDY SILT. (ML) Thinly laminated at 23.5 ft. bgs.
24								Continued on next page.

FIELD BORING LOG

DEPTH HOLE 54' JOB NO. 053-9443 PROJECT WMNY/ Western Expansion Well Installation BORING NO. MW-O(I)
DEPTH SOIL DRILL 52.7' GA INSP. RJM DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 2 of 3
DEPTH ROCK CORE N/A WEATHER SUNNY DRILLING CO. Earth Dimensions, Inc. SURFACE EL. 1478.34
NO. DIST. N/A US. N/A TEMP. 65°-75° F DRILL RIG DIETRICH D-50 DRILLER A. Morris DATUM SITE
DEPTH WL. 44.0' HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0845/8-23-05
TIME WL. 0700 HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1515/8-23-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE"	0-5%
"LITTLE"	5-12%
"SOME"	12-30%
"AND"	30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER .6 M. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
		12	13	DO	4-4-8-9	22"/24"		SA-13 24.0-25.0 ft. Firm to soft, gray, SANDY SILT, thinly laminated, very moist. 25.0-26.0 ft. As above, some clay, with occasional sub-angular to sub-rounded gravel and dark gray shale/sandstone pieces. (ML-CL)
26		20	14	DO	6-10-10-15	13"/24"		SA-14 26.0-28.0 ft. Loose, brown-gray, GRAVEL, little silt, little medium to coarse sand, wet. (GW)
28		35	15	DO	12-15-20-21	11"/24"		SA-15 28.0-29.5 ft. Loose, brown-gray, GRAVEL and coarse SAND, some silt, some fine to medium sand, fractured sandstone pieces, moist to v. moist. (GW) 29.5-30.0 ft. Loose, brown-gray, medium SAND, little fine rounded gravel, moist. (GM)
30		67	16	DO	17-38-29-33	22"/24"		SA-16 30.0-31.0 ft. Loose, dark brown, SILT, some clay, little rounded to sub-angular gravel, moist. (SC) 31.0-32.0 ft. Loose, brown-gray, SANDY GRAVEL, little silt, little fractured shale fragments, moist. (GM)
32	32.0 ft. bgs-Lithology change. SAND & GRAVEL UNIT 32.0-52.0' Compact to loose, moist to saturated, fine to coarse GRAVEL, SILTY GRAVEL and SAND, little to some silt, occasional thin sandy silt zones, occasional fractured shale fragments. (GP-GM) Intervals of compact, gray to dark gray, wet to saturated SILT and fine to medium SAND from 42.0' to 43.0' and 50.0' to 52.0' (SM). Zone of loose, dark brown to brown-gray, moist, fine to medium SAND, little to some f. to m. gravel, from 36.0' to 38.0' (SP).	58	17	DO	25-34-24-34	18"/24"		SA-17 32.0-34.0 ft. Same as above; moist. (SW-GM)
34		110	18	DO	30-80-30-35	13"/24"		SA-18 Same as above; moist. (SW-GW)
36		17	19	DO	8-8-9-13	19"/24"		SA-19 36.0-38.0 ft. Loose, dark brown to brown, fine to medium SAND, little to some fine to medium gravel, moist. (SP) Mottled brown silt lens at 37.5 ft. bgs.
38		22	20	DO	9-10-12-12	17"/24"		SA-20 38.0-40.0 ft. Loose, brown to dark brown, SAND and GRAVEL, very moist to moist.
40		25	21	DO	7-12-13-21	12"/24"		SA-21 40.0-42.0 ft. Loose, tan-brown, subrounded to rounded SILTY GRAVEL, wet. Wet, clean gravel at bottom of interval. Large sandstone cobble in end of spoon shoe.
42		17	22	DO	4-10-7-9	13"/24"		SA-22 42.0-43.0 ft. Firm, gray, SAND and SILT, some clay, wet. Saturated sand and gravel at 42.8 ft. bgs. 43.0-44.0 ft. Compact, gray, SILT and sub-rounded to sub-angular coarse GRAVEL, wet. (GP)
44		11	23	DO	4-4-7-8	24"/24"		SA-23 44.0-46.0 ft. Loose, brown to dark brown, SAND and GRAVEL, saturated. (GM)
46		23	24	DO	9-8-15-18	18"/24"		SA-24 46.0-46.5 ft. Augered without sampling. 46.5-48.0 ft. Loose, brown-gray, SAND and coarse GRAVEL, some silt, occasional angular weathered shale fragments, saturated. (GM)
48								

FIELD BORING LOG

DEPTH HOLE 54' JOB NO. 053-9443 PROJECT WMNY/ Western Expansion Well Installation BORING NO. MW-O(I)
DEPTH SOIL DRILL 52.7' GA INSP. RJM DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 3 of 3
DEPTH ROCK CORE N/A WEATHER SUNNY DRILLING CO. Earth Dimensions, Inc. SURFACE EL. 1478.34
NO. DIST. N/A US. N/A TEMP. 65°-75° F DRILL RIG DIETRICH D-50 DRILLER A. Morris DATUM SITE
DEPTH WL. 44.0' HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0845/8-23-05
TIME WL. 0700 HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1515/8-23-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/ FT.		SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
		44		25	DO	6-9-35-35	16"/24"		SA-25 48.0-50.0 ft. Same as above; saturated.
50		15		26	DO	8-8-7-11	13"/24"		SA-26 50.0-52.0 ft. Compact, dark gray, fine to medium SAND and SILT, saturated. (SM) Silt lenses at 50.8 ft. and 51.8 ft. bgs.
52	52.0 ft. bgs - Lithology change.	28		27	DO	5-10-18-25	19"/24"		SA-27 52.0-54.0 ft. IMPERVIOUS SILT LAYER. Stiff, gray, CLAYEY SILT, little fine sub-rounded gravel, weakly laminated, very moist. (ML)
54	54.0 FT. END OF BOREHOLE								

Golder Associates

MONITORING WELL INSTALLATION LOG

JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-0 (I) SHEET 1 of 1

GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1478.34 Ft. WATER DEPTH 44.0 FT. BGS

WEATHER SUNNY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1480.52 Ft. DATE/TIME 6-24-05/0700

TEMP. 70-85° F DRILL RIG Dietrich D-50 DRILLER A. MORRIS STARTED 710/6-24-05 (TIME / DATE) COMPLETED 1100/6-24-05 (TIME / DATE)

LOCATION / COORDINATES N9552.64, E4805.03

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 44 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS

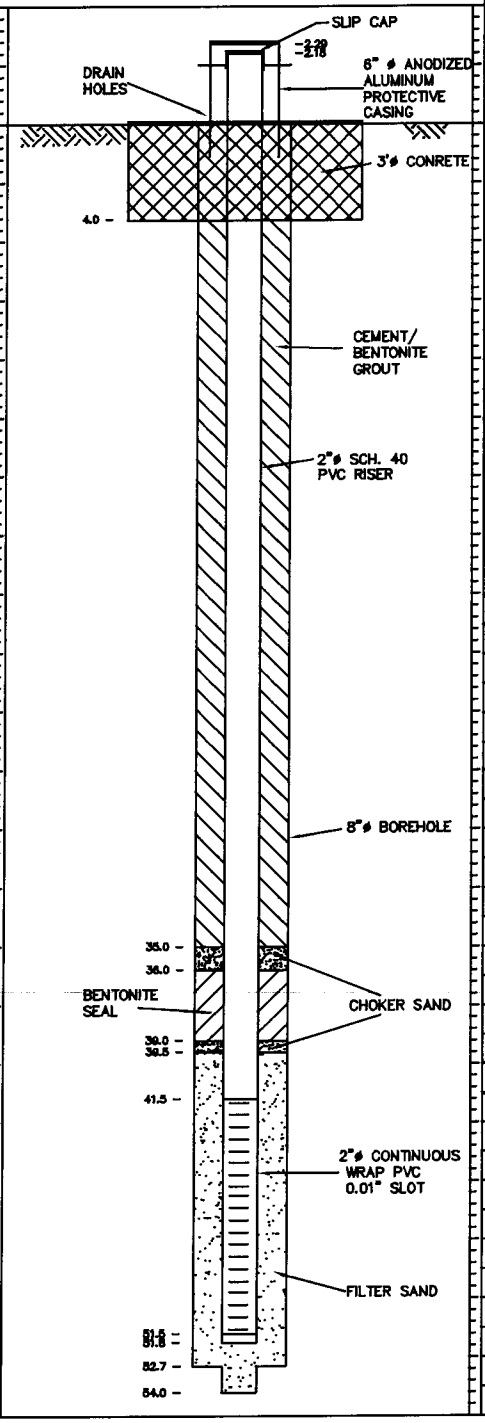
CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

