CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO
NMED FACILITY PERMIT NOS. SWM-030738 AND SWM-030738 (SP)

APPLICATION FOR PERMIT MODIFICATION AND RENEWAL

VOLUME V OF VI
HYDROGEOLOGY AND GROUNDWATER

Prepared for

Camino Real Environmental Center, Inc.

September 2022

Prepared by

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WCG Project No. 0601-667-11-06

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HYDROGEOLOGY

APPLICATION FOR PERMIT
CAMINO REAL COUNTY LANDFILL

VOLUME V: HYDROGEOLOGY AND GROUNDWATER
SECTION 1: HYDROGEOLOGY

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HYDROGEOLOGY

1.0 INTRODUCTION

This hydrogeologic evaluation was prepared by Gordon Environmental/PSC Inc. (GEI-PSC) to update the database that demonstrates the suitability of the hydrogeologic setting for the existing Camino Real Landfill (CRLF). Specifically, this report provides geologic and hydrogeologic data developed in response to requirements set forth in 20.9.3.9.B.7 NMAC.

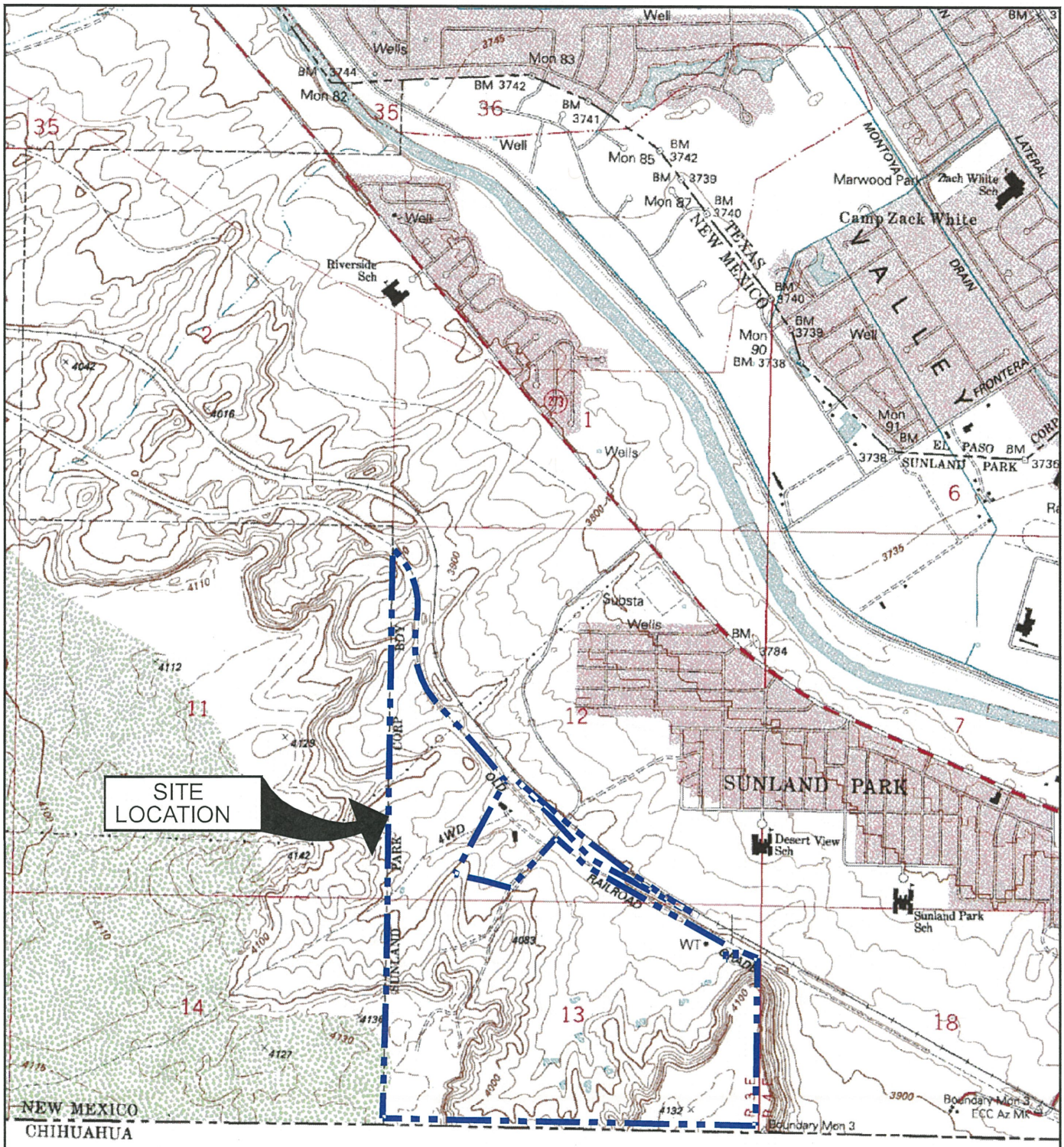
CRLF is situated in southern Doña Ana County, within the corporate city limits of Sunland Park, New Mexico (**Figure V.1.1**). It is located approximately one mile southwest of McNutt Road (NM 273) on Camino Real Boulevard. CRLF is a 480 ± acre site that includes closed disposal cells, the current landfill operations and cells planned for development (i.e., Unit 4). The existing landfill, operating in compliance with New Mexico Environment Department Solid Waste Bureau (NMED-SWB) Permit No. SWM-030738, has been in operation since 1987.

The data presented herein were compiled from published hydrogeologic literature of the south-central New Mexico area, augmented with on-site hydrogeologic investigations consisting of soil boring and testing, and groundwater monitoring well installation and testing. The site specific hydrogeologic investigation results are consistent with area hydrogeologic conditions depicted the published hydrogeologic information on the area.

In addition to summarizing historic site data, this hydrogeologic evaluation presents the results of additional boring investigation on Unit 4, planned for development following the Permit Renewal. Three geotechnical borings were advanced to depths of up to 120' in Unit 4, and soil samples were collected for laboratory analysis.

Upper Santa Fe Group sediments are exposed on the surface at the site. These consist primarily of weakly-consolidated, unsaturated, fine-grained sands and silty sands, with minor interbedded siltstones and mudstones. Groundwater has been encountered below the site at depths ranging from approximately 170 to 392 feet below ground surface (fbgs) under unconfined and semi-confined conditions in semiconsolidated sandstones and siltstones of the Middle Santa Fe Group. The minimum depth to groundwater from the floor

of existing or proposed cells is at least 150 feet (**Figure V.1.9**). Due to the depth to groundwater, low hydraulic conductance of stratigraphic units above the saturated zone, and arid climate, the site is an excellent setting for a municipal solid waste landfill.



Based on Smeltertown, TXNM, Revised 1994
Quadrangle, USGS 7.5' Series (1:24,000 Scale).

LEGEND

SOLID WASTE FACILITY BOUNDARY

NORTH

0' 1000' 2000'

SITE LOCATION MAP

CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO

GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd. NE
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DATE: 12/8/19	CAD:	PROJECT #: 010087.19
DRAWN BY: LCK	REVIEWED BY: MJC	FIGURE V.1.1
APPROVED BY: CWF	www.team-psc.com	

2.0 REGIONAL GEOLOGY AND HYDROGEOLOGY

2.1 Physiographic Setting

CRLF is located within the northern Mexican Highland Section of the Basin and Range Physiographic Province (**Figure V.1.2**) and is within the north-central Chihuahuan Desert. The facility is situated on the eastern flank of a structural basin known as the Mesilla Basin. CRLF is located within the Rio Grande watershed, approximately 125 miles east of the Continental Divide.

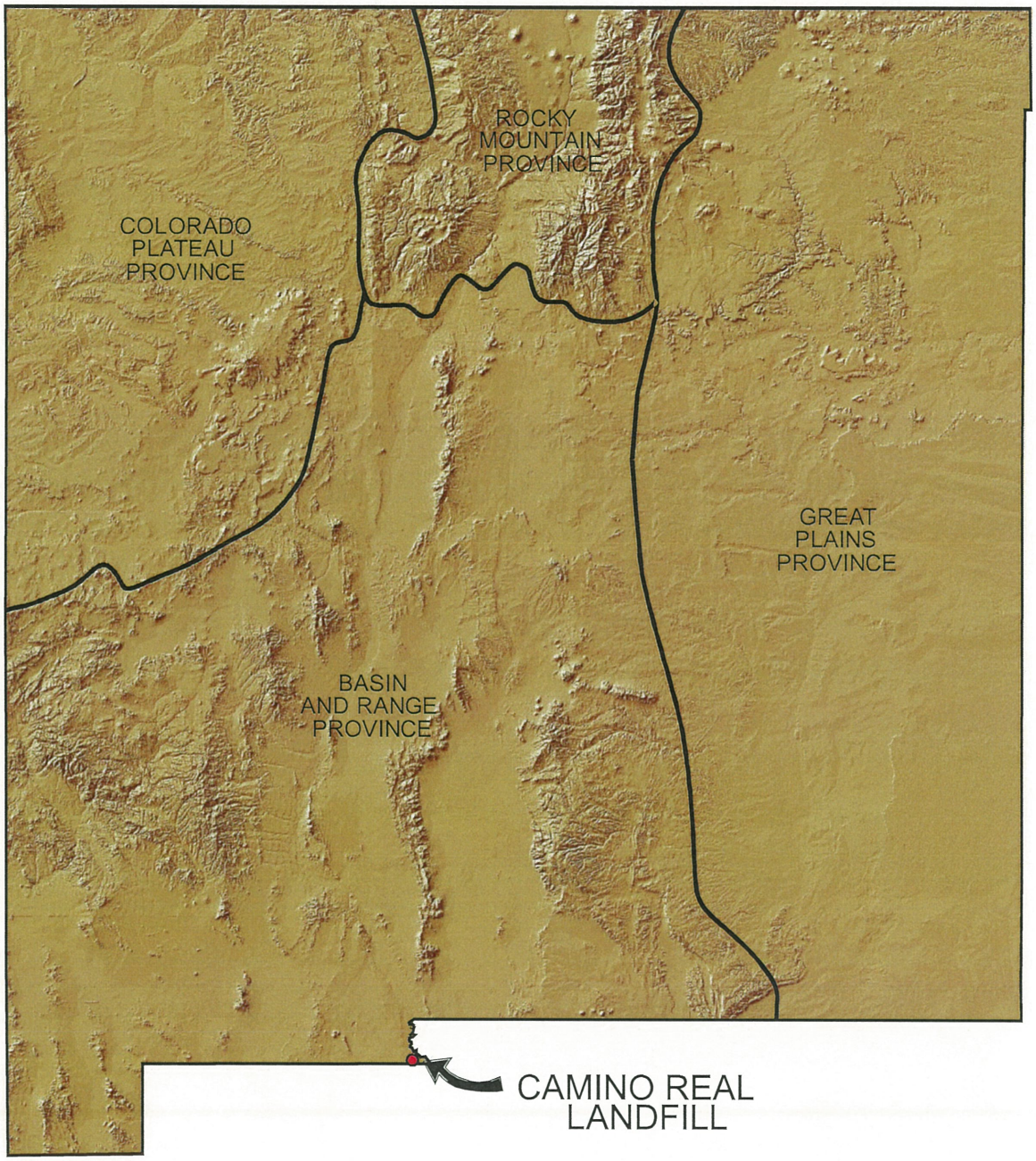
2.2 Structural Setting

The structure and stratigraphy in the region of CRLF have been described by numerous investigators, including Hawley and various Others (1968, 1971, 1975 and 2004), Ramberg and Others, (1978) and Wilson and Others, (1981). The Mesilla Basin is one of a series of basins arrayed along a regional north-south trending structural alignment known as the Rio Grande Rift, which extends from south-central Colorado through central New Mexico and terminates in northern Chihuahua, a distance of approximately 500 miles. The Rio Grande Rift is structurally complex in the area of CRLF, with numerous major regional faults associated with rifting intersecting within and around the Mesilla Basin. The structure of the Mesilla Basin is depicted in **Figure V.1.3** (Hawley and Kennedy, 2004). The Mesilla Basin is the southernmost structural basin developed along the Rio Grande Rift in New Mexico. The Mesilla Basin was formed through crustal spreading occurring within the rift zone, resulting in faulting, subsidence in the basin and uplift of adjacent areas, volcanism and accumulation of up to 3,000 feet of geologically young basin fill erosional detritus near the CRLF. The Mesilla Basin is characterized by its wide, expansive basin-floor, surrounded by small, low-lying mountain uplifts and minor piedmont regions. This basin covers an area of approximately 1,100 square miles and is approximately 65 miles long and approximately 25 miles wide at its center.

CRLF is located on the southeastern flank of the Mesilla Basin, which displays about 10,000 feet of structural relief along its west side (Hawley and Kennedy, 2004). The basin is a sediment-filled inner depression flanked by a series of faulted ramps along the margins. Subsidence within the north-trending basin began about 25 million years ago (Ma), in late

Oligocene, but major structural displacement occurred within the last 4 to 10 Ma (Hawley and Kennedy, 2004). Contemporaneous sedimentation derived from the erosion of newly emerging highlands and associated intermittent volcanic activity filled the basin during subsidence. The Mesilla Valley, containing the Rio Grande, occupies much of the eastern part of this basin. West and southwest of the Mesilla Valley is a geomorphic feature called "La Mesa". This section of undissected valley-floor forms an extensive, gently sloping surface plain that covers the majority of the Mesilla Basin. La Mesa (also called the West Mesa) has numerous shallow depressions and a discontinuous veneer of eolian sands.

NEW MEXICO



NORTH

PHYSIOGRAPHIC PROVINCES

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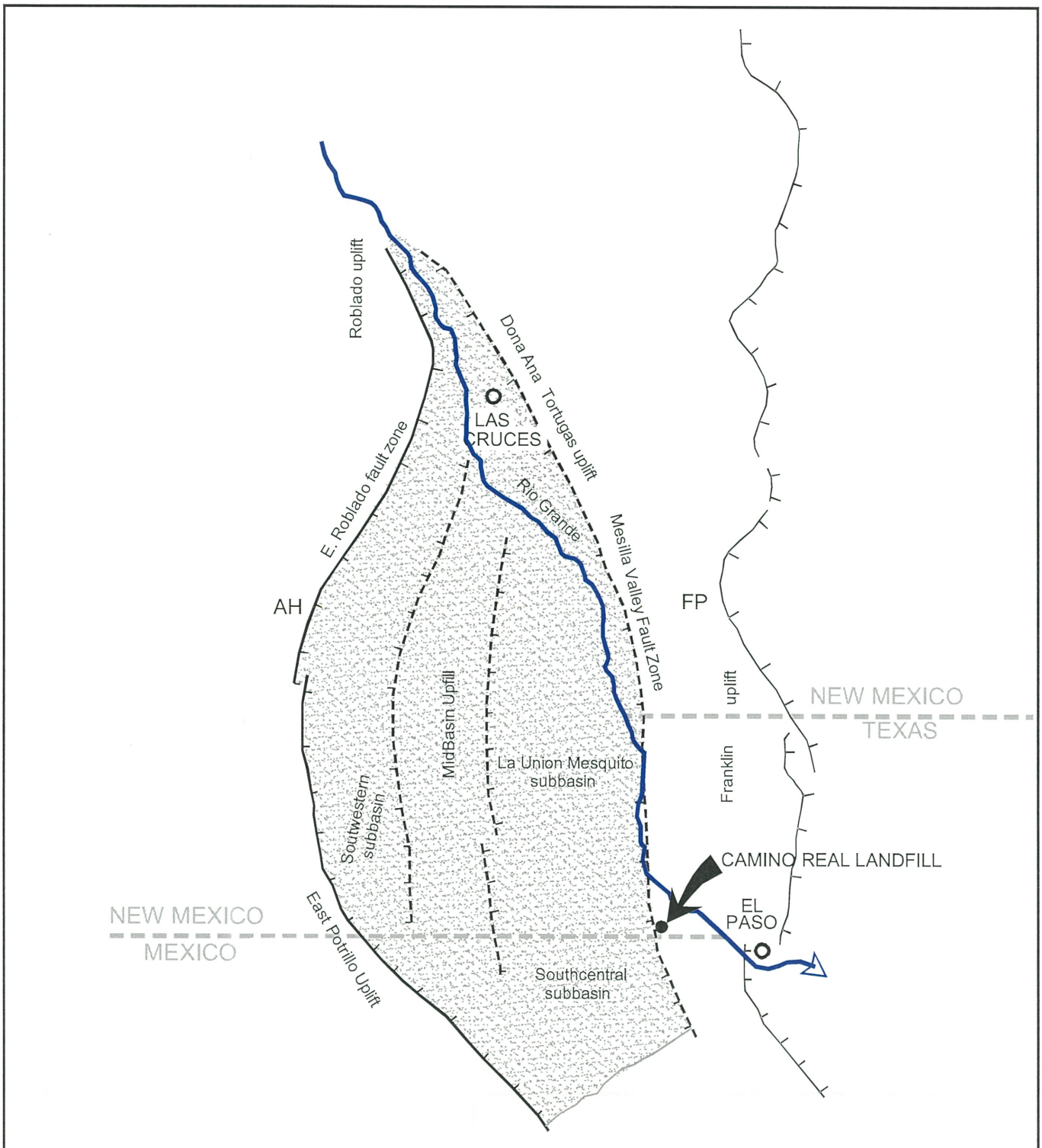

Geologic map modified from WRRI Technical Completion Report No. 332. Hawley and Kennedy, 2004

MESILLA BASIN

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2.3 Regional Stratigraphy

The Mesilla Basin occurs in a tectonic zone (i.e., the Rio Grande Rift) that has been evolving and receiving sediment for at least the last 25 Ma (late Oligocene to present). Hawley and Kennedy (2004) prepared a graphical summary of Tertiary and younger stratigraphic units in the region of the Mesilla Basin, which is presented in **Figure V.1.4**.

Regional stratigraphy in the basin includes rocks ranging in age from Precambrian through Holocene (King and Others, 1971). The regional stratigraphic column (**Figure V.I.4**) identifies Tertiary and younger Quaternary sediments and volcanic rocks. For the purpose of this discussion, the stratigraphic record has been divided into three sections based on age and depositional environment: Pre-Santa Fe Group Tertiary deposits, Santa Fe Group Basin Fill deposits, and post-Santa Fe Group Quaternary deposits.

2.3.1 Pre-Santa Fe Group Tertiary Deposits

Thickness of Tertiary-age deposits in the center of the Mesilla Basin exceeds 10,000 feet. A thick sequence of lower Tertiary sedimentary units was deposited in deep, northwest-trending basins of Laramide age. Overlying these sediments are lower to middle Tertiary volcanics (rhyolites to andesites) and volcaniclastic rocks of intermediate to silicic composition. These volcanic rocks are mixed with lower to middle Tertiary igneous intrusives of intermediate to silicic composition (granites to monzonites), which are exposed in the Cristo del Rey uplift, located approximately 1.5 miles east of CRLF. These older sediments indicate that at least one depositional basin was present prior to the formation of the southern Mesilla Basin.

2.3.2 Santa Fe Group Deposits

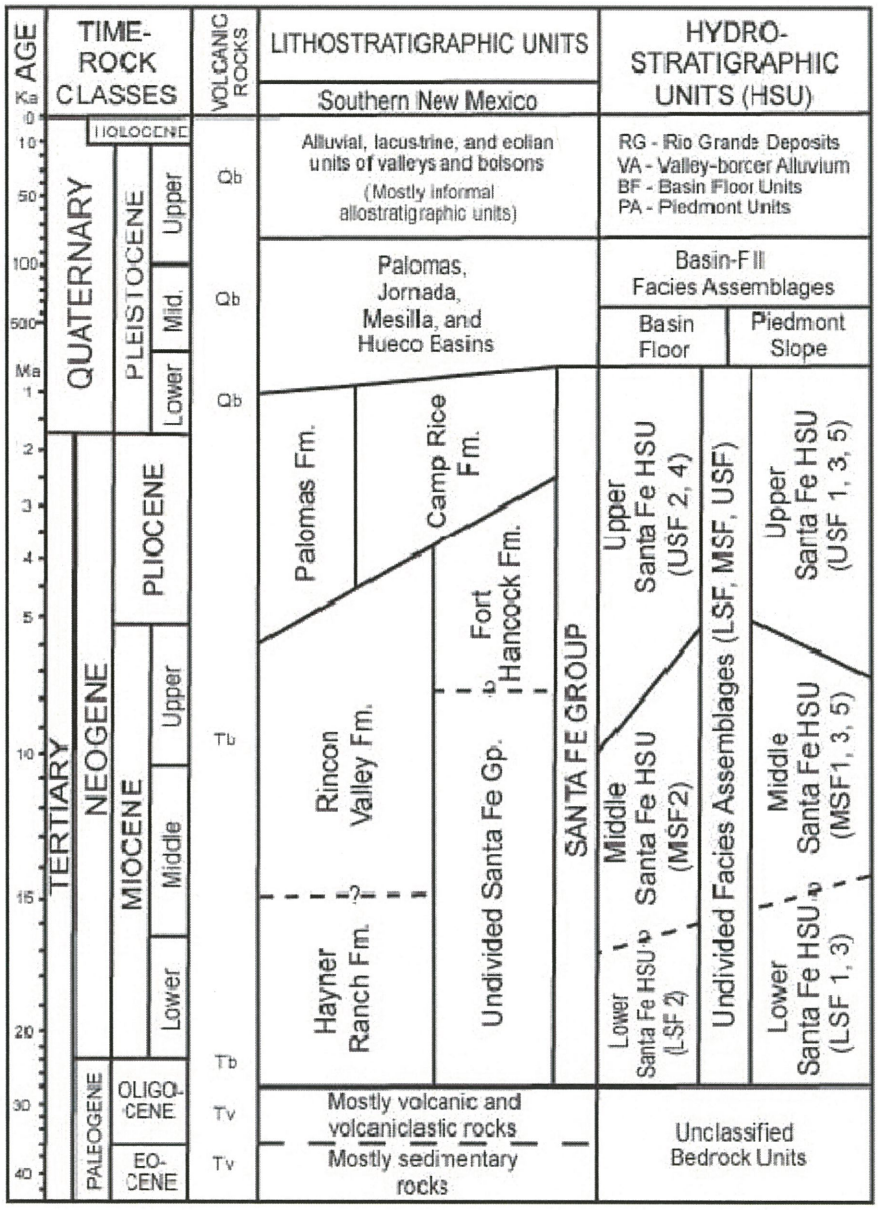
The Santa Fe Group within the Mesilla Basin is comprised of basin-fill sediments. The Santa Fe Group ranges in age from about 25 to 1 Ma and was deposited prior to and during evolution of the Mesilla Basin. The Santa Fe Group consists of alluvium derived from adjacent mountain highlands, with significant contributions from alluvial, fluvial, lacustrine and eolian sources. Maximum thicknesses of the Santa Fe Group range from 1,500 to 2,500 feet (Hawley and Kennedy, 2004). The Santa Fe Group was divided into three units, the

lower, middle and upper Santa Fe, based upon depositional environment and age.

Lower Santa Fe Unit – This unit ranges in age from 25 to 10 Ma and is dominated by fine-grained basin-floor sediments, that were deposited in a closed-basin environment prior to the final deep basin subsidence. Included in these sediments are thick sequences of playa, lacustrine deposits. Interbedded with these fine-grained deposits are thick lenticular sheets of eolian sediments. This unit correlates generally to the Hayner Ranch Formation of the Santa Fe Group.

Middle Santa Fe Unit – This unit was deposited between 10 and 4 Ma when rift tectonism was most active and basin filling was accelerated. Thick sequences of clean sand, silty sand and silty clay deposits filled the basin. This unit correlates to the lower portion of the Fort Hancock Formation and the Rincon Valley Formation of the Santa Fe Group.

Upper Santa Fe Unit – This unit is 4 to 1 Ma and was deposited in a time period when the Mesilla Basin transitioned from a closed basin to an open basin. Sediments were deposited on broad aggrading plains of a large braided fluvial system associated with the ancestral Rio Grande. This extensive fluvial system extended as far north as the San Juan and Sangre de Cristo Mountains of southern Colorado and northern New Mexico. Because of this different depositional environment, the lithologic character of this unit is much different from older Santa Fe units. Dominant lithologies are medium to coarse-grained fluvial sands. These are interbedded with alluvial sequences on the basin margins and local fine-grained (slack water) sediments. This unit correlates with the Upper Fort Hancock Formation and the Camp Rice Formation of the Santa Fe Group.



From: Hawley, J.W. and Kennedy, J.F., 2004, Creation of a Digital Hydrologic Framework Model of the Mesilla Basin and Southern Jornada del Muerto Basin, WRRI Technical Completion Report No. 332, New Mexico Water Resources Research Institute.

STRATIGRAPHIC COLUMN OF THE SOUTHERN NEW MEXICO

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2.3.3 Post-Santa Fe Quaternary Deposits

Post-Santa Fe Quaternary deposits represent a change from basin-fill to valley-fill sediments. These were deposited during incision of the Rio Grande (and tributary arroyo systems) and partial backfilling episodes between about 0.5 and 1 Ma (middle Pleistocene). Coarse to fine-grained fluvial sediments were deposited during repeated episodes of river incision separated by intervals of partial backfilling that produced the present landforms of the Mesilla Valley Tributary alluvial systems delivered more sediment than the river could transport out of the basin, resulting in a net accumulation of fluvial valley-fill deposits.

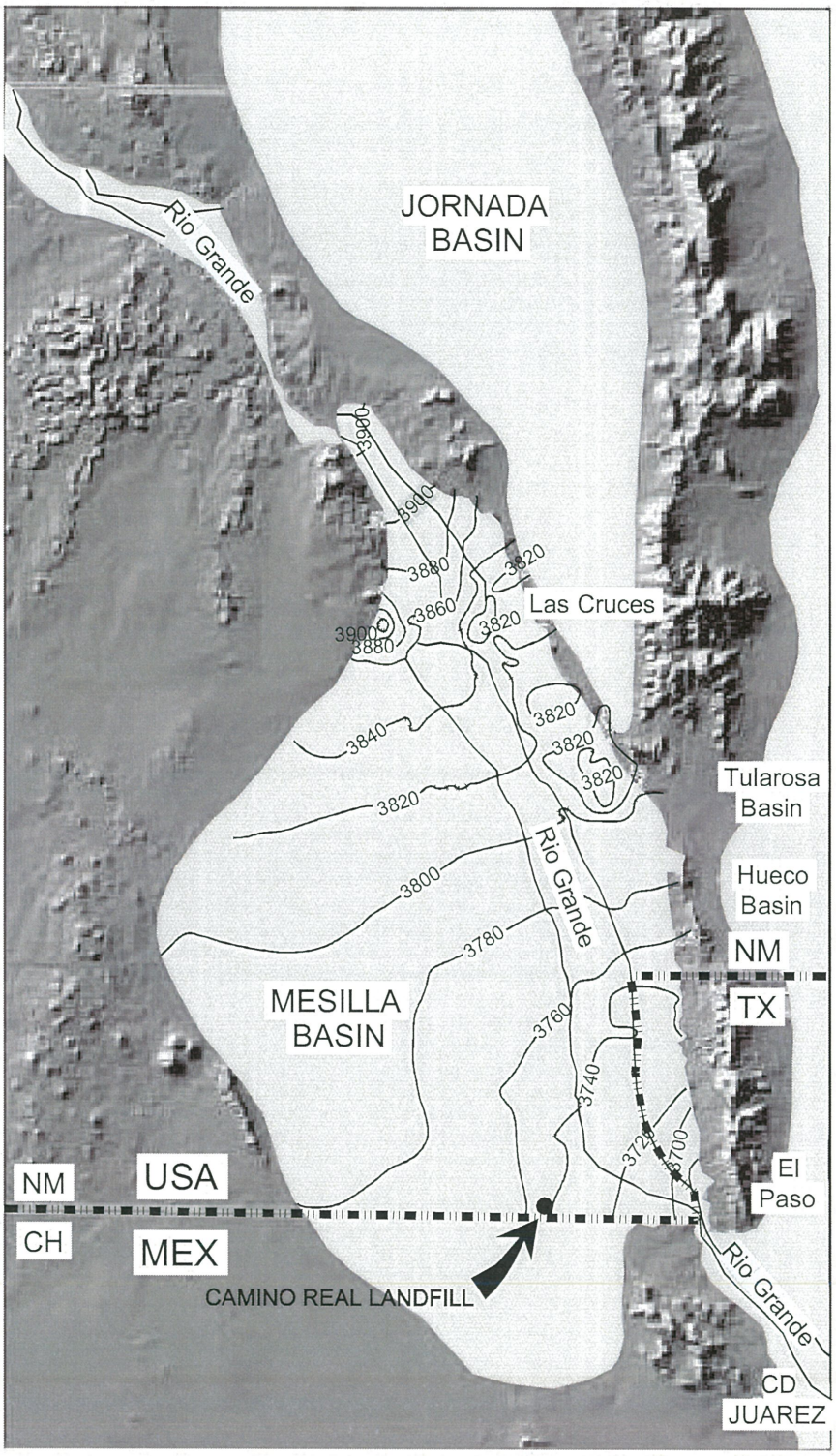
2.4 Regional Hydrogeology

Hydrogeology of the Mesilla Basin has been described by numerous investigators, including Hawley and Kennedy (2004), King and Others (1971) and Wilson and Others (1981). The regional hydrogeologic framework of the Mesilla Basin is typical of basins within the Rio Grande Rift Zone. Primary groundwater reservoirs are located in structural basins, within poorly consolidated basin-fill sediments and in shallow, interconnected valley-fill deposits. The major geologic features which impact these aquifer systems are bedrock boundary conditions, internal basin structures and the lithologic characteristics of the fill sediments.

The most productive aquifer zones for the Mesilla Basin are fluvial deposits of the Quaternary ancestral Rio Grande and the Upper Santa Fe Unit. The coarse-grained Upper Santa Fe fluvial deposits are saturated only in the northeastern portion of the Mesilla Basin (near Las Cruces) and are entirely above the water table in the western and southern portions of the basin in the vicinity of CRLF. In these areas, the major basin-fill aquifers are "deep aquifers" consisting of eolian sands from the Middle and Lower Santa Fe Units.

The general water table configuration and groundwater flow direction within the Mesilla Basin are shown on the regional groundwater gradient map in **Figure V.1.5** (Hawley and Kennedy, 2004). The horizontal hydraulic gradient within the basin closely matches the slope of the Rio Grande floodplain. Beneath the floodplain surface, the water table is at a depth of approximately 10-25 feet. Away from the floodplain, near the western and southern portions of the basin, the depth to groundwater is generally 300 to 600 feet. There is very little groundwater flow from the Mesilla Basin through El Paso del Norte. Limited recharge

to the aquifer through infiltration of precipitation into the vadose zone is offset by heavy discharge through evapotranspiration from irrigated croplands and riparian vegetation, flow to drains, and an increasing amount of pumping from available aquifers.



From: Hawley, J.W. and Kennedy, J.F., 2004, Creation of a Digital Hydrologic Framework Model of the Mesilla Basin and Southern Jornada del Muerto Basin, WRRI Technical Completion Report No. 332, New Mexico Water Resources Research Institute.

REGIONAL GROUNDWATER ELEVATION CONTOUR MAP

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3.0 SITE GEOLOGY AND HYDROGEOLOGY

A substantial database has been developed for CRLF and includes information from previous site-specific studies (1988-2006), as well as the soil boring and testing that was performed in 2019 pursuant to site characterization and design of Unit 4 facilities. This section describes historical investigations at the site, as well as recent studies that supplement the understanding of the site geology and hydrogeology in support of this Permit Modification and Renewal Application.

3.1 Summary of Previous Investigations and Well Installations

Prior to this Application, several site-specific studies were conducted to characterize the geology and hydrogeology and to document the suitability of the site for secure waste disposal. **Table V.1.1** contains a cumulative summary of wells and borings associated with subsurface investigations conducted at CRLF. Pursuant to site stratigraphic and hydrogeologic characterization for landfill permitting and renewal, 10 groundwater monitoring wells and 27 soil borings were drilled at the facility between 1988 and 2006. Three additional soil borings were drilled at the facility in 2019 for incremental site characterization for development of Unit 4. Locations of cumulative soil borings and groundwater monitoring wells are shown on **Figure V.1.6**. Copies of boring logs from the three 2019 Unit 4 borings (4-1, 4-2 and 4-3) are included in **Attachment V.1.A.1**. Copies of boring logs from all previous investigations are provided in **Attachment V.1.A.2**. Tabular summaries of previous (1988-2006) geotechnical soil sample test results are included in **Attachment V.1.E**.

The first site-specific hydrogeologic investigation was conducted in 1988 by Eldredge Engineering Associates, Inc. (EEA, 1990) as part of the initial permit application process. This initial investigation involved the completion of a water supply well (MW-A) located near the current Landfill Administration Office. This well was advanced to a depth of 400 feet below ground surface (fbgs) by Larjon Drilling Company. Depth to groundwater upon completion of the well was 212 fbgs. The water-bearing formation was indicated on the well record as being at a depth of 322 to 410 fbgs, thus suggesting that the water-bearing zone is confined by overlying clay unit(s). **Attachment V.1.A.2** includes the lithology log and

completion details for this initial water well. As part of the initial evaluation, in 1990, EEA also completed five shallow borings (B-1 thru B-5) and three groundwater monitoring wells (MW-B, MW-C and MW-S) to obtain geotechnical samples and shallow groundwater data to assess the hydrogeology of the site. Lithologic logs for these borings are included in **Attachment V.1.A.2.**

Additional investigation was conducted in January 1991 by EEA to obtain supplemental geologic and geotechnical data for the initial permit application. This effort included installation of Well MW-D, advancement and sampling of six test rotary holes (TH-1 thru TH-6) and two borings (AH-6 and AH-7). To support the Permit Renewal Application in 1995, Daniel B. Stephens & Associates (DBS&A) performed field investigations at CRLF, including completing four borings (SB-1 thru SB-4) and installing three additional monitoring wells (MW-E thru MW-G). Lithology logs and completion details for these monitoring wells are provided in **Attachment V.1.A.2.**

Gordon Environmental Inc. (GEI) completed additional site characterization for Unit 3 in 2006. These efforts included soil boring and geotechnical testing performed by Precision Engineering, Inc. (PEI) of Las Cruces, New Mexico. The soil boring was performed using hollow-stem auger (HSA) methods and was completed on January 12, 2006. The boring program included ten borings (SB-5 through 14), ranging in depth from 50 to 135 fbgs. **Table V.1.1** includes a summary of the borings and **Figure V.1.6** shows the boring locations. **Attachment V.1.A.2** includes logs for the borings.

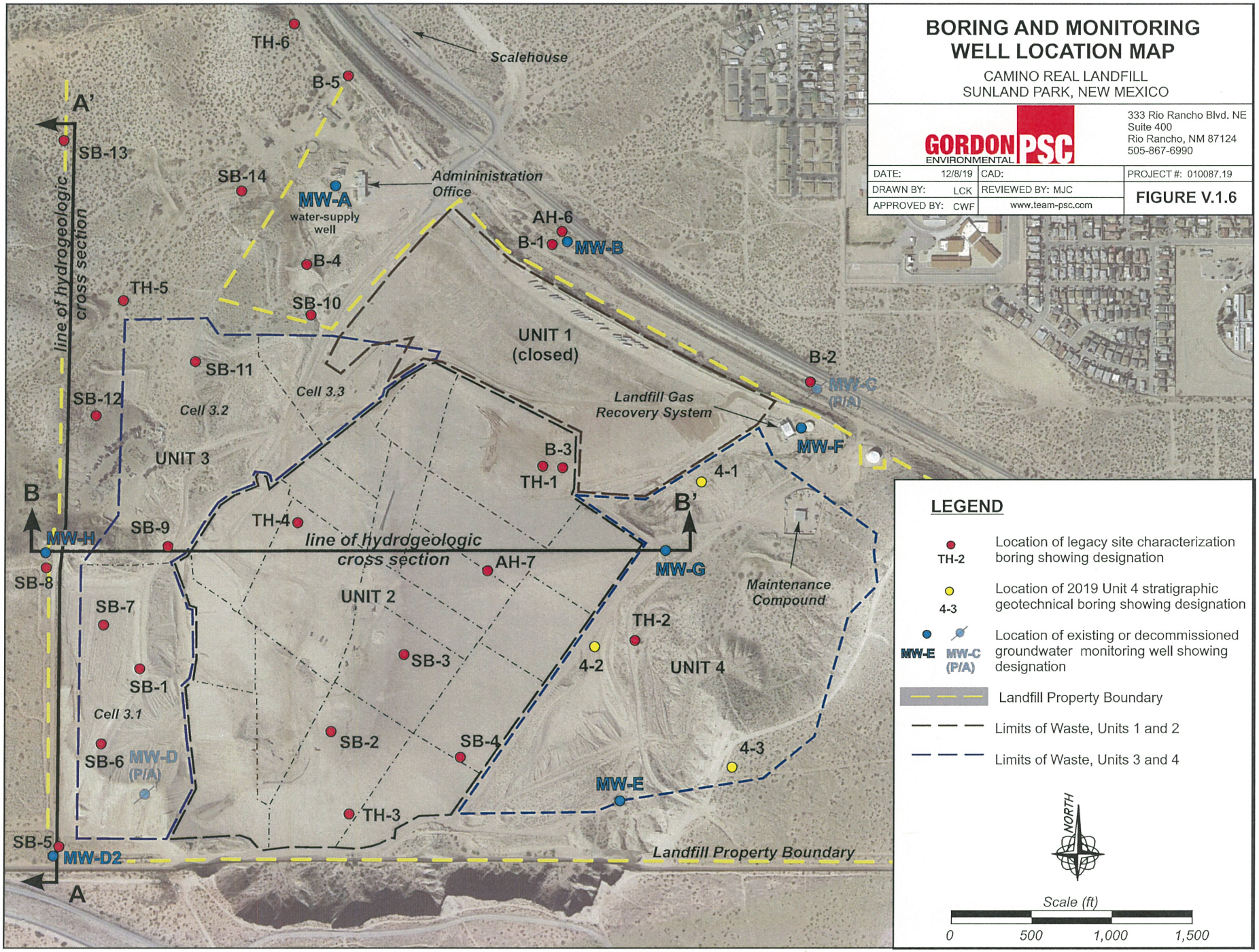
GEI installed two groundwater monitoring wells (MW-D2 and MW-H) along the western boundary of the site (see **Figure V.1.6**). Wells MW-D2 and MW-H were positioned generally upgradient of Unit 3 and older waste deposits in Units 1 and 2. The wells were drilled and completed in February 2006 by Rodgers Environmental Services, Inc. using mud-rotary drilling methods. Downgradient Well C was decommissioned in April 2008. Upgradient Well D was decommissioned in May 2019. Upgradient groundwater monitoring is now being performed using replacement Well D2, which was installed in February of 2006. Well MW-H may be utilized as an additional upgradient monitoring well as waste filling sequences progress to the west and northwest into Cells 3.2 and 3.3.

TABLE V.1.1

SUMMARY OF EXPLORATORY DRILLING CAMINO REAL LANDFILL

Well/Boring No.	Completion Date	Status	Drilling Method	Surface Elevation (fmsl)	Total Depth (fbgs)	Depth to Water (fbgs)
Ground Water Monitoring Wells						
Well-A	01/28/88	Water Supply Well	Mud-Rotary	3926.30	400	212
MW-B	08/22/90	Downgradient MW (Unit 1)	Mud-Rotary	3894.59	206	154
MW-C (P/A)	08/25/90	Decommissioned 4/29/08	Mud-Rotary	3885.71	185	148
MW-D (P/A)	01/28/91	Decommissioned 5/29/19	Mud-Rotary	4128.04	450	390
MW-S (P/A)	11/19/90	Decommissioned 3/13/14	Mud-Rotary	3894	186	146
MW-E	11/03/95	Sidegradient MW (Unit 4)	Air-Rotary	4019.36	305	272
MW-F	10/28/95	Downgradient MW (Unit 4)	Air-Rotary	3894.38	185	155
MW-G	10/28/95	Downgradient MW (Units 2, 4)	Air-Rotary	3933.29	223	191
MW-D2	02/17/06	Upgradient MW (Unit 2)	Mud-Rotary	4130.30	420	381.7
MW-H	02/26/06	Upgradient MW (Unit 3)	Mud-Rotary	4127.79	420	381.5
Site Characterization Borings						
B-1	09/24/90	Geotech Boring (P/A)	Hollow-Stem Auger	3895	116.5	ND
B-2	09/25/90	Geotech Boring (P/A)	Hollow-Stem Auger	3886	100	ND
B-3	09/27/90	Geotech Boring (P/A)	Hollow-Stem Auger	3908	51.5	ND
B-4	09/28/90	Geotech Boring (P/A)	Hollow-Stem Auger	3938	56.5	ND
B-5	09/30/90	Geotech Boring (P/A)	Hollow-Stem Auger	3892	61.5	ND
TH-1	01/25/91	Geotech Boring (P/A)	Mud-Rotary	3911	220	160
TH-2	01/26/91	Geotech Boring (P/A)	Mud-Rotary	3967	300	207
TH-3	01/25/91	Geotech Boring (P/A)	Mud-Rotary	3997	300	245
TH-4	01/31/91	Geotech Boring (P/A)	Mud-Rotary	4060	351	300
TH-5	01/24/91	Geotech Boring (P/A)	Mud-Rotary	3963	251	225
TH-6	02/01/91	Geotech Boring (P/A)	Mud-Rotary	3927	261	180
AH-6	01/31/91	Geotech Boring (P/A)	Hollow-Stem Auger	3897	94	ND
AH-7	01/31/91	Geotech Boring (P/A)	Hollow-Stem Auger	3931	75	ND
SB-1	10/24/95	Geotech Boring (P/A)	Hollow-Stem Auger	4122	110	ND
SB-2	10/17/95	Geotech Boring (P/A)	Hollow-Stem Auger	3994	125	ND
SB-3	10/18/95	Geotech Boring (P/A)	Hollow-Stem Auger	3963	140	ND
SB-4	10/20/95	Geotech Boring (P/A)	Hollow-Stem Auger	3976	140.5	ND
SB-5	12/19/05	Geotech Boring (P/A)	Hollow-Stem Auger	4129.33	70	ND
SB-6	12/20/05	Geotech Boring (P/A)	Hollow-Stem Auger	4113.08	50	ND
SB-7	12/20/05	Geotech Boring (P/A)	Hollow-Stem Auger	4116.63	70	ND
SB-8	12/21/05	Geotech Boring (P/A)	Hollow-Stem Auger	4127.42	135	ND
SB-9	01/09/06	Geotech Boring (P/A)	Hollow-Stem Auger	4120.22	120	ND
SB-10	01/12/06	Geotech Boring (P/A)	Hollow-Stem Auger	3979.93	100	ND
SB-11	01/10/06	Geotech Boring (P/A)	Hollow-Stem Auger	4056.54	100	ND
SB-12	01/11/06	Geotech Boring (P/A)	Hollow-Stem Auger	3995.31	50	ND
SB-13	01/12/06	Geotech Boring (P/A)	Hollow-Stem Auger	3960.89	70	ND
SB-14	01/10/06	Geotech Boring (P/A)	Hollow-Stem Auger	3921.66	50	ND
SB-4-1	12/12/19	Geotech Boring (P/A)	Hollow-Stem Auger	3897	100	ND
SB-4-2	12/13/19	Geotech Boring (P/A)	Hollow-Stem Auger	3954	100	ND
SB-4-3	12/11/19	Geotech Boring (P/A)	Hollow-Stem Auger	4141	120	ND

Surface elevations for existing Wells A, B, C, D, E, F, G, D2, H, and S are based on 2005/2006 surveys.
Surface elevations for soil borings B-1 to SB-4 based upon site terrain models 1990, 1991 and 1995
Surface elevations for soil borings SB-5 to SB-14 based upon 2006 staked location surveys
Surface elevations for soil borings 4-1 to 4-3 based upon 2019 Google Earth terrain model
Well S is a decommissioned groundwater monitoring well located off-site in the inactive sludge disposal area.
Well C is a decommissioned groundwater monitoring well located off-site on property owned by the Union Pacific Railroad.
Well D is a decommissioned groundwater monitoring well (P/A 2019)
ND = not detected during drilling fmsl = feet above mean sea level fbgs = feet below ground surface
P/A = decommissioned well



BORING AND MONITORING WELL LOCATION MAP

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SUNLAND PARK, NEW MEXICO

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APPROVED BY: CWF	www.team-psc.com		

LEGEND

- TH-2 — Location of legacy site characterization boring showing designation
- 4-3 — Location of 2019 Unit 4 stratigraphic geotechnical boring showing designation
- MW-E / MW-C (P/A) — Location of existing or decommissioned groundwater monitoring well showing designation
- Landfill Property Boundary
- Limits of Waste, Units 1 and 2
- Limits of Waste, Units 3 and 4

NORTH

Scale (ft)

0 500 1,000 1,500

3.2 2019 Unit 4 Geotechnical Drilling and Sampling

In accordance with the notification requirements of 20.9.3.9.B.7(b)(i) NMAC, Weaver Consultants, Group (Weaver) submitted a Site Assessment Boring Plan to NMED-SWB on November 29, 2019 to conduct stratigraphic and geotechnical investigations to supplement the information collected during previous studies (**Attachment V.1.B**). This Plan was approved by NMED in December 2019 (**Attachment V.1.C**). As detailed in the work plan, the objectives of the subsurface investigation are to:

- Document the geologic suitability of the site specific to Unit 4.
- Acquire detailed geologic and geotechnical data to support the detailed engineering design as required by 20.9.3.9.B.7.b NMAC.

On December 11, 2019, Construction Quality Control, Inc., (CQC) of El Paso, Texas, initiated the hollow-stem auger (HSA) boring program which was completed on December 13, 2019. The program consisted of three borings (4-1, 4-2 and 4-3), ranging from 100 to 120 fbgs, which were logged by a qualified PSC field representative. **Table V.1.1** summarizes completion information for the borings and **Figure V.1.6** shows the boring locations.

These borings were completed using a portable CME 75 drill rig with 8-inch diameter augers to collect geotechnical data for the Unit 4 area. **Attachment V.1.A.1** provides the boring logs for the 2019 Unit 4 HSA borings. The logs include a visual field classification of the materials from each boring, as well as a graphical log of the materials; sample type; standard penetration drive blow counts (per half-foot); laboratory measurements of dry density, moisture content (gravimetric), soil classification; and any comments regarding the lithology or drilling activities.

In each of the borings, samples were collected at five-foot intervals using a standard 2-inch outside diameter (OD) split-spoon sampler. Additionally, bulk samples (5-gallon buckets) and 3-inch Shelby tubes and 2-inch California tube samples were obtained at depths corresponding to fine grained plastic soils, as well as at projected base grades for the Unit 4 development. Split-spoon, bulk and tube samples were evaluated for visual soil classification. Drilling, sample collection and shipping were conducted in accordance with standard industry practice. Laboratory testing results for these samples are described in Section 3.4, Geotechnical Evaluation. In addition to the acquisition of geotechnical samples,

field logging observations of the borings (see **Attachment V.1.A.1**) were used to interpret the site geology. These interpretations are provided in Section 3.5, Site Geology.

3.3 Borehole Plugging

Upon completion, the Unit 4 borings were plugged in accordance with 20.9.1.3.8.C.10 NMAC and requirements of the New Mexico Office of the State Engineer (NMOSE). In order to ensure that the abandoned borings will not provide a conduit for fluid migration, all borings were backfilled with hydrated granular bentonite to the ground surface. This provides a seal with a permeability less than the natural formation across an interval that is below the planned landfill liner invert. The required Borehole Plugging Certification for this drilling program is provided in Section 4.0. **Attachment V.1.D** includes the closure reports from CQC for borings 4-1 through 4-3.

3.4 Geotechnical Evaluation

Over 100 lithologic samples collected at the facility during both previous studies and the 2005/2006 investigation have been tested in the laboratory for measurement of physical properties. Geotechnical testing was performed on soil samples collected during the completion of the initial and 1995 subsurface investigation programs. These samples consisted of sands, silty sands, silts, sandy clays and clays representative of the site stratigraphy. Tests included moisture content, density, particle size, Atterberg Limits, and permeability. **Attachment V.1.E** contains tabular summaries of all geotechnical testing performed on samples from site borings 1998-2006.