JOINT TYPE FLUSH THREADED SLOT SIZE 0.01" FILTER PACK QTY. 2.5 BAGS

GROUT QUANTITY ——— CENTRALIZERS NOT USED FILTER PACK TYPE #00N-SIZE QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1478.34	GROUND SURFACE
0.0	**CLAY TILL UNIT** 0-32.0' Stiff to firm, brown-dark brown to mottled brown-gray to gray, CLAYEY SILT to SILTY CLAY, slightly moist to very moist, slightly to thinly laminated, slight liquefaction, little fine to coarse, sub-rounded to rounded gravel, little to some fine to medium sand, occasional desiccation cracks, occasional fractured shale fragments, occasional thin silt and sand lenses. (ML-CL) Intervals of loose, brown-gray, moist to wet, GRAVEL and med. to c. SAND from 26.0' to 30.0' (GW-GM) Intervals of firm, gray to mottled gray, moist to slightly wet SANDY SILT, little fine gravel, with occasional thin silt lenses from 12.5'-26.0' (SM).
30.0	**SAND & GRAVEL UNIT** 32.0-52.0' Compact to loose, moist to saturated, fine to coarse GRAVEL, SILTY GRAVEL and SAND, little to some silt, occasional thin sandy silt zones, occasional fractured shale fragments. (GP-GM) Intervals of compact, gray to dark gray, wet to saturated SILT and fine to medium SAND from 42.0' to 43.0' and 50.0' to 52.0' (SM). Zone of loose, dark brown to brown-gray, moist, fine to medium SAND, little to some f. to m. gravel, from 36.0' to 38.0' (SP).
50.0	
	EOB @ 54.0'



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 52.7 FT. BELOW GROUND SURFACE (BGS). SAMPLED 0 TO 54.0 FT BGS. SAND POURED THROUGH AUGERS 52.7-51.6 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 43.68 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 53.68 FT. WELL MATERIALS PLACED TO 51.6 FT. BGS WITH 2.18 FT. STICKUP. SAND POURED THROUGH AUGERS 51.6 - 39.5 FT. BGS WHILE REMOVING AUGERS AT 0.5 - 1.0 FT. INCREMENTS. CHOKER SAND PLACED 39.5 - 39.0 FT BGS. BENTONITE CHIP SEAL PLACED 39.0 - 36.0 FT. BGS. CHOKER SAND PLACED 36.0 - 35.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 35.0 - 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC ON-SITE DURING INSTALLATION AND CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/15 TO 7/25/05

DEVELOPMENT METHOD: STAINLESS STEEL BAILER

VOLUME PURGED: 68.25 GALS.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 26' JOB NO. 053-9443 PROJECT WMNY/ Western Expansion Well Installation BORING NO. MW-P(S)
DEPTH SOIL DRILL 27' GA INSP. RJM DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 1 of 1
DEPTH ROCK CORE N/A WEATHER OVERCAST DRILLING CO. Earth Dimensions, Inc. SURFACE EL. 1465.59
NO. DIST. N/A US. N/A TEMP. 75° F DRILL RIG CME-550 DRILLER B. Bartron DATUM SITE
DEPTH WL. 15.98' HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0725/7-5-05
TIME WL. 920 HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 920/7-5-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE		
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED		
C	COARSE	MOT	MOTTLED	SD	SAND		
CA	CASING	NP	NON-PLASTIC	SI	SILT		
CL	CLAY	OG	ORANGE	SIY	SILTY		
CLY	CLAYEY	ORG	ORGANIC	SM	SOME		
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE		
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL		
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER		
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS		
LI	LITTLE	ROK	ROCK	Y	YELLOW		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
2	SEE SOIL BORING LOG FOR MW-P (I)							0.0-16.0 ft. Augered with no sampling.
4								
16								
18		18	1	DO	5-8-10-13	24"/24"		SA-1 16.0-18.0 ft. Stiff, olive-gray, CLAYEY SILT, olive-brown mottling, trace sub-rounded medium to coarse gravel, slightly laminated, very slight liquefaction, moist to very moist. (ML)
		14	2	DO	4-6-8-11	20"/24"		SA-2 18.0-20.0 ft. Stiff, olive-brown, CLAYEY SILT, trace fine sand, trace coarse gravel, very moist. (ML)
20		13	3	DO	2-3-10-12	22"/24"		SA-3 20.0-21.7 ft. Stiff to firm, olive-gray, CLAYEY SILT, slightly laminated, very moist. (ML) 21.7-22.0 ft. Loose to compact, SILTY SAND, wet to saturated. (SM)
22		11	4	DO	4-4-7-9	24"/24"		SA-4 22.0-23.0 ft. Loose, c. SAND and f. GRAVEL, wet. 23.0-23.3 ft. Loose, fine to coarse sub-rounded GRAVEL, little silt. (GW) 23.3-24.0 ft. Stiff, olive-brown, CLAYEY SILT, slightly laminated, very moist. (ML)
24		24	5	DO	3-6-18-33	24"/24"		SA-5 24.0-26.0 ft. Stiff, olive-gray, CLAYEY SILT, trace coarse sub-rounded gravel, weakly to moderately laminated, very moist. (ML)
26								26.0-27.0 ft. Augered with no sampling.
	27.0 FT. END OF BOREHOLE							

MONITORING WELL INSTALLATION LOG

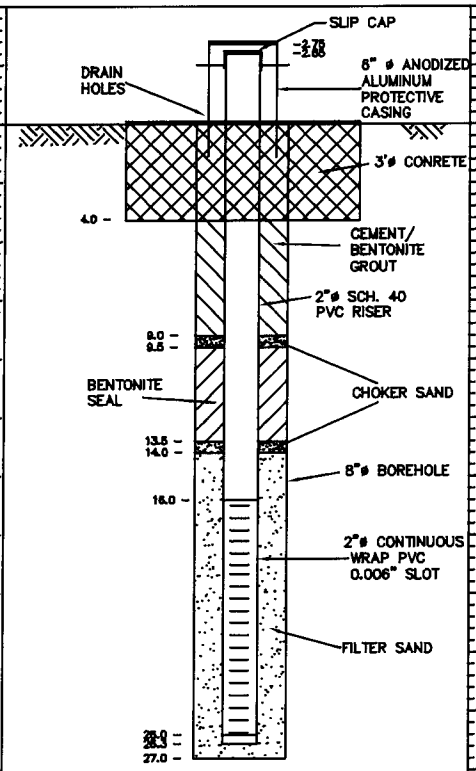
JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-P (S) SHEET 1 of 1
GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1465.59 Ft. WATER DEPTH 15.98 FT BGS
WEATHER OVERCAST DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1468.24 Ft. DATE/TIME 7-5-05/920
TEMP. 75-85° F DRILL RIG CME-550 DRILLER B. BARTRON STARTED 1000/7-5-05 (TIME / DATE) COMPLETED 1130/7-5-05 (TIME / DATE)
LOCATION / COORDINATES N9940.36, E5453.08

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 18.5 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS
CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS
JOINT TYPE FLUSH THREADED SLOT SIZE 0.006" FILTER PACK QTY. 2.5 BAGS
GROUT QUANTITY —— CENTRALIZERS NOT USED FILTER PACK TYPE #00-SIZE QUARTZ SAND
GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1465.59	GROUND SURFACE
0.0	CLAY TILL UNIT 0-26' SEE SOIL BORING LOG FOR MW-P (I).
10.0	
15.0	
20.0	
	EOB @ 27.0'
30.0	

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 27.0 FT. BELOW GROUND SURFACE (BGS). SAMPLED 16.0 TO 26.0 FT BGS. SAND POURED THROUGH AUGERS 27.0'-26.0' FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 18.65 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 28.65 FT. WELL MATERIALS PLACED TO 26.0 FT. BGS WITH 2.65 FT. STICKUP. SAND POURED THROUGH AUGERS 26.0 - 14.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 - 1.0 FT. INCREMENTS. CHOKER SAND PLACED 14.0 - 13.5 FT BGS. BENTONITE CHIP SEAL PLACED 13.5 - 9.5 FT. BGS. CHOKER SAND PLACED 9.5 - 9.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 9.0 - 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC CONCURRED WITH THE PLACEMENT OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/12 TO 7/25/05

DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: 110 GALS.
FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

FIELD BORING LOG

DEPTH HOLE 56'	JOB NO. 053-9443	PROJECT WMNY/ Western Expansion Well Installation			BORING NO. MW-P(1)
DEPTH SOIL DRILL 54.1'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 1 of 3
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1466.28
NO. DIST. N/A US. N/A	TEMP. 80-90° F	DRILL RIG CME-550	DRILLER B. Bartron		DATUM SITE
DEPTH WL. 27.1'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"		STARTED 0900/6-30-05
TIME WL. 1030/7-1-05	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1015/7-1-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE, OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
		14	1	DO	3–6–8–10	17"/24"		SA–1 0.0-2.0 ft. Stiff, light tan to light brown, mottled gray, SILTY CLAY, little medium gravel, sl. moist to dry. (CL) Slight desiccation. TOPSOIL
2		16	2	DO	6–7–9–9	20"/24"		SA–2 2.0-4.0 ft. Stiff, dark brown to brown, SILTY CLAY to CLAYEY SILT, occasional thin silt lenses, slight lamination, little clay content, moist. (SM-CL) Loose, dark brown, SANDY SILT from 2.3-2.5 ft. bgs.
4		24	3	DO	5–10–14–16	23"/24"		SA–3 4.0-6.0 ft. Stiff, light brown to olive-brown, CLAYEY SILT, trace to little fine gravel, trace fine sand, weakly laminated, slightly desiccated, moist. (SL) Fractured shale fragments @ 4.6 ft. bgs. Thin silt lens @ 5.9 ft. bgs.
6		29	4	DO	9–12–17–14	24"/24"		SA–4 6.0-7.2 ft. Same as above. 7.2-8.0 ft. Compact to loose, dark brown, SANDY SILT, trace to little gravel, weakly stratified, very moist.
8	7.2 ft. bgs - Lithology change.	24	5	DO	7–11–13–11	19"/24"		SA–5 8.0-9.5 ft. Stiff to firm, lt. brown to olive-brown, CLAYEY SILT, little sub-rounded c. gravel, sl. laminated, slight liquefaction, v. moist to wet. (ML) Zone of wet, silty gravel from 8.4-8.7 ft. bgs.
10	9.5 ft. bgs. - Color change.	8	6	DO	2–3–5–7	16"/24"		9.5-10.0 ft. Firm, dk gray to gray, SILTY CLAY, v. moist. (CL) SA–6 10.0-12.0 ft. Firm, dark gray, SILTY CLAY, occasional silt lenses, distinct lamination, very slight liquefaction, very moist. (CL)
12	CLAY TILL UNIT 0–38.5' Firm to stiff, dark-light brown to olive gray to dark gray, CLAYEY SILT to SILTY CLAY, moist to slightly wet, slightly to weakly laminated, slight liquefaction, trace to some f. to c., sub-rounded to rounded gravel, occasional desiccation cracks, slight ol. br. mottling, occasional thin	8	7	DO	3–3–5–7	24"/24"		SA–7 12.0-14.0 ft. Same as above. No gravel.
14		13	8	DO	4–7–6–7	23"/24"		SA–8 14.0-14.7 ft. Same as above. 14.7-15.6 ft. Soft, gray to brown, SANDY SILT, little medium gravel, wet. (SM) 15.6-16.0 ft. Firm, olive brown, CLAYEY SILT, some fractured shale fragments, very moist to moist. (SM)
16	silt and sand lenses, occasional fractured shale fragments. (ML-CL) Intervals of compact to loose, dk. br. to gray-br., SANDY SILT to SILTY SAND, from 7.2.' to 8.0', 14.7' to 15.6', 21.8' to 22.0', 24.0' to 26.0' and 31.2' to 32.0' (SM).	20	9	DO	5–8–12–17	24"/24"		SA–9 16.0 to 18.0 ft. Stiff, olive to gray, CLAYEY SILT, little medium to coarse sand, very moist to slightly wet. Thin fine gravel and sand layer @ 16.3 ft. bgs. (ML-CL)
18		68	10	DO	37–36–32–26	5"/24"		SA–10 18.0 to 20.0 ft. Compact/stiff, CLAYEY SILT to SILTY CLAY (as above); fractured rock fragments in spoon. (ML-CL)
20	Zone of loose, wet, coarse SAND @ 22.0' to 23.0' (SP)	16	11	DO	8–8–8–13	24"/24"		SA–11 20.0-21.8 ft. Stiff, olive-gray, CLAYEY SILT, occasional thin sandy silt lenses, moist to very moist. (SM) 21.8-22.0 ft. Loose to compact, SILTY SAND, wet.(ML-SM)
22	21.8 ft. bgs - Lithology change.	6	12	DO	WH–2–4–5	16"/24"		SA–12 22.0-23.0 ft. Loose, coarse, SAND, wet. (SP) 23.0-23.5 ft. Loose, sub-rounded to rounded course gravel, little silt. (SM) 23.5-24.0 ft. Firm to soft, olive-brown, CLAYEY SILT, very moist. (SW)
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Continued on next page.

FIELD BORING LOG

DEPTH HOLE 56'	JOB NO. 053-9443	PROJECT WMNY/ Western Expansion Well Installation			BORING NO. MW-P(1)
DEPTH SOIL DRILL 54.1'	GA INSP. RJM	DRILLING METHOD 4-1/4" ID Hollow Stem Augers			SHEET 2 of 3
DEPTH ROCK CORE N/A	WEATHER SUNNY	DRILLING CO. Earth Dimensions, Inc.			SURFACE EL. 1466.28
NO. DIST. N/A US. N/A	TEMP. 80-90° F	DRILL RIG CME-550	DRILLER B. Bartron		DATUM SITE
DEPTH WL. 27.1'	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"		STARTED 0900/6-30-05
TIME WL. 1030/7-1-05	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A		COMPLETED 1015/7-1-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE, OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE"	0-5%
"LITTLE"	5-12%
"SOME"	12-30%
"AND"	30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.		SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
		33		13	DO	WH-15-18-20	16"/24"		SA-13 24.0-26.0 ft. Very loose, coarse, SILTY SAND, saturated; liquefaction present. (SM)
26		28		14	DO	6-11-17-19	20"/24"		SA-14 26.0-28.0 ft. Stiff to firm, olive-gray, CLAYEY SILT, trace sub-rounded medium gravel, weakly laminated, very moist. (ML)
28		23		15	DO	5-7-16-22	18"/24"		SA-15 28.0-30.0 ft. Firm to stiff, olive-gray, CLAYEY SILT, trace to little fine sub-rounded gravel, slight olive brown mottling, moist. (ML)
30		57		16	DO	7-22-35-29	20"/24"		SA-16 30.0-31.2 ft. Same as above. 31.2-32.0 ft. Compact to loose, medium to course gravelly SILTY SAND, some fractured shale fragments, very moist to wet. (ML-CL)
	31.2 ft. bgs. - Lithology change.								
32		30		17	DO	14-14-16-20	22"/24"		SA-17 32.0-34.0 ft. Firm to stiff, olive-gray, CLAYEY SILT, trace coarse gravel, very moist. (ML) Layer of fractured shale fragments @34.2 ft. bgs.
34		29		18	DO	9-14-15-18	24"/24"		SA-18 34.0-36.0 ft. Same as above; little to some clay, trace to little medium to coarse gravel.
36		30		19	DO	10-14-16-21	20"/24"		SA-19 36.0-38.0 ft. Stiff, olive-gray, CLAYEY SILT, trace fine to coarse gravel, very moist. (SM)
38									SA-20 38.0-38.5 ft. Same as above. 38.5-40.0 ft. Gravelly SILTY SAND, v. moist to wet. (SW) Pocket of silty, m. to c. sand from 38.3-38.6 ft. bgs. Fractured shale fragments from 39.0-39.2 ft. bgs.
	38.5 ft. bgs. - Lithology change.	103		20	DO	22-38-65-36	17"/24"		
40	SAND & GRAVEL UNIT 38.5-54.1' Compact to loose, very moist to wet, fine to coarse GRAVEL, SAND and SILTY SAND, some silt, occasional fractured shale fragments. (SM-GM) Interval of loose, brown, wet, GRAVELLY-SILT/SAND/CLAY @ 42.0' to 45.6' (SM). Occasional pocket of stiff, olive brown, very moist CLAYEY SILT (ML).	76		21	DO	23-35-41-30	17"/24"		SA-21 40.0-42.0 ft. Same as above. Wet. (SW)
42		39		22	DO	16-18-21-19	15"/24"		SA-22 42.0-42.5 ft. Gravelly SILT/SAND/CLAY. (SM) 42.5-44.0 ft. Gravelly SILT/SAND/CLAY, little to some clay content, olive-brown to gray, wet. (SM)
44		65		23	DO	18-27-38-29	21"/24"		SA-23 44.0-45.6 ft. Same as above. 45.6-46.0 ft. Gravelly SAND, some silt, some fractured shale fragments, wet. (SM)
46		57		24	DO	21-23-34-38	21"/24"		SA-24 46.0-47.1 ft. Same as above. Wet. 47.1-47.6 ft. Loose, SILTY m. to c. SAND. 47.6-48.0 ft. Loose, gravelly SILTY SAND. (SM)
48									Continued on next page.