Samples from the 2005/2006 drilling program were selected for geotechnical testing to characterize the shallow subsurface and to characterize materials for subgrade, drainage sand and final cover material applications. The samples were tested for grain size distribution, Atterberg limits, moisture content, uniformity coefficient, specific gravity, porosity, dry density, and saturated hydraulic conductivity. **Attachment V.1.E** (Table V.1.4) summarizes the results of these laboratory tests, including USCS classification and quantitative test results. **Attachment V.1.F** includes the laboratory testing results from the earlier testing programs, cell construction projects, and the 2005/2006 drilling program.

Three soil borings were advanced pursuant to geotechnical testing on Unit 4 in December 2019. Summary soil boring data on the Unit 4 borings is included in **Table V.1.1.** Copies of the lithologic logs for the Unit 4 borings are included in **Attachment A**. A summary of Unit 4 geotechnical lab testing results is presented in **Table V.1.2**. A copy of the geotechnical laboratory test results of the Unit 4 boring samples is included as **Attachment V.1.G**.

TABLE V.1.2
SUMMARY OF UNIT 4 GEOTECHNICAL TEST RESULTS
CAMINO REAL LANDFILL

Sample	Depth to Top (ft)	Depth to Bottom (ft)	Work Completed by	USCS Classification	Sieve - % Passing						Wet or Dry Sieve	C_c	C_u	Liquid Limit	Plastic Limit	Plasticity Index	Max Density (pcf)	Moisture Content (%)	Optimum Moisture (%)	k Value (cm/sec)	Compression Index (C_r)	Peak Strength	
					0.375	No. 4	No. 10	No. 40	No. 100	No. 200												ϕ'_d (degrees)	C'_d (psi)
4-1	10.0	11.5	CQC	SC	100.0%	99.0%	99.0%	94.0%	45.0%	28.0%	Dry			26	16	10	122.6	10.7	10.7				
4-1	20.0	21.5	CQC	CL	100.0%	99.0%	99.0%	99.0%	98.0%	95.0%	Dry							27.7					
4-1	30.0	31.5	CQC	SW	100.0%	99.0%	99.0%	99.0%	30.0%	12.0%	Dry	1.37	3.4					3.3					
4-1	55.0	56.5	CQC	CL	100.0%	99.0%	99.0%	99.0%	93.5%	81.0%	Dry			40	14	26	117.5	22.0	12.4	1.1×10^{-1}	0.244	13.7	6.5
4-1	75.0	76.5	CQC	SM	100.0%	99.0%	99.0%	98.0%	33.0%	22.0%	Dry			NP	NP	NP		7.6					
4-2	15.0	16.5	CQC	SC	100.0%	99.0%	99.0%	99.0%	58.0%	48.0%	Dry							16.9					
4-2	35.0	36.5	CQC	CL	100.0%	99.0%	99.0%	99.0%	92.5%	75.0%	Dry			28	18	10		14.3					
4-2	50.0	51.5	CQC	SM	100.0%	99.0%	99.0%	99.0%	77.0%	22.0%	Dry							6.1					
4-2	60.0	61.5	CQC	SC-SM	100.0%	100.0%	100.0%	97.0%	49.0%	32.8%	Dry			23	17	6	121.2	11.1	11.1				
4-2	65.0	66.5	CQC	CH	100.0%	99.0%	99.0%	99.0%	91.5%	88.0%	Dry			65	19	46		25.7					
4-2	85.0	86.5	CQC	SC	100.0%	96.0%	95.0%	95.0%	94.0%	19.0%	Dry			28	16	12		3.6		1.2×10^{-1}			
4-3	15.0	16.5	CQC	SP	100.0%	97.0%	94.0%	75.0%	11.0%	3.0%	Dry	0.91	2.42	NP	NP	NP		1.1					
4-3	30.0	31.5	CQC	SW	100.0%	99.0%	99.0%	85.0%	22.0%	11.0%	Dry	1.52	4.04					2.6					
4-3	45.0	46.5	CQC	SM	100.0%	99.0%	99.0%	91.0%	32.5%	15.0%	Dry			NP	NP	NP		1.1					
4-3	60.0	61.5	CQC	SP	100.0%	98.0%	97.0%	97.5%	22.5%	14.0%	Dry							2		9.8×10^{-2}			
4-3	75.0	76.5	CQC	CH	100.0%	99.0%	99.0%	99.0%	80.0%	62.0%	Dry			58	18	40		14.4				43.4	5.8

Notes:

SP	Poorly graded sands or gravelly sands; little or no fines
SC	Clayey sands or sand-clay mixtures
SM	Silty sands, sand-silt mixtures
SW	Well-graded sands, gravelly sands; little or no fines
GP	Poorly graded gravels or gravel-sand mixtures; little or no fines
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
CH	Inorganic clays of medium to high plasticity, fat clays
CQC	Construction Materials Testing, El Paso, TX

3.5 Site Geology

CRLF is underlain by a sequence of sediments consisting predominately of sands and silty sands, with interbeds of siltstones and mudstones. These sediments belong to the Camp Rice Formation and the Fort Hancock Formation of the Upper Santa Fe Group. These are fluvial and alluvial deposits associated with the ancestral Rio Grande. Overlying and interfingering with these Upper Santa Fe basin-fill sediments are younger (Quaternary) valley-fill deposits associated with major tributaries to the Rio Grande Valley (**Figure V.1.7**).

3.5.1 Site Stratigraphy

Figure V.1.8 shows the site-specific stratigraphy in the area of CRLF. Information shown on this stratigraphic column is the result of mapping by the New Mexico Bureau of Mines and Mineral Resources, as well as on-site drilling and mapping activities by GEI-PSC.

Quaternary – As shown in **Figure V.1.8**, the easternmost and lowest portions of CRLF contain exposures of unsaturated, valley-fill sediments associated with the entrenchment and backfilling of major tributaries to the Rio Grande Valley. These deposits overlie and cut into the exposed Upper Santa Fe Group sediments. They consist of fine to medium-grained, brown, unconsolidated sandstones and silty sandstones with interbeds of siltstones, clays and pebbly gravels.

Upper Santa Fe Unit – The major stratigraphic unit underlying CRLF is the Upper Santa Fe Unit. In this area, this unit is likely less than 250 feet thick and is comprised of the Camp Rice Formation and the upper portion of the Hancock Formation. Both formations are exposed on an outcrop near the west-central portion of the site.

The Camp Rice Formation varies from 80-100 feet thick at CRLF and can be seen cropping out near the top of the slopes along the southern and southwestern portions of the site. It contains approximately 9 feet of basal, pebbly sandstone grading up into gray to brown, fine- grained, massively bedded, unconsolidated to weakly consolidated sandstone and silty sandstone. The La Mesa geomorphic surface is developed on this formation and the Camp Rice Formation contains a 13-foot caliche section that corresponds to this surface.

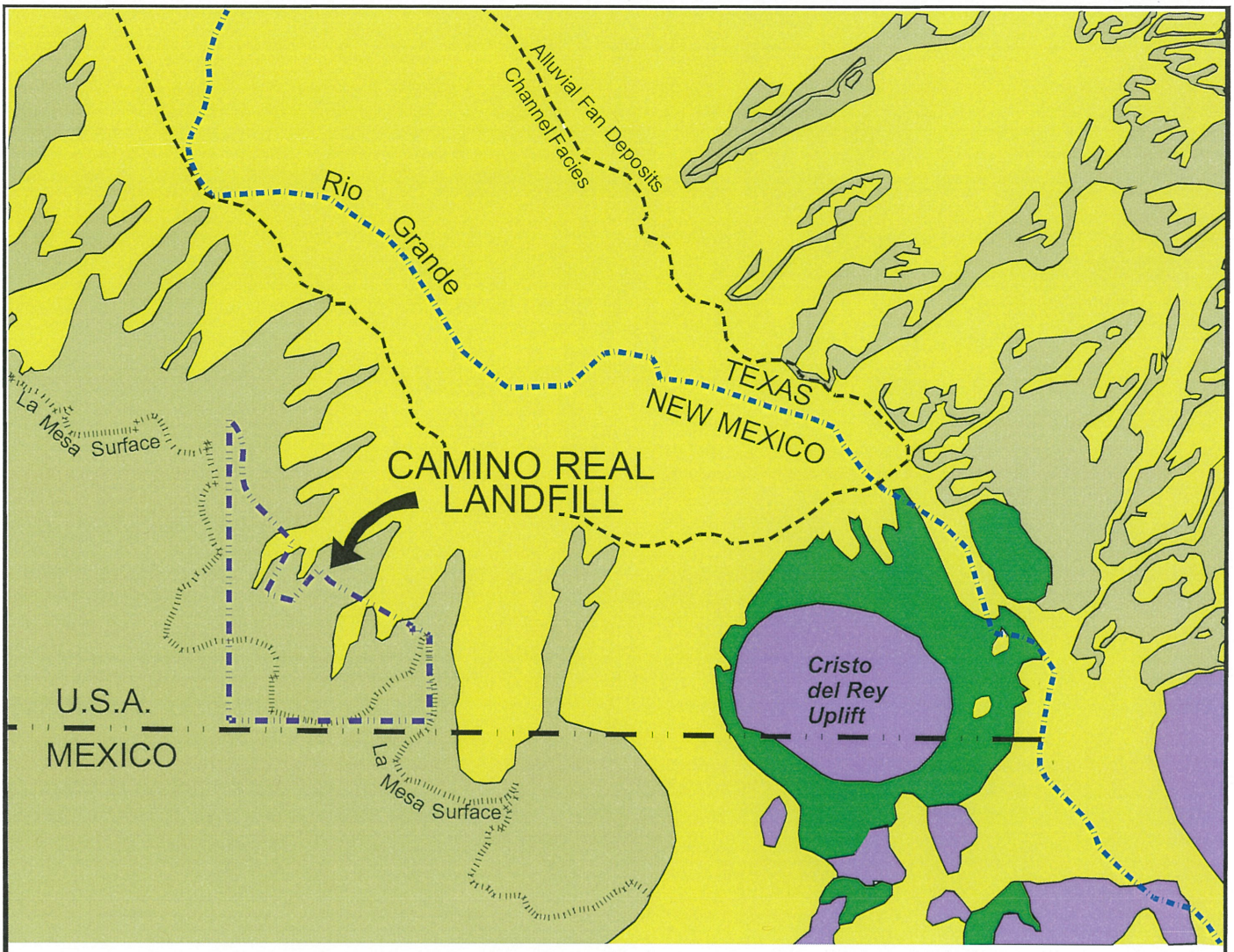
The upper portion of the Fort Hancock Formation is also considered to be within the Upper

Santa Fe Unit. On the surface of CRLF, the upper Fort Hancock Formation is similar in appearance to the Camp Rice Formation and consists of mostly brown to buff-colored, fine to medium-grained friable sandstone exhibiting trough cross-bedding. These sands are mapped as being approximately 150 feet thick and considered to have developed within a fluvial channel deposition environment. There is an increase in thin lenses of siltstones and mudstones toward the basal portion of this unit.

Middle Santa Fe Unit – The lower portion of the Fort Hancock Formation contains fine-grained sediments, which are consistent with basin-fill deposits of the Middle Santa Fe Unit. These sediments are not exposed on the surface at the site and consist of light reddish brown, slightly consolidated, fine to very fine-grained silty sandstones, interbedded with siltstones, sandy siltstones and sequences of hard reddish-brown clays. The sandstones are interpreted as being lacustrine and eolian in nature. Fine-grained sediments (siltstones and claystones) account for greater than 50% of this unit. The monitoring wells for CRLF have been developed within this unit.

Lower Tertiary – A series of crystalline rocks, consisting of volcanics, mixed with latite, dacite and andesite intrusions and flows of intermediate composition, unconformably underlie Middle Santa Fe sediments at CRLF. These crystalline rocks are not exposed at the site and were not encountered in any site drilling. They have been recognized in oil well drill holes in the region and are exposed at the surface in the Cristo Rey uplift, two miles east of CRLF.

Figure V.1.9 illustrates the relationships between these stratigraphic units at CRLF. Cross-section A-A' is a south-to-north section along the western boundary of the site that shows the outlines of Cell 3.1 and Cell 3.2. Cross-section B-B' is a west-to-east section that shows a veneer of Quaternary alluvial fan sediments in the topographically lower areas along the eastern portion of the site. The locations of Sections A-A' and B-B' are shown on **Figure V.1.6**.



LEGEND

- QUATERNARY VALLEY FILL
- UPPER SANTA FE GROUP
- TERTIARY INTRUSIVES
- CRETACEOUS SEDIMENTS

Geologic map modified from WRRI Technical Completion Report No. 332. Hawley and Kennedy, 2004

NORTH

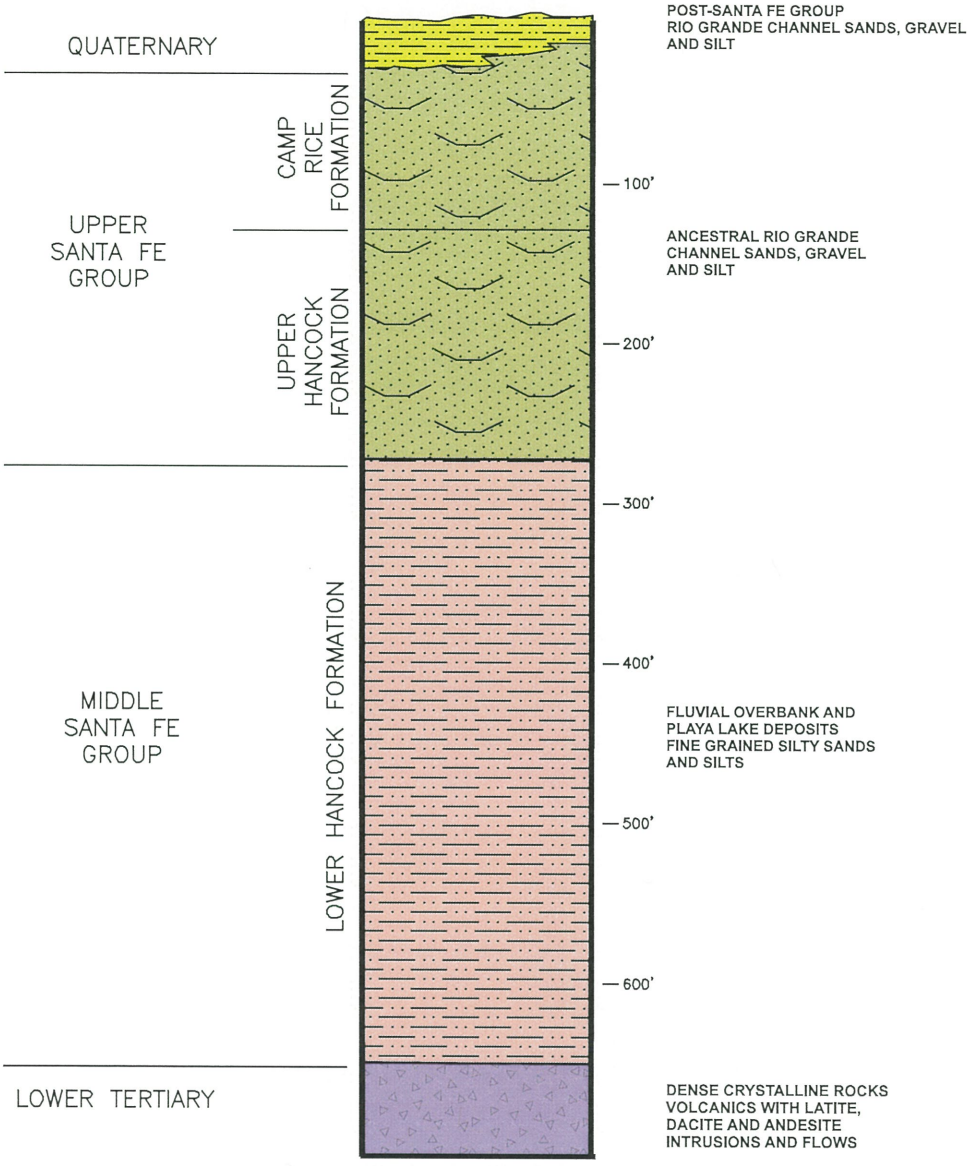
0' 0.5 MILE 1 MILE

SITE GEOLOGIC MAP

CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO

GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd. NE
Suite 400
Rio Rancho, NM 87124
505-867-6990

DATE: 12/8/19	CAD:	PROJECT #: 010087.19	
DRAWN BY: LCK	REVIEWED BY: MJC	FIGURE V.1.7	
APPROVED BY: CWF	www.team-psc.com		



SITE STRATIGRAPHIC COLUMN

CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO

GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd. NE
Suite 400
Rio Rancho, NM 87124
505-867-6990

DATE: 12/8/19	CAD:		PROJECT #: 010087.19
DRAWN BY: LCK	REVIEWED BY: MJC		FIGURE V.1.8
APPROVED BY: CWF	www.team-psc.com		

3.5.2 Site Structures

There are no geologic structures visible on the surface at CRLF. Hawley and Kennedy (2004) mapped a Rio Grande Rift-related fault approximately 2 miles west of the facility boundary. As shown in **Figure V.1.3**. This fault is described as a normal fault (Mesilla Valley Fault) and has a few hundred feet of displacement within Santa Fe Group sediments; however, it does not exhibit evidence of movement during Holocene time (during the last 10,000 years).

There is no folding mapped or observed in the surficial sediments in the region of CRLF. The Upper Santa Fe Group sediments appear to be flat-lying, although Baker (1991) suggested that these sediments have a gentle dip to the southwest.

3.6 Site Hydrogeology

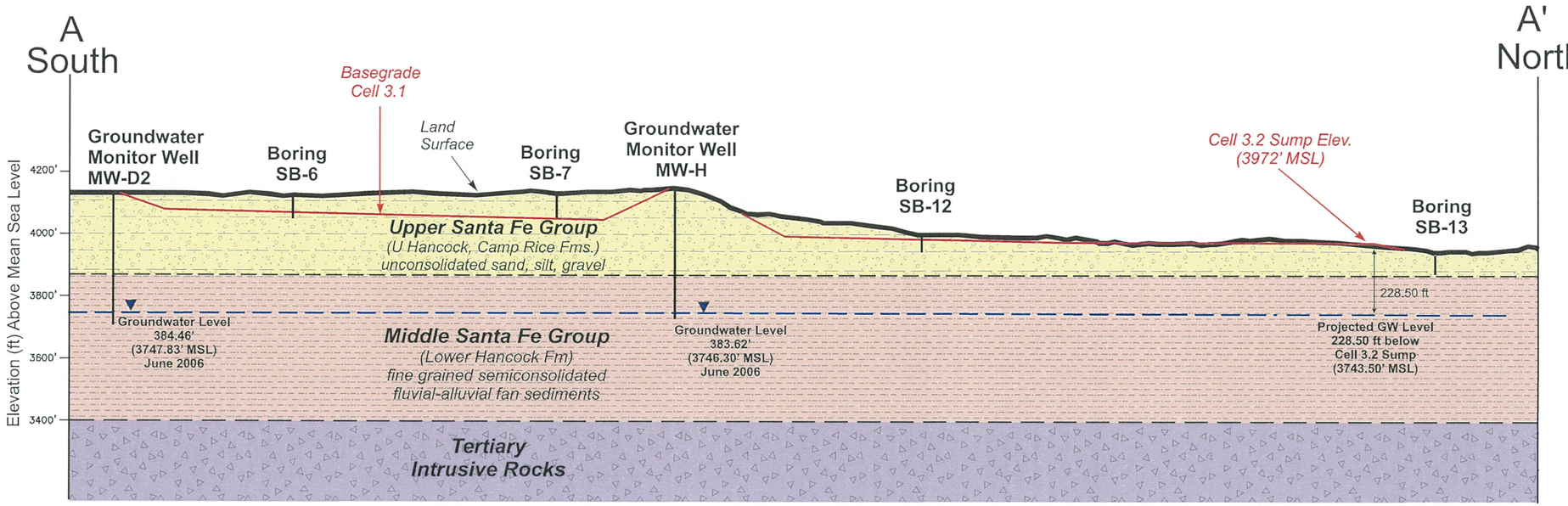
The uppermost groundwater saturation at CRLF is present in generally fine-grained, weakly-consolidated interbedded silts and sands within the Lower Fort Hancock Formation (Middle Santa Fe Group). Depth to groundwater saturation ranges from approximately 156 fbgs in the northeastern corner of the landfill property (MW-B) to approximately 385 fbgs along the western margin of the property (MW-D2, MW-H).

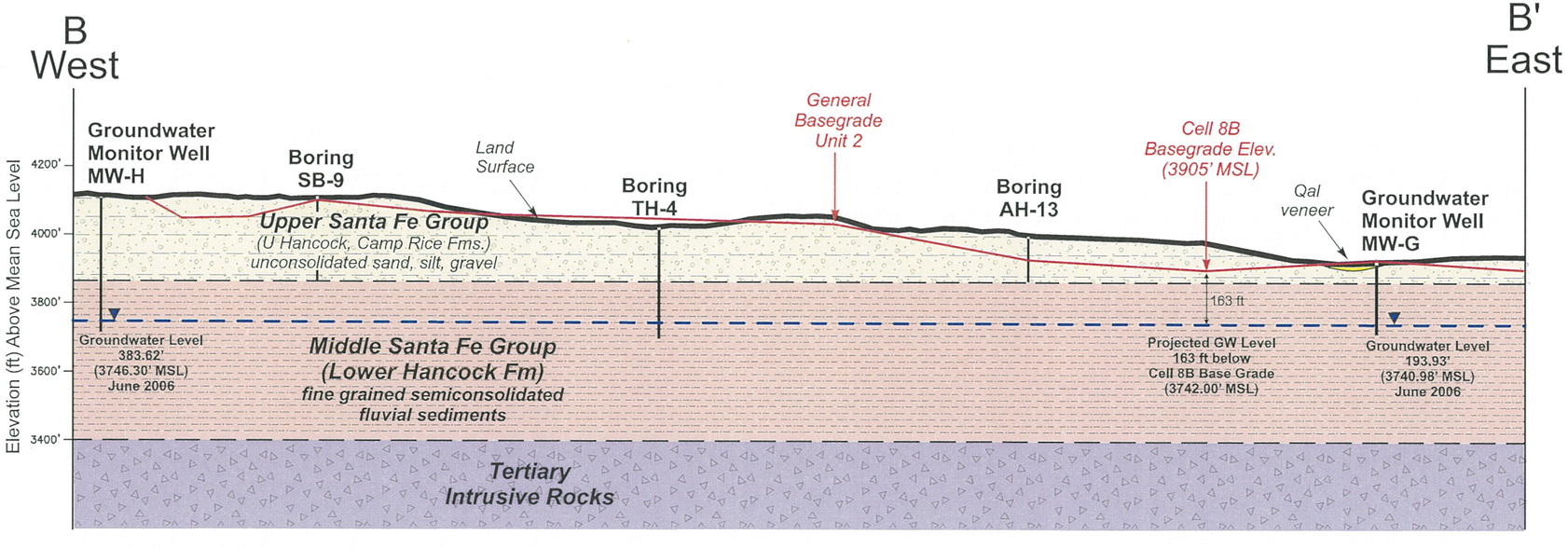
As discussed in Section 3.5.1, the Lower Fort Hancock Formation is predominately fine-grained, with interbedded sands and low-permeability silts. Locally confined or semi-confined conditions are present in shallow water-bearing zones at CRLF. During drilling of monitoring well MW-D, groundwater saturation was encountered at a depth of 390 fbgs beneath a 10-foot plastic silt. The static water level in the well rose to a depth of 380 fbgs, indicating (at least locally) confined or semi-confined conditions. A northeasterly groundwater flow direction and gradient (see **Volume V, Section 2**) has been consistently documented from site monitoring data since 1992. The average hydraulic gradient calculated from water level data from 1992-2006 (GEI, 2006) was approximately 0.002 foot per foot (ft/ft). More recent gradient data (Carel, 2018, 2019) indicate similar gradient direction and slope of 0.0016 ft/ft.

Using geotechnical values from on-site drilling and testing, DBS&A (1996) estimated a saturated hydraulic conductivity on the order of 10^{-3} centimeters per second (cm/sec) for the

shallow water-bearing zone at the site. This estimate was based on the assumption that vertical and horizontal conductivities were approximately equal. GEI (2006) estimated that the horizontal groundwater flow velocity beneath the site was approximately 0.038 feet per day (13.7 feet per year) based on the following assumptions:

- Site-specific saturated hydraulic conductivity of 1×10^{-3} cm/s
- An estimated effective porosity of 0.15
- An average groundwater gradient of 0.002 ft/ft (1992-2006)





Modified from: Gordon Environmental, 2006

NOTES:

1. SEE FIGURE V.1.6 FOR CROSS–SECTION LOCATIONS.
2. ALL WATER LEVEL MEASUREMENTS RECORDED IN JUNE 2006.
3. SEE FIGURES IV.1.5 AND V.2.2 FOR GROUNDWATER ELEVATION DATA.
4. NOT TO SCALE

SITE HYDROGEOLOGIC CROSS SECTIONS

CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO

GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd. NE
Suite 400
Rio Rancho, NM 87124
505-867-6990

DATE: 12/8/19	CAD:	PROJECT #: 010087.19	FIGURE V.1.9
DRAWN BY: LCK	REVIEWED BY: MJC		
APPROVED BY: CWF	www.team-psc.com		

4.0 BOREHOLE PLUGGING CERTIFICATION

The undersigned certifies that the Unit 4 site characterization boreholes drilled by Construction Quality Control Inc., were properly plugged and abandoned, as documented in **Attachment V.1.D,** in accordance with the following:

- 20.9.3.8.C.10 NMAC of the New Mexico Solid Waste Management Regulations
- New Mexico State Engineer's Office (1995) Rules and Regulations Governing Drilling of Wells and Appropriation and Use of Groundwater in New Mexico

L. Clay Kilmer, P.G.
Gordon Environmental-PSC, Inc.

2/19/2020
Date

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ATTACHMENT V.1.A.1

Unit 4 2019 Boring Logs

GORDON ENVIRONMENTAL PSC

333 Rio Rancho Blvd.
Rio Rancho, NM 87124
505.867.6990

Geotechnical Boring Log - Boring 4-1

SITE NAME AND LOCATION: name and location

CAMINO REAL LANDFILL, SUNLAND PARK, NM

NORTHING: 31.79033° North
EASTING: 106.587130° West
DATUM: amsl
ELEVATION:

DRILLING METHOD: **HOLLOW-STEM AUGER - 8-inch OD**

SAMPLING METHOD: 1.0-inch x 18 inch split spoon, Shelby Tube, California Sampler

BORING NO. **Area 4 Boring 1**

SHEET 1 of 1

							DRILLING START	DRILLING FINISH
WATER LEVEL								
TIME								
DATE							DATE	DATE
CASING DEPTH								

DRILL RIG:
ANGLE: 90 BEARING: -

SURFACE CONDITIONS: Unimproved dirt

DEPTH IN FEET (ELEVATION)	GEOTECHNICAL TEST SAMPLE DETAILS		SAMPLE NUMBER AND DESCRIPTION OF MATERIAL (i.e., angularity, moisture, HCL reaction, cementation, max. particle size, gravel/cobble hardness, odor, interbeds, lam.)	% OVERSIZE	% GRAVEL	% SAND	% FINES	PLASTICITY (np, l, m, h)	SPLIT SPOON SAMPLE INTERVAL	SPLIT SPOON BLOW COUNTS (6")	COMMENTS
---		**SW**	Sand, fine to medium grained dull orange, 7.5 YR 7/4, slightly moist.			90	10	NP	0-1.5'	2//2/3	

---	(2) 5 gallon grab samples 5'-10'	**SW**	Sand, fine to medium grained dull orange, 7.5 YR 7/4, Moist			90	10	NP	5-6.5'	4/9/11	

----10	Shelby tube 10'-11'4"	**SM**	Silt, sandy, fine grained, orange, 7.5 YR 7/6			50	50	M	N/A	N/A	

---		**ML**	Silt, very fine grained, dull yellow orange 10 YR 6/4, Moist			15	85	M	15-16.5'	9/10/13	

----20											
---		**ML**	Silt, very fine grained mottled dull orange yellow A.A. bluish grey N7/1, Moist.			15	85	M	20-21.5'	6/7/12	

---		**SW**	Sand, very fine, dull orange 7.5 YR 7/3, slightly moist.			95	5	NP	25-26.5'	12/22/35	

----30											
---		**SW**	Sand, fine to medium grained, grey 7.5 YR 7/3, slightly moist.			95	5	NP	30-31.5'	19/26/25	

---		**SW**	Sand, fine to medium grained, grey 7.5 YR 7/3, slightly moist.			95	5	NP	35-36.5'	19/30/35	

----40		**SM**				85	15	L			
---		**SW**	Bedded, fine grained, as above, slightly moist.			95	5	NP	40-41.5'	12/10/47	

---		**SW**	Sand, fine to medium grained, light grey 10 YR 8/2, very slightly moist.			90	10	NP	45-46.5	31/50/55	

----50		**SW**	Sand, fine grained, light grey 7.5 YR 8/2, dry.			95	5	NP	50-51.5'	23/33/36	
---	(2) 5 gallon grab samples 50'-55'	**ML**	Silt, very fine grained, brown 7.5 YR 6/3, slightly moist.			20	80	M	55-56.5	10/18/29	
---	Shelby tube 56.5'-58'9"								N/A	N/A	

----60		**SP**	Sand, fine grained, light yellow 7.5 YR 8/3, slightly moist			85	15	L	60-61.5'	23/26/26	

---		**SP**	Sand, fine to medium grained, dull orange 7.5 YR 6/4, slightly moist.			85	15	NP	65-66.5'	14/38/45	

----70		**SP**	Sand, fine grained, light grey 10 YR 8/2, dry.			85	15	NP	70-71.5'	21/34/50+	

---		**SP**	Sand, fine grained, light grey 10 YR 8/2, dry.			90	10	NP	75-76.5'	15/22/19	

----80		**SM**	Sand, fine grained, light grey 10 YR 8/2, dry.			85	15	NP	80-81.5'	26/33/32	

---		**SM**	Sand, fine grained, light grey 10 YR 8/2, slightly moist.			85	15	NP	85-86.5'	17/49/45	

----90		**SM**	Sand, fine grained, light grey 10 YR 8/2, dry.			85	15	NP	90-91.5'	64/52/52	

---		**SW**	Sand, fine grained, light yellow 10 YR 8/3, dry.			95	5	NP	95-96.5'	23/40/54	

----100		**SM**	Sand silty, fine to medium grained, dull orange 5 YR 6/4, slightly moist.			80	20	M	100-101.5'	26/23/58	

----110									110-111.5'		

----120									120-121.5'		

DRILLING CONTRACTOR: CONSTRUCTION QUALITY CONTROL

LOGGED BY: CLAY KILMER

DATE: 12/12/2019

JOB NO.: 0089.19

FILE NAME: WEAVER CAMINO REAL GEOTECH

GORDON ENVIRONMENTAL PSC
333 Rio Rancho Blvd.
Rio Rancho, NM 87124
505.867.6990

Geotechnical Boring Log - Boring 4-2

SITE NAME AND LOCATION: name and location

CAMINO REAL LANDFILL, SUNLAND PARK, NM

NORTHING: 31.787528° North
EASTING: 106.589159° West
DATUM: amsl
ELEVATION:

DRILLING METHOD: **HOLLOW-STEM AUGER - 8-inch OD**

SAMPLING METHOD: 1.0-inch x 18 inch split spoon, Shelby Tube, California Sampler

BORING NO. **Area 4 Boring 2**

SHEET 1 of 1

		DRILLING START	DRILLING FINISH
WATER LEVEL			
TIME			
DATE	DATE	DATE	DATE
CASING DEPTH			

DRILL RIG:
ANGLE: 90 BEARING: -

SURFACE CONDITIONS: Unimproved dirt

DEPTH IN FEET (ELEVATION)	GEOTECHNICAL TEST SAMPLE DETAILS	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL (i.e., angularity, moisture, HCL reaction, cementation, max. particle size, gravel/cobble hardness, odor, interbeds, lam.)		% OVERSIZE	% GRAVEL	% SAND	% FINES	PLASTICITY (np, l, m, h)	SPLIT SPOON SAMPLE INTERVAL	SPLIT SPOON BLOW COUNTS (6")	COMMENTS
---		**SP**	Sand, fine grained, dull orange 5 YR 6/4, slightly moist.			90	10	NP	0-1.5'	2/5/5	

---		**SP**	Sand, fine grained, grey 5 YR 7/2, dry.			90	10	NP	5-6.5'	12/14/23	

----10		**SM**	Sand, fine grained, dull orange 7.5 YR 7/4, slightly moist.			85	15	L	10-11.5'	18/14/22	

---		**SM**	Sand silty, fine grained, brown 7.5 YR 6/3, moist.			70	30	M	15-16.5'	6/11/21	

----20		**SW**	Sand, fine to medium grained, grey 7.5 YR 8/2, dry.			90	5	NP	20-21.5'	13/28/42	

---		**SW**	Sand, fine to medium grained, grey 7.5 YR 8/2, dry.			90	10	NP	25-26.5'	20/34/42	

---		**SW**				90	10				
----30		**ML**	Sand/Silt, fine grained, orange 7.5 YR 6/6, dry.			50	50	M	30-31.5'	21/25/25	

---		**ML**	Sand/silt, fine grained, dull orange 7.5 YR 7/3, slightly moist.			50	50	L	35-36.5'	10/17/20	

----40		**ML**	Sand/Silt, very fine grained, light grey 10 YR 8/2, dry.			65	35	NP	40-41.5	13/35/54	

---		**SP**	Sand, very fine grained, light yellow 10 YR 8/2, dry.			90	10	NP	45-46.5'	20/33/49	

----50		**SP**	Sand, fine to medium grained, light yellow 10 YR 8/2, dry.			95	5	NP	50-51.5'	18/25/30	

---		**SP**	Sand, fine grained, light grey 10 YR 8/1, dry.			90	10	NP	55-56.5'	14/25/36	

----60		**SW**	Sand, fine grained, light yellow 10 YR 8/1, dry.			95	5	NP	60-61.5'	24/30/35	

---	California Sample	**CL**	Brown 10 YR 6/8, dry, California sample intervals 65-65.5', 56.5-66', 66-66.6'			15	85	H	N/A	N/A	

----70	5 gal grab sample	**ML**	Silt/sand, fine grained, light yellow 7.5 YR 8/3, slightly moist.			50	50	M	70-71.5'	17/29/32	

---	(2) 5 gal grab	**CL**	Sandy, brown 10 YR 6/8, slightly moist			15	85	H	75-76.5'	10/14/22	
---	samples 75-90'										

----80		**SM**	Silty, fine grained, light grey 10 YR 8/2, dry.			85	15	NP	80-81.5'	24/27/42	

---		**SM**	Silty, fine grained, light grey 10 YR 7/2, dry.			80	20	NP	85-86.5'	22/54/56	

----90		**SW**	Fine to medium grained, light grey 10 YR 8/2, dry.			95	5	NP	90-91.5'	4/6/19	

---		**SM**	Fine to medium grained, light yellow 10 YR 8/3, dry.			85	15	NP	95-96.5'	6/8/23	

----100	Shelby tube 100'-101'3"	**SM**	Fine to medium grained, light yellow 10 YR 8/3, dry.					NP	N/A	N/A	

----110											

----120											

DRILLING CONTRACTOR: CONSTRUCTION QUALITY CONTROL

LOGGED BY: CLAY KILMER

DATE: 12/13/2019

JOB NO.: 0089.19

FILE NAME: WEAVER CAMINO REAL GEOTECH

GORDON ENVIRONMENTAL PSC
333 Rio Rancho Blvd.
Rio Rancho, NM 87124
505.867.6990

Geotechnical Boring Log - Boring 4-3

SITE NAME AND LOCATION: name and location

CAMINO REAL LANDFILL, SUNLAND PARK, NM

NORTHING: 31.785449° North
EASTING: 106.589476° West
DATUM: amsl
ELEVATION:

DRILLING METHOD: **HOLLOW-STEM AUGER - 8-inch OD**

SAMPLING METHOD: 1.0-inch x 18 inch split spoon, Shelby Tube, California Sampler

BORING NO. **Area 4 Boring 3**

SHEET 1 of 1

							DRILLING START	DRILLING FINISH
WATER LEVEL								
TIME								
DATE							DATE	DATE
CASING DEPTH								

DRILL RIG:
ANGLE: 90 BEARING: -

SURFACE CONDITIONS: Unimproved dirt

DEPTH IN FEET (ELEVATION)	GEOTECHNICAL TEST SAMPLE DETAILS		SAMPLE NUMBER AND DESCRIPTION OF MATERIAL (i.e., angularity, moisture, HCL reaction, cementation, max. particle size, gravel/cobble hardness, odor, interbeds, lam.)	% OVERSIZE	% GRAVEL	% SAND	% FINES	PLASTICITY (np, l, m, h)	SPLIT SPOON SAMPLE INTERVAL	SPLIT SPOON BLOW COUNTS (6")	COMMENTS
---		**SW**	Sand, fine grained, slightly silty, dull orange 5 YR 6/4, slightly moist.			95	5	NP	0-2'	4/5/10	

---			Caliche, soft light orange 10 YR 8/4, slightly moist.		85	10	5	NP	5-6.5'	14/12/13	

----10			Softer, transition to sand, fine, dry.					NP	10-11.5'	8/10/42	

---		**SW**	Sand, fine, silty, grey 5 YR 8/8, dry.			85	15	NP	15-16.5'	9/7/50+	

----20		**SM**	Sand silty, fine grained, light grey 5 YR 8/1, dry.			80	20	NP	20-21.5'	22/15/50+	

---		**SM**	Sand silty, fine grained, light grey 5 YR 8/1, dry.					NP	25-26.5'	12/15/24	

----30		**SC, SM**	Interbedded, course sand 10 YR 7/2, slightly moist.			75	25	L	30-31.5'	19/7/8	

---		**SP**	Gravelly sand, medium grained, pale orange 5 YR 8/3, dry.		15	75	10	NP	35-36.5'	16/18/50+	

----40		**SW**	Sand slightly silty, fine grained, light yellow 10 YR 8/4, dry.			90	10	NP	40-41.5'	33/19/33	

---		**SC, SM**	Bedded, fine grained, light orange 10 YR 8/6, dry.			85	15	L	45-46.5	39/11/21	

----50		**SW**	Sand, medium to course grained, dull orange 7.5 YR 7/4, dry.			95	5	NP	50-51.5'	7/15/19	

---		**SW**	Sand, Medium grained, light yellow 10 YR 8/3, dry, $CaCO_3$ Laminae.			90	10	NP	55-56.5	14/13/27	

----60		**SW**	Sand, medium grained, light yellow 10 YR 8/3, dry.			95	5	NP	60-61.5'	42/35/50	

---		**SW**	Sand, fine grained, light grey 10 YR 8/2, dry.			95	5	NP	65-66.5'	33/20/33	

----70		**SM**	Silty sand, fine grained, dull orange 7.5 YR 7/6, slightly moist.			65	35	L	70-71.5'	35/15/20	

---		**ML**	Sandy silt, fine grained, orange 7.5 YR 6/6, slightly moist.			50	50	M	75-76.5'	24/25/29	
---	Shelby tube 76.5'-77.75'								N/A	N/A	

----80		**SM**	Silty sand, fine grained, light yellow 7.5 YR 8/3, slightly moist.			80	20	L	80-81.5'	18/25/29	

---		**SM**	Silty sand, very fine grained, light grey 10 YR 8/1, dry.			85	15	NP	85-86.5'	28/23/49	

----90		**SM**	Silty sand, very fine grained, light grey 10 YR 8/1, dry.			85	15	NP	90-91.5'	18/21/26	

---		**SW**	Sand, fine grained, light grey 10 YR 8/1, dry.			95	5	NP	95-96.5'	24/31/36	

----100		**SW**	Sand, fine to medium grained, grey 7.5 YR 8/2, dry.			95	5	NP	100-101.5	14/26/40	

---		**SW**	Sand, fine grained, light grey, 7.5 YR 8/1, dry.			90	10	NP	105-106.5	23/19/30	

----110		**SP**	Sand, fine grained, light grey 7.5 YR 8/1, dry.			90	10	NP	110-111.5	18/27/32	

---		**SP**	Sand, fine to medium grained, light grey 7.5 YR 8/1, dry.			80	20	NP	115-116.5	16/30/35	

---	Shelby tube 120'-120.75'										
----120		**SP**	Sand, fine grained, light grey 7.5 YR 8/1 dry.			85	15		N/A	N/A	

DRILLING CONTRACTOR: CONSTRUCTION QUALITY CONTROL

LOGGED BY: CLAY KILMER

DATE: 12/11/2019

JOB NO.: 0089.19

FILE NAME: WEAVER CAMINO REAL GEOTECH

ATTACHMENT V.1.A.2

Monitor Well and Soil Boring Logs

1988-2005

Summary of Wells and Borings Prior to 1995

Table 1-1. Summary of Data for Wells and Borings from Previous Site Investigations at Camino Real Landfill

Well No.[a]	Boring No.[b]	Location (Old Grid)		Location (New Grid)		Ground Surface (fsml)	Completion Date	Boring Depth (ft bgs)	Well Depth (ft bgs)	Screen Length (ft)
		Northing	Easting	Northing	Easting					
MW-A	---	22+50	16+50	41+50	16+50	3929.1	01/28/88	400.0	400.0	80.0
MW-B	---	18+00	31+00	37+00	31+00	3897.6	08/22/90	206.0	190.0	40.0
MW-C	---	9+50	46+00	28+50	46+00	3889.0	08/25/90	186.0	180.0	40.0
MW-D	---	(15+00)	5+00	4+00	5+00	4130.0	01/28/91	450.0	430.0	40.0
MW-S	---	1+00	27+00	20+00	27+00	3894.0	11/19/90	186.0	186.0	40.0
---	B-1	18+00	31+00	37+00	31+00	3894.9	09/24/90	116.5	---	---
---	B-2	10+00	46+00	29+00	46+00	3886.2	09/25/90	100.0	---	---
---	B-3	5+00	30+00	24+00	30+00	3908.0	09/27/90	51.5	---	---
---	B-4	17+00	15+00	36+00	15+00	3938.4	09/28/90	56.5	---	---
---	B-5	28+00	17+00	47+00	17+00	3892	09/31/90	61.5	---	---
---	TH-1	NA	NA	14+00	35+00	3911	01/25/91	220	---	---
---	TH-2	NA	NA	14+00	35+00	3967	01/26/91	300	---	---
---	TH-3	NA	NA	4+00	18+00	3997	01/25/91	300	---	---
---	TH-4	NA	NA	21+00	15+00	4060	01/31/91	351	---	---

MW = Ground-water monitor well
B = Soil boring
TH = Test hole
AH = Auger boring
G = Gas probe
SB = Soil boring
M = Methane monitor well

NA = Not available
--- = Does not apply

Data source: Weaver Boos Consultants, Inc.

J:\5260\PERMIT.N95\WLS&BORS.N95

Table 1-1. Summary of Data for Wells and Borings from Previous Site Investigations at Camino Real Landfill

Well No.[a]	Boring No.[b]	Location (Old Grid)		Location (New Grid)		Ground Surface (fsml)	Completion Date	Boring Depth (ft bgs)	Well Depth (ft bgs)	Screen Length (ft)
		Northing	Easting	Northing	Easting					
---	TH-5	NA	NA	34+00	4+00	3963	01/24/91	251	---	---
---	TH-6	NA	NA	50+00	14+00	3927	02/01/94	261	---	---
---	AH-6	19+00	31+00	38+00	31+00	3897	01/30/91	94.0	---	---
---	AH-7	(1+00)	26+00	18+00	26+00	3930.6	01/31/91	75.0	---	---
Old Well 1	---	NA	NA	NA	NA	NA	NA	NA	NA	NA
Old Well 2, 29S.3E.12.331	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Well 29S.3E.13.223	NA	NA	NA	NA	NA	3920	NA	452.0	390.0	20.0
G-1	---	9+00	47+00	28+00	47+00	NA	NA	190.0	NA	NA
G-2	---	14+00	38+00	33+00	38+00	NA	NA	NA	NA	NA
G-3	---	19+00	31+00	38+00	31+00	NA	NA	NA	NA	NA
G-4	---	24+00	24+00	43+00	24+00	NA	NA	NA	NA	NA

MW = Ground-water monitor well
B = Soil boring
TH = Test hole
AH = Auger boring
G = Gas probe
SB = Soil boring
M = Methane monitor well

NA = Not available
--- = Does not apply

Data source: Weaver Boos Consultants, Inc.

J:\5260\PERMIT.N95\WLS&BORS.N95

Revised June 197

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Sunland Park NuMex Landfill Owner's Well No. _____
Street or Post Office Address P. O. Box 580
City and State Sunland Park, NM 88063

Well was drilled under Permit No. LRG 6726 and is located in the:

a. _____ ¼ NW ¼ SE ¼ SW ¼ of Section 12 Township 29S Range 3E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor LarJon Drilling Company License No. 611

Address P. O. Box 925 Mesilla Park, New Mexico 88047

Drilling Began 1/20/88 Completed 1/28/88 Type tools Mud Rotary Size of hole 12-1/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 400 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 212 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
322	400	78	Sand & Sandy Clay	180

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
8	Steel		0	300	300	-	-	-
6	PVC		0	400	400		320	400

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	300	12-1/4	40	150	Pump
300	400	7-7/8	5 gal. Polymer		Pump

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received May 3, 1988

Quad _____ FWL _____ FSL _____

File No. LRG-6726 V.1.A.2-5 Use CLOW 29S.3E.12.341

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	8	8	Blow Sand
8	49	41	Pink Sandy Clay
49	55	6	Clay
55	64	9	Sandy Clay
64	102	38	Sand
102	111	9	Tight Clay
111	204	93	Sandy Clay
204	208	4	Tight Clay
208	285	77	Sandy Clay
285	288	3	Tight Clay
288	313	25	Sandy Clay
313	320	7	Sand
320	322	2	Clay
322	340	18	Sandy Clay
340	347	7	Sand
347	376	29	Sandy Clay
376	392	16	Sand
392	400	8	Sandy Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

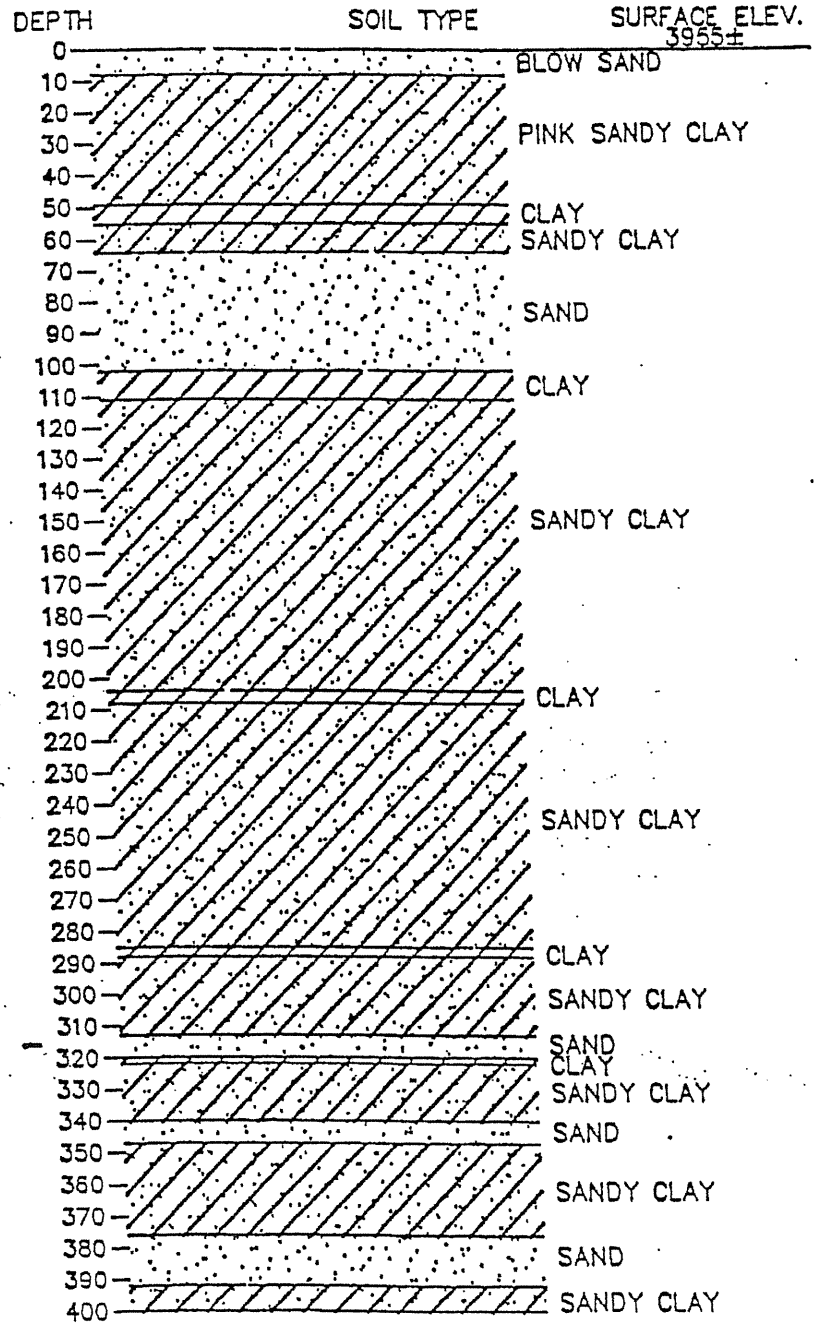
The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the abo described hole.