FIELD BORING LOG

DEPTH HOLE 56' JOB NO. 053-9443 PROJECT WMNY/ Western Expansion Well Installation BORING NO. MW-P(1)
DEPTH SOIL DRILL 54.1' GA INSP. RJM DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 3 of 3
DEPTH ROCK CORE N/A WEATHER SUNNY DRILLING CO. Earth Dimensions, Inc. SURFACE EL. 1466.28
NO. DIST. N/A US. N/A TEMP. 80-90° F DRILL RIG CME-550 DRILLER B. Bartron DATUM SITE
DEPTH WL. 27.1' HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0900/8-30-05
TIME WL. 1030/7-1-05 HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1015/7-1-05

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
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R.C.	ROCK CORE
S.T.	SLOTTED TUBE
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CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/ FT.		SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
50		48		25	DO	22-23-25-27	15"/24"		SA-25 48.0-50.0 ft. Same as above; wet.
52		54		26	DO	17-24-28-32	17"/24"		SA-26 50.0-52.0 ft. Loose, SILTY SAND, and coarse GRAVEL. (GM)
54	54.1 ft. bgs - Lithology change.	43		27	DO	16-20-23-25	15"/24"		SA-27 52.0-54.1 ft. Loose, SILTY fine to mediumSAND and GRAVEL, occasional pocket of stiff,olive-brown, clayey silt,very moist, little subrounded gravel. (GM)
56	56.0 FT. END OF COREHOLE	24		28	DO	7-9-15-18	21"/24"		SA-28 54.1-56.0 ft. CLAYEY SILT, trace to little medium to coarse, sub-rounded gravel. (ML)

MONITORING WELL INSTALLATION LOG

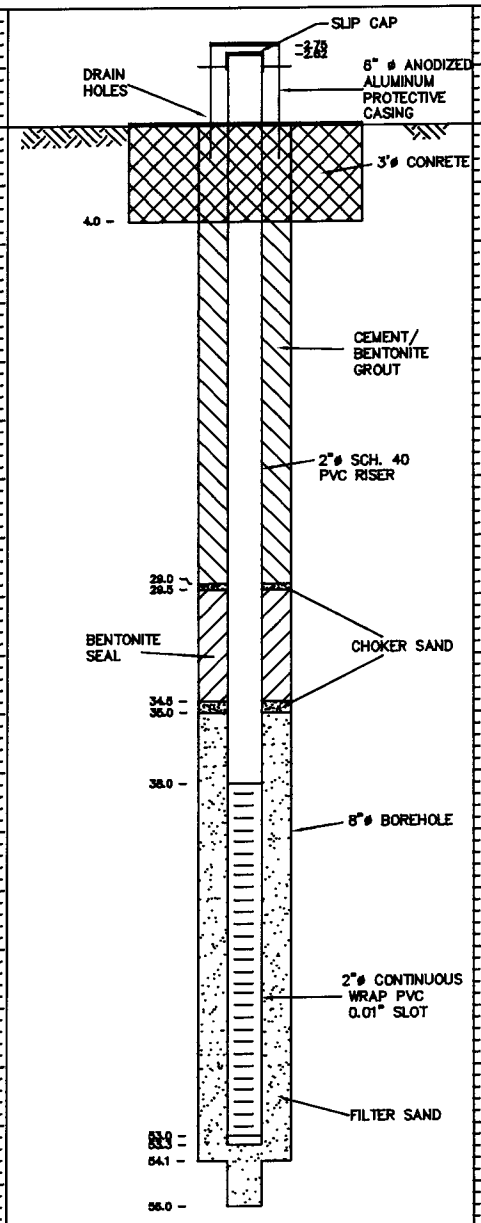
JOB NO. 053-9443 PROJECT WMNY/WESTERN EXPANSION WELL INSTALLATION/NY WELL NO. MW-P (I) SHEET 1 of 1
GA INSP. RJM DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1466.28 Ft. WATER DEPTH 21.7 FT. BGS
WEATHER SUNNY DRILLING COMPANY EARTH DIMENSIONS COLLAR ELEV. 1468.91 Ft. DATE/TIME 7-1-05/1030
TEMP. 80-90° F DRILL RIG CME-550 DRILLER B. BARTRON STARTED 1105/7-1-05 TIME / DATE COMPLETED 1415/7-1-05 TIME / DATE
LOCATION / COORDINATES N9942.01, E5447.89

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 40.5 l.f. WELL SCREEN 2.0 in. dia. 15 l.f. BENTONITE SEAL MEDIUM BENTONITE CHIPS
CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS
JOINT TYPE FLUSH THREADED SLOT SIZE 0.01" FILTER PACK QTY. 4 BAGS
GROUT QUANTITY —— CENTRALIZERS NOT USED FILTER PACK TYPE #00N-SIZE QUARTZ SAND
GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD POUR THROUGH AUGERS

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1466.28	GROUND SURFACE
0.0	**CLAY TILL UNIT** 0-38.5' Firm to stiff, dark-light brown to olive gray to dark gray, CLAYEY SILT to SILTY CLAY, moist to slightly wet, slightly to weakly laminated, slight liquefaction, trace to some f. to c., sub-rounded to rounded gravel, occasional desiccation cracks, slight ol. br. mottling, occasional thin silt and sand lenses, occasional fractured shale fragments. (ML-CL) Intervals of compact to loose, dk. br. to gray-br., SANDY SILT to SILTY SAND, from 7.2' to 8.0', 14.7' to 15.6', 21.8' to 22.0', 24.0' to 26.0' and 31.2' to 32.0' (SM). Zone of loose, wet, coarse SAND @ 22.0' to 23.0' (SP)
10.0	
20.0	
30.0	
	SAND & GRAVEL UNIT 38.5-54.1' Compact to loose, very moist to wet, fine to coarse GRAVEL, SAND and SILTY SAND, some silt, occasional fractured shale fragments. (SM-GM) Interval of loose, brown, wet, GRAVELLY-SILT/SAND/CLAY @ 42.0' to 45.6' (SM). Occasional pocket of stiff, olive brown, very moist CLAYEY SILT (ML).
40.0	
50.0	
	EOB @ 56.0'
60.0	

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 54.1 FT. BELOW GROUND SURFACE (BGS). SAMPLED 0 TO 56.0 FT BGS. SAND POURED THROUGH AUGERS 54.1'-53.0' FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 15 FT. OF WELL SCREEN, END CAP, 40.62 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 55.62 FT. WELL MATERIALS PLACED TO 53.0 FT. BGS WITH 2.62 FT. STICKUP. SAND POURED THROUGH AUGERS 53.0 - 35.0 FT. BGS WHILE REMOVING AUGERS AT 0.5 - 1.0 FT. INCREMENTS. CHOKER SAND PLACED 35.0 - 34.5 FT BGS. BENTONITE CHIP SEAL PLACED 34.5 - 29.5 FT. BGS. CHOKER SAND PLACED 29.5 - 29.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 29.0 - 4.0 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC ON-SITE DURING INSTALLATION AND CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 7/12 TO 7/25/05

DEVELOPMENT METHOD: STAINLESS STEEL BAILER

VOLUME PURGED: 108 GALS. FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT FIELD RECORD.

Soil Borrow Area

FIELD BORING LOG

DEPTH HOLE 30' JOB NO. 093-89169 PROJECT WMNY/West Borrow Area Wells / NY BORING NO. MW-BA-1
DEPTH SOIL DRILL 30' GA INSP. AJN DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 1 of 2
DEPTH ROCK CORE N/A WEATHER CLEAR DRILLING CO. NOTHNAGLE DRILLING SURFACE EL. 1464.18
NO. DIST. 15 US. N/A TEMP. 40° F DRILL RIG CME-850 DRILLER T. MANGEFRIDA DATUM SITE
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0945/11-2-09
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1130/11-3-09

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	CLAY TILL UNIT 0–18.7'	10	1	DO	2–3–7–11	16"/24"		SA–1 0.0-1.25 ft. Firm, dark brown SILTY CLAY topsoil, some organic matter, trace fine sand, very moist. 1.25-2.0 ft. Compact, olive brown SILT, little to trace plant matter, little fine sand, trace fine gravel, moist. (CL-ML)
2		28	2	DO	7–14–14–17	20"/24"		SA–2 2.0-4.0 ft. Compact, olive brown SILT, some clay, little plant matter, trace coarse gravel, moist. (ML)
4		10	3	DO	5–5–5–5	14"/24"		SA–3 4.0-6.0 ft. Compact, brown to mottled gray-brown CLAYEY SILT, trace fine sand, trace gravel, moist. (ML)
6		23	4	DO	6–9–14–15	22"/24"		SA–4 6.0-8.0 ft. Compact, brown CLAYEY SILT, little fine sand, trace coarse gravel, moist. (ML)
8		15	5	DO	4–7–8–10	14"/24"		SA–5 8.0-10.0 ft. Compact, brown CLAYEY SILT to SILTY CLAY, trace coarse gravel, trace fine sand, moist. (ML-CL)
10		16	6	DO	3–6–10–11	18"/24"		SA–6 10.0-12.0 ft. Stiff, brown CLAYEY SILT to SILTY CLAY, trace to little coarse gravel, trace fine sand, moist. (ML-CL)
12		43	7	DO	11–15–28–33	24"/24"		SA–7 12.0-14.0 ft. Dense, gray-brown to mottled orange, CLAYEY SILT, trace to little fine to coarse gravel, trace fine sand, moist. (ML)
14		15	8	DO	3–6–9–10	22"/24"		SA–8 14.0-16.0 ft. Compact, gray to bray-brown CLAYEY SILT, trace to little fine to coarse gravel, trace fine sand, moist. (ML)
16		40	9	DO	10–12–28–31	24"/24"		SA–9 16.0-18.0 ft. Dense, gray, CLAYEY SILT, trace fine to coarse gravel, trace fine sand, moist. Thin layer of gray fine sand at bottom of interval. (ML)
18	SAND & GRAVEL UNIT 18.7–28.0'	4	10	DO	3–2–2–1	18"/24"		SA–10 18.0-18.7 ft. Very loose, orange-brown SILT, some fine sand, moist; then 0.3 ft compact, gray-brown m-c SAND, very moist. 19.0-20.0 ft. Very loose, brown fine to medium sand, trace clay, saturated. (ML-SM)
20		1	11	DO	WH–WH–1–1	16"/24"		SA–11 20.0-21.1 ft. Very loose, brown fine to medium SAND, trace clay, saturated. 21.1-22.0 ft. Very loose, brown, medium to coarse SAND, trace clay, wet. (SM)
22		14	12	DO	3–7–7–4	16"/24"		SA–12 22.0-22.8 ft. Loose, brown coarse SAND and fine GRAVEL, wet. 22.8-24.0 ft. Compact, brown medium to coarse SAND and fine to coarse GRAVEL, little to some clay, wet to saturated. (GW)
24								

Continued on next page.

FIELD BORING LOG

DEPTH HOLE 30' JOB NO. 093-89169 PROJECT WMNY/West Borrow Area Wells / NY BORING NO. MW-BA-1
DEPTH SOIL DRILL 30' GA INSP. AJN DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 2 of 2
DEPTH ROCK CORE N/A WEATHER CLEAR DRILLING CO. NOTHNAGLE DRILLING SURFACE EL. 1464.18
NO. DIST. 15 US. N/A TEMP. 40° F DRILL RIG CME-850 DRILLER T. MANGEFRIDA DATUM SITE
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0945/11-2-09
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1130/11-3-09

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE		
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED		
C	COARSE	MOT	MOTTLED	SD	SAND		
CA	CASING	NP	NON-PLASTIC	SI	SILT		
CL	CLAY	OG	ORANGE	SLY	SILTY		
CLY	CLAYEY	ORG	ORGANIC	SOM	SOME		
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE		
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL		
GR	GRAVEL	R	RED	WH	WEIGHT OF HAMMER		
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS		
LI	LITTLE	RX	ROCK	Y	YELLOW		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0-5%
"LITTLE" - 5-12%
"SOME" - 12-30%
"AND" - 30-50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	SAMPLES TYPE	SAMPLES HAMM. BLOWS PER 6 IN. (FORCE)	SAMPLES REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
24		9	13	DO	4-4-5-4	18"/24"		SA-13 24.0-24.9 ft. Loose, brown fine GRAVEL,some silt, wet; 24.9-25.2 ft. compact, brown SILTY fine SAND, trace coarse sand, wet. 25.2-26.0 ft. Loose, brown medium SAND, little coarse sand, trace silt, very moist to wet. (GM-SM)
26		19	14	DO	7-8-11-13	14"/24"		SA-14 26.0-28.0 ft. Compact, brown, medium SAND, some coarse sand, trace silt, very moist. (SP)
28	CLAY TILL UNIT	38	15	DO	3-18-20-16	10"/24"		SA-15 28.0-29.2 ft. Compact, gray, CLAYEY SILT, trace fine to medium sand, moist. 29.2-30.0 ft. Compact, brown, SILTY GRAVEL, trace clay, very moist. (ML-GW)
30	30.0 FT. END OF BOREHOLE							(Composite Geotechnical Laboratory Sample Collected between 18.7 and 28.0 ft. bgs.)

MONITORING WELL INSTALLATION LOG

JOB NO. 093-89169 PROJECT WMNY/WEST BORROW AREA WELLS/NY WELL NO. MW-BA-1 SHEET 1 of 1

GA INSP. AJN DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1456.40 WATER DEPTH N/A

WEATHER CLEAR DRILLING COMPANY NOTHNAGLE DRILLING RISER ELEV. 1457.65 DATE/TIME N/A

TEMP. 46° F DRILL RIG CME-850 DRILLER T. MANGEFRIDA STARTED 1200 / 11-3-09 (TIME / DATE) COMPLETED 1100 / 11-4-09 (TIME / DATE)

LOCATION / COORDINATES N938980.00, E1171539.30

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 20.85 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL 3/8" BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

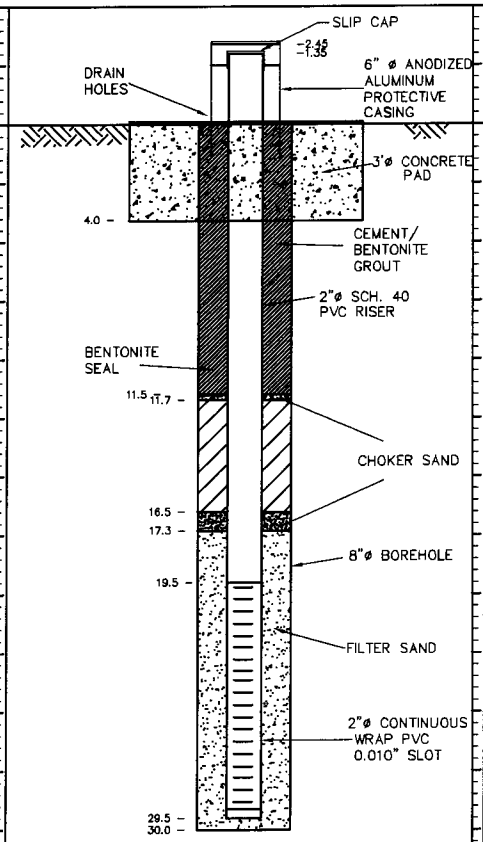
JOINT TYPE FLUSH THREADED SLOT SIZE 0.010" FILTER PACK QTY. 2.5 BAGS

GROUT QUANTITY — CENTRALIZERS NOT USED FILTER PACK TYPE #00N QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD TREMIE

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1456.40	GROUND SURFACE
0.0	
5.0	CLAY TILL UNIT 0–18.7'
10.0	
15.0	
20.0	SAND & GRAVEL UNIT 18.7–28.0'
25.0	
30.0	CLAY TILL UNIT
	END OF BORING 30' BGS

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 30.0 FT. BELOW GROUND SURFACE (BGS). SAMPLED 0.0–30.0 FT BGS. SAND POURED THROUGH AUGERS 30.0–29.5 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 20.85 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 30.85 FT. WELL MATERIALS PLACED TO 29.5 FT. BGS WITH 1.35 FT. STICKUP. SAND POURED THROUGH AUGERS 29.5 – 17.3 FT. BGS WHILE REMOVING AUGERS AT 0.5–1.0 FT. INCREMENTS. CHOKER SAND PLACED 17.3–16.5 FT BGS. BENTONITE CHIP SEAL PLACED 16.5–11.7 FT. BGS. CHOKER SAND PLACED 11.7–11.5 FT. BGS. CEMENT/BENTONITE GROUT ADDED 11.5–0.0 FT. BGS. REMAINING AUGERS REMOVED. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 11/9–11/2009

DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: 78 GALS.

FIELD BORING LOG

DEPTH HOLE 30'	JOB NO. 093-89169	PROJECT WMNY/West Borrow Area Wells / NY		BORING NO. MW-BA-2	
DEPTH SOIL DRILL 30'	GA INSP. AJN	DRILLING METHOD 4-1/4" ID Hollow Stem Augers		SHEET 1 of 2	
DEPTH ROCK CORE N/A	WEATHER CLOUDY	DRILLING CO. NOTHNAGLE DRILLING		SURFACE EL.	
NO. DIST. 15 US. N/A	TEMP. 42° F	DRILL RIG CME-850	DRILLER T. MANGEFRIDA	DATUM SITE	
DEPTH WL. N/A	HRS. PROD. N/A	WT. SAMPLER HAMMER 140 lb.	DROP 30"	STARTED 0930/11-4-09	
TIME WL. N/A	HRS. DELAYED N/A	WT. CASING HAMMER N/A	DROP N/A	COMPLETED 1030/11-5-09	