Barry Johnson
Driller

EXHIBIT 5

LOG OF NUMEX LANDFILL WELL "A"

NW 1/4, SE 1/4, SW 1/4 SEC.12 29S 3E NMPM.



611-070

LOG OF WELL-B

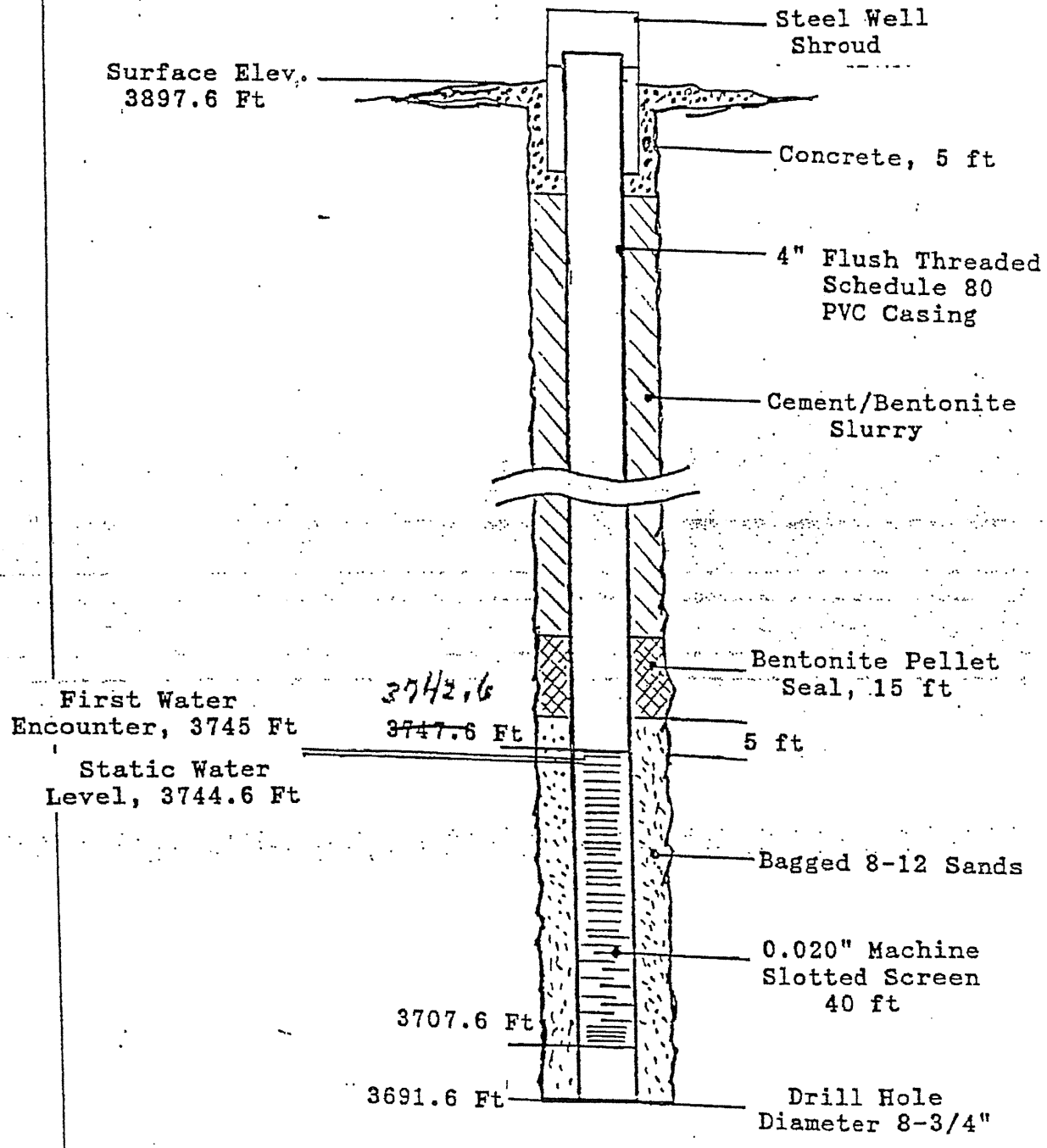
Location: Grid 18N, 31E
Surface Elevation: 3895.2 ft

Name: New Well B
Date: 08-22-90

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	30	30	Sand - tan, fine
30	40	10	Clay - brown
40	59	19	Sand - tan, silty
59	90	31	Sand and Clay
90	110	20	Clay and Sand - with some sandstone
110	126	16	Clay - brown, tight
126	157	31	Clay and Sand - with some sandstone
157	168	11	Sand - tan, coarser, water
168	170	2	Clay - brown, tight
170	184	14	Clay and Sand
184	206	22	Sand and Clay
			206 ft. total depth

Nu-Mex Landfill Ground Water Monitoring Well Details

Well-B



LOG OF WELL-C

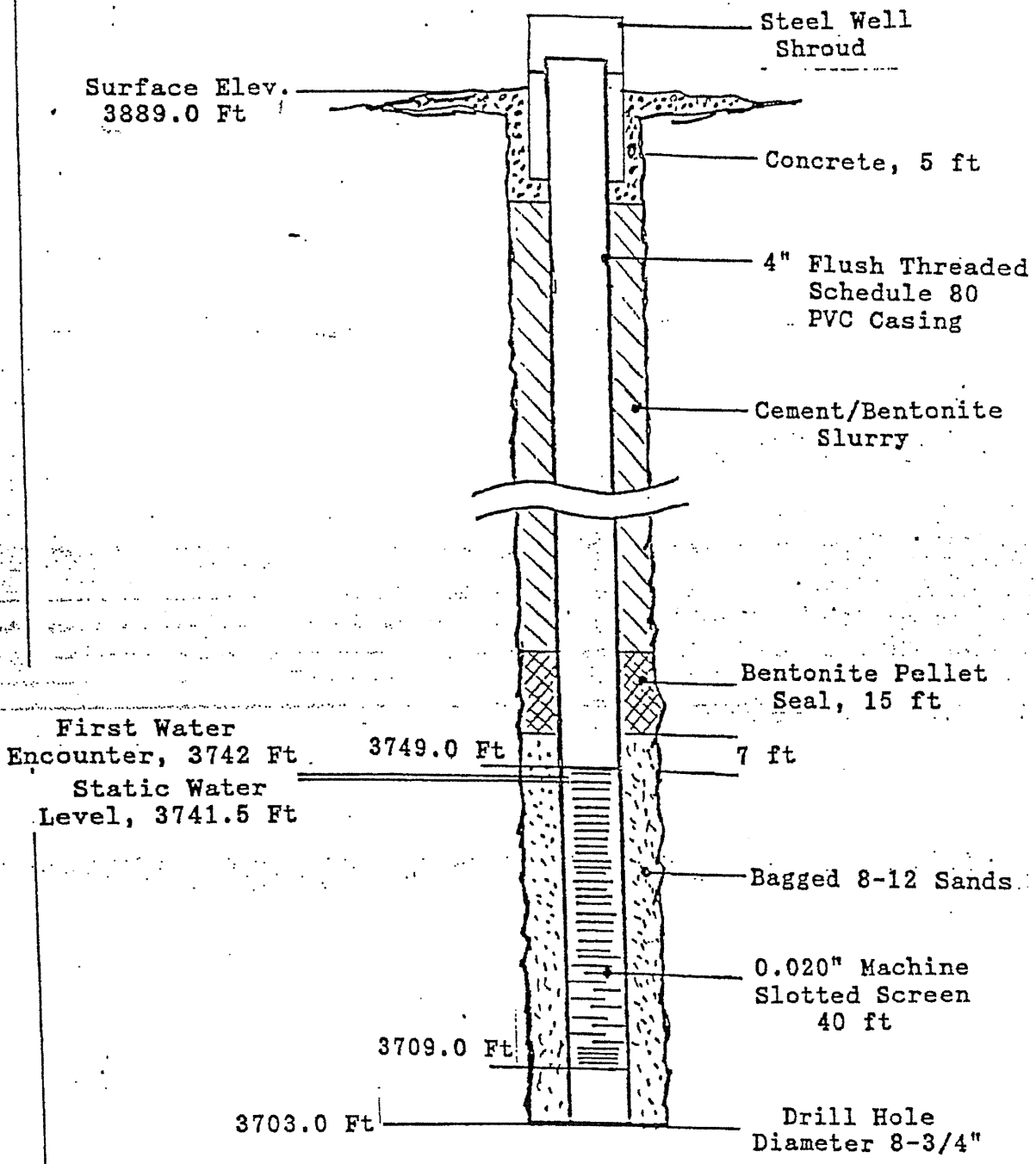
Location: Grid 10N, 46E
Surface Elevation: 3886.0 ft

Name: New Well C
Date: 08-25-90

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	26	26	Sand - tan, fine
26	55	24	Sand and Clay - interbedded layers
55	80	25	Sand - grey, with few clay layers
80	95	15	Clay and Sand
95	113	18	Clay - brown, tight
113	147	34	Clay and Sand
147	160	13	Sand - white, with some sandstone, water
160	185	25	Sand and Clay
			185 ft total depth

Nu-Mex Landfill Ground Water Monitoring Well Details

Well-C



LOG OF WELL D

Location: Grid 15S, 5E
Surface Elevation: 4128 ft

Name: New Well D
Date: 01-28-91

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	3	3	Top soil
3	8	5	Caliche - duracrust
8	25	17	Sand
25	31	6	Clay
31	44	13	Sandy Clay
44	65	21	Sand
65	90	25	Sand and Clay
90	140	50	Sandy Clay
140	155	15	Sand
155	176	21	Clay with some sand
176	206	30	Sand
206	226	20	Clay
226	235	9	Sand
235	242	7	Clay
242	255	13	Sand and Clay
255	265	10	Clay
265	280	15	Sand and Clay
280	293	13	Clay
293	305	12	Sand
305	311	6	Clay
311	320	9	Sand

LOG OF WELL D

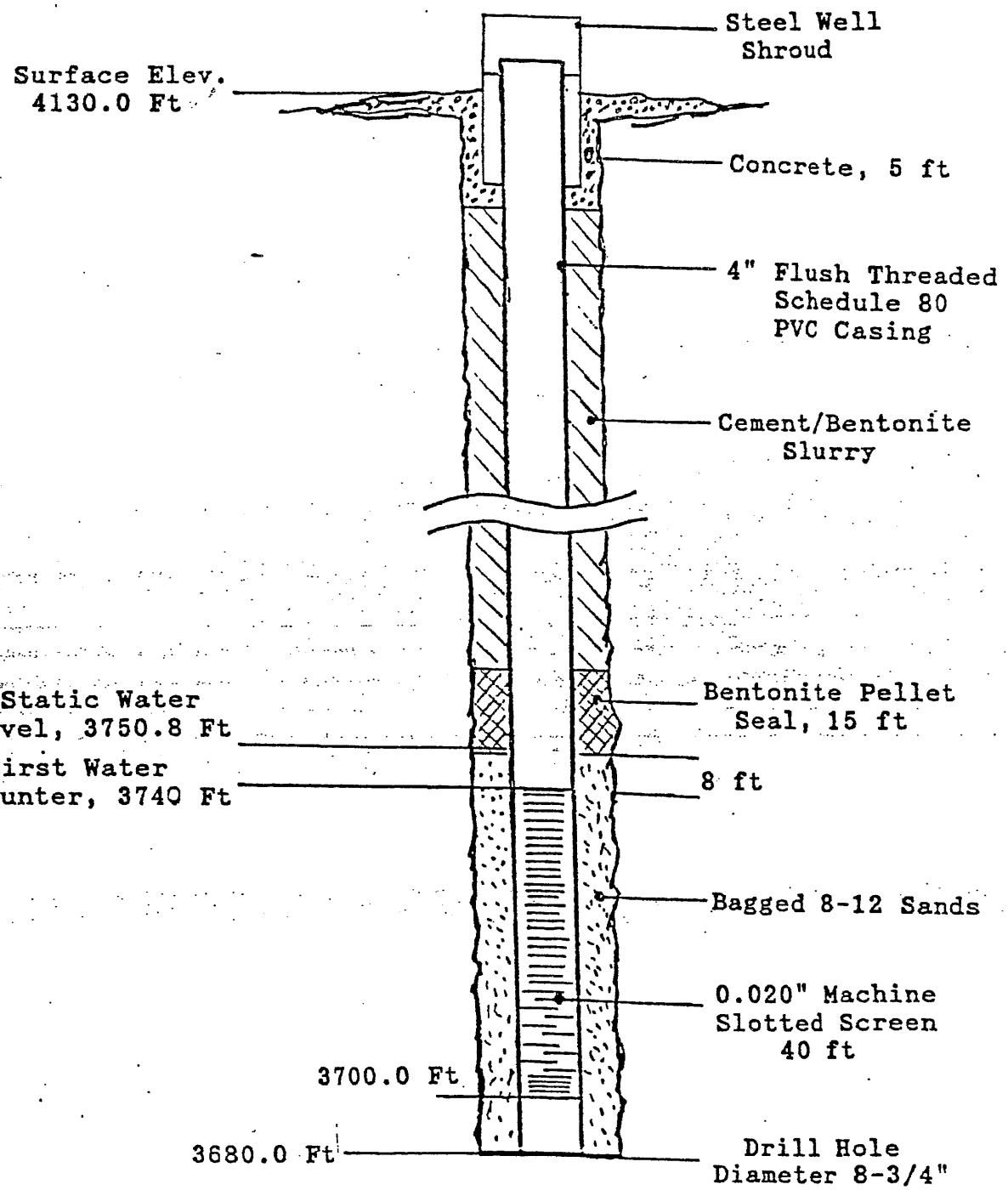
Location: Grid 15S, 5E
Surface Elevation: 4128 ft.

Name: New Well D
Date: 01-28-91

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
320	330	10	Clay
330	340	10	Sand
340	350	10	Hard Clay
350	370	20	Sand
370	396	26	Hard Clay
396	412	16	Sand
412	420	8	Sand and Clay
420	423	3	Clay
423	441	18	Sand and some clay
441	443	3	Clay
443	450	7	Sand
			450 feet total depth

Nu-Mex Landfill Ground Water Monitoring Well Details

Well-D



LOG OF WELL-S

Location: 1N, 27E Sludge Area Name: New Well S
Surface Elevation: 3894 ft Date: 11-19-90

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	17	17	Sand - tan, fine, silty
17	20	3	Clay - brown
20	22	2	Sand - fine with sandstone
22	30	8	Sand - tan
30	57	27	Sand and Clay - interbedded
57	66	9	Clay - brown, very tight
66	96	30	Sand - tan, slightly coarser
96	100	4	Clay - brown
100	110	10	Sand - white, with some sandstone
110	117	7	Sand and Clay - interbedded
117	125	8	Clay - brown, very tight
125	150	25	Sand - Slightly coarser
150	154	4	Clay - brown, tight, water
154	185	31	Sand - with some clay and sandstone
185	186	1	Clay - brown, very tight
			186 ft. total depth

LOG OF WELL-S

Location: 1N, 27E Sludge Area Name: New Well S
Surface Elevation: 3894 ft Date: 11-19-90

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	17	17	Sand - tan, fine, silty
17	20	3	Clay - brown
20	22	2	Sand - fine with sandstone
22	30	8	Sand - tan
30	57	27	Sand and Clay - interbedded
57	66	9	Clay - brown, very tight
66	96	30	Sand - tan, slightly coarser
96	100	4	Clay - brown
100	110	10	Sand - white, with some sandstone
110	117	7	Sand and Clay - interbedded
117	125	8	Clay - brown, very tight
125	150	25	Sand - slightly coarser
150	154	4	Clay - brown, tight, water
154	185	31	Sand - with some clay and sandstone
185	186	1	Clay - brown, very tight
			186 ft. total depth

--SUMMARIZED LITHOLOGIC LOG FOR WELL 23S.3E.13.223

(Surface Elevation: 3920 feet)

FORMATION	THICKNESS (feet)	DEPTH (feet)
Sand, fine to meduim grained, rounded-to well-rounded, well sorted, clear and colorless quartz grains with few dark igneous rock fragments, some hornblende, mica, and biotite present. Large fragments of a very hard caliche present.	24	0-24
Clay, light brown (5 YR 6/4), very soft, stickey, very soluble, trace of very-fine, well-rounded, quartz sand. Some caliche present.	16	24-40
Clay, and sand. Light brown (5 YR 6/4), same as before and a dark yellowish-brown (10 YR 4/2) clay. Clay +80%. Sand, fine-to medium-grained, rounded to well-rounded mostly quartz sand with some darker igneous rock grains, +20%.	86	40-126
Sand and clay. Clay same as last interval. Sand now in the very fine to fine grained size range.	90	126-216
Sand and clay, sand +50%, fine to medium grained, rounded-to well-rounded colorless quartz sand. Clay, same as before, +(50%). Trace of caliche, (dendrites of pyrolusite on caliche and clay fragments at top of interval). Trace of well-rounded, small gravel. Some mica flakes. Calcareous. Slichtly more clay present from 385-452', another clay also present, a moderate brown (5 YR 4/4) clay.	236	216-452

(Source: New Mexico Water Resources Research Institute, Las Cruces, New Mexico)

LOG OF BORING #1

Location: Grid 18N, 31E
Surface Elevation: 3894.9 ft

Boring No.: 1
Date: 9-24-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0	grab			Sand - light brown, dry, fine
5-6.5	ss	A-1	9-10-14	Sand - light brown, dry, fine, medium dense
10-11.5	ss	A-2	5-6-9	Sand - light brown, dry, fine, medium dense
15-16.5	ss	A-3	10-12-18	Sand - light brown, damp, fine, dense, bottom 1" silty
20-21.5	ss	A-4	12-25-45	Silty Sand - light brown, damp, very dense
25-26.5	ss	A-5	13-27-47	Sand - white, dry, fine, very dense
29				Harder drilling
30-31.5	ss	A-6	12-24-26	Clay - brown, damp, stiff
35-36.5	ss	A-7	8-12-32	Clay - brown, dry, stiff bottom 3" silty
39				Softer drilling
40-41.5	ss	A-8	21-32-35	Silty Sand - light brown, dry, very dense
42-43				Harder drilling - possibly clay
45-46.5	ss	A-9	25-36-50	Sand - grey, fine, dry, very dense
50-51.5	ss	A-10	18-34-50	Sand - grey, dry, slightly coarser very dense
55-56.5	ss	A-11	15-35-50	Sand - grey, dry, fine, bottom 2" silty, very dense
60-61.5	ss	A-12	18-22-37	Sand/Clay - distinct layers, dry 1" sandstone
65-66.5	ss	A-13	18-34-50 (4")	Clay - top 3", brown, dry Sand - 6", dry, grey, fine Silty Clay - 3", dry, brown
70-71.5	ss	A-14 (a) (b)	8-23-33 split sample	Clay - brown, damp, 4" in top Sand - grey, dry, coarse, dense
75-76.5	ss	A-15	12-22-25	Sand - grey, dry, dense Clay - brown, dry, bottom 3"
80-81.5	ss	A-16	21-49-50 (5")	Sand - grey, dry, fine, 3" silty layer in middle very dense
85-86.5	ss	A-17	16-44-47	Sand - white, dry, fine, 3" clay in center, sandstone

LOG OF BORING #1 (Cont'd)

Location: Grid 18N, 31E Boring No.: 1
Surface Elevation: 3894.9 ft Date: 9-24-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
89				Harder drilling
90-91.5	ss	A-18	17-33-26	Clay - brown, damp, stiff 4" silty sand in center
93.5				Easier drilling
95-96.5	ss	A-19	8-50 (4")	Clay - brown, damp, 6" Sandstone - fine grained 1"
100 - 101.5	ss	A-20	45-50 (2")	Clay - brown, damp, 3" Silty Sand - white, damp, 3" Sandstone - fine, white, 1"
105-106.5	ss	A-21	47-50 (3")	Sand - white, dry, fine
107				Hard drilling
110-11.5	ss	A-22	18-24-29	Clay - brown, moist, stiff
115-116.5	ss	A-23	13-19-33	Clay - brown, moist, stiff
116.5				Total depth - auger refusal

LOG OF BORING #2

Location: Grid 10N, 46E — Boring No.: 2
Surface Elevation: 3886.2 ft — Date: 9-25-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 5	cont	B-1		Silty Sand - tan, dry
5 - 10	cont	B-2		Silty Sand - tan, dry, some fine gravel
10 - 15	cont	B-3		Silty Sand - tan, dry, no gravel
15 - 20	cont	B-4		" " " " " "
20 - 25	cont	B-5		" " " " " "
25 - 30	cont	B-6		Silty Sand - tan, dry, 1" sand-stone and 2" clay in center
30 - 35	cont	B-7		Silty Sand - grey, fine, dry
35 - 40	cont	B-8		Sand - grey, fine, dry, 6" silt layer in center
40 - 45	cont	B-9		Silty Sand - grey, fine, dry
45 - 50	cont	B-10		Sand - grey, fine, dry, 6" clay/ silt layer in center
50 - 55	cont	B-11		Silty Sand - grey, fine, dry, bottom 1' silty
55 - 60	cont	B-12		Sand - grey, fine, dry bottom 1' silty
60 - 65	cont	B-13		Sand - grey, slightly coarser, dry bottom 1' silty
65 - 70	cont	B-14		Sand - grey, fine, dry, 6" clay layer in center, bottom 2" sand damp
70 - 75	cont	B-15		Sand - grey, fine, damp, top 1' Silty Clay - brown, damp, mid 1' Silty Sand - white, fine, dry
75 - 80	cont	B-16		Clay - brown, dry, dense, top 1' Sand - white, fine, damp, mid 1' Clay - brown, damp, dense
80 - 85	cont	B-17		Sand - grey, fine, damp Clay - brown, damp, bottom 9"
85 - 90	cont	B-18		Clay - brown, damp, dense, top 1' Sand/clay - fine layers, damp, 2' Sand - grey, fine, wet
90 - 95	cont	B-19	split(a) sample (b)	Sand - grey, fine, wet, with sand-stone lenses, 4" Clay - brown, moist, dense
95 -100	cont	B-20		Clay - brown, moist, dense
100				Total depth - auger refusal

LOG OF BORING #3

Location: Grid 5N, 30E — Boring No.: 3
Surface Elevation: 3908.0 ft — Date: 9-27-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 5	cont	C-1		Sand - tan, fine, damp
5 - 10	cont	C-2		Sand - tan, fine, damp
10 - 15	cont	C-3		Sand - tan, fine, damp caliche 1' in center
15 - 20	cont	C-4		Sand - tan, medium, dry
20 - 25	cont	C-5		Sand - tan, some gravel, no recovery
40-41.5	ss	C-6	14-14-23	Sand - tan, fine, dry, top 4"
40.5				Clay - brown, moist, stiff
45-46.5	ss	C-7	11-17-20	Clay - brown, moist, stiff
49				Sand - easier drilling
50-51.5	ss	C-8	16-28-40	Sand - grey, fine, dry
51.5				Total Depth

LOG OF BORING #4

Location: Grid 17N, 15E
Surface Elevation: 3938.4 ft

Boring No.: 4
Date: 9-28-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 2	grab			Clay - brown, recently deposited
2 - 17	grab			Sand - tan, fine, dry
17 - 19	grab			Clay - brown, dry, silty
20-21.5	ss	D-1	12-26-36	Sand - white, fine, dry, sandstone 2" in center, fine
25-26.5	ss	D-2	25-26-31	Clay - brown, damp, stiff, 4" Sand - grey, dry, dense, 6" Silty Clay - brown, damp
30-31.5	ss	D-3	2-32-50 (plug)	Sand - grey, fine, dry caliche in end
35-36.5	ss	D-4	20-50 (7")	Silty Sand - tan, fine, dry
40-41.5	ss		21-50 (7")	Sand - no sample
45-46.5	ss	D-5	10-15-20	Dendritic Siltstone 1" Clay - brown, damp, dense
47-48				Easier drilling - possibly sand
50-51.5	ss	D-6	26-40-50 (5")	Silty Sand - tan, dry, dense Sand - white, dry, dense, 2" in bottom
55-56.5	ss	D-7	20-39-40 split(a) sample (b)	Clay - brown, damp, top 1' Sand - grey, fine, dry, with 1" clay stringer in center
56.5				Total depth - auger refusal

LOG OF BORING #5

Location: Grid 28N, 17E
Surface Elevation: 3892

Boring No.: 5
Date: 9-31-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 3	grab			Sand - tan, fine, damp
3 - 5	grab			Sand - tan, fine, damp, with caliche
5 - 25	grab			Sand - tan, fine, damp
25-26.5	ss	E-1	10-12-14	Sand - tan, fine, damp, some small gravel, med. dense
34				Harder drilling - possibly clay
35-36.5	ss	E-2	3-5-6(a) split(b) sample	Clay - brown, damp, soft, top 6" Sand - tan, damp, loose
36				Softer drilling - sand
39				Harder drilling - possibly clay
40-41.5	ss	E-3	6-9-15	Clay - brown, damp, silty, moderately stiff
45-46.5	ss	E-4	10-17-22	Clay - brown, moist, stiff
48				Easier drilling - clattering possibly some gravel
50-51.5	ss	E-5	25-32-18	Sandy Silt - brown, dry, 8" Clay - brown, dry, 6" Silt - brown, dry, 4"
55-56.5	ss	E-6	35-35-31	Silty Sand - tan, dry, dense, 1' Clayey Silt - brown, dry, 6"
60-61.5	ss	E-7	50 (6")	Sand - tan, dry, with thin clay layer in center, dense
61.5				Total depth - auger refusal

Amendment 7 of Supplementary to Permit Application
Nu-Mex Landfill, Inc., June 7, 1991

Note: This amendment is to respond to the letter from Mr. William Moats, Geologist III, Permitting and Compliance Section, Solid Waste Bureau of N.M. EID, on May 29, 1991. The letter was received on June 6, 1991.

RE: Tabulated Information for Geological Test Holes at Nu-Mex Landfill

1. Phase I

TH I.D.#	B-1	B-2	B-3	B-4	B-5
Location	18N/31E	10N/46E	5N/30E	17N/15E	28N/17E
Collar Elevation	3894.9'	3886.2'	3908.0'	3938.4'	3892.0'
Drilling Contractor	Southwest Engineering, Inc. for all 5 borings				
Date drilled	9/24/90	9/25/90	9/27/90	9/28/90	9/30/90
Drilling Method	Continuous Flight Hollow Stem Auger				
Sampling Method	SS	Cont	Cont-SS	SS	SS
	(SS: Split Spoon; Cont: Continuous)				
Person Logging Geology	Marvin Magee, Geotechnical Engineer, JOAB, Inc.				
Person Performing Geophysical Logging	Geophysical logging was not performed for these 5 borings.				

1. Phase I (Cont'd)

TH I.D.#	Well-S	Well-B	Well-C
Location	67N/00E	18N/31E	9+50N/46E
Collar Elevation	3894.0'	3895.2'	3886.0'
Drilling Contractor	LarJon Drilling Co., for all three wells		
Date drilled	11/19/90	8/22/90	8/25/90
Drilling Method	Mud Rotary Method, for all three wells		
Sampling Method	Drill cutting grab sampling, for all three wells		
Person Logging Geology	Mavin Magee, Geotechnical Engineer, JOAB, Inc.		
Person Performing Geophysical Logging	S.Stubberud, Southwest Survey, Inc. performed the field logging work.		

2. Phase II

TH I.D.#	TH-1	TH-2	TH-3	TH-4	TH-5
Location	5N/30E	5S/35E	15S/18E	2N/15E	15N/4E
Collar Elevation	3911.0'	3967.0'	3997.0'	4060.0'	3963.0'
Drilling Contractor	LarJon Drilling Co., for all 5 test holes				
Date drilled	1/25/91	1/26/91	1/25/91	1/31/91	1/24/91
Drilling Method	Mud Rotary Method, for all 5 test holes				
Sampling Method	Drill cutting grab sampling and modified coring				
Person Logging Geology	Marvin Magee, Geotechnical Engineer, JOAB, Inc.				
Person Performing Geophysical Logging	S.Stubberud, Southwest Survey, Inc., performed the field logging work.				

2. Phase II (Cont'd)

TH I.D.#	TH-6	AH-6	AH-7	Well-D
Location	31N/14E	18N/31E	1S/26E	15S/5E
Collar Elevation	3927.0'	3897.0'	3931.0'	4128.0'
Drilling Contractor	LarJon Drilling Co., for TH-6 and Well-D; Southwest Engineering, Inc., for AH-6 and AH-7			
Date drilled	2/01/91	1/31/91	1/31/91	1/29/91
Drilling Method	Mud rotary method for TH-6 and Well-D; Continuous Flight Hollow Stem Auger for AH-6 and AH-7			
Sampling Method	Drill cutting grab sample and modified coring for TH-6 and Well-D; Continuous sampling for AH-6 and AH-7			
Person Logging Geology	Marvin Magee, Geotechnical Engineer, JOAB, Inc.			
Person Performing Geophysical Logging	S.Stubberud, Southwest Survey, Inc. performed the field logging work.			

Summary of Wells and Borings 1995

Table 1-2. Summary of Data for Wells and Borings from Permit Renewal Investigation at Camino Real Landfill

Well No.[a]	Boring No.[b]	Location (Old Grid)		Location (New Grid)		Ground Surface (fsml)	Completion Date	Boring Depth (ft bgs)	Well Depth (ft bgs)	Screen Length (ft)
		Northing	Easting	Northing	Easting					
MW-E	---	---	---	416.7785	3377.2924	4021.83	11/03/95	305	298	30
MW-F	---	---	---	2644.8177	4453.7291	3896.95	10/28/95	185	182	30
MW-G	---	---	---	1901.8017	3642.3527	3935.77	10/28/95	223	218	30
---	SB-1	---	---	1220.7241	572.6021	4121.96	10/24/95	110.0	---	---
---	SB-2	---	---	870.6374	1715.0074	3994.35	10/17/95	125.0	---	---
---	SB-3	---	---	1318.1289	2140.8633	3962.68	10/18/95	140.3	---	---
---	SB-4	---	---	703.2134	2446.8657	3975.85	10/20/95	140.5	---	---
M-5	---	---	---	2618.4287	4652.4495	3900.50	10/24/95	---	15.0	10
M-6	---	---	---	3781.6162	2983.9470	3907.53	10/25/95	---	15.4	10
M-7	---	---	---	4059.5357	2322.0704	3926.54	10/24/95	---	15.0	10
M-8	---	---	---	3784.6228	1878.1967	3932.01	10/25/95	---	15.0	10

MW = Ground-water monitor well
B = Soil boring
TH = Test hole
AH = Auger boring
G = Gas probe
SB = Soil boring
M = Methane monitor well

NA = Not available
--- = Does not apply

Data source: Daniel B. Stephens & Associates, Inc.

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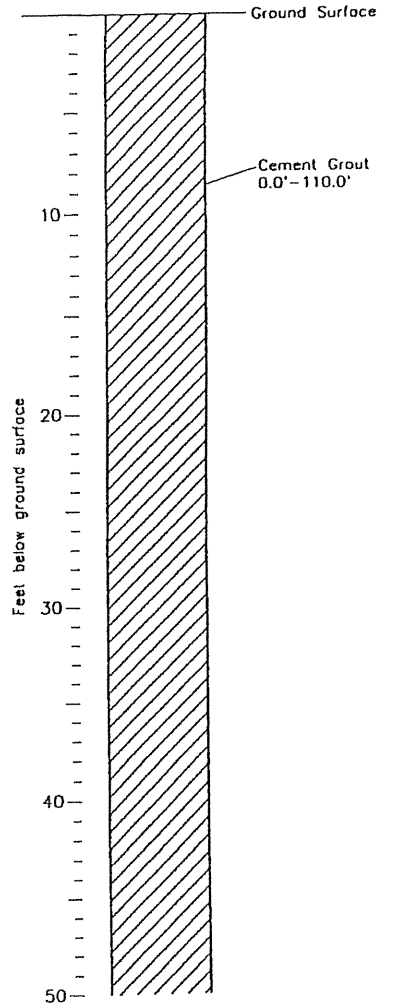

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
		cuttings		(Grab)	2.5–5.0	SW	2.5	Sand with silt; reddish yellow (7.5 YR 6/6); very fine- to medium-grained; moderately sorted
	2.0	split spoon	19,41,50	1.5	4.5–6.5	SM	5	Calcareous silty sand; pink (7.5 YR 7/4); very fine-grained; moderately to poorly sorted; subrounded grains; slightly consolidated; moist; 70% sand in 30% matrix of silt and carbonate, stringers of carbonate;
	0.0	split spoon cuttings	10,15,27	1.8	9.5–11.5 10.0–12.0	SM	10	Calcareous silty sand; reddish yellow (7.5 YR 7/6); very fine- to coarse-grained; poorly sorted; subrounded to rounded grains; slightly consolidated; moist; 85% sand in 15% silt and carbonate matrix; contact with sand at 10'
	NA	split spoon	10,14,20	see note	14.5–16.5	SW	15	Sand; light brown (7.5 YR 6/3); very fine- to coarse-grained; poorly sorted; subangular to rounded grains; unconsolidated; moist; few pebble-size clasts Note: upper slough only
	0.0	split spoon	16,22,22	1.8	19.5–21.5	SW	20	Sand; same as above, only slightly darker in color; very pale brown (10 YR 7/3)
	0.0	split spoon	14,17,25	1.5	24.5–26.5	SW	25	Sand; same as above; darker in color; light brownish gray (10 YR 6/2); some thin calcareous silty sand layers
	NA	split spoon	19,35,47	0	29.5–31.5	SP	30	No sample recovery; fine-grained sand in splitspoon
	NA	split spoon	28,57,50/.4	0	34.5–36.4	SP	35	No sample recovery; fine-grained sand in splitspoon
	NA	split spoon	24,40,50	0	39.5–41.5	SP	40	No sample recovery; fine-grained sand in splitspoon
	0.0	split spoon	29,53,50/.4	1.8	44.5–45.9	SW	45	Sand; light gray (10 YR 7/2); very fine- to medium-grained; moderately sorted; subangular to subrounded grains; unconsolidated; dry

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-24-95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 110.0 ft.
Surface El.: 4121.95 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

NA = Not applicable/not available

CAMINO REAL LANDFILL
Boring Log: SB-1

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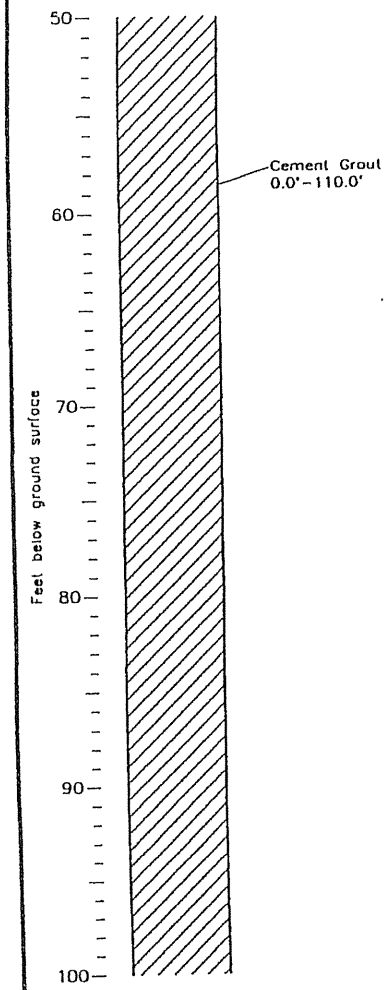

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	27,50,50/.4	0.9	49.5–50.9	SW	50	– Sand; light gray (10 YR 7/2); very fine- to coarse-grained; poorly sorted; subangular to subrounded grains; unconsolidated; damp; few pebble-size clasts
	0.0	split spoon	25,47,50	1.4	54.5–56.5	SW	55	– Sand; same as above
	0.0	split spoon	25,40,50	1.3	59.5–61.5	SW	60	– Sand; same as above, except slightly darker in color; light brownish gray (10 YR 6/2); no pebble-size clasts
	0.0	split spoon	29,70,50	1.5	64.5–66.5	SW	65	– Sand; same as above (50') with few gravel clasts 3/4" to 1" in length; thin calcareous layer at 67' (base of Camp Rice Formation)
	0.0	split spoon	26,50,50/.3	1.4	69.5–70.8	SW	70	– Sand; pinkish white (7.5 YR 8/2); very fine- to medium-grained; moderately sorted; subrounded grains; unconsolidated; damp to dry (top of Fort Hancock Formation)
	0.0	split spoon	50,55/.3	1.2	74.5–75.3	SW	75	– Sand; light gray (10 YR 7/2); very fine- to coarse-grained; poorly sorted; subangular to rounded grains; unconsolidated; damp
	0.0	split spoon	53,50/.3	1.2	79.5–80.3	SW	80	– Sand; light gray (10 YR 7/2); very fine- to medium-grained; moderately sorted; subrounded grains; unconsolidated; damp
	0.5	split spoon	22,32,58	1.8	84.5–86.5	SW	85	– Sand; same as above; thin calcareous layer at 86'
	0.0	split spoon	18,28,35	1.9	89.5–91.5	SP	90	– Sand; light gray (10 YR 7/2); fine- to medium-grained; well sorted; subrounded grains; unconsolidated; damp to dry

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-24-95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 110.0 ft.

Surface El.: 4121.95 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

= Not applicable/not available

CAMINO REAL LANDFILL
Boring Log: SB-1

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Well Completion	Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
Cement Grout 0.0'-110.0'		NA	split spoon	31,40,52	0	99.5–101.5	SP	100	Sand; no recovery; few clay gauls with sand in cuttings may indicate few thin clay layers
		0.0	split spoon	82/.4	0.8	104.5–104.9	SP	105	Sand; grayish brown (10 YR 5/2); very fine- to medium-grained; moderately sorted; subrounded to rounded grains; unconsolidated; damp to dry; few caliche nodules
T.D. = 110.0'		0.0(sand) 2.5(caliche)	split spoon	28,51,55/.3	1.2	109.5–110.3	SP	110	Sand; same as above; carbonate cemented calcareous sand encountered at 110'

Feet below ground surface: 100, 110, 120, 130, 140, 150

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand-silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-24-95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 110.0 ft.

Surface El.: 4121.95 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

NA = Not applicable/not available

CAMINO REAL LANDFILL
Boring Log: SB-1

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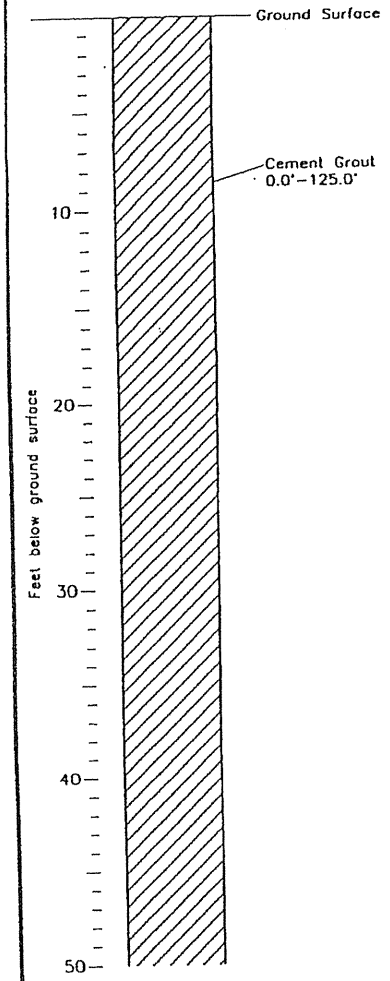

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.75	split spoon	9,11,11	1.7	5.5–7.5	SP	5	Sand: yellowish brown (10 YR 5/4); fine-grained; very well sorted; subangular to subrounded grains; unconsolidated; wet; 100% sand
	0.0	split spoon	7,11,10	1.8	9.5–11.5	SP	10	Sand; pinkish gray (7.5 YR 6/2); fine- to medium-grained; well sorted; subrounded grains; unconsolidated; wet; 100% sand
	0.75	split spoon	14,20,30	1.7	14.5–16.5	SP	15	Sand; same as above
	0.25	split spoon cuttings	10,19,25	1.6	19.5–21.5 20.0–23.0	SP	20	Sand; same as above
	1.0	split spoon	18,35,57	1.7	24.5–26.5	SP	25	Sand; pinkish gray (7.5 YR 6/2); fine- to coarse-grained; moderately sorted; subrounded grains; unconsolidated; wet; 100% sand
	0.25	split spoon	12,25,40	1.8	29.5–31.5	SP	30	Sand; same as above with thin bed of caliche nodules at 32.5 feet; nodules up to 2" in diam.
	0.0	split spoon	18,36,43	1.8	34.5–36.5	SP–SM	35	Sand with silt; pinkish gray (7.5 YR 7/2); very fine- to fine-grained; moderately sorted; subrounded grains; unconsolidated; damp to dry; 90% sand, 10% silt
	>4.5(clay)	split spoon	35,48,38	1.5	39.5–41.5	SW/CH	40	Interbedded sand and clay; brown (7.5 YR 5/2); sand varies from very fine- to medium-grained; moderately sorted; subrounded grains; dry to wet above clay layers; moderately sorted; clay; reddish brown (5 YR 4/3); moderate to high plasticity; dry; clay limestone layer at 40 feet
	>4.5(clay)	split spoon	27,72	1.1	44.5–45.5	SW/CH	45	Interbedded sand and clay; same as above; clay slightly consolidated

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-17-95
Drilling Meth Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 125.0 ft.
Surface El.: 3994.35 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring L SB-2

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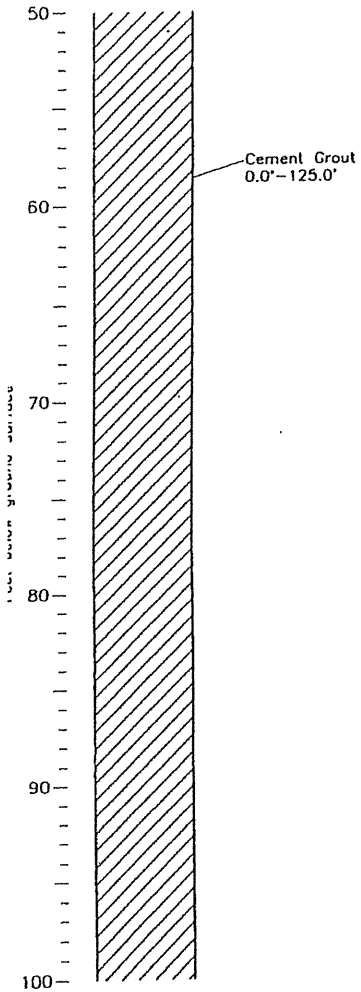

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	23,44,45/.3	1.4	49.5–50.8	SP–SM	50 –	Sand with silt; light gray (10 YR 7/2); very fine- to medium-grained, moderately sorted; subrounded to rounded grains; damp; unconsolidated; few gray very thin clay layers; gray calcareous sandstone (caliche) from 54' to 55'
	>4.5(clay)	split spoon	14,33,37	1.8	54.5–56.5	SP–SM	55 –	Sand with silt; gray (7.5 YR N6); very fine- to medium-grained; poorly sorted; subangular grains; wet; unconsolidated; reddish brown clay from 55 to 55.5 feet
	0.0 (sand)	split spoon	24,48,>50/.3	1.5	59.5–60.8	SM	60 –	Silty sand; pale brown (10 YR 6/3); very fine- to medium-grained; poorly sorted; subangular to rounded grains; unconsolidated; damp to dry; 80% sand, 20% silt
	0.0 (sand)	split spoon	16,33,54	1.7	64.5–66.5	SM	65 –	Silty sand; same as above
	0.0 (sand)	split spoon	17,40,56	1.8	69.5–71.5	SM	70 –	Silty sand; same as above, only moist; at 72.5 encountered very silty fine-grained sand
	3.0 (silt)	split spoon	29,46,48/.3	1.5	74.5–75.8	SM	75 –	Silty sand; light brown (7.5 YR 6/3); very fine-grained; poorly sorted; subrounded grains; slightly consolidated; moist; 60% sand, 40% silt
	4.5 (silt)	split spoon	45,75/.4	1.4	79.5–80.9	SM	80 –	Silty sand; Same as above
	0.0	split spoon	23,50,50/.3	1.5	84.5–85.8	SP–SM	85 –	Sand with silt; very pale brown (10 YR 7/3); very fine- to fine-grained; moderately sorted; subangular to subrounded grains; unconsolidated; damp; 90% sand, 10% silt
	0.0	split spoon	18,41,50/.3	1.6	89.5–90.8	SP–SM	90 –	Sand with silt; pinkish white (7.5 YR 8/2); very fine- to medium-grained; moderately sorted; subrounded grains; unconsolidated; damp; 95% sand, 5% silt
	0.0	split spoon	31,52,50/.3	1.6	94.5–95.8	SP–SM	95 –	Sand with silt; same as above; a lot of black mafic grains

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10–17–95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 125.0 ft.