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE, OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SLY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" = 0–5%
"LITTLE" = 5–12%
"SOME" = 12–30%
"AND" = 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
C	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
0	CLAY TILL UNIT 0–16.9	12	1	DO	3–6–6–8	24"/24"		SA–1 0.0-0.5 ft. Compact, dark brown CLAYEY SILT topsoil, some plant matter, trace fine sand, trace fine gravel, moist. 0.5-2.0 ft. Compact, lt brown, mottled gray CLAYEY SILT, trace to little f. gravel, trace f. sand, moist. (ML)
2		15	2	DO	8–7–8–7	8"/24"		SA–2 2.0-4.0 ft. Stiff, light brown, mottled gray, CLAYEY SILT to SILTY CLAY, trace to little fine to coarse gravel, trace fine sand, moist. (ML-CL)
4		18	3	DO	6–8–10–14	22"/24"		SA–3 4.0-6.0 ft. Compact, light brown-gray CLAYEY SILT, little fine to coarse gravel, trace fine sand, moist. (ML)
6		40	4	DO	14–18–22–28	20"/24"		SA–4 6.0-8.0 ft. Dense, light brown-gray CLAYEY SILT, little fine to coarse gravel, trace fine sand, moist. (ML)
8		15	5	DO	3–6–9–14	22"/24"		SA–5 8.0-10.0 ft. Compact, light brown-gray CLAYEY SILT, little fine to coarse gravel, trace fine sand, moist. (ML)
10		22	6	DO	4–11–11–13	23"/24"		SA–6 10.0-10.9 ft. Compact, light brown-gray CLAYEY SILT, little fine to coarse gravel, trace fine sand, moist. 10.9-12.0 ft. Firm, gray CLAYEY SILT to SILTY CLAY, slightly plastic, little fine to coarse gravel, moist. (ML-CL)
12		36	7	DO	12–17–19–28	24"/24"		SA–7 12.0-14.0 ft. Stiff, gray SILTY CLAY, moderately plastic, trace fine gravel, moist. (CL)
14		21	8	DO	4–7–14–19	24"/24"		SA–8 14.0-15.5 ft. Stiff, gray SILTY CLAY, moderately plastic, trace fine gravel, moist. 15.5-16.0 ft. Dense, brown, CLAYEY SILT, little fine to coarse gravel, slightly moist. (ML-CL)
16								SA–9 16.0-16.9 ft. Dense, brown SILT and very fine SAND, little clay, moist.
18	SAND & GRAVEL UNIT 16.9–30.0'	46	9	DO	15–21–25–30	18"/24"		16.9-18.0 ft. Dense, gray-brown coarse GRAVEL and coarse SAND, trace to little clay, very moist. (SM-GW)
		30	10	DO	16–15–15–15	12"/24"		SA–10 18.0-20.0 ft. Loose to compact, brown to gray fine to coarse GRAVEL, little to some fine sand, trace to little clay, saturated. (GW)
20		42	11	DO	25–22–20–14	12"/24"		SA–11 20.0-22.0 ft. Loose to compact, brown to gray fine to coarse GRAVEL, little to some fine sand, trace to little clay, saturated. (GW)
22		26	12	DO	12–14–12–15	18"/24"		SA–12 22.0-22.8 ft. As above. 22.8-24.0 ft. Compact, gray CLAYEY SILT, trace to little fine sand, trace fine gravel, moist. (GW-ML)
24								

Continued on next page.

FIELD BORING LOG

DEPTH HOLE 30' JOB NO. 093-89169 PROJECT WMNY/West Borrow Area Wells / NY BORING NO. MW-BA-2
DEPTH SOIL DRILL 30' GA INSP. AJN DRILLING METHOD 4-1/4" ID Hollow Stem Augers SHEET 2 of 2
DEPTH ROCK CORE N/A WEATHER CLOUDY DRILLING CO. NOTHNAGLE DRILLING SURFACE EL.
NO. DIST. 15 US. N/A TEMP. 42° F DRILL RIG CME-850 DRILLER T. MANGEFRIDA DATUM SITE
DEPTH WL. N/A HRS. PROD. N/A WT. SAMPLER HAMMER 140 lb. DROP 30" STARTED 0930/11-4-09
TIME WL. N/A HRS. DELAYED N/A WT. CASING HAMMER N/A DROP N/A COMPLETED 1030/11-5-09

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OR	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SOM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	WR	WEIGHT OF RODS
LI	LITTLE	RX	ROCK	Y	YELLOW

SOIL DESCRIPTION – RANGE OF PROPORTION

"TRACE" – 0–5%
"LITTLE" – 5–12%
"SOME" – 12–30%
"AND" – 30–50%

CONSISTENCY

LS	LOOSE	S	SOFT
CP	COMPACT	FM	FIRM
DN	DENSE	ST	STIFF
V	VERY	H	HARD

ELEV. DEPTH	DESCRIPTION	BLOWS/FT.		SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN. (FORCE)	REC/ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
24	SAND & GRAVEL UNIT 16.9–30.0'	26		13	DO	12–13–13–18	14"/24"		SA–13 24.0-24.8 ft. Very stiff, gray SILTY CLAY, some fine sand, very moist. 24.8-26.0 ft. Loose, brown-gray coarse GRAVEL, some fine gravel, some coarse sand, trace to little silt, saturated. (CL-GW)
26		38		14	DO	21–22–16–18	16"/24"		SA–14 26.0-28.0 ft. Dense, dark gray to black, medium to coarse SAND, little silty clay, moist, grading to fine to coarse GRAVEL, well sorted, broken angular rock fragments, very moist. (SM-GW)
28		39		15	DO	12–15–24–30	18"/24"		SA–15 28.0-30.0 ft. Loose, dark gray to black, fine to coarse GRAVEL, well sorted, broken angular rock fragments, very moist. (SM-GW)
30	30.0 FT. END OF BOREHOLE								(Composite Geotechnical Laboratory Sample Collected between 18.0 and 30.0 ft. bgs.)

MONITORING WELL INSTALLATION LOG

JOB NO. 093-89169 PROJECT WMNY/WEST BORROW AREA WELLS/NY WELL NO. MW-BA-2 SHEET 1 of 1

GA INSP. AJN DRILLING METHOD 4 1/4" I.D. HOLLOW STEM AUGERS GROUND ELEV. 1454.84 WATER DEPTH N/A

WEATHER RAIN DRILLING COMPANY NOTHNAGLE DRILLING RISER ELEV. 1457.04 DATE/TIME N/A

TEMP. 40° F DRILL RIG CME-850 DRILLER T. MANGEFRIDA STARTED 1100 / 11-5-09 (TIME / DATE) COMPLETED 1430 / 11-5-09 (TIME / DATE)

LOCATION / COORDINATES N938960.83, E1171294.50

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 20.7 l.f. WELL SCREEN 2.0 in. dia. 10 l.f. BENTONITE SEAL 3/8" BENTONITE CHIPS

CASING TYPE SCH. 40 PVC SCREEN TYPE CONTINUOUS WRAP PVC INSTALLATION METHOD POUR THROUGH AUGERS

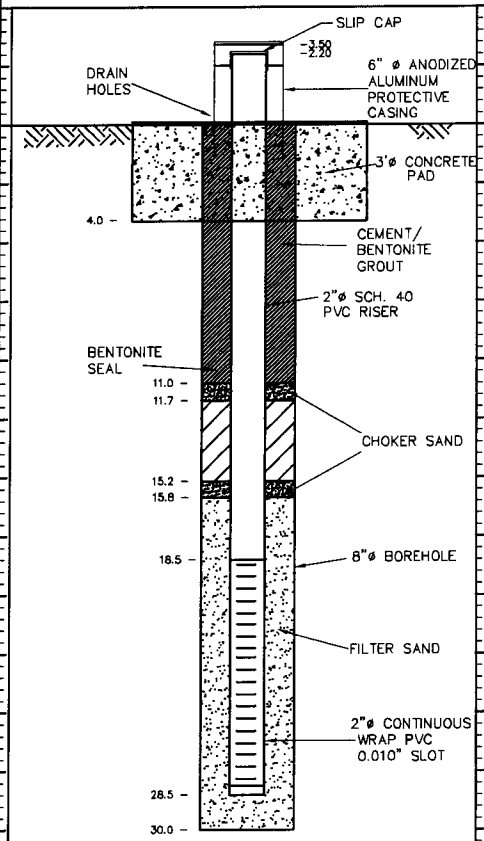
JOINT TYPE FLUSH THREADED SLOT SIZE 0.010" FILTER PACK QTY. 2.5 BAGS

GROUT QUANTITY ——— CENTRALIZERS NOT USED FILTER PACK TYPE #00N QUARTZ SAND

GROUT TYPE CEMENT/BENTONITE DRILLING MUD TYPE NOT USED INSTALLATION METHOD TREMIE

ELEV./DEPTH	SOIL/ROCK DESCRIPTION
1454.84	GROUND SURFACE
0.0	
5.0	CLAY TILL UNIT 0–16.9'
10.0	
15.0	
20.0	SAND & GRAVEL UNIT 16.9–30.0'
25.0	
30.0	END OF BORING 30' BGS

WELL SKETCH



INSTALLATION NOTES

AUGERED WITH 4 1/4 I.D. HOLLOW STEM AUGER TO 30.0 FT. BELOW GROUND SURFACE (BGS). SAMPLED 0.0–30.0 FT BGS. SAND POURED THROUGH AUGERS 30.0–28.5 FT BGS. WELL MATERIALS PLACED IN BOREHOLE USING 10 FT. OF WELL SCREEN, END CAP, 20.7 FT. OF WELL RISER AND SLIP TOP CAP FOR OVERALL LENGTH OF 30.7 FT. WELL MATERIALS PLACED TO 28.5 FT. BGS WITH 1.35 FT. STICKUP. SAND POURED THROUGH AUGERS 28.5 – 15.8 FT. BGS WHILE REMOVING AUGERS AT 0.5–1.0 FT. INCREMENTS. CHOKER SAND PLACED 15.8–15.2 FT BGS. BENTONITE CHIP SEAL PLACED 15.2–11.7 FT. BGS. CHOKER SAND PLACED 11.7–11.0 FT. BGS. CEMENT/BENTONITE GROUT ADDED 11.0–0.0 FT. BGS. 6-INCH DIAMETER ANODIZED ALUMINUM CASING PLACED IN 3-FT. DIAMETER BY 4 FT. DEEP CONCRETE PAD. DRAINHOLES DRILLED INTO PROTECTIVE CASING. NYSDEC CONCURRED WITH THE LOCATION OF THE SCREENED INTERVAL.

WELL DEVELOPMENT NOTES

DATE DEVELOPED: 11/10–11/2009

DEVELOPMENT METHOD:
STAINLESS STEEL BAILER

VOLUME PURGED: 59.7 GALS.

Area 7/8 Development Logs

EARTH DIMENSIONS, INC.

Soil and Hydrogeologic Investigations • Wetland Delineations

1091 Jamison Road • Elma, NY 14059

(716) 655-1717 • FAX (716) 655-2915

2A79ch HOLE NO. MWSE1-19 SURF. ELEVATION 1449.7

PROJECT WMNY Chaffee Landfill - Southern Expansion LOCATION Northing: 939377.7 PVC Riser: 1451.92

Town of Sardinia, Erie County, NY Easting: 1171481.0

CLIENT GEI Consultants Inc. P.C. DATE STARTED 04/16/19 COMPLETED 04/17/19

DEPTH IN FT	SN REC	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
	1	1						Extremely moist brown (CLAYEY-SILT) topsoil with little organic matter and clay, trace sand, very soft, granular soil structure, (ML-CL).	(1)	(1) 4-inch locking steel protective casing 2.4 feet above ground surface, PVC stickup 2.2 feet above ground surface
	16		3			8				
				5						
					5					
	2	3						clear transition to 0.3		
	22		3			9		Moist to extremely moist gray (SILTY-CLAY) with 3 to 7% gravel, trace sand, firm to stiff, weakly thinly laminated with very thin coarse silt lenses, (CL).		
				6						
					7					
	3	2								
5	24		4			10				
				6						
					8					
	4	3								
	24		5			22		clear transition to 7.3		
				17				Moist faintly mottled to distinctly mottled, light brown to orangish brown, (SANDY-SILT) with some mostly very fine size sand with an occasional (SILTY-CLAY) lense, compact, thinly bedded, (ML) with an occasional thin (CL) interbed.		
					19					
	5	3								
	23		7			19				
				12						
10					17					
	6	8								
	19		19			41		grades downward to 9.4		
				22				Extremely moist brown (SILTY-SAND) with 3 to 7% gravel, little silt, compact, thinly bedded, (SM).		
					14					
	7	10								
	20		22			47		grades downward to 10.0		
				25				Moist brown (SILTY-SAND) with 20 to 30% gravel, trace to little silt, dense, stratified, (SM).		
					16					
	8	10								
15	17		10			23		grades downward to 14.0		
				13				Extremely moist brown gravelly (SILTY-SAND) with 30 to 50% gravel, trace to little silt, dense, stratified, (SM), (GM).		
					12					
	9	11								
	11		12			26		grades downward to 16.0		
				14				Wet brown gravelly (SILTY-SAND) with 20 to 40% gravel, trace to little silt, compact, stratified, (SM).		
					16					
	10	9								
	9		11			24				
				13						
20					13			grades downward to 20.0		

(2) 2-inch Schedule 40 FJT PVC Riser

(3) CEMENT BENTONITE GROUT

(4) #00N size morie sand pack

← 9.0'

← 9.5'

(2) #00 size choke sand

(3) Bentonite Seal (chips)

← 12.5'

← 13.0'

← 15.0'

(4) 2" schedule 40 PVC 0.010 slot continuous wrap screen

Water at approximately 15.5 feet below ground surface upon completion.

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists, (cns)

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2A79ch HOLE NO. MWSE1-19 SURF. ELEVATION 1449.7

PROJECT WMNY Chaffee Landfill - Southern Expansion LOCATION Northing: 939377.7 PVC Riser: 1451.92

Town of Sardinia, Erie County, NY Easting: 1171481.0

CLIENT GEI Consultants Inc. P.C. DATE STARTED 04/16/19 COMPLETED 04/17/19

DEPTH IN FT	SN REC	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
	11	14						Wet brownish gray gravelly (SILTY-SAND) with 30 to 50% gravel, trace to little silt, dense, stratified, (SM), (GM).		(5) 2" schedule 40 PVC 0.010 slot continuous wrap screen
	9		14			36				
				22						
					26					
	12	8								
	20		12			28				
				16						
					22					
	13	12								
25	20		14			30				← 25.0'
				16						
					20					← 26.0'
								Moist to extremely moist gray (SANDY-SILT) with 3 to 7% gravel, trace to little sand, compact, weakly thinly bedded, (ML).		
								grades downward to 25.0		
								Wet gray (SAND) mostly very fine to fine size, trace silt, dense, thinly bedded, (SP).		
								26.0		
								Boring completed at 26.0 feet.		
30										
35										
40										

(5) #60N size morie sand pack

Note: Advanced bore hole with 6 5/8" ID x 10" OD hollow stem auger casing with continuous split spoon sampling to 26.0 feet. Installed 2-inch PVC monitoring well according to NYS DEC regulations.

Cement Bentonite Grout

7.8 gallons water
94 lb portland cement
4 lb Bentonite

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists, (cns)

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2A79ch HOLE NO. MWSE2-19 SURF. ELEVATION 1449.9

PROJECT WMNY Chaffee Landfill – Southern Expansion LOCATION Northing: 939038.2 PVC Riser: 1452.25

Town of Sardinia, Erie County, NY Easting: 1171136.7

CLIENT GEI Consultants Inc. P.C. DATE STARTED 04/17/19 COMPLETED 04/18/19

DEPTH IN FT | BLOWS ON SAMPLER

SN REC	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
1	2						Extremely moist brown (SANDY-SILT) topsoil with little sand and organic matter, very loose, granular soil structure, (ML).	(1)	(1) 4-inch locking steel protective casing 2.6 feet above ground surface, PVC sitckup 2.3 feet above ground surface
23		4			10		clear transition to 0.2		
			6				Moist gray (SILTY-CLAY) with 3 to 7% gravel, trace sand, stiff, weakly thinly laminated with very thin coarse silt lenses, (CL).		Note: Advanced bore hole with 6 5/8" ID x 10" OD hollow stem auger casing with continuous split spoon sampling to 26.0 feet. Installed a 2-inch monitoring well in completed bore hole according to NYS DEC regulations.
				7			clear transition to 3.4		
2	9						Moist brown (CLAYEY-SILT) with 3 to 7% gravel, little to some clay, trace sand, very stiff, weakly thinly laminated with very thin coarse silt lenses, (ML-CL).		
20		6			17		grades downward to 4.0		
			11				Moist grayish brown (SAND) with 3 to 7% gravel, mostly fine to medium size sand, compact, thinly bedded, (SP).		← 9.0'
				17			grades downward to 6.0		← 9.5'
3	11						Moist brown very gravelly (SILTY-SAND) with 30 to 50% gravel, occasional cobble, trace to little silt, compact to dense, stratified, (SM).		(2) #00 size choke sand
14		5					grades downward to 10.0		(3) Bentonite seal (chips)
			7		12		Moist brown very gravelly (SAND) with 40 to 60% gravel, occasional cobble, trace silt, compact, stratified, (SW).		← 12.5'
				17			grades downward to 11.7		← 13.0'
4	15						Extremely moist to wet brown gravelly (SAND) with 30 to 50% gravel, trace silt, compact to dense, stratified, (SW).		
11		13			25		grades downward to 14.0		← 15.0'
			12				Wet brown very gravelly (SAND) with 40 to 60% gravel, trace silt, compact to dense, stratified, (SW).		Sample 11 taken with 3-inch spoon due to low recovery.
				12			grades downward to 19.0		(4) 2-inch 0.010 slot continuous wrap screen
5	13						See next sheet		Water at approximately 15.0 feet below ground surface upon completion.
17		14			31				
			17						
				11					
6	19								
15		11			20				
			9						
				8					
7	10								
4		14			31				
			17						
				17					
8	5								
6		6			13				
			7						
				8					
9	10								
12		17			31				
			14						
				12					
10	5								
13		12			29				
			17						
				15					

WELL: (1) 4-inch Schedule 40 FJT PVC Riser; CEMENT BENTONITE GROUT; (2); (3); (4) #00N size morie sand pack

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists, (cns)

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2A79ch HOLE NO. MWSE2-19 SURF. ELEVATION 1449.9

PROJECT WMNY Chaffee Landfill – Southern Expansion LOCATION Northing: 939038.2 PVC Riser: 1452.25
Town of Sardinia, Erie County, NY Easting: 1171136.7