Surface El.: 3994.35 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring Log: SB-2

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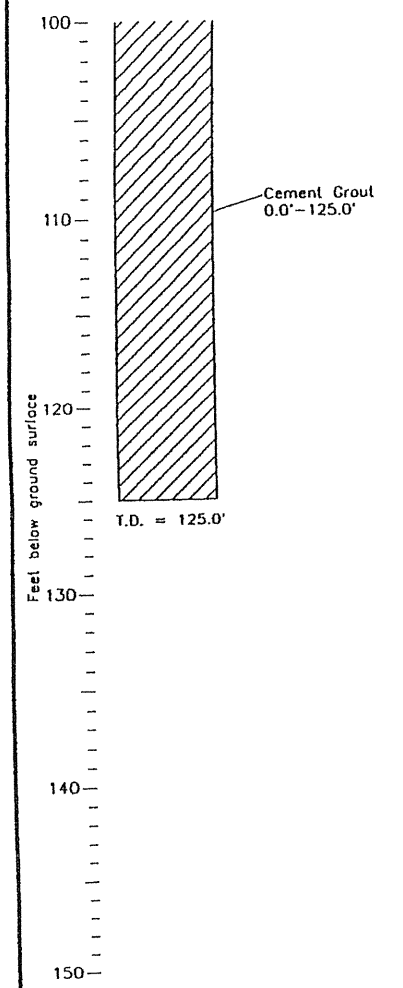

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	split spoon	>65	(see note) 0	99.5-99.6	SM	100	Silty sand; light reddish brown (5 YR 6/3); very fine- to fine-grained; moderately sorted; subrounded to rounded grains; slightly consolidated; damp to dry; 80% sand, 20% silt; calcareous sand (caliche) at 104.5-105' Note: soil in shoe only
	4.5	split spoon	60,59/.3	0.8	104.5-105.3	SM	105	Silty sand; pink (7.5 YR 7/3); very fine- to fine-grained; moderately sorted; subrounded grains;slightly consolidated; moist; 90% sand, 10% silt
	0.0	split spoon	35,76,40/.2	1.2	109.5-110.7	SM	110	Silty sand; pinkish gray (7.5 YR 7/2); very fine- to fine-grained; moderately sorted; subangular to subrounded grains; unconsolidated; dry; 90% sand, 10% silt
	0.25	split spoon	34,50/.3	0.8	114.5-115.3	SM	115	Silty sand; same as above, except moist
	0.0	split spoon	23,57,50/.3	1.3	119.5-120.8	SP-SM	120	Sand with silt; very pale brown (10 YR 7/3); very fine- to fine-grained; well sorted; subrounded grains; unconsolidated; dry; 95% sand, 5% silt
	0.75	split spoon	50,50/.4	0.9	124.5-125.4	SW	125	Silty sand; very pale brown (10 YR 7/4); very fine- to medium-grained; poorly sorted; subrounded grains; slightly consolidated; moist; 90% sand; 10% silt

Graphic Log Symbols

SP - Poorly graded sands, gravelly sands, little or no fines

SM - Silty sands, sand-silt mixture

CA - Caliche, calcareous sands

ML - Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity

SW - Well graded sands, gravelly sand, little or no fines

CH - Inorganic clays of high plasticity, fat clays

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-17-95
Drilling Meth Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 125.0 ft.
Surface El.: 3994.35 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring L SB-2

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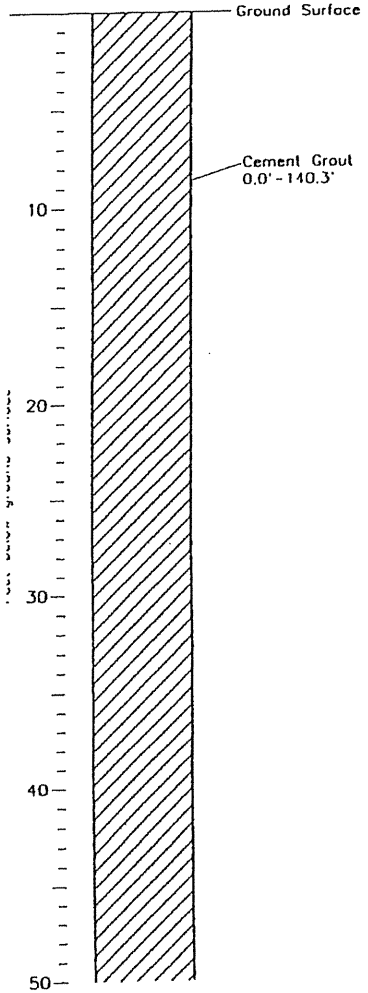

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	6,7,8	1.6	4.5–6.5	SW	5	Sand; pale brown (10 YR 6/3); very fine- to coarse-grained; moderately sorted; subrounded grains; unconsolidated; moist
	0.25	split spoon	7,10,12	1.8	9.5–11.5	SW	10	Sand; same as above except dry
	0.50	split spoon cuttings	14,21,22	1.5	14.5–16.5 15.0–17.0	SM	15	Silty sand; pinkish gray (7.5 YR 7/2); very fine- to medium-grained; poorly sorted; subrounded to rounded grains; unconsolidated; damp; some caliche and clay layers
	0.0	split spoon	18,30,39	1.9	19.5–21.5	SW	20	Sand; light gray (10 YR 7/2); very fine- to medium-grained; poorly sorted; subrounded to rounded grains; unconsolidated; dry; caliche layer at 22'
	0.0 (sand) 1.2 (clay)	split spoon	18,52,50/.3	1.6	24.5–26.5	SP-SM	25	Sand with silt; light gray (10 YR 7/2); very fine- to medium-grained, poorly sorted; subrounded grains; unconsolidated; moist; reddish brown thin clay layer at 25'
	1.5	split spoon cuttings	21,54,50/.4	1.5	29.5–30.9 30.0–32.0	SP-SM	30	Sand with thin clay layers; sand; light gray (10 YR 7/2); very fine- to medium-grained; poorly sorted; subrounded grains; unconsolidated; moist; clay; reddish brown (5 YR 4/4); moderate plasticity; slightly consolidated; dry to damp
	0.0	split spoon	25,62,50/.2	1.4	34.5–35.7	SP-SM	35	Sand with silt; pale brown (10 YR 6/2); very fine- to fine-grained; moderately sorted; angular to subrounded grains; unconsolidated; dry, thin clay layers at 37.5' and 49'
	0.0	split spoon	11,40,50	1.8	39.5–41.5	SW	40	Sand with silt; pinkish gray (7.5 YR 7/2); very fine- to medium-grained; poorly sorted; subangular grains; unconsolidated; dry
	0.0	split spoon	23,58,35/.2		44.5–45.7	SW	45	Sand with silt; same as above; clay layer at 45.7', 4" thick layer of caliche nodules at 49.5'

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-18-95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 140.3 ft.

Surface El.: 3962.68 fsml

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring Log: SB-3

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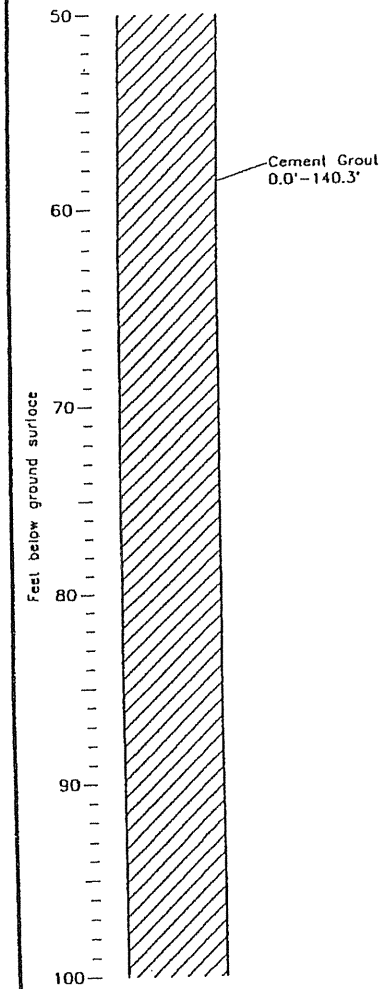

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 6 in.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	20,51,38/.3	1.4	49.5–50.8	SM	50	Silty sand; pink (7.5 YR 7/3); very fine- to medium-grained; poorly sorted; subrounded grains; unconsolidated; moist; some caliche layers; clay layer at 52'
	0.0	split spoon	23,49,22/.4	1.8	54.5–55.9	SP	55	Sand; pinkish gray (7.5 YR 7/2); fine- to medium-grained; well sorted; subrounded grains; unconsolidated; dry
	0.25	split spoon	18,30,50/.3	1.6	59.5–60.8	SP	60	Sand; same as above, only very fine- to medium-grained; moderately sorted; contact with clay unit at 62.5'
	>4.5	split spoon	20,48,40/.3	1.4	64.5–65.8	CH	65	Silty sand; pink (5 YR 7/4); very fine- to medium-grained; poorly sorted; slightly consolidated; dry; 70% sand, 30% silt; carbonate cement (caliche)
	>4.5	split spoon	27,57/.4	1.0	69.5–70.4	SM	70	Silty sand; same as above, only moderately sorted
	0.0	split spoon	15,35,50	1.8	74.5–76.5	SW	75	Sand; pinkish gray (7.5 YR 7/2); very fine- to fine-grained; poorly sorted; subrounded grains; unconsolidated; dry
	1.0	split spoon	26,70	1.0	79.5–80.5	SW–SM	80	Sand with silt; pinkish gray (7.5 YR 6/2); very fine- to medium-grained; poorly sorted; subrounded grains; moist; unconsolidated
	0.75	split spoon	33,70	1.0	84.5–85.5	SM	85	Silty sand; pink (7.5 YR 7/4); very fine-grained; poorly sorted; slightly consolidated; damp to dry; carbonate cement
	0.0	split spoon	15,22,37	1.7	89.5–91.5	SP	90	Sand; pinkish gray; very fine- to fine-grained; well sorted; subrounded grains; unconsolidated; dry; thin caliche layer at 97'

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10–18–95
Drilling Me[illegible] Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 140.3 ft.

Surface El.: 3962.68 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring [illegible]g: SB-3

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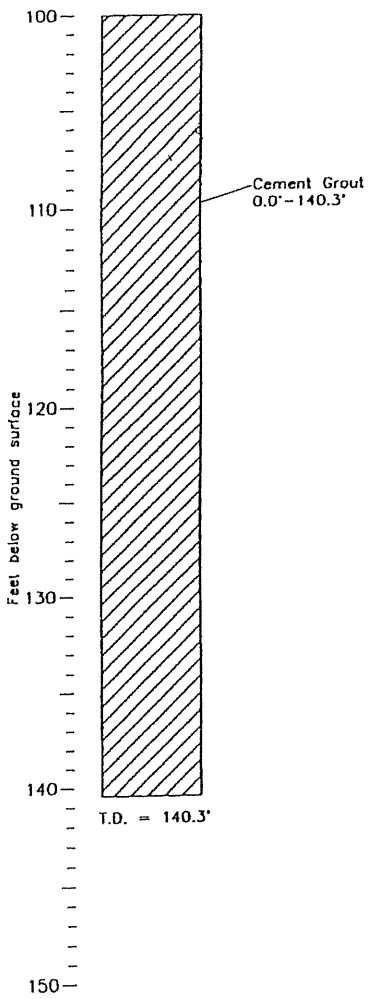

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 6 in.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	40,80/.3	1.2	99.5–100.3	SW–SM	100	Sand with silt; pinkish gray (7.5 YR 7/2); very fine- to medium-grained; poorly sorted; subrounded grains; unconsolidated; dry
	>4.5	split spoon	16,27,38	1.9	109.5–111.5	CH	110	Clay; light reddish brown (5 YR 6/3); variegated with grayish green clay; moderate plasticity; unconsolidated; moist to wet
		cuttings				SM	115	Silty sand with carbonate (caliche); slightly consolidated
	0.0	split spoon	25,52	1.0	119.5–120.5	SW	120	Sand; pinkish gray (7.5 YR 7/2); very fine- to medium-grained; poorly sorted; subrounded grains; unconsolidated; dry
		cuttings				SM	125	Silty sand with carbonate cement (caliche); slightly consolidated
	0.5	split spoon	33,70/.3	1.0	129.5–130.3	SM	130	Silty sand; light gray (10 YR 7/2); very fine-grained; moderately sorted; unconsolidated; moist to damp; 55% sand, 45% silt
	0.0	split spoon	50,58/.3	1.0	139.5–140.3	SP–SM	140	Sand with silt; light gray (10 YR 7/2); very fine- to medium-grained; moderately sorted; subrounded grains; unconsolidated; damp to dry; 90% sand, 10% silt

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand-silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-18-95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 140.3 ft.

Surface El.: 3962.68 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring Log: SB-3

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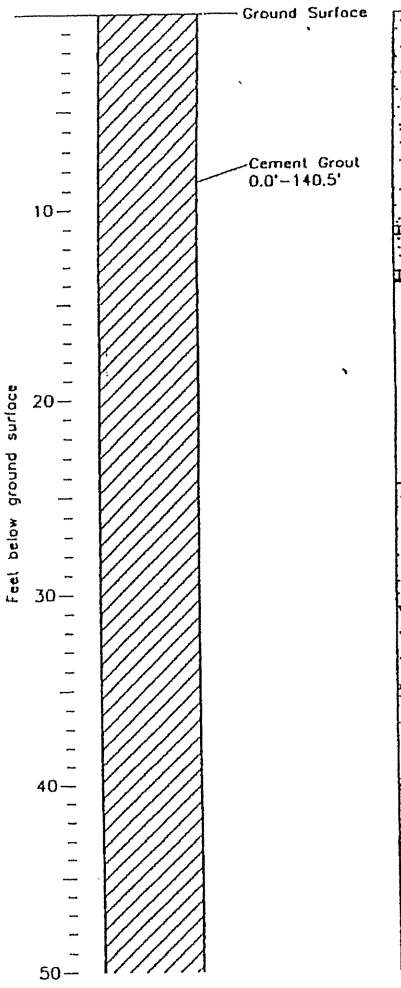

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.75	split spoon	9,7,8	1.5	4.5–6.5	SW–SM	5	– Sand with silt; light brown (7.5 YR 6/3); very fine– to medium–grained; poorly sorted; subrounded grains; unconsolidated; moist; carbonate (caliche) cement and matrix
	0.0	split spoon	12,14,27	1.4	9.5–11.5	SM	10	– Silty sand; light brown (7.5 YR 6/4); very fine– to coarse–grained; poorly sorted; subrounded grains; moist; carbonate (caliche) layers at 11.5' and 14'; some pebble size gravel
	0.0	split spoon	12,19,22	1.6	14.5–16.5	SP	15	– Sand; light gray (10 YR 7/2); very fine– to medium–grained; moderately sorted; subrounded to rounded grain; unconsolidated; dry
		cuttings			15.0–17.0			
	0.0	split spoon	21,36,49	1.8	19.5–21.5	SP	20	– Sand; light gray (10 YR 7/2); very fine– to medium–grained; same as above; at 24.5', contact with silty sand (carbonate cement)
	0.25	split spoon	28,41,53	1.7	24.5–26.5	SM	25	– Silty sand with clay; light brown (7.5 YR 6/4); very fine– to medium–grained; poorly sorted; subrounded grains; slightly consolidated; carbonate (caliche) cement and matrix; damp; some thin clay layers
		cuttings			25.0–27.0			
	0.0	split spoon	31,49,50/.3	1.7	29.5–31.5	SW–SM	30	– Sand with silt; light gray (10 YR 7/2); very fine– to fine–grained; moderately sorted; subangular to subrounded grains; unconsolidated; dry
		cuttings			30.0–32.0			
	0.0	split spoon	17,39,52	1.4	34.5–36.5	SW–SM	35	– Sand with silt; same as above
	0.0	split spoon	23,42/.3	1.0	39.5–40.5	SW	40	– Sand; pinkish gray (7.5 YR 7/2); very fine to medium–grained; moderately sorted; subrounded grains; unconsolidated; dry; thin clay or caliche layer at 41.5' and 42.5
	0.0	split spoon	49,75	1.0	44.5–45.5	SP	45	– Sand; light gray (10 YR 7/2); very fine– to medium–grained; moderately sorted; subrounded grains; unconsolidated; dry; caliche layer at 47.5'

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10–20–95
Drilling Metho[illegible]ollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 140.5 ft.

Surface El.: 3975.85 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring L[illegible] SB-4

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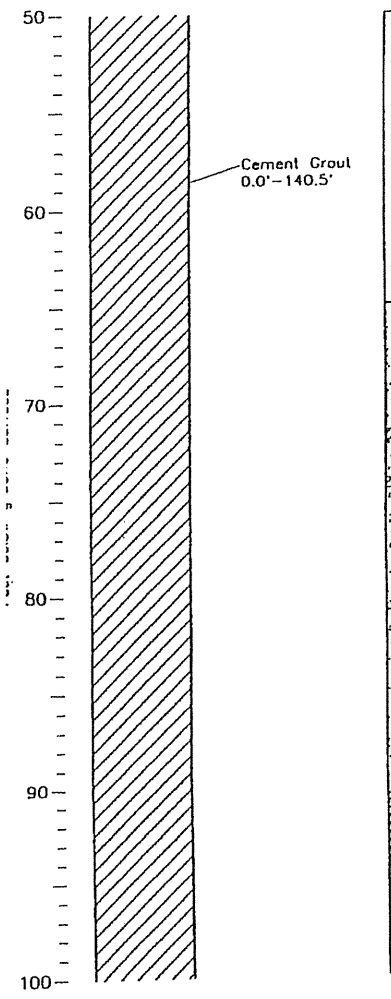

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	12,28,50	1.8	44.5–51.5	SP	50	– Sand; same as above; very fine– to medium–grained
	0.0	split spoon	42,50/.4	1.1	54.5–55.4	SP	55	– Sand; same as above; little darker in color; pale brown (10 YR 6/3)
	0.0	split spoon	34,64/.7	1.3	59.5–60.7	SP–SM	60	– Sand with silt; light brownish gray (10 YR 6/2); very fine– to medium–grained; moderately sorted; subrounded grains; unconsolidated; damp
	1.25	split spoon	22,40,50/.2	1.6	64.5–65.7	SP–SM	65	– Sand with silt; pinkish gray (7.5 YR 7/2); very fine– to medium–grained; moderately sorted; subrounded grains; unconsolidated; moist
	3.25	split spoon	22,44,40/.3	1.4	69.5–70.8	SM	70	– Silty sand with clay layers; light brown (7.5 YR 6/4); very fine–grained; poorly sorted; slightly consolidated; moist; silt and carbonate matrix; dark brown clay layers thin <1 inch to few inches in thickness
	>4.5	split spoon	11,36,54/.4	1.6	74.5–75.9	SM	75	– Silty sand; same as above; slightly coarser; very fine– to fine–grained; 80% sand, 20% silt
	>4.5	split spoon	20,39,55/.3	1.6	79.5–80.8	SM	80	– Silty sand; same as above; very fine– to fine–grained; slightly sandier; 90% sand, 10% silt
	>4.5	split spoon	12,30,75	2.0	84.5–86.5	SW–SM	85	– Sand with silt; pinkish gray (7.5 YR 7/2); very fine– to fine–grained; poorly sorted; subrounded grains; unconsolidated; dry to damp; 95% sand, 5% silt
	4.5	split spoon	30,47,50/.4	1.8	89.5–90.9	SM/CH	90	– Silty sand with clay; pinkish gray (7.5 YR 7/2); very fine–grained; poorly sorted; slightly consolidated; dry; 55% sand, 30% silt, 15% clay; 2'–3' thick clay layer at 90.5'

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10–20–95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 140.5 ft.
Surface El.: 3975.85 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring Log: SB-4

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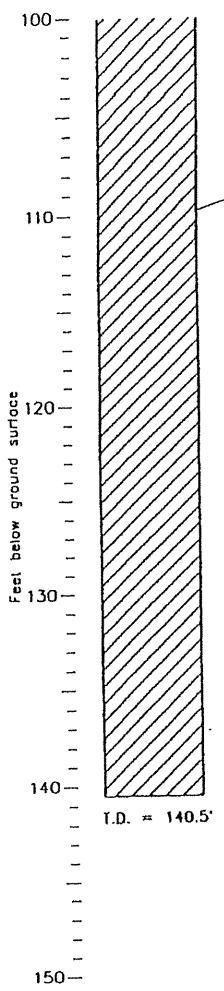

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	19,33,38/.4	1.8	99.5–100.9	SP	100	Sand; light brownish gray (10 YR 6/2); very fine- to fine-grained; moderate to well sorted; subrounded grains; unconsolidated; damp; 103' thin caliche layer
	0.5	split spoon	20,48,41/.3	1.7	109.5–110.8	SP	110	Sand; light gray (10 YR 7/2); very fine- to fine-grained; well sorted; subrounded grains; unconsolidated; damp to dry; encountered clay at 110.5'
	>4.5	split spoon	16,25,50/.3	2.0	114.5–115.8	CH	115	Clay; light reddish brown (5 YR 6/4); moderate to high plasticity; unconsolidated; moist to wet; few grayish green spots in clay
	0.0	split spoon	22,55	1.3	124.5–125.5	SP	125	Sand; pinkish gray (7.5 YR 7/2); very fine- to fine-grained; well sorted; subrounded to rounded grains; unconsolidated; damp
	0.0	split spoon	6,30,50/.3	1.2	134.5–135.8	SP	135	Sand; light brownish gray (10 YR 6/2); very fine- to fine-grained; well sorted; subrounded to rounded grains; unconsolidated; moist
	>4.5	split spoon	17,60	1.2	139.5–140.5	CH	140	Clay; reddish brown (5 YR 5/4); moderate to high plasticity; unconsolidated; moist to wet; at 140.5, encounter carbonate cemented gray sandstone; moderately consolidated

Graphic Log Symbols

SP – Poorly graded sands, gravelly sands, little or no fines

SM – Silty sands, sand–silt mixture

CA – Caliche, calcareous sands

ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity

SW – Well graded sands, gravelly sand, little or no fines

CH – Inorganic clays of high plasticity, fat clays

Geologist: C. Pigman
Driller: Precision Engineering
Date Complete: 10–20–95
Drilling Meth[illegible]ollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 140.5 ft.

Surface El.: 3975.85 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring L[illegible] SB-4

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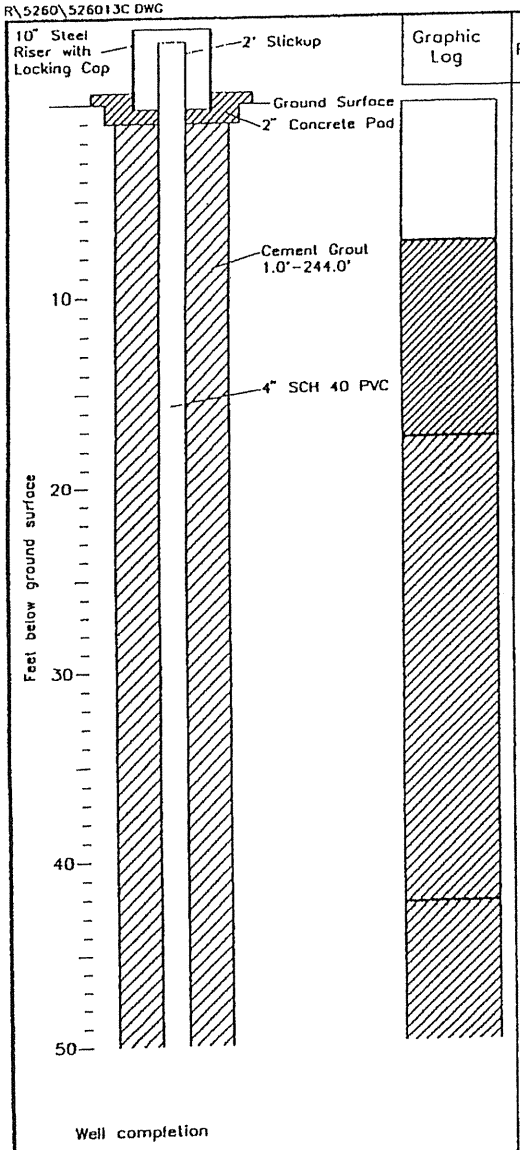

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA			
						SP-SW	5	Silty sand; brown (10 YR 5/4); with silts 10-20%, <15% pebbles; well graded
						CH	10	Clay; brown (7.5 YR 6/3); with <10% silts, <5% sand, <1% pebbles; high plasticity
						CH	15	Same as above
						CL	20	Silty clay; brown (7.5 YR 6/3); with 10-20% silt, <10% sand, <5% pebbles; moderate plasticity
						CL	25	Same as above
						CL	30	Silty clay; brown (7.5 YR 6/3); with <2% silts, <10% sand, <1% pebbles; moderate plasticity
						CL	35	Silty clay; brown (7.5 YR 6/3); with <15% silt, <5% sand, <1% pebbles; slightly consolidated
						CL	40	Same as above
						CL	45	Clay; brown (7.5 YR 6/3); <10% silts, <5% sand, <1% pebbles; slightly consolidated

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11-3-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

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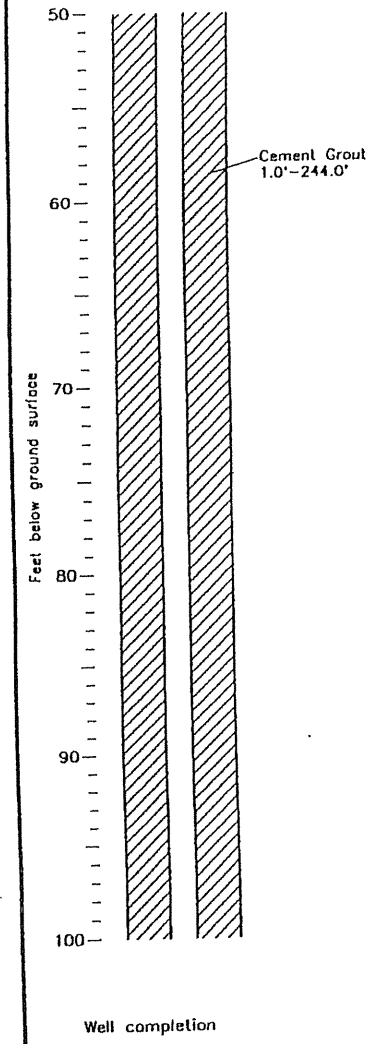

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CL	50	Same as above
						CL	55	Silty clay; brown (7.5 YR 6/3); with <20% clay, <10% sand; low plasticity
						CL	60	Same as above
						CL	65	Same as above
						CH	70	Clay; brown (7.5 YR 6/3); with <10% silt, <5% sand; high plasticity
						CL	75	Silty clay; brown (7.5 YR 4/3); with <20% silt, <5% sand; minor pebbles; moderate plasticity
						CL	80	Same as above
						CL	85	Same as above
						CH	90	Clay; brown (7.5 YR 6/3); with <10% silt, <5% sand, <1% minor pebbles; high plasticity; slighlly consolidated
						CH	95	Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

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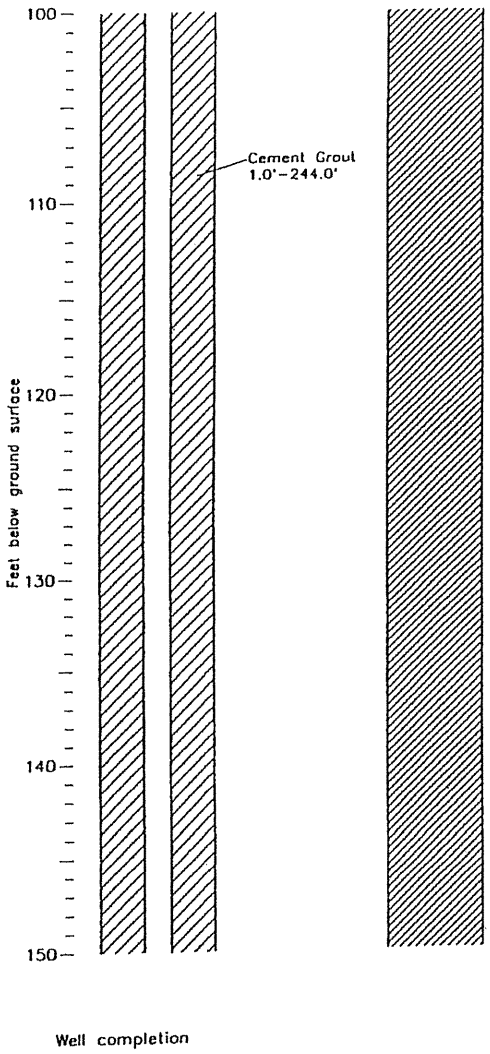

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	100	– Same as above
						CH	105	– Clay; brown (7.5 YR 6/3); with <10% silt, <5% sand; high plasticity; minor black silt-sized particles
						CH	110	– Same as above
						CH	115	– Same as above
						CH	120	– Same as above
						CH	125	– Same as above
						CH	130	– Same as above
						CH	135	– Same as above
						CH	140	– Same as above
						CH	145	– Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11-3-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

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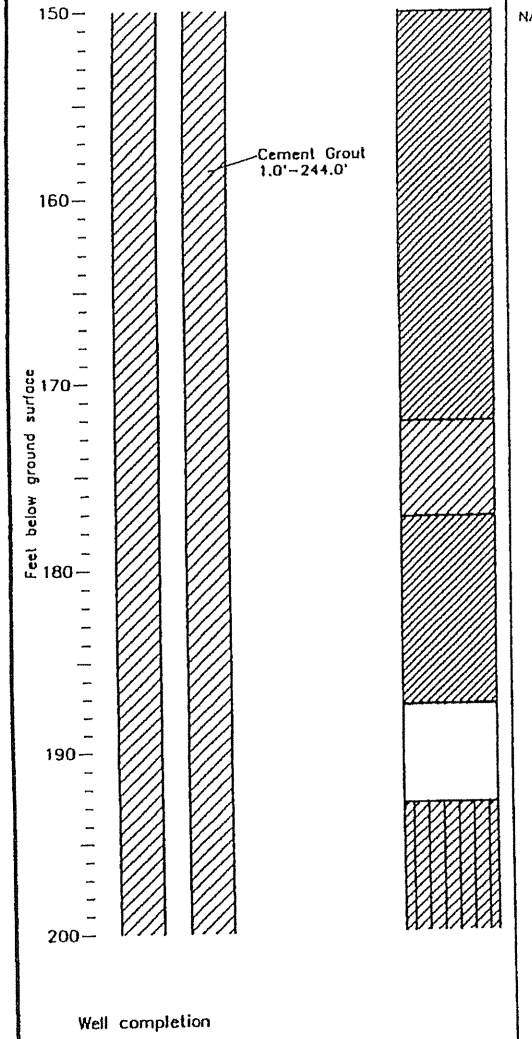

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	150	Clay; brown (7.5 YR 6/3); with <5% silt, <1% sand; high plasticity
						CH	155	Same as above
						CH	160	Same as above
						CH	165	Same as above
						CH	170	Same as above
						CL	175	Silty clay; brown (7.5 YR 6/3); with <10% silty clay, <5% sand; high plasticity
						CH	180	Clay; brown (7.5 YR 6/3); with <5% silt, <1% sand; high plasticity
						CH	185	Same as above; fine-grained sand
						SP-SM	190	Brown (7.5 YR 6/3) silty sand, poorly graded, 10-20% silt, <10% clay
						ML-CL	195	Clayey silt; brown (7.5 YR 6/3); with <20% clay, <5% very fine- grained sand

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11-3-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

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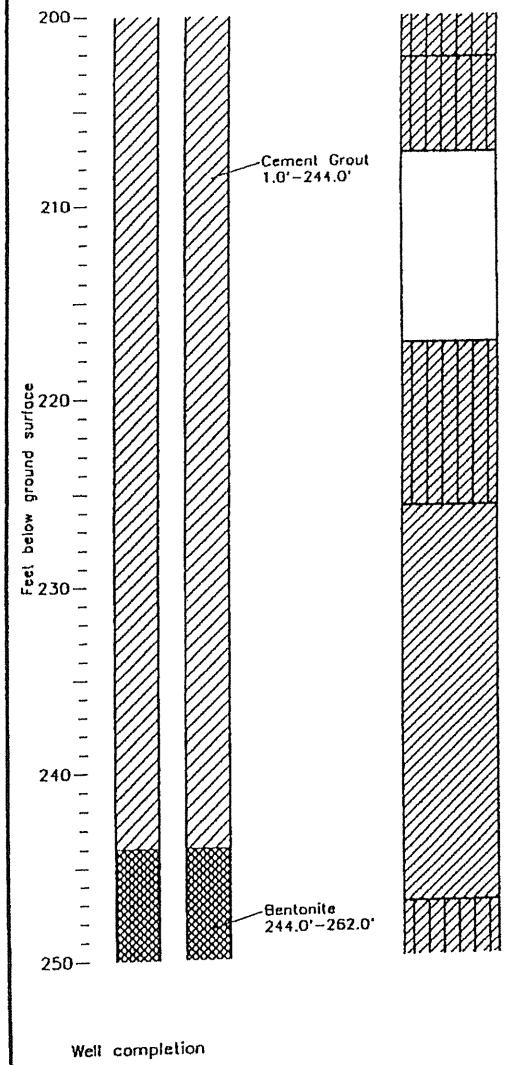

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	ML–CL	200	Clayey silt; brown (7.5 YR 6/3); with <20% clay, <5% very fine– grained sand; minor pebbles
						ML–CL	205	Same as above
						SP–SM	210	Silty sand; brown (7.5 YR 6/3); with 10–20% silt; <5% clay; <1% minor pebbles; poorly graded
						SP–SM	215	Silty sand; brown (7.5 YR 6/3); with 10–20% silt, <5% clay; poorly graded
						ML–CL	220	Clayey silt; brown (7.5 YR 6/3); with <1% sand, <10% clay, <1% minor pebbles
						ML–CL	225	Same as above
						CL	230	Silty clay; brown (7.5 YR 6/3); with <20% silt, <10% very fine– grained sand; clay slightly consolidated; low plasticity
						CL	235	Same as above
						CL	240	Same as above
						CL	245	Silty clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine– grained sand; clay slightly consolidated; low plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

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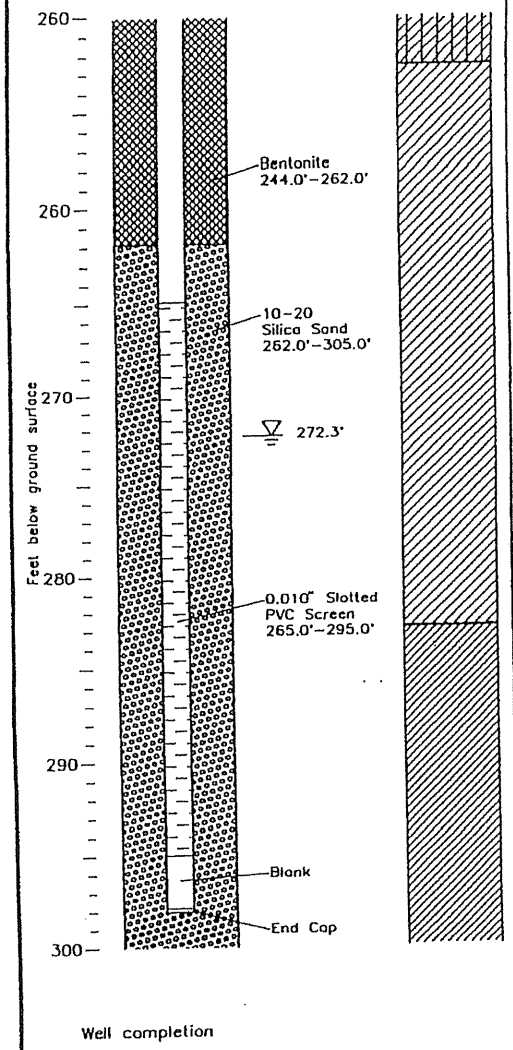

Well completion

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	ML–CL	250 –	Clayey silt; brown (7.5 YR 6/3); with <20% clay, <10% very fine- grained sand; clay slightly consolidated
						CL	255 –	Silty clay; brown (7.5 YR 6/3); with <20% silt, <5% very fine- grained sand, minor pebbles; clay slightly consolidated; moderate plasticity
						CL	260 –	Same as above
						CL	265 –	Silty clay; brown (7.5 YR 6/3); with <20% silt, <5% very fine- grained sand; clay slightly consolidated; moderate plasticity
						CL	270 –	Same as above
						CL	275 –	Same as above
						CL	280 –	Same as above
						CH	285 –	Clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine-grained sand; moderate plasticity
						CH	290 –	Clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine-grained sand; moderate plasticity
						CH	295 –	Clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine-grained sand; clay slightly consolidated; high plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

DANIEL B. STEPHENS & ASSOCIATES, INC.
JN 5260
11-16-95

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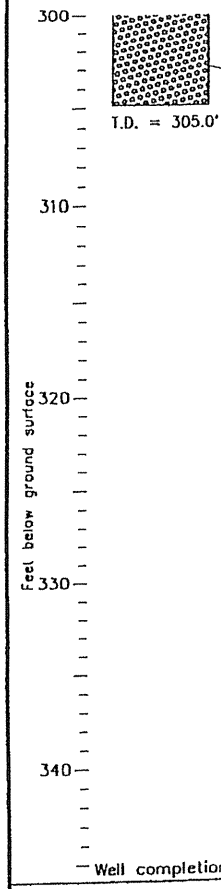

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	300	Same as above
						CH	305	Same as above

Graphic Log Symbols

SP – Poorly graded sands, gravelly sands, little or no fines

SM – Silty sands, sand–silt mixture

CA – Caliche, calcareous sands

ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity

SW – Well graded sands, gravelly sand, little or no fines

CH – Inorganic clays of high plasticity, fat clays

CL – Inorganic clays of moderate to low plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

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11–16–95
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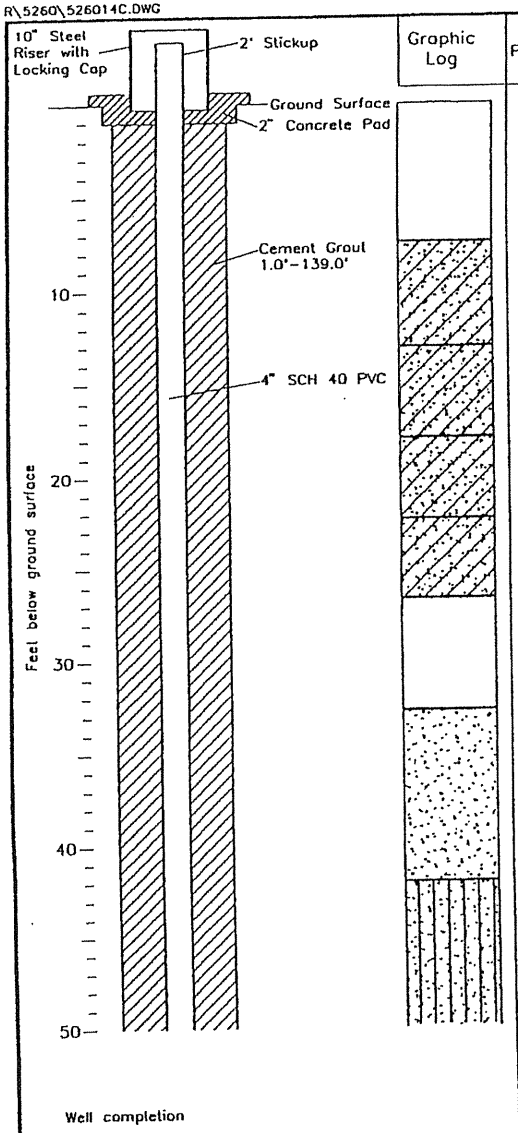

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA			
						SP	5	Fill; sand; brown (7.5 YR 4/3); with <10% silt; <30% pebbles up to 1 cm long
						SC	10	Silty sand with clay; medium brown (7.5 YR 4/3); with 20-30% fines; unconsolidated; poorly graded
						SC	15	Silty sand with clay; medium brown (7.5 YR 4/3); with 20-30% fines; <10% pebble gravel; poorly graded
						SC	20	Silty sand with clay; medium brown (7.5 YR 4/3); with 20-30% fines; <5% pebble gravel; poorly graded
						SC	25	Silty sand with clay; brown (7.5 YR 4/3); with 20-30% fines; <1% pebbles; unconsolidated; poorly graded
						SP-SC	30	Silty sand; brown (7.5 YR 4/3); with 10-20% silt, <5% pebbles; poorly graded
						SW	35	Sand; brown (7.5 YR 4/3); with <5% silt, 10-20% pebbles; well graded
						SW	40	Sand; brown (7.5 YR 4/3); with <5% silt, <10% clay, <5% pebbles; well graded
						SW-SM	45	Sand; brown (7.5 YR 4/3); with <10-20% silt, <10% clay, <1% minor pebbles; well graded

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10-28-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-F

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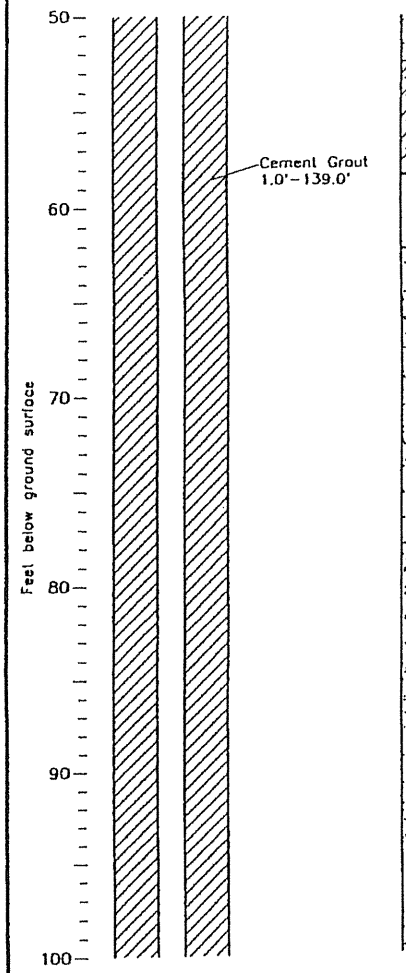

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SW-SM	50	Silty sand; brown (7.5 YR 4/3); with <15% silt, <15% clay; well graded
						SC	55	Clayey silty sand; brown (7.5 YR 4/3); with <10% silt, 10-20% clay, <1% minor pebbles; poorly graded
						SP	60	Sand; brown (7.5 YR 4/3); with <10% silt, 10-20% clay, <1% pebbles; poorly graded
						SW	65	Sand; brown (7.5 YR 4/3); with <10% silt, <10% clay, <1% pebbles; well graded
						SW	70	Sand; brown (7.5 YR 4/3); with <10% silt, <10% clay, <1% pebbles; well graded
						SW	75	Sand; brown (7.5 YR 4/3); with <10% silt, <15% clay, <5% pebbles; well graded
						SW	80	Same as above
						SW	85	Same as above
						SW	90	Same as above
						SW	95	Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10-28-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-F

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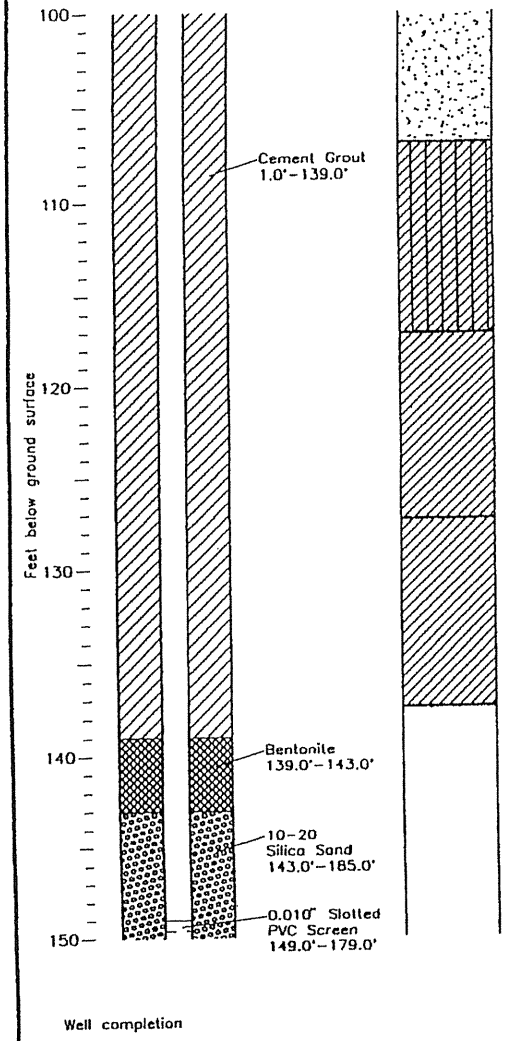

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SW	100	– Same as above
						SW	105	– Same as above
						ML-CL	110	– Silt with clay and sand; brown (7.5 YR 4/3); with sand <10%, clay 10-20%, pebbles <5%
						ML-CL	115	– Silt with clay and sand; brown (7.5 YR 4/3); with sand <10%, clay 10-20%
						CL	120	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, <1% minor pebbles; moderate plasticity
						CL	125	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, <1% minor pebbles; moderate plasticity
						CL	130	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, <10% sand, <5% pebbles
						CL	135	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, 10-20% sand, 5-10% pebbles; well graded
						SP	140	– Sand; brown (7 YR 5/2); with silt 10-20%, <10% pebbles; well graded; minor black silt-sized particles (<1%)
						SP	145	– Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10-28-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 185.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log MW-F

DANIEL B. STEPHENS & ASSOCIATES, INC.
11-16-95
JN 5260

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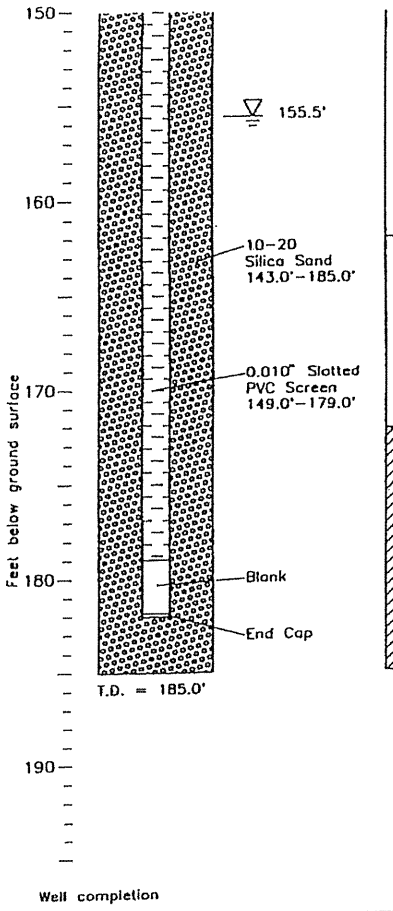

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SP	150	Sand with silt; brown (7 YR 5/2); 10-20% with silt, <5% clay, minor pebbles; poorly graded; minor black silt-sized particles
						SP	155	Same as above
						SP	160	Sand with silt; brown (7 YR 5/2); with silt 10-20%, <10% clay; minor pebbles; poorly graded
						ML	165	Silt; brown (7 YR 5/2); with 10-20% clay, <10% fine sand
						ML	170	Silt; brown (7.5 YR 5/3); with 10-20% clay, <10% fine sand; minor black silt-sized particles
						CL	175	Clay; brown (7.5 YR 4/2); with 10-20% silt, <10% fine sand; <5% black silt-sized particles
						CL	180	Same as above, except increase in black silt-sized particles 5-10%
						CL	185	Same as above

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand-silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SC – Clayey sands, sand-clay mixture
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays
- CL – Inorganic clays of moderate to low plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10-28-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-F

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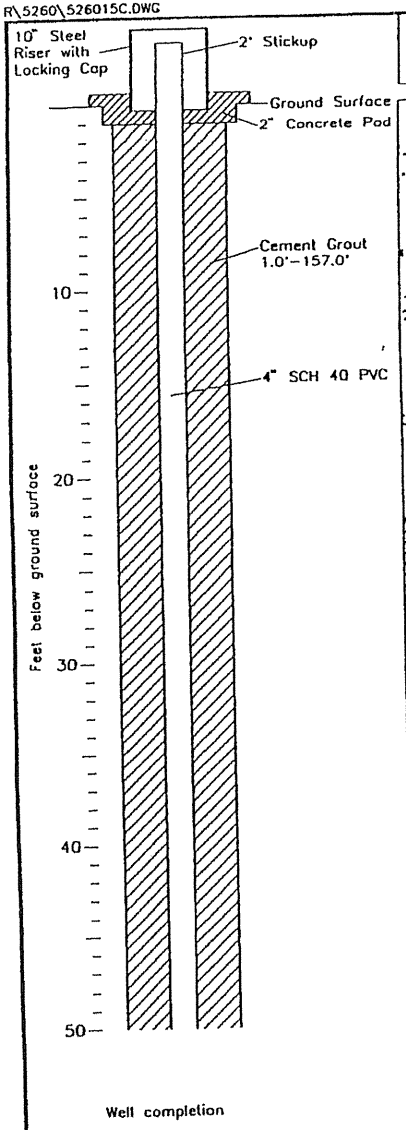

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA			
						SM	10	Silty fine sand; medium brown (5 YR 7/3); with 15-20% silt, <10% pebble gravel; unconsolidated, poorly graded
						SM	15	Silty sand with clay; medium brown (5 YR 7/3); with 20-30% fines, <10% pebble gravel; unconsolidated, poorly graded
						ML	20	Silt with clay; medium brown (5 YR 7/3); with <25% very fine-grained sand, <5% clay, <5% pebbles
						CL	25	Silty clay; medium brown (5 YR 7/3); with minor pebbles; moderate plasticity
						ML-CL	30	Silt with clay; medium brown (5 YR 7/3); with <15% very fine-grained sand; unconsolidated
						CH	35	Clay with silt; brown (5 YR 7/3); with <25% silt; <15% very fine-grained sand; moderately consolidated; high plasticity
						CL	40	Clay with silt; brown (5 YR 7/3); with 10-20% silt, <15% very fine-grained sand; moderately consolidated
						CL	45	Clay with silt; brown (5 YR 7/3); with <25% silt, <15% very fine-grained sand, <1% pebbles; moderate plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10-28-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.
11-17-95
JN 5260

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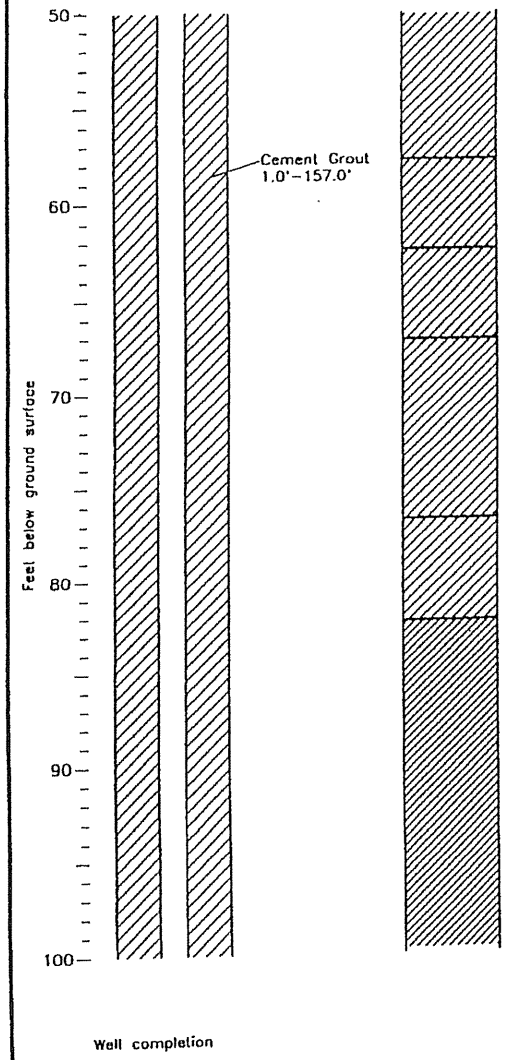

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CL	50	Clay with silt; brown (5 YR 7/3); with <10% silt, <10% very fine- grained sand, <1% minor pebbles; slightly consolidated; moderate plasticity
						CL	55	Clay with silt; brown (5 YR 7/3); with <10% silt; <10% very fine-grained sand; <1% minor pebbles; slightly consolidated; moderate plasticity
						CL	60	Clay; brown (5 YR 7/3); with 10-20% silt (possibly interbedded), 5-10% pebbles; clay slightly consolidated; moderate plasticity
						CL	65	Clay; brown (5 YR 7/3); with <10% silt; slightly consolidated; moderate plasticity
						CL	70	Clay; brown (5 YR 7/3); with 10-20% silt; 10% very fine-grained sand, <1% pebbles; moderate plasticity
						CL	75	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine-grained sand; moderate plasticity
						CL	80	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine-grained sand, <1% pebbles; moderate plasticity
						CH	85	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine-grained sand, <5% pebbles; high plasticity in the clay
						CH	90	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine-grained sand; high plasticity
						CH	95	Clay with silt; brown (7.5 YR 7/3); with <10% silt; <5% very fine-grained sand; high plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10-28-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

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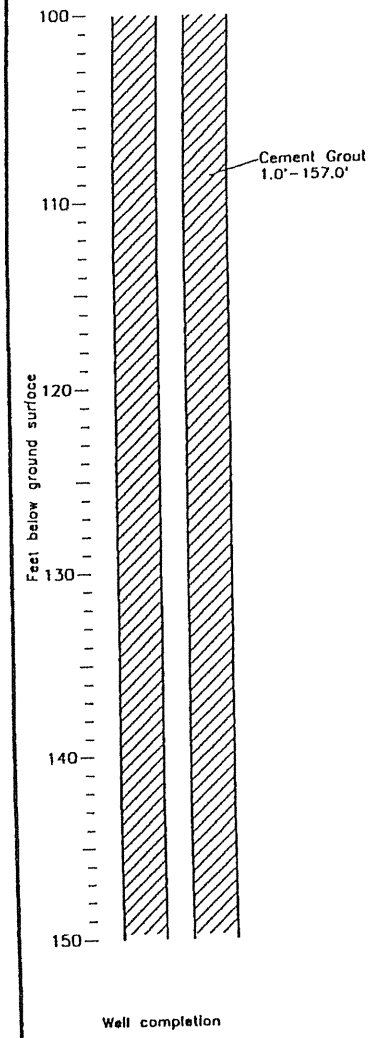

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	100	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine-grained sand; high plasticity
						CH	105	Clay with silt; brown (7.5 YR 7/3); with 10-20% silt, <5% very fine-grained sand, <1% minor pebbles; high plasticity
						SP-SM	110	Sand with silt; brown (7.5 YR 7/3); with <15% silt, <5% clay, <1% minor pebbles; low plasticity; poorly graded
						SP-SM	115	Sand with silt; brown (7.5 YR 7/3); with <10% silt, <10% clay; moderate plasticity; poorly graded
						CH	120	Clay with silt; brown (7.5 YR 7/3); with 10-20% silt, <10% sand; high plasticity
						CH	125	Clay with silt; brown (7.5 YR 6/3); with 10-20% silt; <10% very fine-grained sand; moderate plasticity
						SW	130	Sand with silt; brown (7.5 YR 6/3); with <10% silt, <5% clay; well graded; very fine- to coarse-grained
						SW	135	Sand; brown (7.5 YR 6/3); very fine- to coarse-grained; sand with <10% silt; clay <10%; well graded
						SW	140	Sand; brown (7.5 YR 6/3); very fine- to coarse-grained; with <10% silt, clay <10%; well graded
						CH	145	Clay with silt; brown (7.5 YR 6/3); with <10% silt, <10% sand; high plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10-28-95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 185.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

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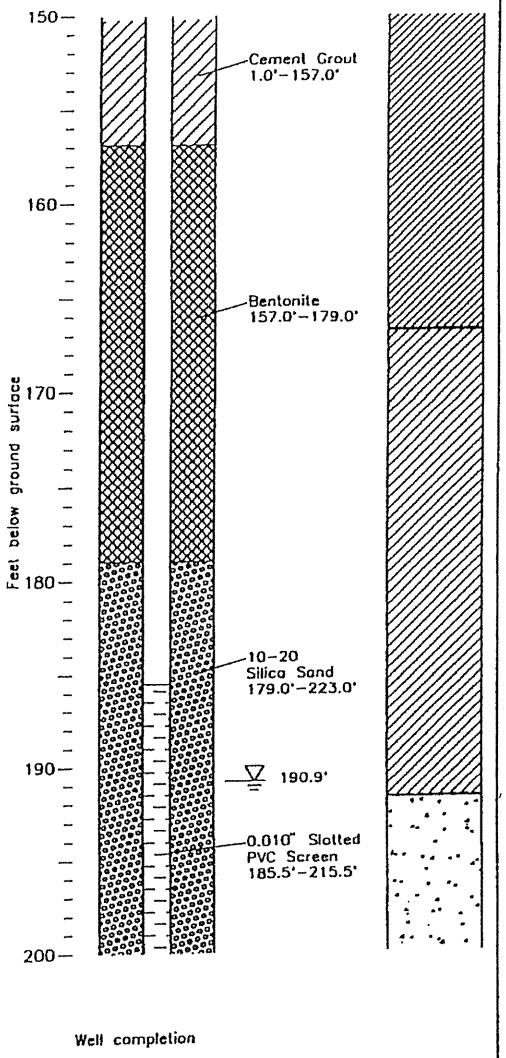

Graphic Log	Packet Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	150	Clay with silt; brown (7.5 YR 6/3); with <10% silt, <5% sand, <1% minor pebbles; high plasticity
						CH	155	Clay with silt; brown (7.5 YR 6/3); with <5% silt, <5% sand, <1% minor pebbles; high plasticity
						CH	160	Clay with silt; brown (7.5 YR 6/3); with <5% silt, <5% sand, <1% minor pebbles; high plasticity
						CH	165	Clay with silt; brown (7.5 YR 6/3); with <5% silt, <5% sand, <1% minor pebbles; high plasticity
						CL	170	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <10% sand, <5% pebbles; moderate plasticity in clay
						CL	175	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <10% sand, <5% pebbles; moderate plasticity
						CL	180	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <10% sand, <5% pebbles; moderate plasticity
						CL	185	Same as above
						CL	190	Same as above
						SW	195	Sand; brown (7.5 YR 6/3); very fine– to coarse–grained; with <10% silt, <10% clay, <5% pebbles; well graded

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 185.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–17–95
JN 5260

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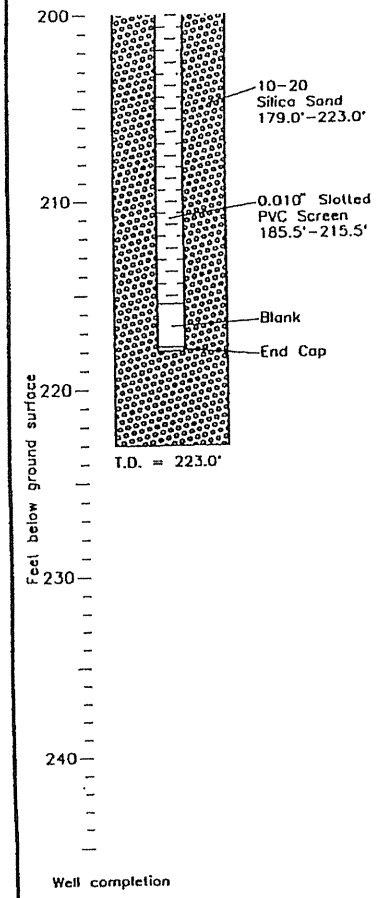

Graphic Log	Packet Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SW	200	Sand; brown (7.5 YR 6/3); very fine- to coarse-grained; with <10% silt, <10% clay, <5% pebbles; well graded
						CL	205	Clay with silt; brown (7.5 YR 6/3); with 20% clay with silt, <10% sand, 5% pebbles; high plasticity
						CL	210	Clay with silt; brown (7.5 YR 6/3); with <10% silt, <5% sand, <1% minor pebbles; high plasticity
						CL	215	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <5% sand, <5% pebbles
						CL	220	Same as above

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand–silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays
- CL – Inorganic clays of low to medium plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.
JN 5260
12-17-95

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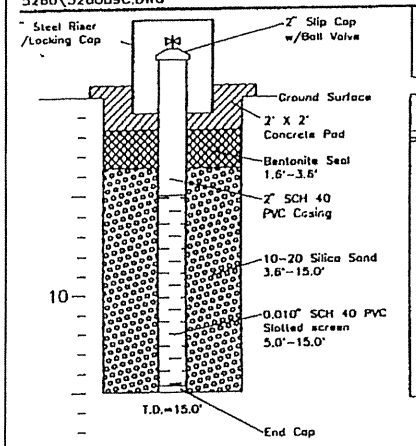

Feet below ground surface: 10, 20, 30, 40, 50

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	5,8,11	1.8	4.5–6.5	SP	5	Sand; very pale brown (10 YR 7/3); very fine- to fine-grained; moderately sorted; subangular to subrounded grains; unconsolidated; dry
	0.0	split spoon	7,10,15	1.7	9.5–11.5	SP	10	Sand; pale brown (10 YR 6/3); same as above, only damp
	0.25	split spoon	11,16,22	1.7	14.5–16.5	SP	15	Sand; same as above

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand–silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10–24–95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 15.0 ft.
Top–of–concrete El.: 3900.50 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring Log: M-5

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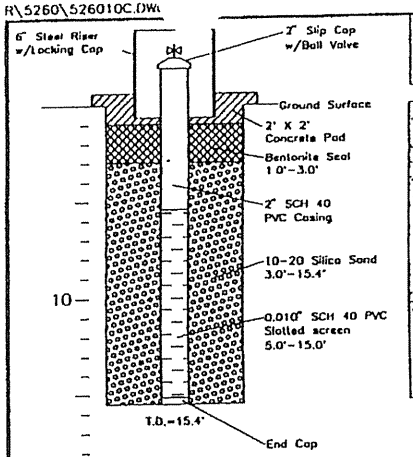

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	7,7,7	1.6	4.5–6.5	SW	5	Sand; light brownish gray (10 YR 6/2); very fine- to medium-grained; poorly sorted; subrounded grains; unconsolidated; dry to damp
	0.25	split spoon	12,15,20	1.8	9.5–11.5	SM	10	Silty sand; light reddish brown (5 YR 6/3); very fine- to medium-grained; poorly sorted; subrounded grains; unconsolidated to slightly consolidated; dry; 85% sand, 15% silt and carbonate
	0.0	split spoon	10,14,15	1.7	14.5–16.5	SM	15	Silty sand; same as above

Feet below ground surface: 10, 20, 30, 40, 50

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand–silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10-25-95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 15.0 ft.
Top-of -concrete El.: 3907.53 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring Log: M-6

11-16-95

MICHAEL B. STEPHENS & ASSOCIATES, INC.
JN 5260

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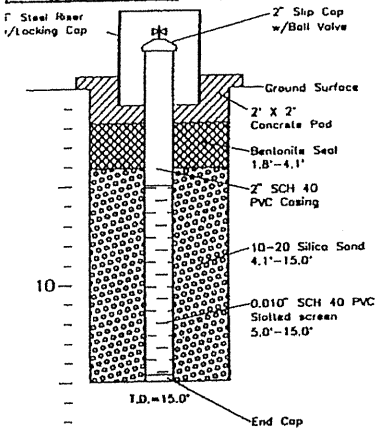

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.0	split spoon	10,12,13	1.1	4.5–6.5	SP	5	Sand; light brownish gray (10 YR 6/2); very fine– to fine–grained; well sorted; subrounded grains; unconsolidated; wet; gray staining
	0.5	split spoon	8,13,16	1.7	9.5–11.5	SP	10	Sand; same as above
	>4.5	split spoon	26,39,38	1.6	14.5–16.5	SW–CH	15	Sand with clay; light brown (7.5 YR 6/4); very fine– to fine–grained; subrounded grains; moderately sorted; unconsolidated; wet; at 15', encountered reddish brown clayey sand

Feet below ground surface: 10, 20, 30, 40, 50

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand–silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays

Geologist: C. Pigman
Driller: Precision Engineering
Date Completed: 10–24–95
Drilling Method: Hollow Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 15.0 ft.

Top–of–concrete El.: 3926.54 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring Log: M–7

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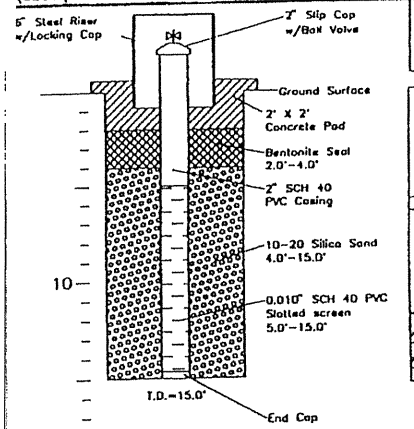

Graphic Log	Pocket * Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	0.12	split spoon	9,15,22	1.6	4.5–6.5	SP	5	Sand; pinkish gray (7.5 YR 6/2); fine-grained; well sorted; rounded grains; unconsolidated; wet; thin gravel layer at 6.0'
	0.0	split spoon	14,35,46	1.8	9.5–11.5	SP	10	Sand; same as above, except very fine- to fine-grained; moderately sorted
	>4.5 (clay)	split spoon	16,19,34	1.6	14.5–16.5	SW/CH	15	Sand with interbeds of clay; pinkish gray (7.5 YR 6/2); very fine- to medium-grained; poorly sorted; subrounded grains; unconsolidated; wet; clay reddish brown (2.5 YR 5/4); high plasticity; gravel layer at 14.5'

Feet below ground surface: 10, 20, 30, 40, 50

Graphic Log Symbols

- SP – Poorly graded sands, gravelly sands, little or no fines
- SM – Silty sands, sand-silt mixture
- CA – Caliche, calcareous sands
- ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SW – Well graded sands, gravelly sand, little or no fines
- CH – Inorganic clays of high plasticity, fat clays

C. Pigman
n Engineering
10-25-95
Stem Auger

Bit Diameter: 7.625 in. O.D.
Total Drill Depth: 15.0 ft.

Top-of-concrete El.: 3932.01 fmsl

* Note: Pocket penetrometer reading in granular soils is used only as a qualitative guide; units of TSF do not apply

CAMINO REAL LANDFILL
Boring M-8

VENS & ASSOCIATES, INC.

Boring Logs 2005/2006

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: SB–5

File No.: III.5.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 161.69	Date Started: 12/19/05	Drilling Co.: PEI	GEI Rep.: DJT & JAB
ND Ft. at completion (below ground surface)	E: 55.26	Date Comp: 12/19/05	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4129.33	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		47–63–42	Fine yellow sandstone and silt, poorly graded with caliche.	SM		
10'		6–8–8	Fine brown clayey sandstone, poorly graded.	SC		
15'		6–24–26	Fine tan silty sand, poorly graded.	SM		
20'		7–9–12	Fine tan silty sand, as above.	SM		
25'		6–19–25	Fine light brown sand, poorly sorted, with 4" silt (MH).	SM		
30'		11–18–18	Light brown silty sandstone, poorly graded.	SM		
35'		11–23–21	Light brown silty sandstone (as above).	SM		
40'		11–23–30	Fine light brown sand and silt, poorly graded.	SP–SM		
45'		4–16–27	Unconsolidated, light brown fine sandstone and silty sandstone.	SP–SM		
50'		15–29–39	Light brown silty sandstone (as above).	SP–SM		
55'		13–26–25	Light brown silty sandstone, poorly graded.	SP–SM		
60'		11–31–25	Fine light brown poorly graded sandstone.	SP		
65'		11–25–27	Fine light brown sandstone (as above).	SP		
70'		no sample	Fine light brown poorly graded, unconsolidated, sand.	SP		

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Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: SB–6

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 766.60	Date Started: 12/20/05	Drilling Co.: PEI	GEI Rep.: DJT & JAB
ND Ft. at completion (below ground surface)	E: 307.73	Date Comp: 12/20/05	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4113.08	Location:	Helper: Bill K.	Sampling Meth.: SPLIT SPOON
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		2–3–5	Fine yellow–brown, unconsolidated, poorly graded sands	SP		
10'		5–8–13	Fine, yellow–brown silts and sand, poorly graded.	SP–SM		
15'		6–11–16	Fine light brown, poorly graded sand.	SP		
20'		10–19–18	Light brown silty sands, poorly graded with lenses of SM	SP–SM		
25'		11–21–33	Light brown silt with lenses of sp and 6" CH	SM		
30'		11–19–27	Fine light brown, poorly graded, unconsolidated sandstone	SP		
35'		14–31–50/5	Light brown unconsolidated silts and sands	SP–SM		
40'		16–32–49	Fine light brown, poorly graded, unconsolidated sandstone	SP		
45'		14–26–42	Fine light brown, poorly graded, unconsolidated sandstone	SP		
50'		NO SAMPLE	Fine light brown poorly graded sandstone	SP		

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Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: SB-7

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 1479.44	Date Started: 12/20/05	Drilling Co.: PEI	GEI Rep.: DJT & JAB
ND Ft. at completion (below ground surface)	E: 318.79	Date Comp: 12/20/05	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4116.63	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		9–12–18	Red–brown silty sand, unconsolidated.	SM		
10'		6–11–16	Red–brown silty sand (as above).	SM		
15'		3–10–20	Red–brown silty sand with carbonates on bedding planes.	SM		
20'		7–18–24	Fine grained, light brown poorly graded sandstone.	SP		
25'		11–19–21	Fine to medium grained, light brown, moderately graded sandstone with scattered pebbles.	SP–SW		
30'		7–23–44	Fine grained light brown poorly graded unconsolidated sandstone.	SP		
35'		7–17–25	Fine light brown sandstone and silty sandstone, poorly graded.	SP–SM		
40'		12–34–50/4	Fine grained light brown sandstone and siltstone (as above).	SP–SM		
45'		14–39–48	Light brown fine sandstone and silt (poor recovery)	SP–SM		
50'		11–30–50/4	Light brown silty sandstone.	SM		
55'		24–30–34	Light brown fine grained poorly graded sandstone.	SP		
60'		10–22–36	Light brown silty sandstone.	SM		
65'		12–25–36	Light brown, fine to medium grained sandstone with well rounded gravel.	SW		
70'		no sample	Light brown, fine to medium grainded, moderately graded sandstone.	SP–SW		

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Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: SB–8

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 1795.30	Date Started: 12/21/05	Drilling Co.: PEI	GEI Rep.: DJT & JAB
ND Ft. at completion (below ground surface)	E: 16.95	Date Comp: 12/21/05	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4127.42	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		7–11–11	Yellow–brown fine grained poorly graded sandstone with caliche and 2" SC.	SP		
10'		12–14–16–17	Yellow–brown fine grained sandstone and silty sandstone with 6" SC.	SP–SM		Ring
15'		8–11–16	Light brown fine grained sandstone and silty sandstone, poorly graded.	SP–SM		
20'		5–12–16	Light brown fine grained unconsolidated sandstone (as above).	SP–SM		
25'		6–11–13	Light brown fine grained sandstone and silty sandstone with lens of SW.	SP–SM		
30'		8–21–27	Light brown fine grained poorly graded sandstone.	SP		
35'		13–25–38	Light brown fine grained unconsolidated sandstone (as above).	SP		
40'		14–24–33	Light brown medium to coarse grained moderately graded unconsolidated sandstone.	SP–SW		
45'		16–34–51	Light brown fine grained poorly graded sandstone.	SP		
50'		12–19–27	Brown clay with light brown fine grained sandstone with 3" SW.	CH		
55'		10–13–17	Light brown fine grained sandstone and silty sanstone, poorly graded.	SP–SM		
60'		10–20–28	Brown silty sand.	SM		
65'		12–20–35	Light brown fine grained poorly graded sandstone with 50% SW.	SP–SW		
70'		4–12–19	Light brown fine grained poorly graded sandstone with some ML.	SP		
75'		6–17–25	Light brown fine grained sandstone and silty sandstone with carbonates.	SP–SM		
80'		9–20–41	Light brown fine grained sandstone and silt with 2" CH.	SP–SM		

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Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: SB-8 (cont.)

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 1795.30	Date Started: 12/21/05	Drilling Co.: PEI	GEI Rep.: DJT & JAB
ND Ft. at completion (below ground surface)	E: 16.95	Date Comp: 12/21/05	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4127.42	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
85'		10–22–32	Light brown fine grained poorly graded sandstone.	SP		
		15–21–22	Light brown fine grained sandstone (as above) with 4" CH.	SP		
90'		10–14–20	Brown clay.	CH		
95'		26–75–50/2	Tan sandy silt.	ML		Ring
100'		17–48–50/2	Gray–green fine grained sandstone and silty sandstone, poorly graded.	SP–SM		
105'		15–29–43	Fine grained sandstone and silty sandstone (as above).	SP–SM		
110'		24–45–50/2	Green fine grained poorly graded sandstone with 6" ML.	SP		
115'		23–18–34	Green fine grained sandstone and silty sandstone with 5" SC.	SP–SM		
120'		11–21–50/3	Brown gummy sandy clay.	CH		
125'		34–50–50/2	Brown silt with 50% light brown SP–SM.	ML		
130'		75–158–200/5	Fine grained salt and pepper sand with 4" glauconite clasts.	SP		Ring
135'						

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Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: SB–9

Page 1 of 2

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 1952.12	Date Started: 01/09/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 703.26	Date Comp: 01/09/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4120.22	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		8–3–4	Manure			
10'		2–2–4	Manure			
15'		4–4–3	Manure			
20'		5–3–5	Manure			
25'		3–4–4	Manure			
30'		6–9–13	Manure			
35'		2–2–3	Manure–burned?			
40'		4–5–12	Waste + poorly graded sandstone?			
45'		5–11–15	50% SW – 50% charcoal and green waste.			
50'		9–15–22	Light tan fine grained clean poorly graded sandstone.	SP		
55'		7–10–10	Light yellow fine grained clean poorly graded limonite stained sandstone.	SP		
60'		5–18–26	Clean medium grained well graded sandstone.	SW		
65'		10–28–33	Clean medium grained sandstone becoming fine poorly sorted sandstone.	SW–SP		
70'		7–20–24	(as above).	SP		
75'		13–34–50/4	Yellow–brown (limonitic) fine to medium grained clean sandstone.	SP		
80'		11–18–29	Light tan clay and silty clay.	CL		

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Log of Borehole No.: SB–9 (cont.)

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 1952.12	Date Started: 01/09/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 703.26	Date Comp: 01/09/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4120.22	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
85'		8–10–27–39	Yellow–brown fine to medium grained clean sandstone.	SP		Ring
90'		7–15–23	Tan clean fine grained poorly graded sandstone.	SP		
95'		30–22–50/5	As above with small yellow silty–clayey globules.	SP		
100'		25–40–55	Yellow–brown fine to medium grained poorly sorted sandstone with clay.	SP		
105'		14–37–47	Light tan fine grained poorly sorted sandstone with small hard clay globules.	SP		
110'		10–16–20	As above with sandy loam clays @ bottom 4".	SP		
115'		28–50–100/4	Fine grained clean poorly graded sandstone with scattered clay globules.	SP		
120'		12–30–45	As above.	SP		Ring sample bagged

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Log of Borehole No.: SB–10

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 3338.21	Date Started: 01/11/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 1522.27	Date Comp: 01/12/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 3979.93	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		4–6–8	Yellow–brown fine grained poorly graded sandstone.	SP		
10'		4–8–10	As above.	SP		
15'		6–10–12	Tan fine grained poorly graded sandstone.	SP		
20'		6–13–21	As above.	SP		
25'		11–19–28	Tan medium grained poorly graded sandstone.	SP		
30'		13–19–20	Tan medium grained moderately graded sandstone.	SW		
35'		14–23–30	Tan fine grained poorly graded sandstone.	SP		
40'		9–21–27	Tan silty sand with 3" ML.	SM		
45'		17–18–19	Tan silty sand with 6" CH.	SM		
50'		10–20–30	Tan silty sand with 6" ML.	SM		
55'		13–22–34	Fine to very fine grained poorly graded sand with 2" ML.	SP–SM		
60'		28–28–42	Fine to very fine poorly graded sandstone (powder).	SP–SM		
65'		11–29–48	As above.	SP–SM		
70'		16–25–33	Fine to very fine grained poorly graded sandstone with 2" CH.	SP–SM		
75'		17–28–34	Yellow silty sandstone with caliche pebbles.	SM		
80'		12–23–22	Brown fine to very fine grained poorly graded sandstone.	SP–SM		

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Log of Borehole No.: SB–10 (cont.)

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 3338.21	Date Started: 01/11/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 1522.27	Date Comp: 01/12/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 3979.93	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
85'		21–46–50/5	Tan fine to very fine grained poorly sorted sandstone.	SP–SM		
90'		8–22–50/2	As above with 5" CL.	SP–SM		
95'		8–16–50	Brown silty clay.	CH		
100'		19–65–100	Light tan silty sand.	ML		Ring bagged.

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Log of Borehole No.: SB–11

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File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 3058.86	Date Started: 01/10/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 844.13	Date Comp: 01/10/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4056.54	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		4–4–7	Well graded sandstone and gravel (Camp Rice?).	SW		
10'		6–10–11	Fine to medium grained moderately graded sandstone.	SW		
15'		8–13–16	Medium grained moderately graded sandstone with limonitic clay.	SW		
20'		9–13–17	Fine grained well graded sandstone with limonitic clays and trace of gravel.	SW		
25'		12–23–27	Medium grained well graded sandstone with clays and trace of gravel, 2" bed silty clay (CL).	SW		
30'		9–19–26	Coarse grained well graded sandstone with limonitic clays and trace gravel.	SW		
35'		4–11–19	Fine grained poorly sorted sand and clay.	SP		
40'		12–30–45	Silty clays with 6" bed of SP.	CL		
45'		7–18–22	Tan fine grained poorly sorted sand and clay.	SP		
50'		10–15–28	Light yellow–brown fine grained sandstone with 2" silty sand layer.	SP		
55'		11–22–31	Tan fine grained poorly graded sandstone with carbonates on bedding planes.	SP		
60'		11–33–46	Light yellow fine to medium grained poorly graded sandstone.	SP		
65'		18–37–54	As above with trace hard clay globules.	SP		
70'		10–25–45	Light yellow fine grained poorly graded sandstone.	SP		
75'		21–30–38	As above.	SP		
80'		13–43–36	As above with 2" caliche (calcite zone).	SP		

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Log of Borehole No.: SB–11 (cont.)

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 3058.86	Date Started: 01/10/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 844.13	Date Comp: 01/10/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 4056.54	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
85'		14–34–46	Tan fine grained poorly graded sandstone.	SP		
90'		27–51–50/5	As above with 5" brown fetid clay	SP		
95'		23–41–50/4	Tan silt and very fine sand.	ML		
100'		10–16–28	Brown clay with silty sandstone.	CH		

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Consulting Engineers

Log of Borehole No.: SB–12

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 2720.63	Date Started: 01/11/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 209.83	Date Comp: 01/11/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 3995.31	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		2–2–2	Yellow–brown silty sand.	ML		
10'		4–5–7	Yellow–brown fine to medium grained well graded sandstone.	SW–SM		
15'		7–11–20	As above with sparse gravel fragments.	SW–SM		
20'		10–19–32	Tan fine to very fine grained poorly graded sandstone.	SP–SM		
25'		4–9–11	As above.	SP–SM		
30'		6–19–33	As above with 2" CL.	SP–SM		
35'		13–24–25	Tan fine grained poorly sorted sandstone.	SP		
40'		22–40–50/4	As above with 2" CL.	SP		
45'		3–11–18	Tan fine to very fine poorly sorted sand.	SP–SM		
50'		16–31–41	As above with 2" ML.	SP–SM		

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Log of Borehole No.: SB–13

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 4295.86	Date Started: 01/12/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 31.52	Date Comp: 01/12/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 3960.89	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		4–5–5	Yellow–brown silty sandstone, >15% ?	SM		
10'		3–7–13	Light yellow fine to very fine grained poorly graded sandstone.	SM–SP		
15'		5–13–20	Tan silty sandstone witn 3" brown CL.	SM		
20'		6–8–18	Brown sandy clay with 6" SM.	CL		
25'		4–15–25	Tan fine to very fine grained silty sandstone.	SM–SP		
30'		12–21–27	As above.	SM–SP		
35'		4–11–19	Tan silty sand with 4" CL.	SM–SP		
40'		7–19–20	As above with 4" CL.	SM–SP		
45'		12–84–59	Light tan silty sand with 2" CL.	ML		
50'		14–27–42	Tan fine grained poorly sorted sandstone with 2" ML	SP		
55'		24–165–100/4	As above (bagged).	SP		Ring
60'		18–65–50/4	Yellow–brown silty sand.	ML		
65'		18–68–50/4	Yellow–brown silty sand (damp).	ML		
70'		32–150–100/3	Yellow silt with 6" CL.	ML		Ring

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Log of Borehole No.: SB–14

File No.: III.05.02

Client: CAMINO REAL

Water Level Data	Location UTM's and Elevation (MSL)	Borehole Information		
ND Ft. While Drilling (below ground surface)	N: 4083.63	Date Started: 01/10/06	Drilling Co.: PEI	GEI Rep.: JAB
ND Ft. at completion (below ground surface)	E: 1056.10	Date Comp: 01/10/06	Driller: Nathan	Drill Meth.: HSA
water level data approximate	Elevation: 3921.66	Location:	Helper: Bill K.	Sampling Meth.: Split Spoon
	loc./elev. data approximate			

Depth (ft. BGS)	Graphic Lithology	Blow Count	Soil/Lithology Description	USCS Classification	Relative Moisture Content	Notes:
5'		3–4–4	Fine grained poorly graded sandstone (damp) Quat.	SP		
10'		3–4–4	As above.	SP		
15'		9–15–21	Tan silt and clayey silt.	ML		
20'		12–38–55	Light yellow–brown fine grained poorly sorted sand.	SP		Ring
25'		3–12–15	Yellow brown fine grained poorly sorted sand with trace hard clay globules.	SP		bagged
30'		14–28–45	As above with some limonite staining.	SP		
35'		14–39–50/5	Fine grained sand (damp) with carbonates on bedding planes.	SP		
40'		22–45–79	Brown clay and silty clay.	CH		Ring
45'		15–36–55	Brown clay and silty clay.	CL		
50'		10–21–30	Tan fine grained poorly sorted sandstone.	SP		

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Log of Borehole No.: **MW-D2**

File No.: 111.05.02

Client: Camino Real Environmental Centers, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.7 ft. at completion (below ground surface) water level data approximate	N: 105.24 E: 19.31 Elev.: 4133.28 top of steel well head	Logged by: DT Date started: 02/09/06 Date comp.: 02/11/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Topsoil and caliche	Quick, relatively quiet drilling to 95'
		Dune sand and caliche	
10		Silty sand	
		Silty sand	
20		Silty sand with caliche	
		Gravelly sand. Gravels are 3/8" or smaller, and consist of 50/50 quartz/mafics	
30		Sandy Siltstone	
		Silty, very coarse sandstone, 1/8" and smaller	
40		Sandy gravel. Gravels range from very coarse sandstone to 1/4"	
		Sandy gravel. Gravels are 1/2" and smaller	
50		Sandy coarse sandstone and gravels (from above?). Gravels still consist of 50/50 mixture of quartz and mafics	
		Silty coarse sandstone. Some gravels 1/2" and smaller	
60		Silty coarse sandstone	
		Very coarse sandstone with some gravels 1/2" and smaller. Lithology of gravels remains 50/50 quartzose/mafic	
		Silty coarse sandstone and gravels 3/8" and smaller with calcite cementing. Some clay present.	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: MW-D2	Page 2 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Centers, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.7 ft. at completion (below ground surface) water level data approximate	N: 105.24 E: 19.31 Elev.: 4133.28 top of steel well head	Logged by: DT Date started: 02/09/06 Date comp.: 02/11/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Clay with some coarse sandstone lag	
80		Sandy, silty, claystone	
		Silty claystone with some sandstone	
90		Silty, clayey, sandstone	
		Siltstone/claystone, grading to cemented gravels of 1/4" and smaller. Slight color change to a more grey color from a maroon color	Drilling more noisy. Contact with Hancock?
100		Claystone with some gravel lag	
		Coarse, poorly indurated, sandstone	
110		Coarse sandstone to 3/8" gravel	
		Coarse sandstone to 1/4" gravel	
120		Coarse, well-cemented, sandstone	
		Coarse, well-cemented, sandstone	
130		Coarse, well-cemented, sandstone	
		Coarse, well-cemented, sandstone	
140		Coarse, well-cemented, sandstone	
		Coarse, well-cemented, sandstone	

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: **MW-D2**

File No.: 111.05.02

Client: Camino Real Environmental Centers, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.7 ft. at completion (below ground surface) water level data approximate	N: 105.24 E: 19.31 Elev.: 4133.28 top of steel well head	Logged by: DT Date started: 02/09/06 Date comp.: 02/11/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Coarse, well-cemented, sandstone. Clay lens at approximately 154' to 156'.	Drilling quiet and slow at 154' to 156'
		Coarse, well-cemented, sandstone	Drilling back to noisy and moderately quick
160		Small lens of kaolinite in a medium-grained to coarse-grained sandstone	Drilling becoming very slow and relatively quiet at approximately 164'
		Claystone with minimal fine-grained sandstone grading to a siltstone	
170		Claystone and siltstone	
		Claystone and siltstone	
180		Claystone and siltstone	
		Claystone and siltstone	
		Claystone and siltstone	
190		Claystone and siltstone	
		Claystone and siltstone and fine sandstone	Drilling becoming more noisy
200		Claystone and siltstone and fine sandstone	
		Claystone and siltstone and fine sandstone	
210		Claystone and siltstone and fine sandstone	
		Claystone	Drilling quiet and slow
0		Claystone	

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Log of Borehole No.: **MW-D2**

File No.: 111.05.02

Client: Camino Real Environmental Centers, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.7 ft. at completion (below ground surface) water level data approximate	N: 105.24 E: 19.31 Elev.: 4133.28 top of steel well head	Logged by: DT Date started: 02/09/06 Date comp.: 02/11/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
230		Claystone	
		Claystone with a small lens of gravel	Small zone of drill chatter, then back to quiet
		Claystone	
240		Mudstone	Drilling still rather slow but more noise
		Mudstone	
		Mudstone	
		Mudstone	
		Mudstone	
260		Mudstone	
		Claystone	Drilling slow and quiet again
270		Claystone	
		Claystone	
280		Mudstone	Drilling slow with increased noise
		Siltstone to fine sandstone	Drilling quick with increased noise
290		Claystone	Drilling slow and quiet again
		Claystone	

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Consulting Engineers

Log of Borehole No.: **MW-D2**

File No.: 111.05.02

Client: Camino Real Environmental Centers, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.7 ft. at completion (below ground surface) water level data approximate	N: 105.24 E: 19.31 Elev.: 4133.28 top of steel well head	Logged by: DT Date started: 02/09/06 Date comp.: 02/11/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Claystone to mudstone	Drilling speed and noise slightly increased
		Mudstone	
310		Mudstone	
		Mudstone	
320		Mudstone	
		Mudstone	
330		Mudstone	
		Mudstone	
340		Mudstone	
		Mudstone to a siltstone at 348'	Drilling quiet and fast
350		Claystone at 352'	Drilling quiet and slow
		Mudstone at 359'	Drilling noise and speed moderate
360		Coarse sandstone at 362'	Drilling noisy and fast
		Coarse sandstone	
370		Coarse sandstone to claystone to mudstone	Drilling noisy and relatively quick

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Consulting Engineers

Log of Borehole No.: **MW-D2**

File No.: 111.05.02

Client: Camino Real Environmental Centers, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.7 ft. at completion (below ground surface) water level data approximate	N: 105.24 E: 19.31 Elev.: 4133.28 top of steel well head	Logged by: DT Date started: 02/09/06 Date comp.: 02/11/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
380		Mudstone contacting a claystone/fine-grained sandstone shale at 380'.	Drilling somewhat less noisy
		Sandstone/claystone shale indicated by shale-like clay flakes in drill cuttings, and significant increase in borehole backfill, which is primarily the claystone flakes, once this zone is breached.	Drilling noisy and moderately quick again
390			
		Claystone/sandstone shale, with a lens of claystone at 396' to 397' grading to a fine sandstone at 398' to 401'	Drilling quiet and slow at 396' to 397'
400		Claystone/sandstone shale	Drilling fast and quiet at 398' to 401'
		Claystone/sandstone shale	Drilling noisy and moderately quick at 401'
410		Claystone/sandstone shale	
		Claystone/sandstone shale	Total Depth at 420' bgs
420			

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: MW-H	Page 1 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Center, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface)	N: 1784.27	Logged by: DT	Drilling Contr.: Rodgers	Drilling Meth.: Mud-Rotary
381.5 ft. at completion (below ground surface)	E: 8.51	Date started: 02/21/06	Head Driller: John	Sampling Meth.: Grab
water level data approximate	Elev.: 4130.85 top of steel well head	Date comp.: 02/22/06	Assistant(s): Berto	

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Caliche	Noisy, slow drilling
		Caliche	
10		Fine to medium-grained sandstone	Quick, relatively quiet drilling
		Medium to coarse-grained sandstone	
20		Coarse-grained sandstone to gravels 1/4" and smaller. Gravels are quartzose and mafic	
		Coarse-grained sandstone	
30		Coarse-grained sandstone	
		Coarse-grained sandstone	
40		Fine to medium-grained sandstone, with gravels 1/4" and smaller.	
		Same as above contacting claystone at 47'	Slow and smooth drilling
50		Claystone to fine to medium-grained sandstone at 54'	Fast and smooth drilling
		Medium to coarse-grained sandstone to 1/4" gravel at 59'	
60		Coarse-grained sandstone and small gravel (1/8")	
		Coarse-grained sandstone and small gravel (1/8")	
J		Coarse-grained sandstone up to 1/4" gravel	

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: **MW-H**

File No.: 111.05.02

Client: Camino Real Environmental Center, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Coarse sandstone up to 1/4" gravel	
80		Coarse sandstone up to 3/8" gravel	
		Coarse sandstone up to 1/4" gravel	
90		Coarse sandstone up to 1/4" gravel contacting a claystone at 93'.	Quiet and slow drilling. Contact with Hancock?
		Claystone	
100		Claystone to a mudstone	
		Mudstone	
110		Mudstone to a siltstone	Quicker but fairly quiet drilling
		Siltstone	
120		Siltstone to a fine sandstone	Fast and fairly noisy drilling
		Fine sandstone and claystone	
130		Fine sandstone to coarse sandstone to 1/4" gravel	
		1/4" gravel to a fine-grained sandstone with lenses of claystone and siltstone	
140		Medium to coarse sandstone with lenses of claystone	
		Medium to coarse sandstone up to 1/8" gravel with lenses of claystone	

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Log of Borehole No.: **MW-H**

File No.: 111.05.02

Client: Camino Real Environmental Center, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Fine sandstone with lenses of claystone and siltstone	Relatively noisy and moderately fast drilling
		Fine sandstone with lenses of claystone and siltstone	
160		Fine to medium-grained sandstone with small claystone lenses	
		Fine to medium-grained sandstone with small claystone lenses	
170		Fine to medium-grained sandstone	
		Fine to medium-grained sandstone to a claystone/mudstone at 178'	
180		Fine to medium-grained sandstone with big flakes of mica	
		Fine to medium-grained sandstone	
190		Fine sandstone with claystone and siltstone lenses	
		Fine sandstone with claystone, siltstone, and a gravel lens	
200		Fine sandstone with claystone and siltstone lenses	
		Fine sandstone with claystone and siltstone lenses	
210		Fine sandstone with claystone and siltstone lenses	
		Claystone with very hard lenses of siltstone	
220		Fine sandstone	

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: MW-H

File No.: 111.05.02

Client: Camino Real Environmental Center, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Mudstone	
230		Mudstone	
		Fine to medium-grained sandstone	
240		Siltstone and claystone	
		Mudstone	
250		Fine sandstone with claystone lenses	
		Fine sandstone with claystone lenses	
260		Siltstone and claystone	
		Siltstone and claystone	
270		Siltstone and claystone	
		Siltstone and claystone	
280		Siltstone and claystone to claystone at 287'	
		Claystone	Slow and quiet drilling
290		Claystone	
		Claystone contacting a mudstone at 304'	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: MW-H	Page 5 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Center, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface)	N: 1784.27	Logged by: DT	Drilling Contr.: Rodgers	Drilling Meth.: Mud-Rotary
381.5 ft. at completion (below ground surface)	E: 8.51	Date started: 02/21/06	Head Driller: John	Sampling Meth.: Grab
water level data approximate	Elev.: 4130.85 top of steel well head	Date comp.: 02/22/06	Assistant(s): Berto	

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Mudstone	More noisy and quicker drilling
		Mudstone to siltstone	
310		Siltstone	
		Siltstone and claystone	
320		Fine-grained sandstone with minor clay lenses	Noisy and moderately fast drilling
		Fine-grained sandstone with minor clay lenses	
330		Fine-grained sandstone with minor clay lenses	
		Fine-grained sandstone with minor clay lenses	
340		Fine-grained sandstone with minor clay lenses	
		Fine-grained sandstone with minor clay lenses	
350		Fine-grained sandstone with minor clay lenses	
		Fine-grained sandstone with minor clay lenses	
360		Mudstone	
		Fine-grained sandstone	
0		Claystone at 370'	Quiet and slow drilling

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: **MW-H**

File No.: 111.05.02

Client: Camino Real Environmental Center, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
380		Claystone contacting claystone/fine-grained sandstone shale at 379'. Sandstone/claystone shale is indicated by shale-like clay flakes in drill cuttings, and significant increase in borehole backfill, which is primarily the claystone flakes, once this zone is breached.	Drilling noisy and moderately fast
390			
		Claystone/fine-grained sandstone shale	
400		Approximately 1' of claystone at 400', grading to a fine-grainded sandstone to 405'.	Drilling quiet and slow at 400' to 401'
		Claystone/sandstone shale	Drilling moderately fast and noisy at 401' to 405'
410		Claystone/sandstone shale	Drilling noisy and moderately fast
		Claystone/sandstone shale	Total Depth at 420' bgs
420			

ATTACHMENT V.1.B

Unit 4 Site Assessment Boring Plan

(Oct. 29, 2019)

Weaver Consultants Group

6420 SOUTHWEST BLVD., STE. 206
FORT WORTH, TEXAS 76109
PHONE: (817) 735-9770
FAX: (817) 735-9775

MEMORANDUM

To: New Mexico Environment Department, Solid Waste Bureau

Date: October 29, 2019

From: David E. Poe, P.E., Weaver Consultants Group

Project No.: 0601-667-11-02

Re: Transmittal of Notice of Intent for Soil Borings at the Camino Real Landfill
NMED Permit No. SW 00-10(M)
Sunland Park, New Mexico

Weaver Consultants Group is pleased to submit to the New Mexico Environment Department (NMED) the attached Notice of Intent for soil borings to be installed at the Camino Real Landfill, located in Sunland Park, New Mexico. As presented in the notice, we plan to install 3 soil borings in support of geotechnical analyses that will be prepared as a component of the permit renewal for the subject facility.

Please do not hesitate to contact me at (817) 735-9770 if you have questions or require additional information.

NEW MEXICO
ENVIRONMENT DEPARTMENT
Solid Waste Bureau
Harold Runnels Building – Room N2150
1190 St Francis Dr.
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-0197 Fax (505) 827-2902
www.env.nm.gov

INSTALL AND/OR DECOMMISSION BOREHOLES, PIEZOMETERS OR GROUND WATER WELLS NOTICE OF INTENT

Date: 10-21-2019

Owner/Operator Name: Camino Real Environmental Center, Inc.

Mailing address: PO Box 580 Sunland Park, NM 88063

Phone: (575) 589-9440 Well or Boring(s) # 3 Borings (4-1, 4-2, 4-3)

Facility Name: Camino Real Landfill

Consultant/Contractor Name: Weaver Consultants Group, LLC

Mailing Address: 6420 Southwest Blvd., Suite 206 Fort Worth, Texas 76109

Phone: (817) 735-9770

Qualified Ground Water Scientist Name (Print): David E. Poe

This Notice of Intent is to provide at least 14 days prior notification to the New Mexico Environment Department Solid Waste Bureau (SWB) of the (X) installation and/or ( ) decommissioning of any boreholes, piezometers, or ground water monitoring wells per 20.9.3.9 and 20.9.9.9.E & F NMAC. Also **include a draft installation or decommissioning plan with this notification** for approval prior to proceeding (include approximate start date).

1. I certify that the (X) installation and/or ( ) decommissioning will comply with the Solid Waste Rules and any other rules or regulations that might apply.
2. I certify that within 90 days of final completion of the installation that an installation report in accordance with 20.9.9.9 F NMAC will be submitted to the SWB.
3. I certify that the ground water system plan will be revised to include the changes (installation and/or decommissioning) and sent to the SWB for final approval and then be placed in the facility ground water monitoring system plan.
4. I certify that I have notified the State Engineers Office of the above install/decommission.

Certification Signature (Ground Water Scientist) (NMED-SWB Revised 5-6-11)

SITE ASSESSMENT BORING PLAN

The Camino Real Landfill is an existing solid waste facility operating in compliance with New Mexico Environment Department (NMED) Permit No. SW 00-10 (M). The Camino Real Environmental Center, Inc. (Camino Real) is applying for a Permit Renewal and Modification (in compliance with Title 20 New Mexico Administrative Code (NMAC) 9.3.25 and 20.9.3.22 NMAC) for continued operation of the facility. This application addresses the development of previously permitted additional disposal cells within the current solid waste facility boundary.

Boring Plan Objectives

Camino Real has retained Weaver Consultants Group, LLC (WCG) to develop and implement a Site Assessment Boring Plan (Plan) for the proposed Permit Renewal/Modification Application. The purpose of this Plan is to obtain NMED input and approval for this Plan prior to its implementation. This Plan was prepared in conformance with the requirements of the New Mexico Solid Waste Management Regulations (20.9.3.9(A)(2) NMAC).

This Plan describes the planned drilling and soil testing of three borings to evaluate the geotechnical engineering characteristics (foundation stability and settlement) of the Unit 4 disposal area. As shown in Figure 1, the facility property is located in Doña Ana County, New Mexico, approximately one-half mile southwest of the City of Sunland Park. Figure 2 shows the location of the permitted solid waste facility boundary and boring locations, and identifies the Unit 4 disposal area.