CLIENT GEI Consultants Inc. P.C. DATE STARTED 04/17/19 COMPLETED 04/18/19

DEPTH IN FT	SN REC	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
	11	24						Wet brown very gravelly (SILTY-SAND) with 40 to 60% gravel, trace to little silt, compact, stratified, (SM).		(5) 2-inch 0.010 slot continuous wrap screen
	16		13			24				
				11						
					13					
	12	10						grades downward to 21.0		
	9		8					Moist to extremely moist gray (SILTY-CLAY) with 3 to 7% gravel, trace sand, very stiff, thinly laminated with very thin coarse silt lenses, (CL).		
				12		20				
					12					
	13	12								
25	2		17			30				← 25.0'
				13						
					15			26.0		← 26.0'
								Boring completed at 26.0 feet.		
30										
35										
40										

(5) #00N size morie sand pack

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists, (cns)

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2A79ch HOLE NO. MWSE3-19 SURF. ELEVATION 1457.2

PROJECT WMNY Chaffee Landfill - Southern Expansion LOCATION Northing: 938987.3 PVC Riser: 1459.29

Town of Sardinia, Erie County, NY Easting: 1170663.1

CLIENT GEI Consultants Inc. P.C. DATE STARTED 04/18/19 COMPLETED 04/22/19

DEPTH IN FT	SN REC	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
	1	1							(1)	(1) 4-inch locking steel protective casing 2.25 feet above ground surface, PVC stickup 2.1 feet above ground surface
	21		5			11		Moist to extremely moist gray (SILTY-SAND) fill with little silt, trace organic matter, very loose, massive soil structure, (SM).		
				6				0.2		
					10					
	2	5								Note: Advanced bore hole with 6 5/8" ID x 10" OD hollow stem auger casing with continuous split spoon sampling to 30.0 feet. Installed a 2-inch monitoring well in completed bore hole according to NYS DEC regulations.
	22		6			14		Moist to extremely moist brown (SILTY-SAND) with 3 to 7% gravel, little to some silt, trace organic matter, compact, weakly blocky soil structure, (SM).		
				8						
					10					
	3	8								
5	23		6			11		grades downward to 2.0		
				5						
					6					
	4	5								
	18		5			11		Moist brown (SILTY-SAND) with 5 to 15% gravel, little silt, compact, stratified, (SM).		
				6				grades downward to 4.0		
					8					
	5	2								
	17		3			6		Moist to extremely moist brown (SILTY-SAND) with 10 to 20% gravel, little to some silt, compact, stratified, (SM).		
				3						
					2					
10	6	3						grades downward to 8.0		
	10		6			13		Extremely moist brown gravelly (SILTY-SAND) with 20 to 40% gravel, little silt, loose to compact, stratified, (SM).		
				7						
					5					
	7	4								
	11		5			11				
				6						
					7					
	8	8								
15	4		9			20				
				11				grades downward to 16.0		
					9					
	9	4						Wet light brown gravelly (SILTY-SAND) with 20 to 40% gravel, little silt, loose to compact, stratified, (SM).		
	12		3			15				
				12						
					14					
	10	4								
	16		4			7				
				3						
20					2					

← 12.0'
← 12.5'
(2) #00 size choke sand
(3) Bentonite seal (chips)
← 15.5'
← 16.0'
(4) #00N size morie sand pack
← 18.0'
(5) 2-inch 0.010 slot continuous wrap screen

4-inch Schedule 40 FJT PVC Riser

CEMENT BENTONITE GROUT

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists. (cns)

EARTH DIMENSIONS, INC.

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(716) 655-1717 • FAX (716) 655-2915

2A79ch HOLE NO. MWSE3-19 SURF. ELEVATION 1457.2

PROJECT WMNY Chaffee Landfill - Southern Expansion LOCATION Northing: 938987.3 PVC Riser: 1459.29

Town of Sardinia, Erie County, NY Easting: 1170663.1

CLIENT GEI Consultants Inc, P.C. DATE STARTED 04/18/19 COMPLETED 04/22/19

DEPTH IN FT	SN REC	0/6 BLOWS ON SAMPLER	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
	11	6								
	11		4			7		Wet light brown gravelly (SILTY-SAND) with 20 to 40% gravel, little silt, loose to compact, stratified, (SM).		
				3						
					2					
	12	2								
	16		4			7				
				3						
					2					
	13	6								
25	8		8			14				
				6				grades downward to 26.0		
					7			Wet gray (SAND) with 3 to 7% gravel, mostly fine to coarse size sand, trace silt, compact, stratified, (SW).		
	14	12								
	12		9			18				
				9				grades downward to 28.0		← 28.0'
					11			Wet brown (SILTY-SAND) with 5 to 15% gravel, little silt, loose, stratified, (SM).		
	15	2								
	7		3			8				
				5						
30					6			30.0		← 30.0'
								Boring completed at 30.0 feet.		
35										
40										

WELL: 2-inch 0.010 slot continuous wrap screen; #00N size morie sand pack.

WATER TABLE AND REMARKS: Water at approximately 16.0 feet below ground surface upon completion.

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists, (cns)

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(716) 655-1717 • FAX (716) 655-2915

2A79ch HOLE NO. MWSE4-19 SURF. ELEVATION 1448.6

PROJECT WMNY Chaffee Landfill - Southern Expansion LOCATION Northing: 939171.9 PVC Riser: 1450.59

Town of Sardinia, Erie County, NY Easting: 1170296.2

CLIENT GEI Consultants Inc. P.C. DATE STARTED 04/22/19 COMPLETED 04/22/19

DEPTH IN FT	SN REC	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N
	1	4				
	15		5			12
				7		
					8	
	2	5				
	13		5			11
				6		
					6	
	3	8				
5	10		4			8
				4		
					6	
	4	5				
	9		5			11
				6		
					6	
	5	2				
	6		2			5
				3		
10					4	
	6	6				
	8		7			12
				5		
					3	
	7	7				
	9		2			5
				3		
					3	
	8	6				
15	13		5			10
				5		
					5	
	9	10				
	10		12			29
				17		
					9	
	10	11				
	15		12			30
				18		
20					21	

LITH

DESCRIPTION AND CLASSIFICATION

Moist to extremely moist brown (SILTY-SAND) fill with 5 to 15% gravel, little sand, trace organic matter, loose, massive soil structure, (ML). 0.3

Extremely moist brown gravelly (SILTY-SAND) with 20 to 40% gravel, little silt, loose to compact, stratified, (SM).

grades downward to 6.0

Wet brown gravelly (SILTY-SAND) with 20 to 40% gravel, little silt, loose to compact, stratified, (SM).

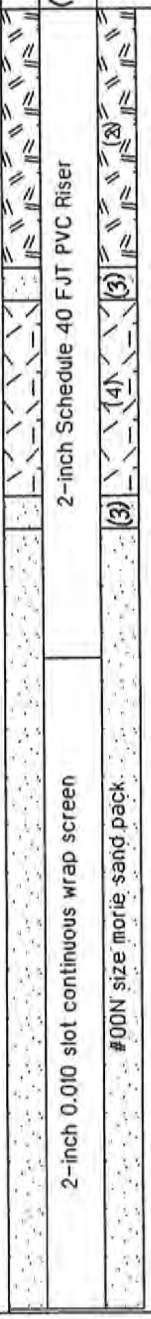
grades downward to 13.0

Wet gray (SAND) with mostly fine to medium size sand, trace silt, loose, weakly stratified, (SW).

grades downward to 14.0

Wet gray very gravelly (SAND) with 40 to 60% gravel, occasional cobble, trace silt, loose to compact, stratified, (SW), (GW).

WELL



WATER TABLE AND REMARKS

(1) 4-inch locking steel protective casing 2.2 feet above ground surface, PVC stickup 2.0 feet above ground surface

(2) Cement Bentonite Grout

← 4.0'

← 4.5'

(3) #00 size choke sand

(4) Bentonite chips (chips)

← 7.5'

← 8.0'

← 10.0'

Note: Advanced bore hole with 6 5/8" ID x 10" OD hollow stem auger casing with continuous split spoon sampling to 20.5 feet. Installed a 2-inch monitoring well in completed bore hole according to NYS DEC regulations.

Water at approximately 13.0 feet below ground surface upon completion.

← 20.0'

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists, (cns)

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2A79ch HOLE NO. MWSE4-19 SURF. ELEVATION 1448.6

PROJECT WMNY Chaffee Landfill - Southern Expansion LOCATION Northing: 939171.9 PVC Riser: 1450.59

Town of Sardinia, Erie County, NY Easting: 1170296.2

CLIENT GEI Consultants Inc, P.C. DATE STARTED 04/22/19 COMPLETED 04/22/19

DEPTH IN FT	SN REC	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	WELL	WATER TABLE AND REMARKS
								Wet gray very gravelly (SAND) with 40 to 60% gravel, occasional cobble, trace silt, loose to compact, stratified, (SW), (GW).	(5)	← 20.5'
								20.5		(5) #00N size morie sand pack
								Boring completed at 20.5 feet.		
25										
30										
35										
40										

N=NUMBER OF BLOWS TO DRIVE 2 " SPOON 12 " WITH 140 lb. WT. FALLING 30 " PER BLOW

LOGGED BY Brian Bartron & Jason Kryszak, Geologists, (cns)