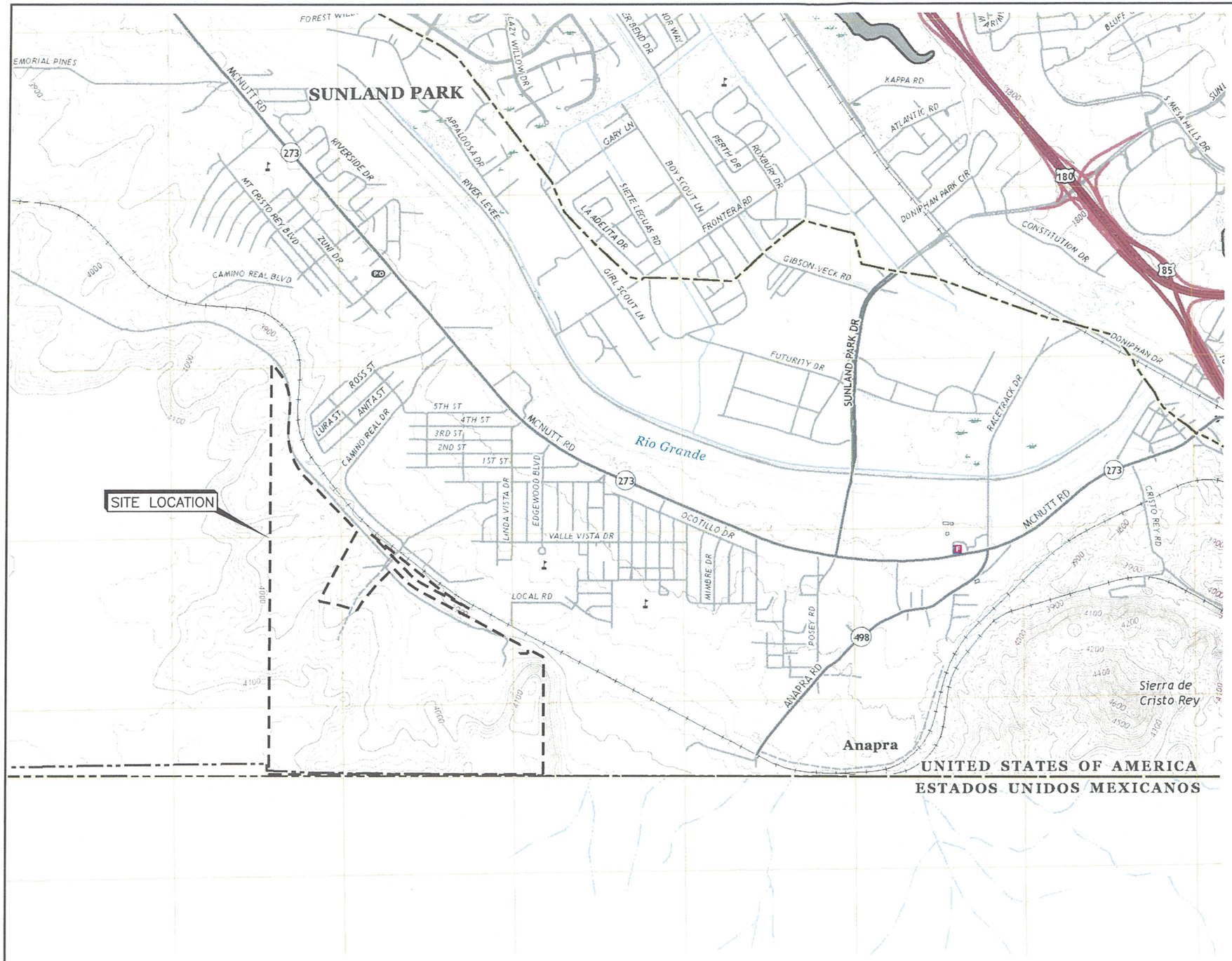
Soil Borings and Testing

The locations of the three proposed soil borings (4-1 through 4-3) are shown on Figure 2. The three soil borings will be completed using a hollow-stem auger to a maximum depth of 120 feet. The depth of borings for the two borings (4-1 and 4-2) completed in the undeveloped Unit 4 waste footprint will be at least 45 feet below the lowest elevation of the proposed base grade liner system in Unit 4 (i.e., 3,896 ft-msl). During boring activities, WCG field staff or a hydrogeologist will be on-site to log the borings and collect soil samples retrieved by a split-spoon sampler or other applicable sample methods for subsequent visual classification and selected laboratory analyses (see Table 1). All soil borings will be plugged and abandoned in accordance with the New Mexico Office of State Engineer's (NMOSE) requirements for plugging or sealing of test holes as specified in 20.9.3.8 NMAC. A copy of the approved NMOSE permit (LRG 17861) is attached to this Plan. No groundwater monitoring wells will be installed for this Plan.

Soil samples collected during installation of the soil borings will be tested to determine specific engineering properties in accordance with the testing schedule presented in Table 1.

TABLE 1. PROPOSED SOIL BORING SAMPLE TESTING SCHEDULE

Boring No.	Depth (ft)	Dry Sieve Analysis	Atterberg Limits	Ksat	Classification (USCS)	Moisture Content	Direct Shear/ Triaxial	Standard Proctor Density	Consolidation
4-1	100	3	2	2	6	6	0	1	1
4-2	100	3	2	2	6	6	0	1	1
4-3	120	3	2	2	6	6	2	1	0



0 1000 2000
SCALE IN FEET

LEGEND

PROPERTY BOUNDARY

NOTES:

1. BASED ON SMELTERTOWN, 2019 USGS QUADRANGLE 7.5' MAP.

P:\Solid waste\WC\Camino Real\Expansion 2019\Borings\1-SITE LOCATION.dwg, rbaker

V.1.B-5

☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 10/2019
FILE: 0601-667-11
CAD: 1-SITE LOCATION.DWG

DRAWN BY: JDW
DESIGN BY: MDM
REVIEWED BY: JAE

Weaver Consultants Group

PREPARED FOR
CAMINO REAL ENVIRONMENTAL CENTER, INC.

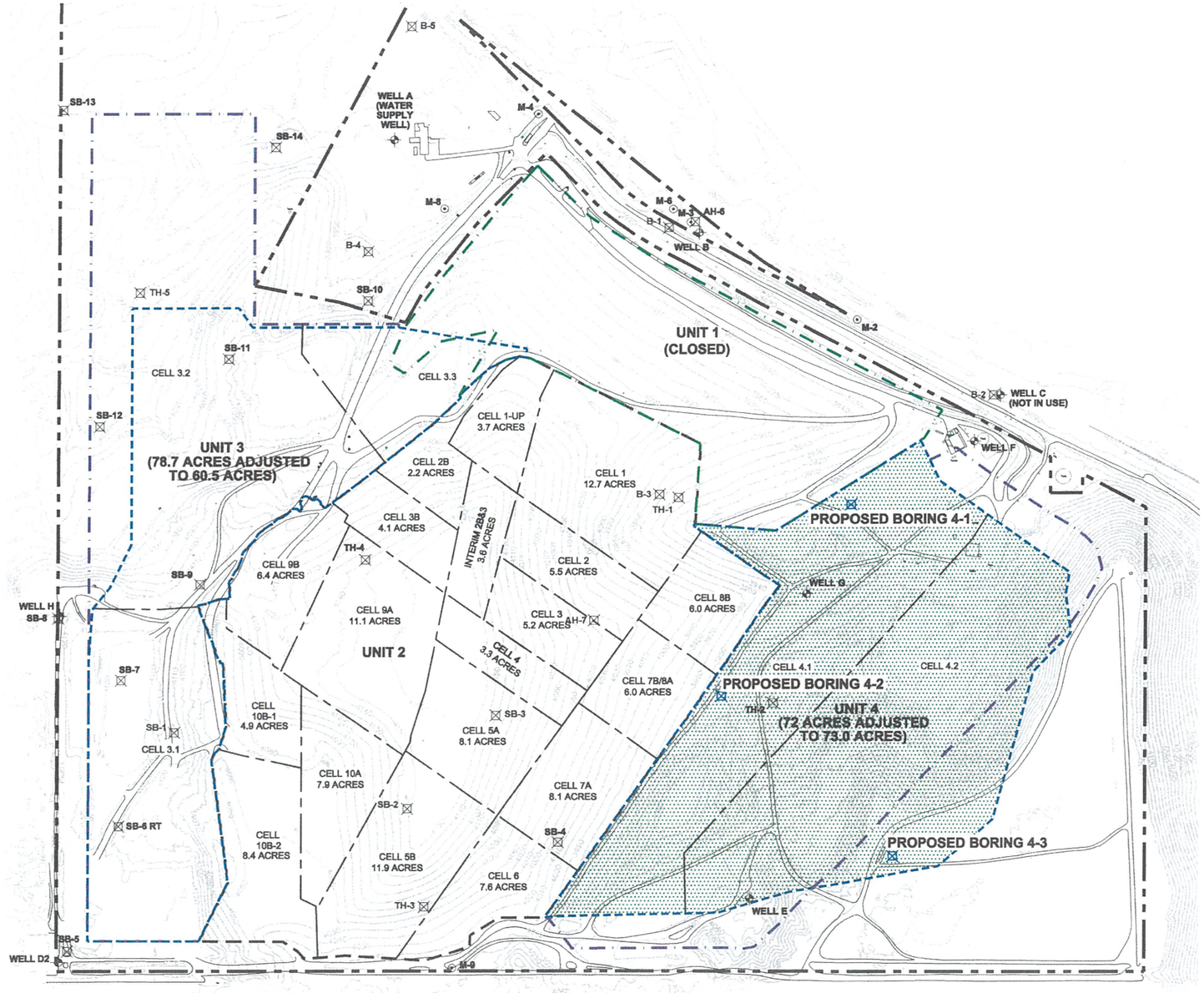
REVISIONS		
NO.	DATE	DESCRIPTION

SITE LOCATION MAP

CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO

WWW.WCGRP.COM

FIGURE 1



N

0 300 600

SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMITTED LIMITS OF WASTE FOR UNIT 2
- PERMITTED LIMITS OF WASTE FOR UNIT 1 (CLOSED)
- PERMITTED LIMITS OF WASTE FOR UNITS 3 AND 4
- ADJUSTED LIMITS OF WASTE FOR UNITS 3 AND 4
- CELL BOUNDARY
- COMPOSITE TOPOGRAPHY (SEE NOTE 1)
- WELL A — EXISTING GROUNDWATER MONITOR WELL
- M-4 — EXISTING LANDFILL GAS PROBE
- SB-12 — EXISTING SOIL BORING LOCATION
- 4-1 — PROPOSED UNIT 4 SOIL BORING LOCATION
- PROPOSED UNIT 4 DISPOSAL AREA

P:\Solid waste\WC\Camino Real\Expansion 2019\Borings\2-BORING LOCATION MAP.dwg, rbaker

☐ DRAFT
☒ FOR INFORMATION PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 10/2019
FILE: 0501-667-11
CAD: 2-UNIT 4 BORING LOC.DWG

DRAWN BY: VRS
DESIGN BY: MDM
REVIEWED BY: JAE

Weaver Consultants Group

PREPARED FOR
CAMINO REAL ENVIRONMENTAL CENTER, INC.

REVISIONS		
NO.	DATE	DESCRIPTION

BORING LOCATION MAP

CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO

WWW.WCGRP.COM

FIGURE 2

John R. D Antonio, Jr., P.E.
State Engineer

District 4 Office
1680 Hickory Loop, Suite J
Las Cruces, NM 88005-6598
Phone: (575) 524-6161
Fax: (575) 524-6160

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 660959
File Nbr: LRG 17861

Oct. 17, 2019

CLAY KILMER
GORDON ENVIRONMENTAL PSC
333 RIO RANCHO BLVD
RIO RANCHO, NM 87124

Received
OCT 22 2019
Gordon Environmental / PSC

Greetings:

Your approved copy of the above numbered permit to drill a well for non-consumptive purposes is enclosed. You must obtain an additional permit if you intend to use the water. It is your responsibility to provide the contracted well driller with a copy of the permit that must be made available during well drilling activities.

Carefully review the attached conditions of approval for all specific permit requirements.

* If use of this well is temporary in nature and the well will be plugged at the end of the well usage, the OSE must initially approve of the plugging. If plugging approval is not conditioned in this permit, the applicant must submit a Plugging Plan of Operations for approval prior to the well being plugged. The Plugging Record must be properly completed and submitted to the OSE within 30 days of the well plugging.
* If the final intended purpose and condition requires a well ID tag and meter installation, the applicant must immediately send a completed meter report form to this office.
* The well record and log must be submitted within 30 days of the completion of the well or if the attempt was a dry hole.
* This permit expires and will be cancelled if no well is drilled and/or a well log is not received by the date set forth in the conditions of approval.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us.

Sincerely,

Aracely Tellez
Water Resources Professional
(575)524-6161

Enclosure

explore

4-3376

File No. LRG-17861

NEW MEXICO OFFICE OF THE STATE ENGINEER

WR-07 APPLICATION FOR PERMIT TO DRILL

A WELL WITH NO WATER RIGHT

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/

Purpose:	☐ Pollution Control And/Or Recovery	☐ Ground Source Heat Pump
☐ Exploratory Well (Pump test)	☐ Construction Site/Public Works Dewatering	☒ Other(Describe): Geotechnical Soil Borings
☐ Monitoring Well	☐ Mine Dewatering	

A separate permit will be required to apply water to beneficial use regardless if use is consumptive or nonconsumptive.

☐ Temporary Request - Requested Start Date: Requested End Date:

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

1. APPLICANT(S)

Name: Waste Connections, Inc.	Name: Gordon Environmental/PSC
Contact or Agent: check here if Agent ☐ Dr. Juan Carlos Tomás	Contact or Agent: check here if Agent ☒ Clay Kilmer
Mailing Address: PO BOX 580	Mailing Address: 333 Rio Rancho Blvd
City: Sunland Park	City: Rio Rancho
State: New Mexico Zip Code: 88063	State: New Mexico Zip Code: 87124
Phone: (575)-589-9440 ☐ Home ☐ Cell Phone (Work):	Phone: (505)-867-6990 ☐ Home ☐ Cell Phone (Work):
E-mail (optional): Juan.Tomas@WasteConnections.com	E-mail (optional): CKilmer@team-psc.com

FOR OSE INTERNAL USE Application for Permit, Form WR-07, Rev 11/17/16

File No.: LRG-17861	Trn. No.: 660959	Receipt No.:
Trans Description (optional): POD1, POD2, POD3		
Sub-Basin: LRS	PCW/LOG Due Date: 10/16/20	

2. WELL(S) Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

■ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
4-1 POD1	106.587067 W 106 35 13.441	31.790322 N 31 47 25 151	Township 29 South, Range 3 East, Section 13, NM
4-2 POD2	106.589086 W 106 35 30.71	31.787747 N 31 47 15.339	Township 29 South, Range 3 East, Section 13, NM
4-3 POD3	106.586414 W 106 35 11.09	31.786414 N 31 47 11.09	Township 29 South, Range 3 East, Section 13, NM

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ☐ Yes ■ No **If yes, how many**_____

Other description relating well to common landmarks, streets, or other:

Well is on land owned by: Waste Connections Inc.

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. **Attached?** ☐ Yes ☐ No
If yes, how many_____

Approximate depth of well (feet): 100ft, 100ft, 120ft	Outside diameter of well casing (inches):
Driller Name: To Be Determined	Driller License Number:

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

Temporary soil borings, to be sealed after drilling and sampling, no well completion.

FOR OSE INTERNAL USE — Application for Permit, Form WR-07

File No.: LRG-17561	Trn No: 660959

4. **SPECIFIC REQUIREMENTS:** The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory:	**Pollution Control and/or Recovery:**	**Construction De-Watering:**	**Mine De-Watering:**
☒ Include a description of any proposed pump test, if applicable.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for the pollution control or recovery operation. ☐ The estimated maximum period of time for completion of the operation. ☐ The annual diversion amount. ☐ The annual consumptive use amount. ☐ The maximum amount of water to be diverted and injected for the duration of the operation. ☐ The method and place of discharge.	☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ☐ Include the reason for the monitoring well, and, ☐ The duration of the planned monitoring.	☐ The method of measurement of water produced and discharged. ☐ The source of water to be injected. ☐ The method of measurement of water injected. ☐ The characteristics of the aquifer. ☐ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ Proof of any permit required from the New Mexico Environment Department. ☐ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	**Ground Source Heat Pump:** ☐ Include a description of the geothermal heat exchange project, ☐ The number of boreholes for the completed project and required depths. ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), Clay Kilmer, Agent for Waste Connections, Inc.
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Clay Kilmer
Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☑ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 17th day of October 20 19, for the State Engineer,

John R. D'Antonio, Jr., STATE ENGINEER

BY Aracely Tellez
Water Resources Professional

State Engineer

Print

STATE OF NEW MEXICO STATE ENGINEER

Print

FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: LRG-17861	Trn No.: 1660959

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

17-4 No water shall be appropriated and beneficially used under this permit.

17-6 The well authorized by this permit shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair and Plugging of Wells; Subsection C of 19.27.4.30 NMAC unless an alternative plugging method is proposed by the well owner and approved by the State Engineer upon completion of the permitted use. All pumping appurtenance shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the state engineer. The well shall be plugged with an office of the state engineer approved sealant for use in the plugging of non-artesian wells. The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two vertical feet of approved sealant. The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil. A Plugging Report for said well shall be filed with the Office of the State Engineer in a District Office within 30 days of completion of the plugging.

17-7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

17-B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with 72-12-12 NMSA 1978. A licensed driller shall not be required for the construction of a well driven without the use of a drill rig, provided that the casing shall not exceed two and three-eighths (2 3/8) inches outside diameter.

Trn Desc: LRG 17861 File Number: LRG 17861
Trn Number: 660959

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

17-C The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. It is the well owner's responsibility to ensure that the well driller files the well record.
The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

17-C1 The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. Test data shall be filed not later than twenty (20) days after completion of the test(s).
It is the well owner's responsibility to ensure that the well driller files the well record. The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

17-C2 No water shall be diverted from this well except for testing purposes which shall not exceed ten (10) cumulative days, and well shall be plugged or capped on or before , unless a permit to use water from this well is acquired from the Office of the State Engineer.

17-G If artesian water is encountered, the well driller shall comply with all rules and regulations pertaining to the drilling and casing of artesian wells.

17-Q The State Engineer retains jurisdiction over this permit.

17-R Pursuant to section 72-8-1 NMSA 1978, the permittee shall allow the State Engineer and OSE representatives entry upon private property for the performance of their respective duties, including access to the ditch or acequia to measure flow and also to the well for meter reading and water level measurement.

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

LOG The Point of Diversion LRG 17861 POD1 must be completed and the Well Log filed on or before 10/16/2020.

LOG The Point of Diversion LRG 17861 POD2 must be completed and the Well Log filed on or before 10/16/2020.

LOG The Point of Diversion LRG 17861 POD3 must be completed and the Well Log filed on or before 10/16/2020.

ACTION OF STATE ENGINEER

Notice of Intention Rcvd:	Date Rcvd. Corrected:
Formal Application Rcvd: 10/15/2019	Pub. of Notice Ordered:
Date Returned - Correction:	Affidavit of Pub. Filed:

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the specific conditions listed previously.

Witness my hand and seal this 17 day of Oct A.D., 2019

John R. D Antonio, Jr., P.E., State Engineer

By: Aracely Tellez

STATE OF NEW MEXICO STATE ENGINEER

Trn Desc: LRG 17861

File Number: LRG 17861
Trn Number: 660959

OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION – LAS CRUCES OFFICE

OFFICIAL RECEIPT NUMBER: 4 - 23765 DATE: 10/15/19 FILE NO.: _____

TOTAL: $15.00 RECEIVED: Fifteen DOLLARS ☐ CASH: ☒ CHECK NO: 142

PAYOR: C.W. & J.E. Fiedler ADDRESS: 1057 Joshua Dr. SE CITY: Rio Rancho

STATE: NM ZIP: 87124 RECEIVED BY: S. Gray

INSTRUCTIONS: Indicate the number of actions to the left of the appropriate type of filing. Complete the receipt information. **Original** to payor; **pink** copy to Program Support/ASD; and **yellow** copy for Water Rights. If a mistake is made, void the original and all copies and submit to Program Support/ASD as part of your daily deposit.

A. Ground Water Filing Fees

___	1. Change of Ownership of Water Right	$ 2.00
___	2. Application to Appropriate or Supplement Domestic 72-12-1 Well	$ 125.00
___	3. Application to Repair or Deepen 72-12-1 Well	$ 75.00
___	4. Application for Replacement 72-12-1 Well	$ 75.00
___	5. Application to Change Purpose of Use 72-12-1 Well	$ 75.00
___	6. Application for Stock Well/Temp. Use	$ 5.00
___	7. Application to Appropriate Irrigation, Municipal, or Commercial Use	$ 25.00
___	8. Declaration of Water Right	$ 1.00
___	9. Application for Supplemental Non 72-12-1 Well	$ 25.00
___	10. Application to Change Place or Purpose of Use Non 72-12-1 Well	$ 25.00
___	11. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Ground Water	$ 50.00
___	12. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Ground Water	$ 50.00
___	13. Application to Change Point of Diversion of Non 72-12-1 Well	$ 25.00
___	14. Application to Repair or Deepen Non 72-12-1 Well	$ 5.00
3	15. Application for Test, Expl. Observ. Wel	$ 5.00
___	16. Application for Extension of Time	$ 25.00
___	17. Proof of Application to Beneficial Use	$ 25.00
___	18. Notice of Intent to Appropriate	$ 25.00

B. Surface Water Filing Fees

___	1. Change of Ownership of a Water Right	$ 5.00
___	2. Declaration of Water Right	$ 10.00
___	3. Amended Declaration	$ 25.00
___	4. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Surface Water	$ 200.00
___	5. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water	$ 200.00
___	6. Application to Change Point of Diversion	$ 100.00
___	7. Application to Change Place and/or Purpose of Use	$ 100.00
___	8. Application to Appropriate	$ 25.00
___	9. Notice of Intent to Appropriate	$ 25.00
___	10. Application for Extension of Time	$ 50.00
___	11. Supplemental Well to a Surface Right	$ 100.00
___	12. Return Flow Credit	$ 100.00
___	13. Proof of Completion of Works	$ 25.00
___	14. Proof of Application of Water to Beneficial Use	$ 25.00
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___	16. Declaration of Livestock Water Impoundment	$ 10.00
___	17. Application for Livestock Water Impoundment	$ 10.00

C. Well Driller Fees

___	1. Application for Well Driller's License	$ 50.00
___	2. Application for Renewal of Well Driller's License	$ 50.00

D. Reproduction of Documents

___ @ 0.25¢ $_____

___ Map(s) $_____

E. Certification $_____

F. *Credit Card Convenience Fee $_____

G. Other_____ $_____

Comments:

_____

_____

_____

_____

_____

_____

_____

_____

All fees are non-refundable.

V.1.B-14

ATTACHMENT V.1.C

NMED Approval for Boring Plan

(Nov. 18, 2019)

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive, PO Box 5469
Santa Fe, NM 87502-5469
Telephone (505) 827-2855
www.env.nm.gov

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

November 18, 2019

Mr. David E. Poe, P.E.,
Weaver Consultants Group
6420 Southwest Blvd., Ste. 206
Fort Worth, Texas 76109

Re: Camino Real Landfill, Notice of Intent for Soil Borings

Dear Mr. Poe:

The Solid Waste Bureau (Bureau) has reviewed the Proposed Soil Boring Plan (Plan), submitted on October 29, 2019, for the Camino Real Landfill (Landfill). The Plan is associated with activities to be performed under the proposed permit modification and describes the proposed installation of three soil borings in the area of the projected Landfill expansion.

Based on review of the documentation provided, it appears that the Plan meets the applicable regulations established under 20.9.3.9 NAMC. Should you have any questions, please feel free to contact me at (505) 383-2078, or by e-mail at james.dyer@state.nm.us.

Sincerely,

James R. Dyer
Hydrologist

cc: Dr. Juan Carlos Tomás, Landfill Manager, Camino Real Environmental Center, Inc., P.O. Box 580, Sunland Park, NM 88063-0580
Ryan McBee, Enforcement Area III, NMED-SWB
Camino Real Landfill Groundwater Monitoring File
J. Dyer Reading Flie

ATTACHMENT V.1.D

Unit 4 Borings NMOSE Permits

And CQC Boring Closure Documentation

John R. D Antonio, Jr., P.E.
State Engineer

District 4 Office
1680 Hickory Loop, Suite J
Las Cruces, NM 88005-6598
Phone: (575) 524-6161
Fax: (575) 524-6160

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 660959
File Nbr: LRG 17861

Oct. 17, 2019

CLAY KILMER
GORDON ENVIRONMENTAL PSC
333 RIO RANCHO BLVD
RIO RANCHO, NM 87124

Received
OCT 2 2 2019
Gordon Environmental / PSC

Greetings:

Your approved copy of the above numbered permit to drill a well for non-consumptive purposes is enclosed. You must obtain an additional permit if you intend to use the water. It is your responsibility to provide the contracted well driller with a copy of the permit that must be made available during well drilling activities.

Carefully review the attached conditions of approval for all specific permit requirements.

* If use of this well is temporary in nature and the well will be plugged at the end of the well usage, the OSE must initially approve of the plugging. If plugging approval is not conditioned in this permit, the applicant must submit a Plugging Plan of Operations for approval prior to the well being plugged. The Plugging Record must be properly completed and submitted to the OSE within 30 days of the well plugging.
* If the final intended purpose and condition requires a well ID tag and meter installation, the applicant must immediately send a completed meter report form to this office.
* The well record and log must be submitted within 30 days of the completion of the well or if the attempt was a dry hole.
* This permit expires and will be cancelled if no well is drilled and/or a well log is not received by the date set forth in the conditions of approval.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us.

Sincerely,

Aracely Tellez
Water Resources Professional
(575)524-6161

Enclosure

explore

4-23765
363

File No. LRG-17861

NEW MEXICO OFFICE OF THE STATE ENGINEER

WR-07 APPLICATION FOR PERMIT TO DRILL

A WELL WITH NO WATER RIGHT

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/

Purpose:	☐ Pollution Control And/Or Recovery	☐ Ground Source Heat Pump
☐ Exploratory Well (Pump test)	☐ Construction Site/Public Works Dewatering	☒ Other(Describe): Geotechnical Soil Borings
☐ Monitoring Well	☐ Mine Dewatering	

A separate permit will be required to apply water to beneficial use regardless if use is consumptive or nonconsumptive.

☐ Temporary Request - Requested Start Date: Requested End Date:

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

1. APPLICANT(S)

Name: Waste Connections, Inc.	Name: Gordon Environmental/PSC
Contact or Agent: check here if Agent ☐ Dr. Juan Carlos Tomás	Contact or Agent: check here if Agent ☒ Clay Kilmer
Mailing Address: PO BOX 580	Mailing Address: 333 Rio Rancho Blvd
City: Sunland Park	City: Rio Rancho
State: New Mexico Zip Code: 88063	State: New Mexico Zip Code: 87124
Phone: (575)-589-9440 ☐ Home ☐ Cell Phone (Work):	Phone: (505)-867-6990 ☐ Home ☐ Cell Phone (Work):
E-mail (optional): Juan.Tomas@WasteConnections.com	E-mail (optional): CKilmer@team-psc.com

FOR OSE INTERNAL USE Application for Permit, Form WR-07, Rev 11/17/16

File No.: LRG-17861	Trn. No.: 660959	Receipt No.:
Trans Description (optional) POD1, POD2, POD3		
Sub-Basin: LRS	PCW/LOG Due Date: 10/16/20	

2. **WELL(S)** Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

■ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: **-Public Land Survey System (PLSS)** ***(Quarters or Halves , Section, Township, Range)*** **OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name**
4-1 POD1	106.587067 W 106 35 13.441	31.790322 N 31 47 25.159	Township 29 South, Range 3 East, Section 13, NM
4-2 POD2	106.589086 W 106 35 20.71	31.787747 N 31 47 15.389	Township 29 South, Range 3 East, Section 13, NM
4-3 POD3	106.586414 W 106 35 11.09	31.786414 N 31 47 11.09	Township 29 South, Range 3 East, Section 13, NM

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ☐ Yes ■ No **If yes, how many**_____

Other description relating well to common landmarks, streets, or other:

Well is on land owned by: Waste Connections Inc.

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. **Attached?** ☐ Yes ☐ No
If yes, how many_____

Approximate depth of well (feet): 100ft, 100ft, 120ft	Outside diameter of well casing (inches):
Driller Name: To Be Determined	Driller License Number:

3. **ADDITIONAL STATEMENTS OR EXPLANATIONS**

Temporary soil borings, to be sealed after drilling and sampling, no well completion.

FOR OSE INTERNAL USE — Application for Permit, Form WR-07

File No.: LRG-17561	Trn No: 660959

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory:	**Pollution Control and/or Recovery:**	**Construction De-Watering:**	**Mine De-Watering:**
☒ Include a description of any proposed pump test, if applicable.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for the pollution control or recovery operation. ☐ The estimated maximum period of time for completion of the operation. ☐ The annual diversion amount. ☐ The annual consumptive use amount. ☐ The maximum amount of water to be diverted and injected for the duration of the operation. ☐ The method and place of discharge. ☐ The method of measurement of water produced and discharged. ☐ The source of water to be injected. ☐ The method of measurement of water injected. ☐ The characteristics of the aquifer. ☐ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ Proof of any permit required from the New Mexico Environment Department. ☐ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ☐ Include the reason for the monitoring well, and, ☐ The duration of the planned monitoring.		**Ground Source Heat Pump:** ☐ Include a description of the geothermal heat exchange project, ☐ The number of boreholes for the completed project and required depths. ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), Clay Kilmer, Agent for Waste Connections, Inc.
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Clay Kilmer
Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☑ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 17th day of October 20 19, for the State Engineer,

John R. D'Antonio, Jr., STATE ENGINEER

BY Aracely Tellez
Aracely Tellez
Water Resources Professional

Print

State Engineer

Print

STATE OF NEW MEXICO STATE ENGINEER

FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: LRG-17861	Trn No.: 660959

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

17-4 No water shall be appropriated and beneficially used under this permit.

17-6 The well authorized by this permit shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair and Plugging of Wells; Subsection C of 19.27.4.30 NMAC unless an alternative plugging method is proposed by the well owner and approved by the State Engineer upon completion of the permitted use. All pumping appurtenance shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the state engineer. The well shall be plugged with an office of the state engineer approved sealant for use in the plugging of non-artesian wells. The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two vertical feet of approved sealant. The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil. A Plugging Report for said well shall be filed with the Office of the State Engineer in a District Office within 30 days of completion of the plugging.

17-7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

17-B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with 72-12-12 NMSA 1978. A licensed driller shall not be required for the construction of a well driven without the use of a drill rig, provided that the casing shall not exceed two and three-eighths (2 3/8) inches outside diameter.

Trn Desc: LRG 17861 File Number: LRG 17861
Trn Number: 660959

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

17-C The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. It is the well owner's responsibility to ensure that the well driller files the well record.
The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

17-C1 The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. Test data shall be filed not later than twenty (20) days after completion of the test(s).
It is the well owner's responsibility to ensure that the well driller files the well record. The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

17-C2 No water shall be diverted from this well except for testing purposes which shall not exceed ten (10) cumulative days, and well shall be plugged or capped on or before , unless a permit to use water from this well is acquired from the Office of the State Engineer.

17-G If artesian water is encountered, the well driller shall comply with all rules and regulations pertaining to the drilling and casing of artesian wells.

17-Q The State Engineer retains jurisdiction over this permit.

17-R Pursuant to section 72-8-1 NMSA 1978, the permittee shall allow the State Engineer and OSE representatives entry upon private property for the performance of their respective duties, including access to the ditch or acequia to measure flow and also to the well for meter reading and water level measurement.

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

LOG The Point of Diversion LRG 17861 POD1 must be completed and the Well Log filed on or before 10/16/2020.

LOG The Point of Diversion LRG 17861 POD2 must be completed and the Well Log filed on or before 10/16/2020.

LOG The Point of Diversion LRG 17861 POD3 must be completed and the Well Log filed on or before 10/16/2020.

ACTION OF STATE ENGINEER

Notice of Intention Rcvd: Date Rcvd. Corrected:
Formal Application Rcvd: 10/15/2019 Pub. of Notice Ordered:
Date Returned - Correction: Affidavit of Pub. Filed:

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the specific conditions listed previously.

Witness my hand and seal this 17 day of Oct A.D., 2019

John R. D Antonio, Jr., P.E., State Engineer

By: Aracely Tellez

STATE OF NEW MEXICO STATE ENGINEER

Trn Desc: LRG 17861 File Number: LRG 17861
Trn Number: 660959

OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION – LAS CRUCES OFFICE

OFFICIAL RECEIPT NUMBER: 4 - 23765 DATE: 10/15/19 FILE NO.: _____

TOTAL: $15.00 RECEIVED: Fifteen DOLLARS ☐ CASH: ☒ CHECK NO: 142

PAYOR: C.W. & J.E. Fiedler ADDRESS: 1057 Joshua Dr. SE CITY: Rio Rancho

STATE: NM ZIP: 87124 RECEIVED BY: S. Gray

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___	17. Application for Livestock Water Impoundment	$ 10.00

All fees are non-refundable.

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D. Reproduction of Documents

___ @ 0.25¢ $_____

___ Map(s) $_____

E. Certification $_____

F. *Credit Card Convenience Fee $_____

G. Other_____ $_____

Comments:

_____

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V.1.D-9

BORING CLOSURE REPORT

Boring 4-1

DATE: January 23, 2020

CQC PROJECT NO.: ADCQC19-008

PROJECT NAME: Contract Drilling Services
Gordon Environment PSC - Camino Landfill Project
Sunland Park, New Mexico

BOREHOLE INFORMATION

BORING DIAMETER [IN.]: 9 IN.
BORING DEPTH [FT.]: 100 FT.
BORING DEPTH AFTER H.S. AUGER REMOVAL [FT.]: 50 FT.
VOLUME OF OPEN BOREHOLE [YD^3]: 0.611 YD^3
TOTAL VOLUME OF GROUT [YD^3]: N/A
GROUT TYPE: N/A

NOTES/REMARKS:

Borehole partially collapsed after the complete removal of hollow-stem augers. Material used consisted of Barcia Bentonite 3/8 In. hole plug pellets. Borehole plugged from approximate collapsed depth to existing ground surface at the completion of field work activities.

Drill Crew Members:

- Mr. Manuel Nava – Head Driller _____.
- Mr. Sergio Chavez – Support Driller _____.
- Mr. Patrick Garcia – Field Logger _____.

The undersigned hereby certifies that; to the best of knowledge and belief, the forgoing is an accurate record of the above described geotechnical engineering borehole.

_____

CQC Testing and Engineering, LLC
TBPE Firm Registration No. F-10632

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG-17861 POD 1 **Boring 4-1**

Well owner: Waste Connections, Inc. Phone No.: 575-589-9440

Mailing address: PO Box 580

City: Sunland Park State: NM Zip code: 88063

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: CQC Testing and Engineering LLC

2) New Mexico Well Driller License No.: N/A Expiration Date: N/A

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): MN/SC/PG

4) Date well plugging began: 12/14/19 Date well plugging concluded: 12/14/19

5) GPS Well Location: Latitude: 106 deg, 35 min, 13.441 sec
Longitude: 31 deg, 47 min, 25.15 sec, WGS 84

6) Depth of well confirmed at initiation of plugging as: 50 ft below ground level (bgl), by the following manner: Bentonite Plug

7) Static water level measured at initiation of plugging: dry ft bgl

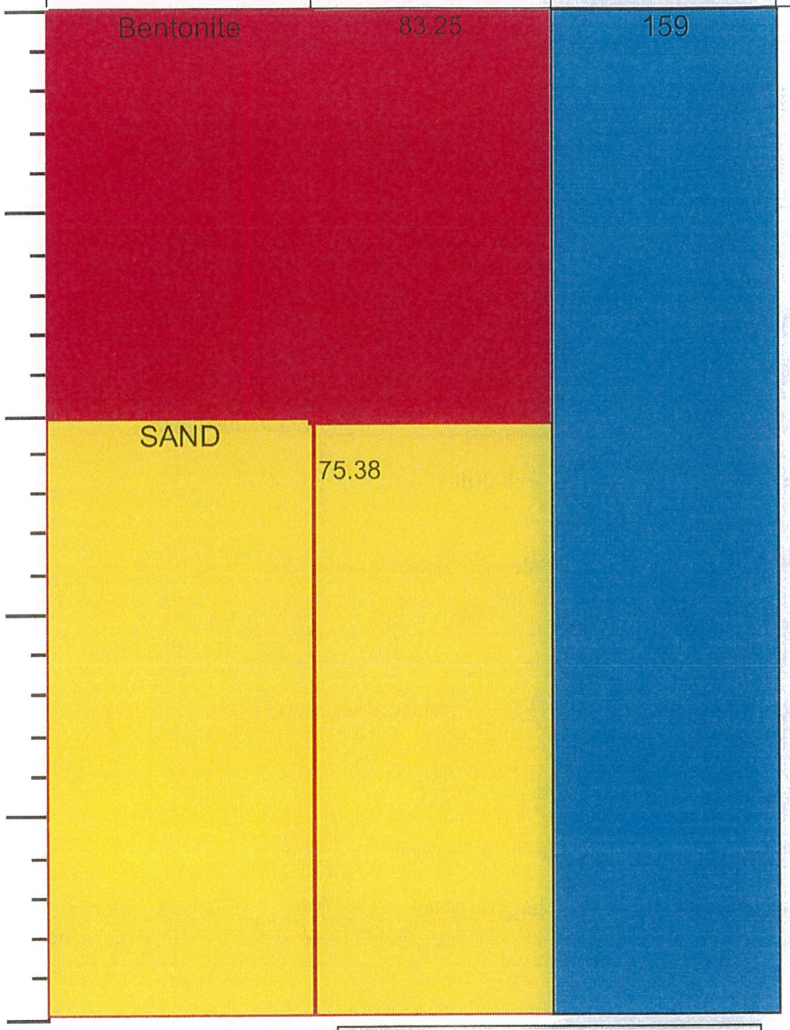
8) Date well plugging plan of operations was approved by the State Engineer: 10/17/19

9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns: **Boring 4-1**

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	Bentonite	83.25	159		
	SAND	75.38			



MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Ben Lopez, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

1-24-20
Date

Version: September 8, 2009
Page 2 of 2

construction quality control
testing and engineering

BORING CLOSURE REPORT

Boring 4-2

DATE: January 23, 2020

CQC PROJECT NO.: ADCQC19-008

PROJECT NAME: Contract Drilling Services
Gordon Environment PSC - Camino Landfill Project
Sunland Park, New Mexico

BOREHOLE INFORMATION

BORING DIAMETER [IN.]: 9 IN.
BORING DEPTH [FT.]: 100 FT.
BORING DEPTH AFTER H.S. AUGER REMOVAL [FT.]: 50 FT.
VOLUME OF OPEN BOREHOLE [YD^3]: 0.611 YD^3
TOTAL VOLUME OF GROUT [YD^3]: N/A
GROUT TYPE: N/A

NOTES/REMARKS:

Borehole partially collapsed after the complete removal of hollow-stem augers. Material used consisted of Barcia Bentonite 3/8 In. hole plug pellets. Borehole plugged from approximate collapsed depth to existing ground surface at the completion of field work activities.

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- Mr. Manuel Nava – Head Driller _____.
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The undersigned hereby certifies that; to the best of knowledge and belief, the forgoing is an accurate record of the above described geotechnical engineering borehole.

_____

CQC Testing and Engineering, LLC
TBPE Firm Registration No. F-10632

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NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

Boring 4-2

State Engineer Well Number: RG-17861 PODS 2

Well owner: Waste Connections, Inc. Phone No.: 575-589-9440

Mailing address: PO Box 580

City: Sunland Park State: NM Zip code: 88063

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: CQC Testing and Engineering LLC

2) New Mexico Well Driller License No.: N/A Expiration Date: N/A

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): MN/SC/PG

4) Date well plugging began: 12/14/19 Date well plugging concluded: 12/14/19

5) GPS Well Location: Latitude: 106 deg, 35 min, 20.71 sec
Longitude: 31 deg, 47 min, 15.889 sec, WGS 84

6) Depth of well confirmed at initiation of plugging as: 50 ft below ground level (bgl), by the following manner: Bentonite Plug

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 10/17/19

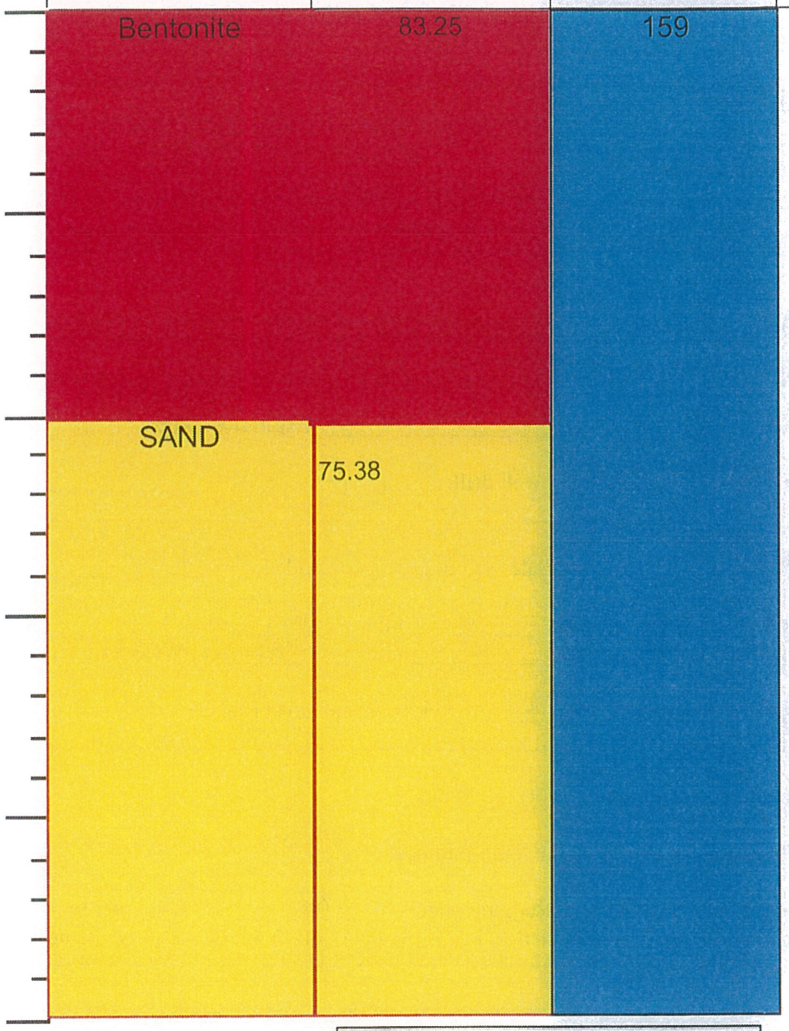
9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Boring 4-2

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	Bentonite	83.25	159		
	SAND	75.38			



MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Ben Lopez, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

1-24-20

Date

BORING CLOSURE REPORT

Boring 4-3

DATE: January 23, 2020

CQC PROJECT NO.: ADCQC19-008

PROJECT NAME: Contract Drilling Services
Gordon Environment PSC - Camino Landfill Project
Sunland Park, New Mexico

BOREHOLE INFORMATION

BORING DIAMETER [IN.]: 9 IN.
BORING DEPTH [FT.]: 120 FT.
BORING DEPTH AFTER H.S. AUGER REMOVAL [FT.]: 70 FT.
VOLUME OF OPEN BOREHOLE [YD^3]: 0.509 YD^3
TOTAL VOLUME OF GROUT [YD^3]: N/A
GROUT TYPE: N/A

NOTES/REMARKS:

Borehole partially collapsed after the complete removal of hollow-stem augers. Material used consisted of Barcia Bentonite 3/8 In. hole plug pellets. Borehole plugged from approximate collapsed depth to existing ground surface at the completion of field work activities.

Drill Crew Members:

- Mr. Manuel Nava – Head Driller _____.
- Mr. Sergio Chavez – Support Driller _____.
- Mr. Patrick Garcia – Field Logger _____.

The undersigned hereby certifies that; to the best of knowledge and belief, the forgoing is an accurate record of the above described geotechnical engineering borehole.

_____

CQC Testing and Engineering, LLC
TBPE Firm Registration No. F-10632

PLUGGING RECORD

NOTE: **A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC**

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG-17861 POD 3 **Boring 4-3**

Well owner: Waste Connections, Inc. Phone No.: 575-589-9440

Mailing address: PO Box 580

City: Sunland Park State: NM Zip code: 88063

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: CQC Testing and Engineering LLC

2) New Mexico Well Driller License No.: N/A Expiration Date: N/A

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): MN/SC/PG

4) Date well plugging began: 12/12/19 Date well plugging concluded: 12/12/19

5) GPS Well Location: Latitude: 106 deg, 35 min, 11.09 sec
Longitude: 31 deg, 47 min, 11.09 sec, WGS 84

6) Depth of well confirmed at initiation of plugging as: 70 ft below ground level (bgl), by the following manner: Bentonite Plug

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 10/17/19

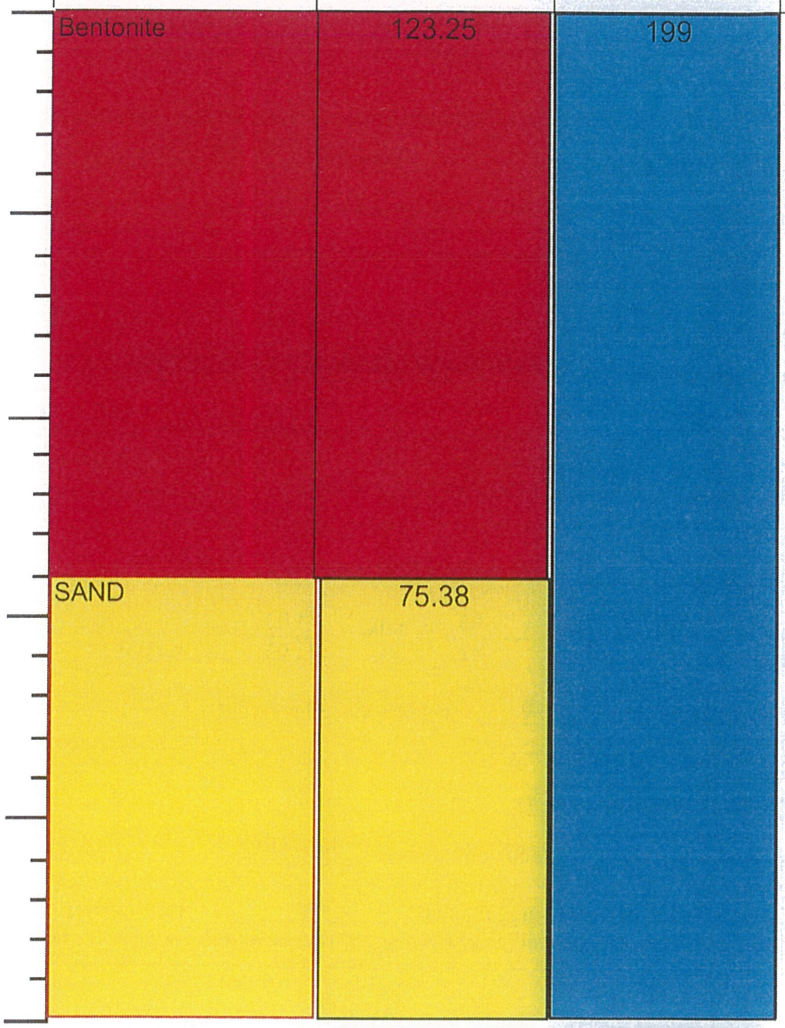
9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Boring 4-3

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	Bentonite	123.25	199		
	SAND	75.38			



MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Ben Logeer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

1-24-20
Date

ATTACHMENT V.1.E

Tabular Summaries

Geotechnical Testing (1988-2005)

TABLE V.1.2
SUMMARY OF HISTORICAL GEOTECHNICAL TEST RESULTS
CAMINO REAL LANDFILL
Sheet 1 of 2

Site Investigation Program	Sample Number[1]	Sample Depth (fbgs)	USCS Class[2]	Grain Size Distribution	Atterberg Limits[3]	Uniformity Coefficient[4]	Natural Moisture[5] (%)	Standard Proctor		Permeability (cm/sec)
				Pass #200 (%)	LL - PL			In-Situ Dry Density (PCF)	Max Density - Optimum Moisture (%)[6]	
Eldredge Engineering Associates - 1990	B-1	30	CL		39 - 22		14.7			
	B-1	50	SM	14.0	NP		2.2	101.8		7.4 E-04
	B-1	70	SM	27.0	NP		3.5			
	B-1	115	CL		37 - 15		21.0	117.8		5.2 E-07
	B-2	25	SM	16.0	NP		5.4			
	B-2	50	SM	30.0	NP		3.6	82.4		
	B-2	90	CH		60 - 35		28.7	93.9		7.6 E-04
	B-2	95	CH		74 - 48					9.6 E-08
	B-3	45	CH		82 - 55		26.0	94.0		3.4 E-08
	B-3	50	SM	10.0	NP		1.8			
	B-4	45	CL		48 - 29		20.5	96.6		1.0 E-08
	B-4	50	SM	44.0	NP					
	B-4	55	SM	18.0	NP		5.7			
	B-5	35	SM	12.0	NP		5.2			
	B-5	45	CH		61 - 41		26.4	92.9		2.5 E-08
	B-5	55	SM	34.0	NP		8.2			
Daniel B. Stephens and Associates - 1995	SB-1	5.5	CL	50.9	29 - 10	59.0	9.1	94.8	109.1 - 17.2	4.7 E-05
	SB-1	10.5	SM		NP		1.6	109.8	112.8 - 12.8	
	SB-1	20.5	SW	1.2	NP	2.6	1.6	103.6		3.3 E-02
	SB-1	25.5	SW		NP		8.1	96.1		
	SB-1	44.9	SW		NP		1.1	99.2		
	SB-1	55.5	SW		NP		2.5	110.4		
	SB-1	65.5	SW		NP		1.5	94.2		
	SB-1	74.8	SW		NP		2.3	91.1		
	SB-1	85.5	SW	4.6	NP	2.3	6.5	88.0		6.5 E-04
	SB-1	91.0	SP		NP		4.8	91.7		
	SB-1	104.4	SP		NP		1.3	91.7		
	SB-2	20.5	SP		NP		4.4	96.1	101.1 - 6.4	
	SB-2	74.8	SM	96.9	NP		22.7	103.0		9.4 E-10
	SB-2	119.8	SP-SM	15.3	NP	3.9	5.1	90.5		7.1 E-04

TABLE V.1.2
SUMMARY OF HISTORICAL GEOTECHNICAL TEST RESULTS
CAMINO REAL LANDFILL
Sheet 2 of 2

Site Investigation Program	Sample Number[1]	Sample Depth (fbgs)	USCS Class[2]	Grain Size Distribution	Atterberg Limits[3]	Uniformity Coefficient[4]	Natural Moisture[5] (%)	Standard Proctor		Permeability (cm/sec)
				Pass #200 (%)	LL - PL			In-Situ Dry Density (PCF)	Max Density - Optimum Moisture (%)[6]	
Daniel B. Stephens and Associates - 1995	SB-3	10.5	SW	6.3	NP	2.6	1.9	101.1		2.5 E-03
	SB-3	29.9	SM/CL	29.5	NP		11.2	91.1	104.4 - 8.9	1.7 E-04
	SB-4	5.5	SW-SM		NP		3.8	101.7		
	SB-4	15.5	SW		NP		1.9	95.5	101.6 - 7.7	
	SB-4	25.5	SM	13.5	NP	29.0	4.0	96.7	103.7 - 9.2	3.9 E-03
	SB-4	30.5	SW-SM		NP		2.5	96.7		
	SB-4	39.8	SW		NP		4.6	84.9		
	SB-4	50.5	SP		NP		1.8	94.8		
	SB-4	59.1	SP-SM		NP		2.9	94.2		
	SB-4	69.8	SM		NP		8.5	89.2		
	SB-4	79.8	SM		NP		5.5	97.3		
	SB-4	90.4	SM/CL		NP		27.4	92.4		
	SB-4	99.9	SP		NP		1.9	101.1		
	SB-4	114.8	CL	96.5			27.4	96.7		1.3 E-08
	SB-4	124.5	SP		NP		5.1	95.5		
	SB-4	139.5	CL	80.1			27.6	92.4		4.9 E-08

NOTES:

Blank field indicates test not conducted or data not available

[1]See Figure V.1.7 for locations of borings and Attachment V.1.A for boring logs. Information for Borings B-1 through B-5 by Nu-Mex Landfill; information for Borings SB-1 through SB-4 by Daniel B. Stephens & Associates.

[2]Unified Soil Classification System: SM = silty sand; SP = poorly graded sand; SW = well-graded sand; SC = clayey sand; ML = low-plasticity silt; CL = low-plasticity clay; CH = high-plasticity clay

[3]LL = liquid limit; PL = plastic limit; NP = non plastic

[4]$CU = D_{60}/D_{10}$

[5]Gravimetric basis

[6]Standard Proctor maximum density (PCF) - optimum moisture content

TABLE V.1.3

Summary of Historical Soil Testing Results
Protective Soil Layer
Camino Real Landfill

Sample ID		Percent Passing								Coefficient of Uniformity (C_u)	Classification (USCS)
		1/2"	3/8"	#4	#10	#40	#60	#100	#200		
CELL 7A 2000	DL-1	-	-	-	-	99.1	70.4	18.4	3.9	2.24	SP
	DL-4	-	-	-	100.0	93.8	66.7	21.0	3.4	1.92	SP
	DL-6	-	-	-	-	98.3	69.3	16.6	1.9	2.07	SP
	DL-8	-	-	-	100.0	90.2	59.0	18.6	3.0	2.04	SP
	DL-10	-	-	-	100.0	86.3	46.5	11.7	1.7	2.20	SP
CELL 7B/8A 2002	COMPOSITE	-	100.0	99.8	99.7	70.7	-	4.4	0.6	2.10	SW
CELL 8B 2004	#5	100.0	99.3	96.7	94.1	72.1	-	4.2	0.4	2.04	SP
	#6	100.0	99.2	97.0	95.2	76.3	-	4.1	0.8	1.95	SP
	#15	100.0	99.1	96.9	94.8	73.0	-	1.1	0.1	1.94	SP
CELL 9 2005	PSL #1	100.0	99.3	97.9	96.7	90.5	71.6	35.8	4.9	2.41	SP
	PSL #2	100.0	100.0	97.5	95.5	89.0	66.7	30.2	4.0	2.41	SP
	PSL #3	98.4	98.2	97.3	96.4	89.9	68.4	30.7	3.8	2.43	SP
	PSL #4	100.0	100.0	99.5	98.9	92.9	71.9	33.9	4.5	2.36	SP
	PSL #5	100.0	100.0	99.4	98.5	91.4	70.2	33.3	4.0	2.37	SP
	PSL #6	100.0	100.0	99.5	98.5	92.4	71.3	32.5	4.0	2.32	SP
	PSL #7	99.0	99.0	98.6	98.1	91.3	69.8	28.1	3.7	2.18	SP
	PSL #8	100.0	99.5	98.7	98.1	91.6	70.8	37.1	4.9	2.46	SP
	PSL #9	100.0	100.0	99.9	99.2	92.1	70.7	34.1	3.8	2.37	SP
	PSL #10	100.0	99.6	99.1	98.3	91.6	67.9	32.6	4.1	2.45	SP
	PSL #11	98.8	98.8	96.5	94.3	72.2	42.5	20.8	5.2	3.52	SP-SM
	PSL #12	100.0	100.0	98.5	95.9	69.7	33.9	14.5	3.4	3.07	SP
	PSL #13	100.0	99.5	97.5	94.4	68.0	34.9	14.9	4.3	3.14	SP
	PSL #14	100.0	100.0	98.8	96.1	70.8	36.1	15.9	4.2	3.19	SP
	PSL #15	100.0	100.0	99.4	96.5	70.0	35.2	14.9	3.9	3.07	SP
	PSL #16	100.0	100.0	98.7	96.2	70.7	36.5	15.7	3.9	3.12	SP
	PSL #17	100.0	100.0	99.3	96.5	69.5	33.3	14.5	3.3	3.10	SP
	PSL #18	100.0	100.0	98.6	95.7	70.3	37.0	17.4	4.3	3.40	SP
	PSL #19	100.0	100.0	98.8	95.7	68.4	32.1	13.5	3.3	3.01	SP
	PSL #20	100.0	100.0	98.4	95.9	67.1	29.3	10.6	2.4	2.66	SP
	PSL #21	97.6	97.6	96.8	94.5	71.3	38.2	15.6	3.2	2.96	SP
	PSL #22	100.0	100.0	98.5	95.3	70.1	36.3	14.7	3.4	2.94	SP
	PSL #23	98.6	98.6	97.5	95.1	73.4	43.0	20.0	5.3	3.36	SP-SM
	PSL #24	100.0	99.6	98.4	95.7	72.2	42.6	19.2	4.8	3.24	SP
	PSL #25	100.0	100.0	98.7	95.6	72.5	42.5	20.1	5.1	3.38	SP-SM
	PSL #26	100.0	100.0	99.0	96.6	72.0	39.9	17.8	4.2	3.19	SP

TABLE V.1.4
SUMMARY OF 2005 - 2006 GEOTECHNICAL TEST RESULTS
CAMINO REAL LANDFILL
Sheet 1 of 3

Sample Number[1]	Sample Depth (fbgs)	USCS Class[2]	Grain Size Distribution			Atterberg Limits[3]	Natural Moisture[4] (%)	Standard Proctor		Permeability (cm/sec)
			Pass #10 (%)	Pass #60 (%)	Pass #200 (%)	LL - PI		Max. Dry Density (PCF)	Optimum Moisture (%)	
SB-5	5-6.5	SM	61	27	19.8	NP	9.4			
SB-5	10-11.5	SC	94	82	46.0	42 - 23	24.9			
SB-5	15-16.5	SM	98	78	36.0	NP	14.7			
SB-5	20-21.5	SM	98	79	27.2	NP	10.6			
SB-5	25-26.5	SM	100	86	18.0	NP	3.7			
SB-5	30-31.5	SM	99	88	31.9	NP	7.8			
SB-5	35-36.5	SM	92	73	35.2	NP	10.0			
SB-5	50-51.5	SP-SM	99	76	5.1	NP	1.3			
SB-5	60-65	SP-SM	100	68	6.7	NP		102.3	12.9	2.3×10^{-2}
SB-6	15-16.5	SP	98	41	3.7	NP	2.4			
SB-6	20-21.5	SP-SM	91	42	6.6	NP	3.9			1.3×10^{-2}
SB-6	25-26.5	SM	92	66	28.2	NP	7.3			
SB-6	30-31.5	SP	96	48	3.5	NP	2.4			
SB-6	40-45	SP	100	62	2.9	NP		102.5	17.2	
SB-7	5-6.5	SM	92	82	31.9	NP	10.9			
SB-7	10-11.5	SM	92	67	26.1	NP	8.2			
SB-7	15-16.5	SM	97	56	16.4	NP	4.5			
SB-7	35-36.5	SP-SM	100	36	5.5	NP	3.3			
SB-7	50-51.5	SM	98	57	16.1	NP	3.4			
SB-7	60-61.5	SP-SM	83	22	8.8	NP	2.9			
SB-7	60-65	SP-SM	99	51	7.2	NP		105.2	16.1	1.1×10^{-2}
SB-8	20-21.5	SP-SM	99	53	5.9	NP	1.9			1.2×10^{-2}
SB-8	50-51.5	CH	100	87	68.1	57 - 33	21.7			
SB-8	55-56.5	SP-SM	84	23	9.0	NP	2.9			
SB-8	60-61.5	SM	82	38	13.8	NP	4.3			
SB-8	65-70	SP	98	35	3.8	NP		107.8	14.6	
SB-8	95-96.5	CH	100	88	62.8	64 - 42	25.2			
SB-8	100-101.5	ML	100	97	56.5	NP	9.5			
SB-8	115-116.5	ML	96	80	53.6	NP	22.7			
SB-8	125-126.5	ML	100	81	54.4	NP	22.9			
SB-8	130-131.5	ML	99	87	56.0	NP	7.7			

TABLE V.1.4
SUMMARY OF 2005 - 2006 GEOTECHNICAL TEST RESULTS
CAMINO REAL LANDFILL
Sheet 2 of 3

Sample Number[1]	Sample Depth (fbgs)	USCS Class[2]	Grain Size Distribution			Atterberg Limits[3]	Natural Moisture[4] (%)	Standard Proctor		Permeability (cm/sec)
			Pass #10 (%)	Pass #60 (%)	Pass #200 (%)	LL - PI		Max. Dry Density (PCF)	Optimum Moisture (%)	
SB-9	50-51.5	SP-SM	100	81	9.0	NP	1.4			6.2×10^{-3}
SB-9	60-61.5	SP-SM	96	17	5.8	NP	2.0			
SB-9	80-81.5	ML	98	96	90.3	NP	12.3			
SB-9	85-86.5	SM	99	74	20.2	NP	4.0			
SB-9	100-101.5	SP	99	48	3.6	NP	2.2			
SB-10	45-46.5	SM	98	79	12.9	NP	3.7			
SB-10	50-51.5	SM	100	95	21.4	NP	5.3			
SB-10	65-66.5	SP-SM	100	95	8.7	NP	2.0			
SB-10	80-81.5	SP-SM	100	58	6.1	NP	2.9			8.1×10^{-3}
SB-10	95-96.5	CH	100	91	65.7	57 - 36	25.1			
SB-10	100-101.5	SM	99	99	23.6	NP	4.3			
SB-11	10-11.5	SP	99	14	1.8	NP	1.2			
SB-11	20-21.5	SP	99	10	3.3	NP	1.6			
SB-11	35-36.5	SP-SM	99	47	6.3	NP	2.1			4.9×10^{-3}
SB-11	40-41.5	CL	100	85	53.4	47 - 32	21.9			
SB-11	60-61.5	SP	100	52	3.0	NP	5.3			
SB-11	75-76.5	SP	100	54	0.6	NP	3.5			
SB-11	95-96.5	SM	98	94	22.8	NP	6.8			
SB-11	100-101.5	SC	100	69	45.8	50 - 32	26.6			
SB-12	10-11.5	SP-SM	98	44	9.2	NP	2.6			
SB-12	20-21.5	SP-SM	98	86	7.8	NP	1.7			
SB-12	35-36.5	SP	97	39	2.9	NP	1.8			
SB-12	35-40	SP	98	51	4.7	NP		106.1	15.2	
SB-12	45-46.5	SP-SM	98	41	6.3	NP	3.0			1.6×10^{-2}
SB-13	10-11.5	SP	97	55	4.1	NP	1.3			

TABLE V.1.4
SUMMARY OF 2005 - 2006 GEOTECHNICAL TEST RESULTS
CAMINO REAL LANDFILL
Sheet 3 of 3

Sample Number[1]	Sample Depth (fbgs)	USCS Class[2]	Grain Size Distribution			Atterberg Limits[3]	Natural Moisture[4] (%)	Standard Proctor		Permeability (cm/sec)
			Pass #10 (%)	Pass #60 (%)	Pass #200 (%)	LL - PI		Max. Dry Density (PCF)	Optimum Moisture (%)	
SB-13	20-21.5	SM	97	46	22.3	NP	5.5			
SB-13	30-31.5	SP	100	82	4.9	NP	2.3			
SB-13	40-41.5	SM	100	76	17.9	NP	5.0			
SB-13	45-46.5	SM	93	81	23.7	NP	4.1			
SB-13	60-61.5	SM	100	99	14.8	NP	2.4			
SB-13	65-66.5	SM	100	78	13.1	23 - 3	5.5			8.2×10^{-4}
SB-13	70-71.5	CL					14.4			2.1×10^{-7}
SB-14	15-20	SM	99	65	21.8	NP		114.7	13.5	
SB-14	10-11.5	SP-SM	99	67	10.1	NP	3.0			
SB-14	30-31.5	SP	100	74	3.3	NP	3.6			
SB-14	40-41.5	CL	100	99	68.6	43 - 26	11.2			1.7×10^{-7}
SB-14	45-46.5	CL	98	93	60.6	32 - 9	3.0			

NOTES:
Blank field indicates test not conducted or data not available
[1]See Figure V.1.7 for locations of borings and Attachment V.1.A for boring logs. Attachment V.1.F includes complete laboratory analyses by Precision Engineering, inc.
[2]Unified Soil Classification System: SM = silty sand; SP = poorly graded sand; SC = clayey sand; ML = low-plasticity silt; CL = low-plasticity clay; CH = high-plasticity clay
[3]LL = liquid limit; PL = plastic limit; NP = non plastic
[4]Gravimetric basis

ATTACHMENT V.1.F

Geotechnical Laboratory

Results 1988-2006

1990 Permit Application

Appendix 11-A: Logs of Borings

Aug 1990

LOG OF BORING #1

Location: Grid 18N, 31E — Boring No.: 1
Surface Elevation: 3894.9 ft — Date: 9-24-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0	grab			Sand - light brown, dry, fine
5-6.5	ss	A-1	9-10-14	Sand - light brown, dry, fine, medium dense
10-11.5	ss	A-2	5-6-9	Sand - light brown, dry, fine, medium dense
15-16.5	ss	A-3	10-12-18	Sand - light brown, damp, fine, dense, bottom 1" silty
20-21.5	ss	A-4	12-25-45	Silty Sand - light brown, damp, very dense
25-26.5	ss	A-5	13-27-47	Sand - white, dry, fine, very dense
29				Harder drilling
30-31.5	ss	A-6	12-24-26	Clay - brown, damp, stiff
35-36.5	ss	A-7	8-12-32	Clay - brown, dry, stiff bottom 3" silty
39				Softer drilling
40-41.5	ss	A-8	21-32-35	Silty Sand - light brown, dry, very dense
42-43				Harder drilling - possibly clay
45-46.5	ss	A-9	25-36-50	Sand - grey, fine, dry, very dense
50-51.5	ss	A-10	18-34-50	Sand - grey, dry, slightly coarser very dense
55-56.5	ss	A-11	15-35-50	Sand - grey, dry, fine, bottom 2" silty, very dense
60-61.5	ss	A-12	18-22-37	Sand/Clay - distinct layers, dry 1" sandstone
65-66.5	ss	A-13	18-34-50 (4")	Clay - top 3", brown, dry Sand - 6", dry, grey, fine Silty Clay - 3", dry, brown
70-71.5	ss	A-14 (a) (b)	8-23-33 split sample	Clay - brown, damp, 4" in top Sand - grey, dry, coarse, dense
75-76.5	ss	A-15	12-22-25	Sand - grey, dry, dense Clay - brown, dry, bottom 3"
80-81.5	ss	A-16	21-49-50 (5")	Sand - grey, dry, fine, 3" silty layer in middle very dense
85-86.5	ss	A-17	16-44-47	Sand - white, dry, fine, 3" clay in center, sandstone

LOG OF BORING #1 (Cont'd)

Location: Grid 18N, 31E Boring No.: 1
Surface Elevation: 3894.9 ft Date: 9-24-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
89				Harder drilling
90-91.5	ss	A-18	17-33-26	Clay - brown, damp, stiff 4" silty sand in center
93.5				Easier drilling
95-96.5	ss	A-19	8-50 (4")	Clay - brown, damp, 6" Sandstone - fine grained 1"
100 - 101.5	ss	A-20	45-50 (2")	Clay - brown, damp, 3" Silty Sand - white, damp, 3" Sandstone - fine, white, 1"
105- 106.5	ss	A-21	47-50 (3")	Sand - white, dry, fine
107				Hard drilling
110- 11.5	ss	A-22	18-24-29	Clay - brown, moist, stiff
115- 116.5	ss	A-23	13-19-33	Clay - brown, moist, stiff
116.5				Total depth - auger refusal

LOG OF BORING #2

Location: Grid 10N, 46E Boring No.: 2
Surface Elevation: 3886.2 ft Date: 9-25-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 5	cont	B-1		Silty Sand - tan, dry
5 - 10	cont	B-2		Silty Sand - tan, dry, some fine gravel
10 - 15	cont	B-3		Silty Sand - tan, dry, no gravel
15 - 20	cont	B-4		" " " " " "
20 - 25	cont	B-5		" " " " " "
25 - 30	cont	B-6		Silty Sand - tan, dry, 1" sand-stone and 2" clay in center
30 - 35	cont	B-7		Silty Sand - grey, fine, dry
35 - 40	cont	B-8		Sand - grey, fine, dry, 6" silt layer in center
40 - 45	cont	B-9		Silty Sand - grey, fine, dry
45 - 50	cont	B-10		Sand - grey, fine, dry, 6" clay/ silt layer in center
50 - 55	cont	B-11		Silty Sand - grey, fine, dry, bottom 1' silty
55 - 60	cont	B-12		Sand - grey, fine, dry bottom 1' silty
60 - 65	cont	B-13		Sand - grey, slightly coarser, dry bottom 1' silty
65 - 70	cont	B-14		Sand - grey, fine, dry, 6" clay layer in center, bottom 2" sand damp
70 - 75	cont	B-15		Sand - grey, fine, damp, top 1' Silty Clay - brown, damp, mid 1' Silty Sand - white, fine, dry
75 - 80	cont	B-16		Clay - brown, dry, dense, top 1' Sand - white, fine, damp, mid 1' Clay - brown, damp, dense
80 - 85	cont	B-17		Sand - grey, fine, damp Clay - brown, damp, bottom 9"
85 - 90	cont	B-18		Clay - brown, damp, dense, top 1' Sand/clay - fine layers, damp, 2' Sand - grey, fine, wet
90 - 95	cont	B-19	split(a) sample (b)	Sand - grey, fine, wet, with sand-stone lenses, 4" Clay - brown, moist, dense
95 -100	cont	B-20		Clay - brown, moist, dense
100				Total depth - auger refusal

LOG OF BORING #3

Location: Grid 5N, 30E
Surface Elevation: 3908.0 ft

Boring No.: 3
Date: 9-27-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 5	cont	C-1		Sand - tan, fine, damp
5 - 10	cont	C-2		Sand - tan, fine, damp
10 - 15	cont	C-3		Sand - tan, fine, damp caliche 1' in center
15 - 20	cont	C-4		Sand - tan, medium, dry
20 - 25	cont	C-5		Sand - tan, some gravel, no recovery
40-41.5	ss	C-6	14-14-23	Sand - tan, fine, dry, top 4"
40.5				Clay - brown, moist, stiff
45-46.5	ss	C-7	11-17-20	Clay - brown, moist, stiff
49				Sand - easier drilling
50-51.5	ss	C-8	16-28-40	Sand - grey, fine, dry
51.5				Total Depth

LOG OF BORING #4

Location: Grid 17N, 15E Boring No.: 4
Surface Elevation: 3938.4 ft Date: 9-28-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 2	grab			Clay - brown, recently deposited
2 - 17	grab			Sand - tan, fine, dry
17 - 19	grab			Clay - brown, dry, silty
20-21.5	ss	D-1	12-26-36	Sand - white, fine, dry, sandstone 2" in center, fine
25-26.5	ss	D-2	25-26-31	Clay - brown, damp, stiff, 4" Sand - grey, dry, dense, 6" Silty Clay - brown, damp
30-31.5	ss	D-3	2-32-50 (plug)	Sand - grey, fine, dry caliche in end
35-36.5	ss	D-4	20-50 (7")	Silty Sand - tan, fine, dry
40-41.5	ss		21-50 (7")	Sand - no sample
45-46.5	ss	D-5	10-15-20	Dendritic Siltstone 1" Clay - brown, damp, dense
47-48				Easier drilling - possibly sand
50-51.5	ss	D-6	26-40-50 (5")	Silty Sand - tan, dry, dense Sand - white, dry, dense, 2" in bottom
55-56.5	ss	D-7	20-39-40 split(a) sample (b)	Clay - brown, damp, top 1' Sand - grey, fine, dry, with 1" clay stringer in center
56.5				Total depth - auger refusal

LOG OF BORING #5

Location: Grid 28N, 17E
Surface Elevation: 3892

Boring No.: 5
Date: 9-31-90

Depth (ft)	Samp Type	Samp ID	SPT Count	Soil Description/ Remarks
0 - 3	grab			Sand - tan, fine, damp
3 - 5	grab			Sand - tan, fine, damp, with caliche
5 - 25	grab			Sand - tan, fine, damp
25-26.5	ss	E-1	10-12-14	Sand - tan, fine, damp, some small gravel, med. dense
34				Harder drilling - possibly clay
35-36.5	ss	E-2	3-5-6(a) split(b) sample	Clay - brown, damp, soft, top 6" Sand - tan, damp, loose
36				Softer drilling - sand
39				Harder drilling - possibly clay
40-41.5	ss	E-3	6-9-15	Clay - brown, damp, silty, moderately stiff
45-46.5	ss	E-4	10-17-22	Clay - brown, moist, stiff
48				Easier drilling - clattering possibly some gravel
50-51.5	ss	E-5	25-32-18	Sandy Silt - brown, dry, 8" Clay - brown, dry, 6" Silt - brown, dry, 4"
55-56.5	ss	E-6	35-35-31	Silty Sand - tan, dry, dense, 1' Clayey Silt - brown, dry, 6"
60-61.5	ss	E-7	50 (6")	Sand - tan, dry, with thin clay layer in center, dense
61.5				Total depth - auger refusal

Appendix 11-B: Soil/Sediment Test Results

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Moisture Content Determination

File No: 90-092
Project: JOAB TESTING

Oct 17, 1990

JOAB ID	A-6	A-10	A-14	A-23	B-6
LAB NO.	14601	14602	14603	14604	14605
CAN NO.	QP	O2	ABC	5	799R
CAN + WET SOIL	86.96	55.90	62.77	82.22	110.82
CAN + DRY SOIL	77.64	55.00	61.14	70.46	105.83
CAN WT.	14.08	14.25	14.36	14.57	14.15
% H2O	14.7	2.2	3.5	21.0	5.4

JOAB ID	B-11	B-19(b)	C-7	C-8	D-5
LAB NO.	14606	14607	14609	14610	14611
CAN NO.	408	620P	145R	0671-72	648R
CAN + WET SOIL	72.36	71.30	84.60	90.10	75.71
CAN + DRY SOIL	70.38	58.65	70.14	88.76	65.30
CAN WT.	14.61	14.52	14.46	14.31	14.49
% H2O	3.6	28.7	26.0	1.8	20.5

Reviewed By: PJJ

Reviewed By:

Certified By: William A. Kemp

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Moisture Content Determination

File No: 90-092
Project: JOAB TESTING

Oct 17, 1990

JOAB ID	D-7	E-2(b)	E-4	E-6
LAB NO.	14613	14614	14615	14616
CAN NO.	079P	1	648	576R
CAN + WET SOIL	84.70	73.22	86.35	81.40
CAN + DRY SOIL	80.91	70.31	71.38	76.31
CAN WT.	14.48	14.49	14.62	14.61
% H2O	5.7	5.2	26.4	8.2

LAB NO.
CAN NO.
CAN + WET SOIL
CAN + DRY SOIL
CAN WT.
% H2O

Reviewed By:

Reviewed By:

Certified By:

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Plasticity Index of Soils

(ASTM D-4318-83)

FILE NUMBER: 90-092
LAB NUMBER: 14601 DATE: OCTOBER 17, 1990
PROJECT: JOAB TESTING
JOAB ID: A-6

TEST PERFORMED(YES=1,NO=3)	1	LAB NO.	14601	
ON PLASTIC (B1=0)	ORGANIC?(YES=1,NO=0 IN E2)		0	

LIQUID LIMIT DETERMINATION

CAN I.D.	A	B	C	D
WET SOIL + CAN	21.77	23.36	23.75	
DRY SOIL + CAN	19.53	20.90	21.22	
WT. OF CAN	14.29	14.57	14.49	
MOISTURE CONTENT	42.75%	38.86%	37.59%	#DIV/0!
NUMBER OF BLOWS	15	22	35	
LIQUID LIMIT(ONE POINT)	40%	38%	39%	
LIQUID LIMIT	39.			

PLASTIC LIMIT DETERMINATION

	A	B	C	D
WET SOIL + CAN	18.07	17.54		
DRY SOIL + CAN	17.56	17.05		
WT. OF CAN	14.53	14.19		
MOISTURE CONTENT	16.83%	17.13%	#DIV/0!	#DIV/0!
PLASTIC LIMIT	17.			
PLASTICITY INDEX	22.			

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	CLEAN FINE SAND	SM	A-2-4
Sampled From:	SACK# A-10		

Lab No.: 14602

BEFORE WASH		POST WASH	
Dry + Container	288.5	Dry + Container	263.9
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	288.5	Dry Soil Wt.	263.9

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4				
1/2				
3/8				
#4	.0	.0	100.0	
#10	.2	.1	99.9	
#20	.4	.1	99.9	
#40	3.8	1.3	98.7	
#60	60.1	20.8	79.2	
#140	215.0	74.5	25.5	
#200	248.9	86.3	13.7	
PAN	263.8			

SOIL LOST= .10 PERCENT ERROR= .03

Remarks:

LL:
PL:
PI:

REVIEWED BY: PJJ

REVIEWED BY:

CERTIFIED: William H. Kemp

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

COEFFICIENT OF PERMEABILITY
CONSTANT HEAD

:JOAB, INC.
:P.O. BOX 580
:SUNLAND PARK, NM 88063

PROJECT: CONTRACT TESTING
:
FILE NO.: 90-092

DATE OF REPORT: OCTOBER 24, 1990

JOAB ID: A-10

LAB NO.: 14602

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:

WET UNIT WEIGHT: 104.0 % MOISTURE: 2.2
DRY UNIT WEIGHT: 101.8 % COMPACTION:

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): 7.4×10^{-4}

Remarks:

Reviewed By

Reviewed By

Certified By

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	SILTY. FINE SAND	SM	A-2-4
Sampled From:	SACK# A-14		

Lab No.: 14603

BEFORE WASH		POST WASH	
Dry + Container	341.2	Dry + Container	292.2
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	341.2	Dry Soil Wt.	292.2

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4	.0	.0	100.0	
1/2	18.0	5.3	94.7	
3/8	18.0	5.3	94.7	
#4	18.8	5.5	94.5	
#10	19.3	5.7	94.3	
#20	20.0	5.9	94.1	
#40	21.2	6.2	93.8	
#60	32.8	9.6	90.4	
#140	186.7	54.7	45.3	
#200	250.6	73.4	26.6	
PAN	292.2			

SOIL LOST= 0 PERCENT ERROR= 0

Remarks:

LL:
PL:
PI:

REVIEWED BY: MZJ

REVIEWED BY:

CERTIFIED: William H. Kingsley

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Plasticity Index of Soils

(ASTM D-4318-83)

FILE NUMBER: 90-092
LAB NUMBER: 14604 DATE: OCTOBER 17, 1990
PROJECT: JOAB TESTING
JOAB ID: A-23

TEST PERFORMED(YES=1,NO=3)	1	LAB NO.	14604	
N PLASTIC (B1=0)	ORGANIC?(YES=1,NO=0	IN E2)	0	

LIQUID LIMIT DETERMINATION

CAN I.D.	A	B	C	D
WET SOIL + CAN	22.60	22.97	20.92	
DRY SOIL + CAN	20.46	20.73	19.17	
WT. OF CAN	14.78	14.68	14.40	
MOISTURE CONTENT	37.68%	37.02%	36.69%	#DIV/0!
NUMBER OF BLOWS	17	25	35	
LIQUID LIMIT(ONE POINT)	36%	37%	38%	
LIQUID LIMIT	37.			

PLASTIC LIMIT DETERMINATION	A	B	C	D
WET SOIL + CAN	15.71	16.44		
DRY SOIL + CAN	15.43	16.09		
WT. OF CAN	14.11	14.59		
MOISTURE CONTENT	21.21%	23.33%	#DIV/0!	#DIV/0!
PLASTIC LIMIT	22.			
PLASTICITY INDEX	15.			

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

COEFFICIENT OF PERMEABILITY
FALLING HEAD

:JOAB, INC.
:P.O. BOX 580
:SUNLAND PARK, NM 88063

PROJECT: CONTRACT TESTING
:
FILE NO.: 90-092

DATE OF REPORT: OCTOBER 24, 1990

JOAB ID: A-23

LAB NO.: 14604

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:

WET UNIT WEIGHT: 119.9 % MOISTURE: 1.8
DRY UNIT WEIGHT: 117.8 % COMPACTION:

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): 5.2×10^{-7}

Remarks:

Reviewed By

Reviewed By

Certified By

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	SILTY SAND	SM	A-2-4
Sampled From:	SACK# B-6		
Lab No.:	14605		

BEFORE WASH		POST WASH	
Dry + Container	650.9	Dry + Container	570.9
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	650.9	Dry Soil Wt.	570.9

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2	.0	.0	100.0	
1	71.9	11.0	89.0	
3/4	71.9	11.0	89.0	
1/2	71.9	11.0	89.0	
3/8	71.9	11.0	89.0	
#4	76.3	11.7	88.3	
#10	81.1	12.5	87.5	
#20	87.8	13.5	86.5	
#40	108.9	16.7	83.3	
#60	249.6	38.3	61.7	
#140	525.0	80.7	19.3	
#200	549.5	84.4	15.6	
PAN	570.9			

SOIL LOST= 0 PERCENT ERROR= 0

Remarks:

LL:
PL:
PI:

REVIEWED BY:

REVIEWED BY:

CERTIFIED:

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	SILTY SAND	SM	A-2-4
Sampled From:	SACK# B-11		

Lab No.: 14606

BEFORE WASH		POST WASH	
Dry + Container	625.9	Dry + Container	489.3
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	625.9	Dry Soil Wt.	489.3

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4	.0	.0	100.0	
1/2	35.9	5.7	94.3	
3/8	59.3	9.5	90.5	
#4	76.9	12.3	87.7	
#10	82.5	13.2	86.8	
#20	86.8	13.9	86.1	
#40	101.7	16.2	83.8	
#60	137.8	22.0	78.0	
#140	372.5	59.5	40.5	
#200	440.6	70.4	29.6	
PAN	489.4			

SOIL LOST= -.10 PERCENT ERROR= -.02

Remarks:

LL:
PL:
PI:

REVIEWED BY: PJ

REVIEWED BY:

CERTIFIED: William H. Kingsley

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

COEFFICIENT OF PERMEABILITY
CONSTANT HEAD

:JOAB, INC.
:P.O. BOX 580
:SUNLAND PARK, NM 88063

PROJECT: CONTRACT TESTING
:
FILE NO.: 90-092

DATE OF REPORT: OCTOBER 24, 1990

JOAB ID: B-11

LAB NO.: 14606

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:

WET UNIT WEIGHT: 84.6 % MOISTURE: 2.7
DRY UNIT WEIGHT: 82.4 % COMPACTION:

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): 7.6×10^{-4}

Remarks:

Reviewed By PJJ

Reviewed By

Certified By

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Plasticity Index of Soils

(ASTM D-4318-83)

FILE NUMBER: 90-092
LAB NUMBER: 14607 DATE: OCTOBER 17, 1990
PROJECT: JOAB TESTING
JOAB ID: B-19

TEST PERFORMED(YES=1,NO=3)	1	LAB NO.	14607	
NON PLASTIC (B1=0)	ORGANIC?(YES=1,NO=0 IN E2)		0	

LIQUID LIMIT DETERMINATION				
CAN I.D.	A	B	C	D
WET SOIL + CAN	22.83	23.33	24.08	
DRY SOIL + CAN	19.53	19.98	20.54	
WT. OF CAN	14.18	14.40	14.44	
MOISTURE CONTENT	61.68%	60.04%	58.03%	#DIV/0!
NUMBER OF BLOWS	18	27	35	
LIQUID LIMIT(ONE POINT)	59%	61%	60%	
LIQUID LIMIT	60.			

PLASTIC LIMIT DETERMINATION	A	B	C	D
WET SOIL + CAN	16.35	16.02		
DRY SOIL + CAN	15.93	15.72		
WT. OF CAN	14.23	14.53		
MOISTURE CONTENT	24.71%	25.21%	#DIV/0!	#DIV/0!
PLASTIC LIMIT	25.			
PLASTICITY INDEX	35.			

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

COEFFICIENT OF PERMEABILITY
FALLING HEAD

:JOAB, INC.
:P.O. BOX 580
:SUNLAND PARK, NM 88063

PROJECT: CONTRACT TESTING
:
FILE NO.: 90-092

DATE OF REPORT: OCTOBER 24, 1990

JOAB ID: B-19

LAB NO.: 14607

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:

WET UNIT WEIGHT: 120.9 % MOISTURE: 28.7
DRY UNIT WEIGHT: 93.9 % COMPACTION:

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): 9.6×10^{-8}

Remarks:

Reviewed By

Reviewed By

Certified By

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Plasticity Index of Soils

(ASTM D-4318-83)

FILE NUMBER: 90-092
LAB NUMBER: 14608 DATE: OCTOBER 17, 1990
PROJECT: JOAB TESTING
JOAB ID: B-20

TEST PERFORMED(YES=1,NO=3)	1		LAB NO.	14608	
NON PLASTIC (B1=0)	ORGANIC?(YES=1,NO=0 IN E2)			0	
LIQUID LIMIT DETERMINATION					
CAN I.D.	A	B	C	D	
WET SOIL + CAN	22.04	22.51	22.39		
DRY SOIL + CAN	18.63	19.17	19.12		
WT. OF CAN	14.23	14.72	14.60		
MOISTURE CONTENT	77.50%	75.06%	72.35%	#DIV/0!	
NUMBER OF BLOWS	16	23	30		
LIQUID LIMIT(ONE POINT)	73%	74%	74%		
LIQUID LIMIT	74.				
PLASTIC LIMIT DETERMINATION	A	B	C	D	
WET SOIL + CAN	15.91	16.31			
DRY SOIL + CAN	15.54	15.84			
WT. OF CAN	14.04	14.06			
MOISTURE CONTENT	24.67%	26.40%	#DIV/0!	#DIV/0!	
PLASTIC LIMIT	26.				
PLASTICITY INDEX	48.				

PRECISION ENGINEERING, INC.
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NEW MEXICO 88004
505-523-7674

Plasticity Index of Soils

(ASTM D-4318-83)

FILE NUMBER: 90-092
LAB NUMBER: 14609 DATE: OCTOBER 17, 1990
PROJECT: JOAB TESTING
JOAB ID: C-7

TEST PERFORMED(YES=1,NO=3)	1	LAB NO.	14609
ON PLASTIC (B1=0)	ORGANIC?(YES=1,NO=0 IN E2)		0

LIQUID LIMIT DETERMINATION

CAN I.D.	A	B	C	D
WET SOIL + CAN	21.19	21.97	22.36	
DRY SOIL + CAN	18.14	18.47	18.81	
WT. OF CAN	14.48	14.25	14.47	
MOISTURE CONTENT	83.33%	82.94%	81.80%	#DIV/0!
NUMBER OF BLOWS	17	22	33	
LIQUID LIMIT(ONE POINT)	80%	82%	85%	
LIQUID LIMIT	82.			

PLASTIC LIMIT DETERMINATION

	A	B	C	D
WET SOIL + CAN	18.04	18.39		
DRY SOIL + CAN	17.30	17.57		
WT. OF CAN	14.45	14.61		
MOISTURE CONTENT	25.96%	27.70%	#DIV/0!	#DIV/0!
PLASTIC LIMIT	27.			
PLASTICITY INDEX	55.			

PRECISION ENGINEERING, INC.
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505-523-7674

COEFFICIENT OF PERMEABILITY
FALLING HEAD

:JOAB, INC.
:P.O. BOX 580
:SUNLAND PARK, NM 88063

PROJECT: CONTRACT TESTING
:
FILE NO.: 90-092

DATE OF REPORT: OCTOBER 24, 1990

JOAB ID: C-7

LAB NO.: 14609

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:

WET UNIT WEIGHT: 118.4 % MOISTURE: 26.0
DRY UNIT WEIGHT: 94.0 % COMPACTION:

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): 3.4×10^{-8}

Remarks:

Reviewed By

Reviewed By

Certified By

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	CLEAN FINE SAND	SP-SM	A-2-4
Sampled From:	SACK# C-8		

Lab No.: 14610

BEFORE WASH		POST WASH	
Dry + Container	519.1	Dry + Container	477.0
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	519.1	Dry Soil Wt.	477.0

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4				
1/2				
3/8				
#4	.0	.0	100.0	
#10	.0	.0	100.0	
#20	.3	.1	99.9	
#40	2.2	.4	99.6	
#60	111.5	21.5	78.5	
#140	438.8	84.5	15.5	
#200	465.0	89.6	10.4	
PAN	476.8			

SOIL LOST= .20 PERCENT ERROR= .04

Remarks:

LL:
PL:
PI:

REVIEWED BY:

REVIEWED BY:

CERTIFIED:

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

COEFFICIENT OF PERMEABILITY
FALLING HEAD

:JOAB, INC.
:P.O. BOX 580
:SUNLAND PARK, NM 88063

PROJECT: CONTRACT TESTING
:
FILE NO.: 90-092

DATE OF REPORT: OCTOBER 24, 1990

JOAB ID: D-5

LAB NO.: 14611

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:

WET UNIT WEIGHT: 120.7 % MOISTURE: 20.5
DRY UNIT WEIGHT: 96.6 % COMPACTION:

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): 1.0×10^{-8}

Remarks:

Reviewed By PJJ

Reviewed By

Certified By William H. Kemp

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Plasticity Index of Soils

(ASTM D-4318-83)

FILE NUMBER: 90-092
LAB NUMBER: 14611 DATE: OCTOBER 17, 1990
PROJECT: JOAB TESTING
JOAB ID: D-5

TEST PERFORMED(YES=1,NO=3)	1	LAB NO.	14611	
ON PLASTIC (B1=0)	ORGANIC?(YES=1,NO=0	IN E2)	0	
LIQUID LIMIT DETERMINATION				
CAN I.D.	A	B	C	D
WET SOIL + CAN	22.62	24.11	22.86	
DRY SOIL + CAN	19.93	20.97	20.04	
WT. OF CAN	14.50	14.53	14.13	
MOISTURE CONTENT	49.54%	48.76%	47.72%	#DIV/0!
NUMBER OF BLOWS	15	23	33	
LIQUID LIMIT(ONE POINT)	47%	48%	49%	
LIQUID LIMIT	48.			
PLASTIC LIMIT DETERMINATION	A	B	C	D
WET SOIL + CAN	16.21	17.31		
DRY SOIL + CAN	15.92	16.91		
WT. OF CAN	14.40	14.82		
MOISTURE CONTENT	19.08%	19.14%	#DIV/0!	#DIV/0!
PLASTIC LIMIT	19.			
PLASTICITY INDEX	29.			

PRECISION ENGINEERING, INC.
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NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	SILTY SAND	SM	A-4
Sampled From:	SACK# D-6		
Lab No.:	14612		

BEFORE WASH		POST WASH	
Dry + Container	489.1	Dry + Container	290.8
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	489.1	Dry Soil Wt.	290.8

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4				
1/2	.0	.0	100.0	
3/8	17.2	3.5	96.5	
#4	24.2	4.9	95.1	
#10	27.3	5.6	94.4	
#20	29.1	5.9	94.1	
#40	34.4	7.0	93.0	
#60	44.1	9.0	91.0	
#140	233.7	47.8	52.2	
#200	274.3	56.1	43.9	
PAN	290.8			

SOIL LOST= 0 PERCENT ERROR= 0

Remarks:

LL:
PL:
PI:

REVIEWED BY: PJJ

REVIEWED BY:

CERTIFIED: William H. Kingsley

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	SILTY SAND	SM	A-2-4
Sampled From:	SACK# D-7		
Lab No.:	14613		

BEFORE WASH		POST WASH	
Dry + Container	448.1	Dry + Container	395.2
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	448.1	Dry Soil Wt.	395.2

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4				
1/2				
3/8				
#4	.0	.0	100.0	
#10	.0	.0	100.0	
#20	.3	.1	99.9	
#40	3.9	.9	99.1	
#60	43.4	9.7	90.3	
#140	334.3	74.6	25.4	
#200	369.5	82.5	17.5	
PAN	395.2			

SOIL LOST= 0 PERCENT ERROR= 0

Remarks:

LL:
PL:
PI:

REVIEWED BY: PJJ

REVIEWED BY:

CERTIFIED: William H. Kinsley

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	CLEAN FINE SAND	SP-SM	A-2-4
Sampled From:	SACK# E-2		

Lab No.: 14614

BEFORE WASH		POST WASH	
Dry + Container	372.2	Dry + Container	336.8
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	372.2	Dry Soil Wt.	336.8

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4				
1/2				
3/8	.0	.0	100.0	
#4	.6	.2	99.8	
#10	1.3	.3	99.7	
#20	2.6	.7	99.3	
#40	12.7	3.4	96.6	
#60	106.4	28.6	71.4	
#140	310.2	83.3	16.7	
#200	329.2	88.4	11.6	
PAN	336.7			

SOIL LOST= .10 PERCENT ERROR= .03

Remarks:

LL:
PL:
PI:

REVIEWED BY: PJ

REVIEWED BY:

CERTIFIED: William A. Kingsley

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

COEFFICIENT OF PERMEABILITY
FALLING HEAD

:JOAB, INC.
:P.O. BOX 580
:SUNLAND PARK, NM 88063

PROJECT: CONTRACT TESTING
:
FILE NO.: 90-092

DATE OF REPORT: OCTOBER 24, 1990

JOAB ID: E-4

LAB NO.: 14615

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:

WET UNIT WEIGHT: 117.5 % MOISTURE: 26.4
DRY UNIT WEIGHT: 92.9 % COMPACTION:

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): 2.5×10^{-8}

Remarks:

Reviewed By

Reviewed By

Certified By

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Plasticity Index of Soils

(ASTM D-4318-83)

FILE NUMBER: 90-092
LAB NUMBER: 14615 DATE: OCTOBER 17, 1990
PROJECT: JOAB TESTING
JOAB ID: E-4

TEST PERFORMED(YES=1,NO=3)	1	LAB NO.	14615	
NON PLASTIC (B1=0)	ORGANIC?(YES=1,NO=0 IN E2)		0	

LIQUID LIMIT DETERMINATION				
CAN I.D.	A	B	C	D
WET SOIL + CAN	22.23	22.76	23.05	0
DRY SOIL + CAN	19.27	19.64	19.94	0
WT. OF CAN	14.70	14.71	14.56	0
MOISTURE CONTENT	64.77%	63.29%	57.81%	#DIV/0!
NUMBER OF BLOWS	18	21	34	0
LIQUID LIMIT(ONE POINT)	62%	62%	60%	
LIQUID LIMIT	61.			

PLASTIC LIMIT DETERMINATION	A	B	C	D
WET SOIL + CAN	16.42	16.70		
DRY SOIL + CAN	16.04	16.36		
WT. OF CAN	14.26	14.63		
MOISTURE CONTENT	21.35%	19.65%	#DIV/0!	#DIV/0!
PLASTIC LIMIT	21.			
PLASTICITY INDEX	41.			

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

Particle Size Analysis of Soils

JOAB INC.
P.O. BOX 580
SUNLAND PARK, NM 88063

Project: JOAB TESTING
File No.: 90-092
Date: OCTOBER 17, 1990

		UNIFIED	AASHTO
Soil Type and Class.:	SILTY FINE SAND	SM	A-2-4
Sampled From:	SACK# E-6		

Lab No.: 14616

BEFORE WASH		POST WASH	
Dry + Container	466.9	Dry + Container	326.9
Container Wt.	0	Container Wt.	0
Dry Soil Wt.	466.9	Dry Soil Wt.	326.9

SIEVE NUMBER	WT. RETAINED	% RETAINED	% PASSING	SPEC.
3"				
2"				
1-1/2				
1				
3/4				
1/2				
3/8				
#4	.0	.0	100.0	
#10	.5	.1	99.9	
#20	1.1	.2	99.8	
#40	7.7	1.6	98.4	
#60	41.0	8.8	91.2	
#140	256.8	55.0	45.0	
#200	309.1	66.2	33.8	
PAN	326.9			

SOIL LOST= 0 PERCENT ERROR= 0

Remarks:

LL:
PL:
PI:

REVIEWED BY:

REVIEWED BY:

CERTIFIED:

New mexico State University
Soil, Plant and Water Testing Laboratory
Agronomy and Horticulture, Dept. 3Q
Box 30003
Las Cruces, New Mexico 88003-0003

November 12, 1990

Joab, Inc.
P.O. Box 580
Sunland Park, New Mexico 88063

Soil analysis (Lab Nos 662-668)
Invoice 13465

Sample	meq/100gr CEC
A-6	27.06
A-23	24.81
B-19	32.12
B-20	29.42
C-7	31.42
D-5	26.19
E-4	31.66

1995 Permit Application

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 5.5-6.0
Ring Number: SB-1 5.5-6.0
Depth: 5.5-6.0 ft.

Field weight of sample (w/pan and ring):	547.29	(g)
Tare weight, ring:	98.42	(g)
Tare weight cap:	83.10	(g)
Sample volume:	220.77	(cm^3)
Dry weight of sample:	335.20	(g)
Dry bulk density:	1.52	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	42.7	(% vol)
Initial Moisture Content (Volumetric):	13.8	(% vol)
Initial Moisture Content (Gravimetric):	9.1	(% g/g)
Percent Saturation:	32.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 10.5-11.0
Ring Number: SB-1 10.5-11.0
Depth: 10.5-11.0 ft.

Field weight of sample (w/pan and ring):	1107.50	(g)
Tare weight, ring:	204.59	(g)
Tare weight cap:	83.10	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	807.22	(g)
Dry bulk density:	1.76	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	33.4	(% vol)
Initial Moisture Content (Volumetric):	2.8	(% vol)
Initial Moisture Content (Gravimetric):	1.6	(% g/g)
Percent Saturation:	8.2	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 20.5-21.0
Ring Number: SB-1 20.5-21.0
Depth: 20.5-21.0 ft.

Field weight of sample (w/pan and ring):	654.55	(g)
Tare weight, ring:	118.95	(g)
Tare weight cap:	83.10	(g)
Sample volume:	267.87	(cm^3)
Dry weight of sample:	445.28	(g)
Dry bulk density:	1.66	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	37.3	(% vol)
Initial Moisture Content (Volumetric):	2.7	(% vol)
Initial Moisture Content (Gravimetric):	1.6	(% g/g)
Percent Saturation:	7.2	

Comments:

Laboratory analysis performed by: K. Copeland/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 25.5-26.0
Ring Number: SB-1 25.5-26.0
Depth: 25.5-26.0 ft.

Field weight of sample (w/pan and ring):	1049.30	(g)
Tare weight, ring:	204.66	(g)
Tare weight cap:	83.10	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	704.73	(g)
Dry bulk density:	1.54	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	41.9	(% vol)
Initial Moisture Content (Volumetric):	12.4	(% vol)
Initial Moisture Content (Gravimetric):	8.1	(% g/g)
Percent Saturation:	29.7	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 44.9-45.4
Ring Number: SB-1 44.9-45.4
Depth: 44.9-45.4 ft.

Field weight of sample (w/pan and ring):	1022.30	(g)
Tare weight, ring:	204.49	(g)
Tare weight cap:	83.11	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	726.56	(g)
Dry bulk density:	1.59	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	40.1	(% vol)
Initial Moisture Content (Volumetric):	1.8	(% vol)
Initial Moisture Content (Gravimetric):	1.1	(% g/g)
Percent Saturation:	4.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 55.5-56.0
Ring Number: SB-1 55.5-56.0
Depth: 55.5-56.0 ft.

Field weight of sample (w/pan and ring):	1118.40	(g)
Tare weight, ring:	205.09	(g)
Tare weight cap:	83.11	(g)
Sample volume:	458.92	(cm^3)
Dry weight of sample:	810.30	(g)
Dry bulk density:	1.77	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	33.4	(% vol)
Initial Moisture Content (Volumetric):	4.3	(% vol)
Initial Moisture Content (Gravimetric):	2.5	(% g/g)
Percent Saturation:	13.0	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 65.5-66.0
Ring Number: SB-1 65.5-66.0
Depth: 65.5-66.0 ft.

Field weight of sample (w/pan and ring):	990.10	(g)
Tare weight, ring:	205.21	(g)
Tare weight cap:	83.11	(g)
Sample volume:	458.92	(cm^3)
Dry weight of sample:	691.15	(g)
Dry bulk density:	1.51	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	43.2	(% vol)
Initial Moisture Content (Volumetric):	2.3	(% vol)
Initial Moisture Content (Gravimetric):	1.5	(% g/g)
Percent Saturation:	5.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 74.8-75.3
Ring Number: SB-1 74.8-75.3
Depth: 74.8-75.3 ft.

Field weight of sample (w/pan and ring):	963.40	(g)
Tare weight, ring:	205.05	(g)
Tare weight cap:	83.10	(g)
Sample volume:	451.44	(cm^3)
Dry weight of sample:	660.28	(g)
Dry bulk density:	1.46	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	44.8	(% vol)
Initial Moisture Content (Volumetric):	3.3	(% vol)
Initial Moisture Content (Gravimetric):	2.3	(% g/g)
Percent Saturation:	7.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 85.5-86.0
Ring Number: SB-1 85.5-86.0
Depth: 85.5-86.0 ft.

Field weight of sample (w/pan and ring):	530.91	(g)
Tare weight, ring:	103.16	(g)
Tare weight cap:	83.10	(g)
Sample volume:	230.37	(cm^3)
Dry weight of sample:	323.75	(g)
Dry bulk density:	1.41	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	47.0	(% vol)
Initial Moisture Content (Volumetric):	9.1	(% vol)
Initial Moisture Content (Gravimetric):	6.5	(% g/g)
Percent Saturation:	19.3	

Comments:

Laboratory analysis performed by: K. Copeland/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 91.0-91.5
Ring Number: SB-1 91.0-91.5
Depth: 91.0-91.5 ft.

Field weight of sample (w/pan and ring):	1141.70	(g)
Tare weight, ring:	205.20	(g)
Tare weight cap:	233.31	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	671.22	(g)
Dry bulk density:	1.47	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	44.6	(% vol)
Initial Moisture Content (Volumetric):	7.0	(% vol)
Initial Moisture Content (Gravimetric):	4.8	(% g/g)
Percent Saturation:	15.7	

Comments:

Laboratory analysis performed by: M. Trenchik
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 104.4-104.9
Ring Number: SB-1 104.4-104.9
Depth: 104.4-104.9 ft.

Field weight of sample (w/pan and ring):	944.80	(g)
Tare weight, ring:	204.81	(g)
Tare weight cap:	83.10	(g)
Sample volume:	441.10	(cm^3)
Dry weight of sample:	648.20	(g)
Dry bulk density:	1.47	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	44.5	(% vol)
Initial Moisture Content (Volumetric):	2.0	(% vol)
Initial Moisture Content (Gravimetric):	1.3	(% g/g)
Percent Saturation:	4.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-2 20.5-21.0
Ring Number: SB-2 20.5-21.0
Depth: 20.5-21.0 ft.

Field weight of sample (w/pan and ring):	1022.90	(g)
Tare weight, ring:	205.23	(g)
Tare weight cap:	83.11	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	703.36	(g)
Dry bulk density:	1.54	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	42.0	(% vol)
Initial Moisture Content (Volumetric):	6.8	(% vol)
Initial Moisture Content (Gravimetric):	4.4	(% g/g)
Percent Saturation:	16.2	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-2 74.8-75.3
Ring Number: SB-2 74.8-75.3
Depth: 74.8-75.3 ft.

Field weight of sample (w/pan and ring):	130.32	(g)
Tare weight, ring:	30.79	(g)
Tare weight cap:	0.00	(g)
Sample volume:	49.03	(cm^3)
Dry weight of sample:	81.14	(g)
Dry bulk density:	1.65	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	37.6	(% vol)
Initial Moisture Content (Volumetric):	37.5	(% vol)
Initial Moisture Content (Gravimetric):	22.7	(% g/g)
Percent Saturation:	99.9	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-2 119.8-120.3
Ring Number: SB-2 119.8-120.3
Depth: 119.8-120.3 ft.

Field weight of sample (w/pan and ring):	539.26	(g)
Tare weight, ring:	103.83	(g)
Tare weight cap:	83.10	(g)
Sample volume:	231.87	(cm^3)
Dry weight of sample:	335.37	(g)
Dry bulk density:	1.45	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	45.4	(% vol)
Initial Moisture Content (Volumetric):	7.3	(% vol)
Initial Moisture Content (Gravimetric):	5.1	(% g/g)
Percent Saturation:	16.1	

Comments:

Laboratory analysis performed by: K. Copeland/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-3 10.5-11.0
Ring Number: SB-3 10.5-11.0
Depth: 10.5-11.0 ft.

Field weight of sample (w/pan and ring):	552.72	(g)
Tare weight, ring:	99.84	(g)
Tare weight cap:	83.10	(g)
Sample volume:	224.07	(cm^3)
Dry weight of sample:	362.83	(g)
Dry bulk density:	1.62	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	38.9	(% vol)
Initial Moisture Content (Volumetric):	3.1	(% vol)
Initial Moisture Content (Gravimetric):	1.9	(% g/g)
Percent Saturation:	8.0	

Comments:

Laboratory analysis performed by: K. Copeland/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-3 29.9-30.4
Ring Number: SB-3 29.9-30.4
Depth: 29.9-30.4 ft.

Field weight of sample (w/pan and ring):	495.79	(g)
Tare weight, ring:	89.08	(g)
Tare weight cap:	83.11	(g)
Sample volume:	199.78	(cm^3)
Dry weight of sample:	291.06	(g)
Dry bulk density:	1.46	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	45.0	(% vol)
Initial Moisture Content (Volumetric):	16.3	(% vol)
Initial Moisture Content (Gravimetric):	11.2	(% g/g)
Percent Saturation:	36.2	

Comments:

Laboratory analysis performed by: K. Copeland/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 5.5-6.0
Ring Number: SB-4 5.5-6.0
Depth: 5.5-6.0 ft.

Field weight of sample (w/pan and ring):	1060.60	(g)
Tare weight, ring:	204.94	(g)
Tare weight cap:	83.11	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	743.96	(g)
Dry bulk density:	1.63	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	38.6	(% vol)
Initial Moisture Content (Volumetric):	6.2	(% vol)
Initial Moisture Content (Gravimetric):	3.8	(% g/g)
Percent Saturation:	16.2	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 15.5-16.0
Ring Number: SB-4 15.5-16.0
Depth: 15.5-16.0 ft.

Field weight of sample (w/pan and ring):	1003.30	(g)
Tare weight, ring:	204.96	(g)
Tare weight cap:	83.10	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	701.69	(g)
Dry bulk density:	1.53	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	42.1	(% vol)
Initial Moisture Content (Volumetric):	3.0	(% vol)
Initial Moisture Content (Gravimetric):	1.9	(% g/g)
Percent Saturation:	7.0	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 25.5-26.0
Ring Number: SB-4 25.5-26.0
Depth: 25.5-26.0 ft.

Field weight of sample (w/pan and ring):	508.09	(g)
Tare weight, ring:	91.58	(g)
Tare weight cap:	83.10	(g)
Sample volume:	206.97	(cm^3)
Dry weight of sample:	320.59	(g)
Dry bulk density:	1.55	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	41.5	(% vol)
Initial Moisture Content (Volumetric):	6.2	(% vol)
Initial Moisture Content (Gravimetric):	4.0	(% g/g)
Percent Saturation:	14.9	

Comments:

Laboratory analysis performed by: K. Copeland/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 30.5-31.0
Ring Number: SB-4 30.5-31.0
Depth: 30.5-31.0 ft.

Field weight of sample (w/pan and ring):	1013.00	(g)
Tare weight, ring:	205.03	(g)
Tare weight cap:	83.10	(g)
Sample volume:	455.96	(cm^3)
Dry weight of sample:	707.02	(g)
Dry bulk density:	1.55	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	41.5	(% vol)
Initial Moisture Content (Volumetric):	3.9	(% vol)
Initial Moisture Content (Gravimetric):	2.5	(% g/g)
Percent Saturation:	9.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 39.8-40.3
Ring Number: SB-4 39.8-40.3
Depth: 39.8-40.3 ft.

Field weight of sample (w/pan and ring):	924.60	(g)
Tare weight, ring:	204.58	(g)
Tare weight cap:	83.10	(g)
Sample volume:	449.48	(cm^3)
Dry weight of sample:	609.10	(g)
Dry bulk density:	1.36	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	48.9	(% vol)
Initial Moisture Content (Volumetric):	6.2	(% vol)
Initial Moisture Content (Gravimetric):	4.6	(% g/g)
Percent Saturation:	12.7	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 50.5-51.0
Ring Number: SB-4 50.5-51.0
Depth: 50.5-51.0 ft.

Field weight of sample (w/pan and ring):	998.30	(g)
Tare weight, ring:	205.48	(g)
Tare weight cap:	83.10	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	697.29	(g)
Dry bulk density:	1.52	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	42.5	(% vol)
Initial Moisture Content (Volumetric):	2.7	(% vol)
Initial Moisture Content (Gravimetric):	1.8	(% g/g)
Percent Saturation:	6.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 59.1-60.2
Ring Number: SB-4 59.1-60.2
Depth: 59.1-60.2 ft.

Field weight of sample (w/pan and ring):	1005.60	(g)
Tare weight, ring:	204.74	(g)
Tare weight cap:	83.10	(g)
Sample volume:	460.41	(cm^3)
Dry weight of sample:	697.38	(g)
Dry bulk density:	1.51	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	42.8	(% vol)
Initial Moisture Content (Volumetric):	4.4	(% vol)
Initial Moisture Content (Gravimetric):	2.9	(% g/g)
Percent Saturation:	10.3	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 69.8-70.3
Ring Number: SB-4 69.8-70.3
Depth: 69.8-70.3 ft.

Field weight of sample (w/pan and ring):	1002.90	(g)
Tare weight, ring:	203.99	(g)
Tare weight cap:	83.10	(g)
Sample volume:	460.41	(cm^3)
Dry weight of sample:	660.00	(g)
Dry bulk density:	1.43	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	45.9	(% vol)
Initial Moisture Content (Volumetric):	12.1	(% vol)
Initial Moisture Content (Gravimetric):	8.5	(% g/g)
Percent Saturation:	26.4	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 79.8-80.3
Ring Number: SB-4 79.8-80.3
Depth: 79.8-80.3 ft.

Field weight of sample (w/pan and ring):	1040.10	(g)
Tare weight, ring:	205.59	(g)
Tare weight cap:	83.09	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	712.02	(g)
Dry bulk density:	1.56	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	41.3	(% vol)
Initial Moisture Content (Volumetric):	8.6	(% vol)
Initial Moisture Content (Gravimetric):	5.5	(% g/g)
Percent Saturation:	20.9	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 90.4-90.9
Ring Number: SB-4 90.4-90.9
Depth: 90.4-90.9 ft.

Field weight of sample (w/pan and ring):	297.24	(g)
Tare weight, ring:	0.00	(g)
Tare weight cap:	16.15	(g)
Sample volume:	148.68	(cm^3)
Dry weight of sample:	220.57	(g)
Dry bulk density:	1.48	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	44.0	(% vol)
Initial Moisture Content (Volumetric):	40.7	(% vol)
Initial Moisture Content (Gravimetric):	27.4	(% g/g)
Percent Saturation:	92.5	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 99.9-100.4
Ring Number: SB-4 99.9-100.4
Depth: 99.9-100.4 ft.

Field weight of sample (w/pan and ring):	1047.20	(g)
Tare weight, ring:	204.82	(g)
Tare weight cap:	83.10	(g)
Sample volume:	460.41	(cm^3)
Dry weight of sample:	744.81	(g)
Dry bulk density:	1.62	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	39.0	(% vol)
Initial Moisture Content (Volumetric):	3.1	(% vol)
Initial Moisture Content (Gravimetric):	1.9	(% g/g)
Percent Saturation:	8.1	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 114.8-115.3
Ring Number: SB-4 114.8-115.3
Depth: 114.8-115.3 ft.

Field weight of sample (w/pan and ring):	219.74	(g)
Tare weight, ring:	40.25	(g)
Tare weight cap:	0.00	(g)
Sample volume:	91.17	(cm^3)
Dry weight of sample:	140.89	(g)
Dry bulk density:	1.55	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	41.7	(% vol)
Initial Moisture Content (Volumetric):	42.3	(% vol)
Initial Moisture Content (Gravimetric):	27.4	(% g/g)
Percent Saturation:	101.6	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 124.5-125.0
Ring Number: SB-4 124.5-125.0
Depth: 124.5-125.0 ft.

Field weight of sample (w/pan and ring):	1024.10	(g)
Tare weight, ring:	204.76	(g)
Tare weight cap:	83.10	(g)
Sample volume:	457.44	(cm^3)
Dry weight of sample:	700.50	(g)
Dry bulk density:	1.53	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	42.2	(% vol)
Initial Moisture Content (Volumetric):	7.8	(% vol)
Initial Moisture Content (Gravimetric):	5.1	(% g/g)
Percent Saturation:	18.5	

Comments:

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

DATA FOR INITIAL MOISTURE CONTENT, BULK DENSITY, POROSITY, AND PERCENT SATURATION

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 139.5-140.0
Ring Number: SB-4 139.5-140.0
Depth: 139.5-140.0 ft.

Field weight of sample (w/pan and ring):	118.49	(g)
Tare weight, ring:	29.48	(g)
Tare weight cap:	0.00	(g)
Sample volume:	47.06	(cm^3)
Dry weight of sample:	69.74	(g)
Dry bulk density:	1.48	(g/cm^3)
Particle density:	2.65	(g/cm^3)

(Method: Assumed particle density of 2.65 g/cm^3)

Calculated Porosity:	44.1	(% vol)
Initial Moisture Content (Volumetric):	40.9	(% vol)
Initial Moisture Content (Gravimetric):	27.6	(% g/g)
Percent Saturation:	92.9	

Comments:

Laboratory analysis performed by: K. Copeland/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

APPENDIX B

SATURATED HYDRAULIC CONDUCTIVITY

SUMMARY OF SATURATED HYDRAULIC CONDUCTIVITY TESTS

Sample Number	K_{sat} (cm/sec)	Method of Analysis	
		Constant Head	Falling Head
SB-1 (5.5-6.0')	4.7×10^{-5}	X	
SB-1 (20.5-21.0')	3.3×10^{-2}	X	
SB-1 (85.5-86.0')	6.5×10^{-4}	X	
SB-2 (74.8-75.3')	9.4×10^{-10}	M	
SB-2 (119.8-120.3')	7.1×10^{-4}	X	
SB-3 (10.5-11.0')	2.5×10^{-3}	X	
SB-3 (29.9-30.4')	1.7×10^{-4}	X	
SB-4 (25.5-26.0')	3.9×10^{-3}	X	
SB-4 (114.8-115.3')	1.3×10^{-8}	M	
SB-4 (139.5-140.0')	4.9×10^{-8}		X

M = Modified constant head method: pressure-assisted water gradient to improve flux and saturation time

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-1 5.5-6.0
Ring number: SB-1 5.5-6.0
Depth: 5.5-6.0 ft.
Type of water used: TAP
Collection vessel tare: 10.63 g
Sample length: 7.36 cm
Sample diameter: 6.18 cm
Sample cross-sectional area: 30.00 cm3

Date	Time	Temp (C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
06-Nov-95	12:28:57	21.0	3.5	18.6	8.0	12069	4.6E-05	4.5E-05
06-Nov-95	15:50:06							
06-Nov-95	17:13:00	21.0	3.4	12.1	1.5	2208	4.9E-05	4.8E-05
06-Nov-95	17:49:48							
07-Nov-95	09:38:42	20.0	3.4	13.6	3.0	4468	4.8E-05	4.8E-05
07-Nov-95	10:53:10							

Average Ksat: 4.7E-05 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-1 20.5-21.0
Ring number: SB-1 20.5-21.0
Depth: 20.5-21.0 ft.
Type of water used: TAP
Collection vessel tare: 11.81 g
Sample length: 8.93 cm
Sample diameter: 6.18 cm
Sample cross-sectional area: 30.00 cm3

Date	Time	Temp (C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
07-Nov-95	09:38:00	20.0	1.6	35.0	23.2	126	3.4E-02	3.4E-02
07-Nov-95	09:40:06							
07-Nov-95	14:12:15	20.0	1.6	34.6	22.8	117	3.6E-02	3.6E-02
07-Nov-95	14:14:12							
08-Nov-95	09:50:07	19.0	1.6	37.0	25.2	160	2.9E-02	3.0E-02
08-Nov-95	09:52:47							

Average Ksat: 3.3E-02 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-1 85.5-86.0
Ring number: SB-1 85.5-86.0
Depth: 85.5-86.0 ft.
Type of water used: TAP
Collection vessel tare: 10.63 g
Sample length: 7.68 cm
Sample diameter: 6.18 cm
Sample cross-sectional area: 30.00 cm3

Date	Time	Temp (C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
06-Nov-95	12:29:45	21.0	3.5	18.0	7.4	804	6.7E-04	6.6E-04
06-Nov-95	12:43:09							
06-Nov-95	17:10:56	21.0	3.5	15.6	5.0	555	6.6E-04	6.4E-04
06-Nov-95	17:20:11							
07-Nov-95	09:41:24	20.0	3.4	17.3	6.7	782	6.4E-04	6.4E-04
07-Nov-95	09:54:26							

Average Ksat: 6.5E-04 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-2 74.8-75.3
Ring number: SB-2 74.8-75.3
Depth: 74.8-75.3 ft.
Type of water used: TAP
Collection vessel tare: 0.00 g
Sample length: 2.60 cm
Sample diameter: 4.90 cm
Sample cross-sectional area: 18.86 cm3

Date	Time	Temp (C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
14-Nov-95	17:02:32	21.0	1143.8	0.5	0.5	56318	9.8E-10	9.6E-10
15-Nov-95	08:41:10							
15-Nov-95	08:41:10	20.0	1138.7	0.3	0.3	33951	9.6E-10	9.6E-10
15-Nov-95	18:07:01							
15-Nov-95	18:07:01	20.0	1134.0	0.4	0.4	52549	9.0E-10	9.0E-10
16-Nov-95	08:42:50							

Average Ksat: 9.4E-10 cm/sec

Comments: Modified constant head method to improve flux and saturation times

Laboratory analysis by: G. Stansifer/R. Maranville
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-2 119.8-120.3
Ring number: SB-2 119.8-120.3
Depth: 119.8-120.3 ft.
Type of water used: TAP
Collection vessel tare: 11.42 g
Sample length: 7.73 cm
Sample diameter: 6.18 cm
Sample cross-sectional area: 30.00 cm3

Date	Time	Temp (C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
06-Nov-95	12:30:45	21.0	3.8	17.9	6.4	620	7.0E-04	6.9E-04
06-Nov-95	12:41:05							
06-Nov-95	17:14:29	21.0	3.8	17.2	5.7	530	7.3E-04	7.2E-04
06-Nov-95	17:23:19							
07-Nov-95	09:42:06	20.0	3.8	18.3	6.9	648	7.2E-04	7.2E-04
07-Nov-95	09:52:54							

Average Ksat: 7.1E-04 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-3 10.5-11.0
Ring number: SB-3 10.5-11.0
Depth: 10.5-11.0 ft.
Type of water used: TAP
Collection vessel tare: 10.63 g
Sample length: 7.47 cm
Sample diameter: 6.18 cm
Sample cross-sectional area: 30.00 cm3

Date	Time	Temp (C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
03-Nov-95	10:55:52	21.0	1.5	19.1	8.5	599	2.4E-03	2.3E-03
03-Nov-95	11:05:51							
06-Nov-95	12:31:57	21.0	1.6	16.6	6.0	345	2.7E-03	2.6E-03
06-Nov-95	12:37:42							
06-Nov-95	17:15:15	21.0	1.7	17.5	6.9	388	2.6E-03	2.5E-03
06-Nov-95	17:21:43							

Average Ksat: 2.5E-03 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-3 29.9-30.4
Ring number: SB-3 29.9-30.4
Depth: 29.9-30.4 ft.
Type of water used: TAP
Collection vessel tare: 11.47 g
Sample length: 6.66 cm
Sample diameter: 6.18 cm
Sample cross-sectional area: 30.00 cm3

Date	Time	Temp (C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
06-Nov-95	12:23:42	21.0	3.3	20.6	9.2	3405	1.8E-04	1.8E-04
06-Nov-95	13:20:27							
06-Nov-95	17:10:04	21.0	3.4	17.8	6.3	2330	1.8E-04	1.7E-04
06-Nov-95	17:48:54							
07-Nov-95	09:36:21	20.0	3.4	18.3	6.8	2523	1.8E-04	1.8E-04
07-Nov-95	10:18:24							

Average Ksat: 1.7E-04 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-4 25.5-26.0
Ring number: SB-4 25.5-26.0
Depth: 25.5-26.0 ft.
Type of water used: TAP
Collection vessel tare: 10.82 g
Sample length: 6.90 cm
Sample diameter: 6.18 cm
Sample cross-sectional area: 30.00 cm3

Date	*Time*	*Temp (C)*	*Head (cm)*	*Q + Tare (g)*	*Q (cm^3)*	*Elapsed time (sec)*	*K_{sat} (cm/sec)*	*K_{sat} @ 20 C (cm/sec)*
06-Nov-95	12:31:34	21.0	2.6	22.6	11.8	259	4.0E-03	3.9E-03
06-Nov-95	12:35:53							
06-Nov-95	17:14:50	21.0	2.6	21.0	10.2	225	4.0E-03	3.9E-03
06-Nov-95	17:18:35							
07-Nov-95	09:42:31	20.0	2.7	27.3	16.5	357	3.9E-03	3.9E-03
07-Nov-95	09:48:28							

Average Ksat: 3.9E-03 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
CONSTANT HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB-4 114.8-115.3
Ring number: SB-4 114.8-115.3
Depth: 114.8-115.3 ft.
Type of water used: TAP
Collection vessel tare: 0.00 g
Sample length: 3.01 cm
Sample diameter: 6.21 cm
Sample cross-sectional area: 30.29 cm3

Date	*Time*	*Temp (C)*	*Head (cm)*	*Q + Tare (g)*	*Q (cm^3)*	*Elapsed time (sec)*	*K_{sat} (cm/sec)*	*K_{sat} @ 20 C (cm/sec)*
07-Nov-95	14:33:47	19.0	1099.5	10.6	10.6	74359	1.3E-08	1.3E-08
08-Nov-95	11:13:06							
08-Nov-95	11:13:06	19.5	1089.8	3.1	3.1	22357	1.3E-08	1.3E-08
08-Nov-95	17:25:43							
08-Nov-95	17:25:43	19.0	1081.0	9.2	9.2	68919	1.2E-08	1.3E-08
09-Nov-95	12:34:22							

Average Ksat: 1.3E-08 cm/sec

Comments: Modified constant head method to improve flux and saturation times

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

SATURATED HYDRAULIC CONDUCTIVITY
FALLING HEAD METHOD

Job name: CAMINO R
Job number: 5800.20
Sample number: SB4 139.5-140.0
Ring number: SB4 139.5-140.0

Permeameter type
Standard = 1, Double =2: 1
Depth: 139.5-140.0 ft.
Type of water used: TAP

Sample length: 2.59 cm
Sample cross-sectional area: 18.17 cm2
Reservoir cross-sectional area: 0.70 cm2
Offset: 0 cm

Date	Time	Temp. (C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	K_{sat} (cm/sec)	K_{sat} @ 20 C (cm/sec)
Test # 1:							
08-Nov-95	11:00:50	19.0	127.2	127.2			
08-Nov-95	17:22:55	20.0	125.8	125.8	22925	4.8E-08	4.9E-08
Test# 2:							
08-Nov-95	17:22:55	20.0	125.8	125.8			
13-Nov-95	12:20:17	19.0	103.0	103.0	413842	4.8E-08	4.9E-08
Test # 3:							
13-Nov-95	16:05:35	19.0	102.1	102.1			
14-Nov-95	09:15:14	21.5	99.0	99.0	61779	5.0E-08	4.9E-08

Average Ksat: 4.9E-08 cm/sec

Comments:

Laboratory analysis by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

APPENDIX C

PARTICLE SIZE CHARACTERISTICS

SUMMARY OF PARTICLE SIZE CHARACTERISTICS

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Classification
SB-1 (5.5-6.0')	0.0015	0.074	0.087	59	15	Sandy lean clay
SB-1 (20.5-21.0')	0.28	0.63	0.73	0.63	2.6	Poorly graded sand
SB-1 (85.5-86.0')	0.091	0.19	0.21	2.3	1.0	Poorly graded sand
SB-2 (74.8-75.3')	*	0.0052	0.0085	--	--	Atterberg required
SB-2 (119.8-120.3')	0.047	0.16	0.18	3.9	1.5	Atterberg required
SB-3 (10.5-11.0')	0.090	0.21	0.23	2.6	1.1	Atterberg required
SB-3 (29.9-30.4')	*	0.15	0.18	--	--	Silty sand
SB-4 (25.5-26.0')	0.0085	0.21	0.25	29	10	Silty sand
SB-4 (114.8-115.3')	*	*	*	--	--	Atterberg required
SB-4 (139.5-140.0')	*	*	0.0023	--	--	Atterberg required

* d_{10} not reached with test specified

-- value dependent upon d_{10}

d_{50} = median particle diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

PARTICLE SIZE ANALYSIS
WET SIEVE DATA

Job Name: CAMINO R
Job Number: 5800.20
Test Date: 11/09/95
Sample Number: SB-1 5.5-6.0
Depth: 5.5-6.0 ft.

Initial Dry Weight of Sample: 335.33 (g)
Weight Passing #10: 323.44 (g)
Weight Retained #10: 11.89 (g)
Weight of Hydrometer Sample: 44.70 (g)
Calculated Weight of Sieve Sample: 46.34 (g)

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	335.33	100.00
	1.5"	38.1	0.00	0.00	335.33	100.00
	3/4"	19.0	0.00	0.00	335.33	100.00
	3/8"	9.5	0.00	0.00	335.33	100.00
	4	4.75	2.19	2.19	333.14	99.35
	10	2.00	9.70	11.89	323.44	96.45
-10			(Based on calculated sieve wt.)			
	20	0.85	1.29	2.93	43.41	93.67
	40	0.425	1.21	4.14	42.20	91.06
	60	0.250	0.79	4.93	41.41	89.36
	140	0.106	7.13	12.06	34.28	73.97
	200	0.075	10.69	22.75	23.59	50.90
	dry pan		1.31	24.06	22.28	
	wet pan			22.28	0.00	

d_{10}: 0.0015 (mm)
d_{16}: 0.0055 (mm)
d_{30}: 0.044 (mm)
d_{50}: 0.074 (mm)
d_{60}: 0.087 (mm)
d_{84}: 0.20 (mm)

Median Particle Diameter (d_{50}): 0.074
Uniformity Coefficient, Cu (d_{60}/d_{10}): 59
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: 15
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: 0.093

Soil Classification: Sandy lean clay

Laboratory analysis performed by: M. Trenchik
Calculations made by: R. Maranville
Checked by: J. Vinson

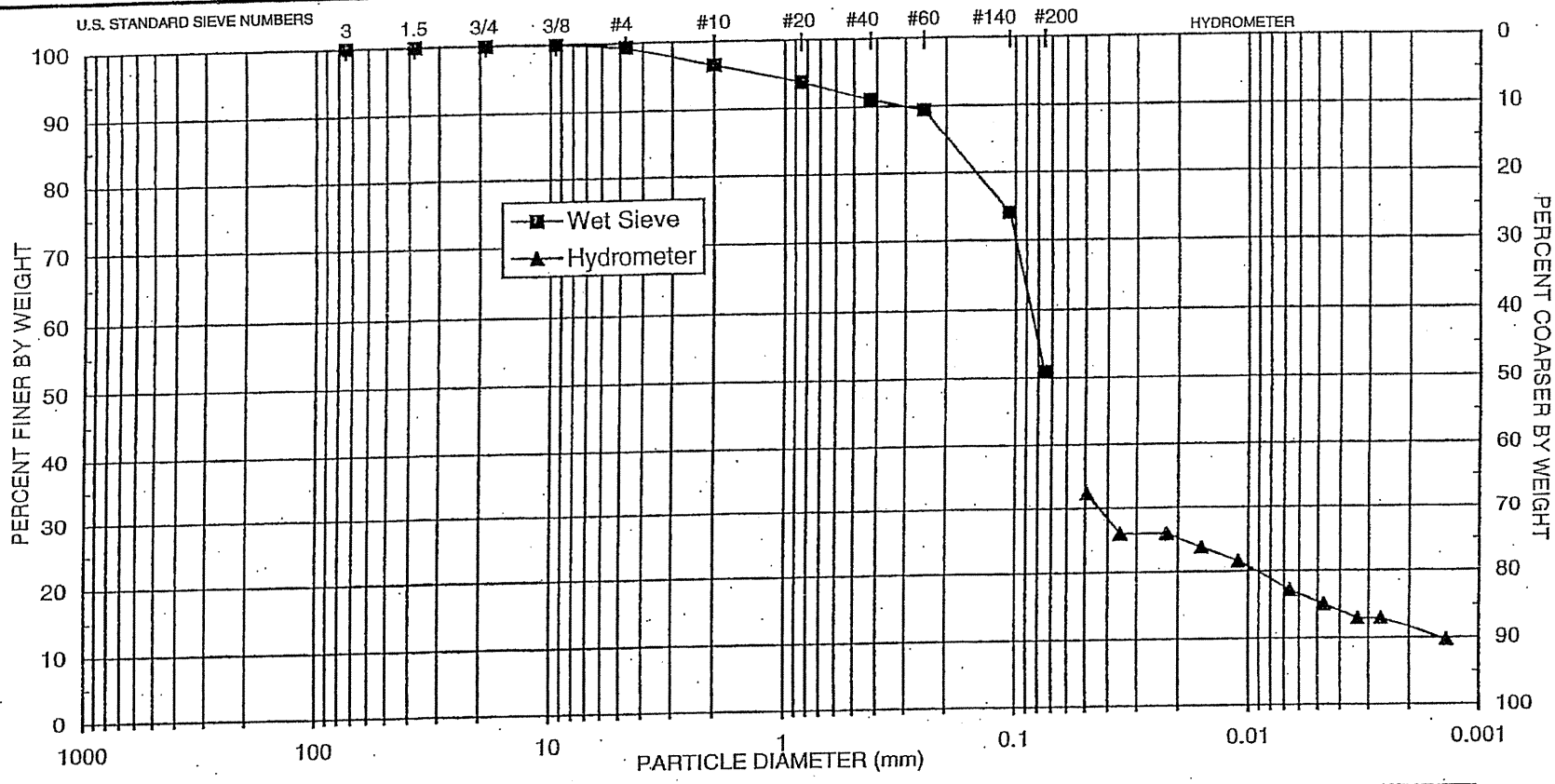
PARTICLE SIZE ANALYSIS
HYDROMETER DATA

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 5.5-6.0
Type of Water Used: DISTILLED
Reaction with H_2O_2: SLIGHT
Dispersant: $(NaPO_3)_6$
Particle Density: 2.65

Test Date: 11/14/95
Depth: 5.5-6.0 ft.
Initial Wt.: 44.70 (g)
Total Sample Wt.: 335.33 (g)
Wt. Passing #10: 323.44 (g)
Start Time: 1024

Date	Time (min)	Temp (°C)	R (g/L)	RI (g/L)	Rcorr (g/L)	L (cm)	D (mm)	P (%)	% Finer
11/15	1	21.0	18.0	3.0	15.0	13.3	0.04917	33.6	32.37
	2	21.0	15.0	3.0	12.0	13.8	0.03540	26.8	25.89
	5	21.0	15.0	3.0	12.0	13.8	0.02239	26.8	25.89
	10	21.0	14.0	3.0	11.0	14.0	0.01593	24.6	23.74
	21	21.0	13.0	3.0	10.0	14.2	0.01105	22.4	21.58
	60	21.0	11.0	3.0	8.0	14.5	0.00661	17.9	17.26
	120	21.0	10.0	3.0	7.0	14.7	0.00470	15.7	15.10
	240	21.0	9.0	3.0	6.0	14.8	0.00334	13.4	12.95
	379	21.5	9.0	3.0	6.0	14.8	0.00265	13.4	12.95
11/16	1403	22.0	7.5	3.0	4.5	15.1	0.00138	10.1	9.71

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY			
		Coarse	Fine	Coarse	Medium	Fine				
USDA	COBBLES	GRAVEL		SAND				SILT	CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine		

d_{10} = 0.0015	d_{30} = 0.044	d_{50} = 0.074	d_{60} = 0.087	C_u = 59	C_c = 15

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-1 5.5-6.0	5.5-6.0 ft.	Sandy lean clay

PARTICLE SIZE ANALYSIS
DRY SIEVE DATA

Job Name: CAMINO-R
Job Number: 5800.20
Test Date: 11/13/95
Sample Number: SB-1 20.5-21.0
Depth: 20.5-21.0 ft.

Total Sample Weight: 444.98 (g)

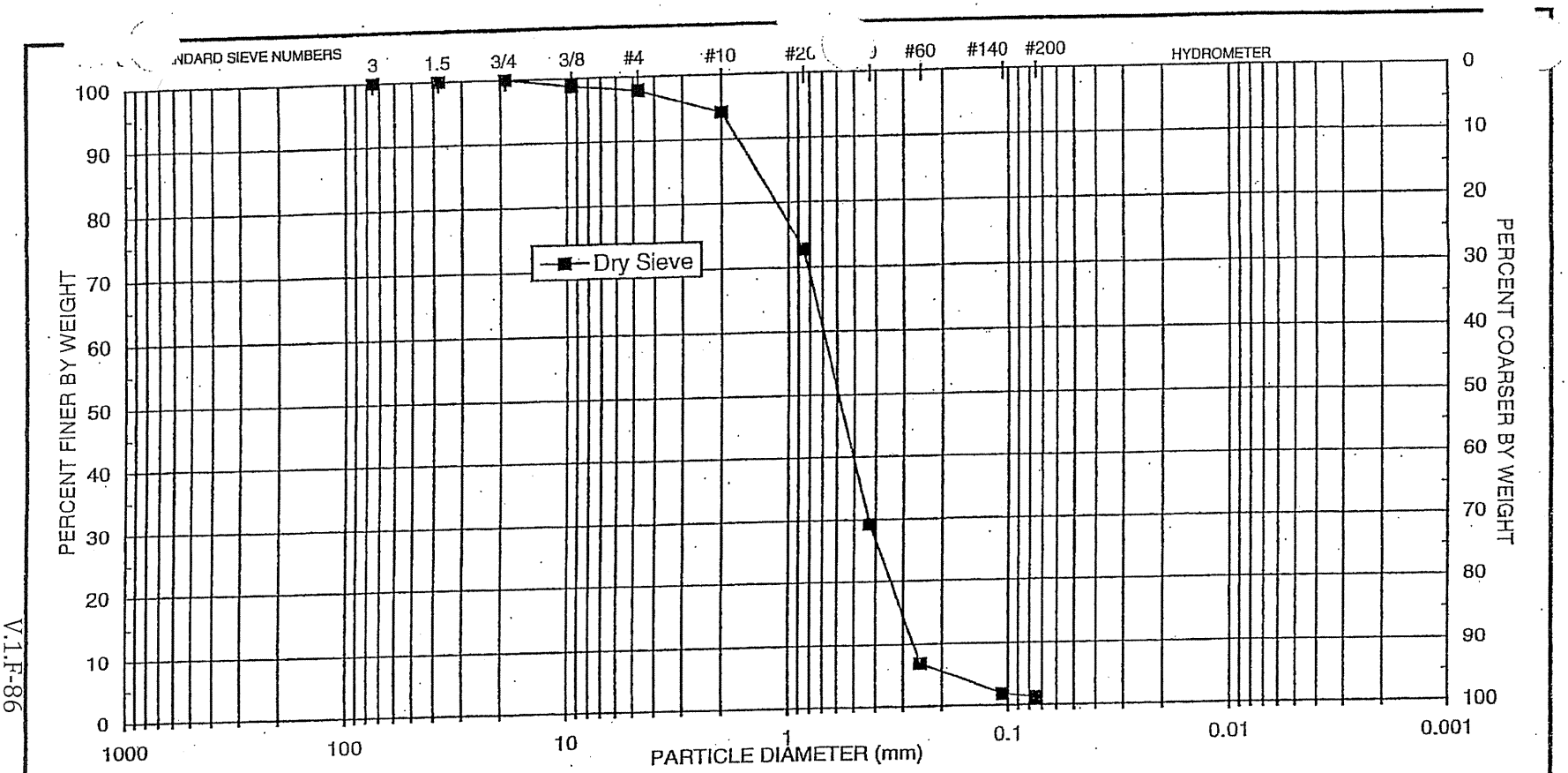
Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
3"	75	0.00	0.00	444.98	100.00
1.5"	38.1	0.00	0.00	444.98	100.00
3/4"	19.0	0.00	0.00	444.98	100.00
3/8"	9.5	5.54	5.54	439.44	98.76
4	4.75	3.94	9.48	435.50	97.87
10	2.00	16.20	25.68	419.30	94.23
20	0.85	95.80	121.48	323.50	72.70
40	0.425	193.59	315.07	129.91	29.19
60	0.250	99.39	414.46	30.52	6.86
140	0.106	22.87	437.33	7.65	1.72
200	0.075	2.47	439.80	5.18	1.16
pan		3.27	443.07	1.91	

d_{10}:	0.28 (mm)	d_{50}:	0.63 (mm)
d_{16}:	0.32 (mm)	d_{60}:	0.73 (mm)
d_{30}:	0.43 (mm)	d_{84}:	1.5 (mm)

Median Particle Diameter (d_{50}): 0.63
Uniformity Coefficient, Cu (d_{60}/d_{10}): 2.6
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: 0.94
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: 0.80

Soil Classification: Poorly-graded sand

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL: Coarse, Fine	SAND: Coarse, Medium, Fine	SILT OR CLAY		
USDA	COBBLES	GRAVEL	SAND: Very coarse, Coarse, Medium, Fine, Very fine	SILT	CLAY	

d_{10} = 0.28	d_{30} = 0.43	d_{50} = 0.63	d_{60} = 0.73	C_u = 2.6	C_c = 0.94

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-1 20.5-21.0	20.5-21.0 ft.	Poorly-graded sand

V.1.F-86

PARTICLE SIZE ANALYSIS
DRY SIEVE DATA

Job Name: CAMINO-R
Job Number: 5800.20
Test Date: 11/13/95
Sample Number: SB-1 85.5-86.0
Depth: 85.5-86.0 ft.

Total Sample Weight: 323.43 (g)

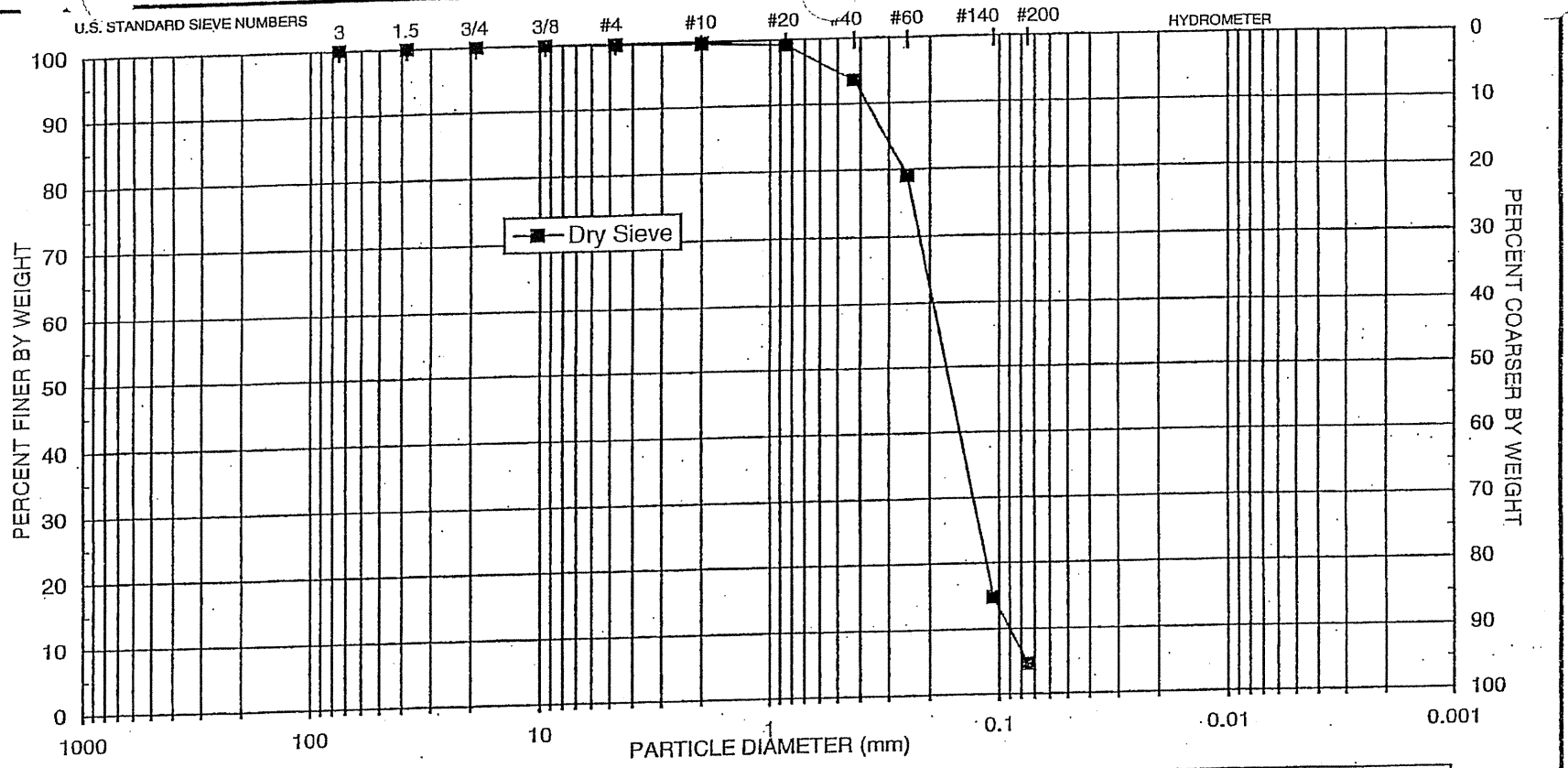
Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
3"	75	0.00	0.00	323.43	100.00
1.5"	38.1	0.00	0.00	323.43	100.00
3/4"	19.0	0.00	0.00	323.43	100.00
3/8"	9.5	0.00	0.00	323.43	100.00
4	4.75	0.56	0.56	322.87	99.83
10	2.00	0.41	0.97	322.46	99.70
20	0.85	1.64	2.61	320.82	99.19
40	0.425	17.97	20.58	302.85	93.64
60	0.250	47.35	67.93	255.50	79.00
140	0.106	207.47	275.40	48.03	14.85
200	0.075	33.16	308.56	14.87	4.60
pan		11.59	320.15	3.28	

d_{10}:	0.091 (mm)	d_{50}:	0.19 (mm)
d_{16}:	0.11 (mm)	d_{60}:	0.21 (mm)
d_{30}:	0.14 (mm)	d_{84}:	0.31 (mm)

Median Particle Diameter (d_{50}): 0.19
Uniformity Coefficient, Cu (d_{60}/d_{10}): 2.3
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: 1.0
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: 0.20

Soil Classification: Poorly-graded sand

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



d_{10} = 0.091	d_{30} = 0.14	d_{50} = 0.19	d_{60} = 0.21	C_u = 2.3	C_c = 1.0

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-1 85.5-86.0	85.5-86.0 ft.	Poorly-graded sand

V1.F-88

PARTICLE SIZE ANALYSIS
WET SIEVE DATA

Job Name: CAMINO R
Job Number: 5800.20
Test Date: 11/13/95
Sample Number: SB-2 74.8-75.3
Depth: 74.8-75.3 ft.

Initial Dry Weight of Sample: 327.51 (g)
Weight Passing #10: 324.26 (g)
Weight Retained #10: 3.25 (g)
Weight of Hydrometer Sample: 42.74 (g)
Calculated Weight of Sieve Sample: 43.17 (g)

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	327.51	100.00
	1.5"	38.1	0.00	0.00	327.51	100.00
	3/4"	19.0	0.00	0.00	327.51	100.00
	3/8"	9.5	0.00	0.00	327.51	100.00
	4	4.75	2.76	2.76	324.75	99.16
	10	2.00	0.49	3.25	324.26	99.01
-10			(Based on calculated sieve wt.)			
	20	0.85	0.08	0.51	42.66	98.82
	40	0.425	0.05	0.56	42.61	98.71
	60	0.250	0.04	0.60	42.57	98.61
	140	0.106	0.32	0.92	42.25	97.87
	200	0.075	0.44	1.36	41.81	96.85
	dry pan		0.05	1.41	41.76	
	wet pan			41.76	0.00	

d_{10}:	-- (mm)	d_{50}:	0.0052 (mm)
d_{16}:	-- (mm)	d_{60}:	0.0085 (mm)
d_{30}:	-- (mm)	d_{84}:	0.024 (mm)

Median Particle Diameter (d_{50}): 0.0052
Uniformity Coefficient, Cu (d_{60}/d_{10}): --
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: --
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: --

Soil Classification: Atterberg required for complete classification

Laboratory analysis performed by: G. Stansifer/H.T. Tran
Calculations made by: R. Maranville
Checked by: J. Vinson

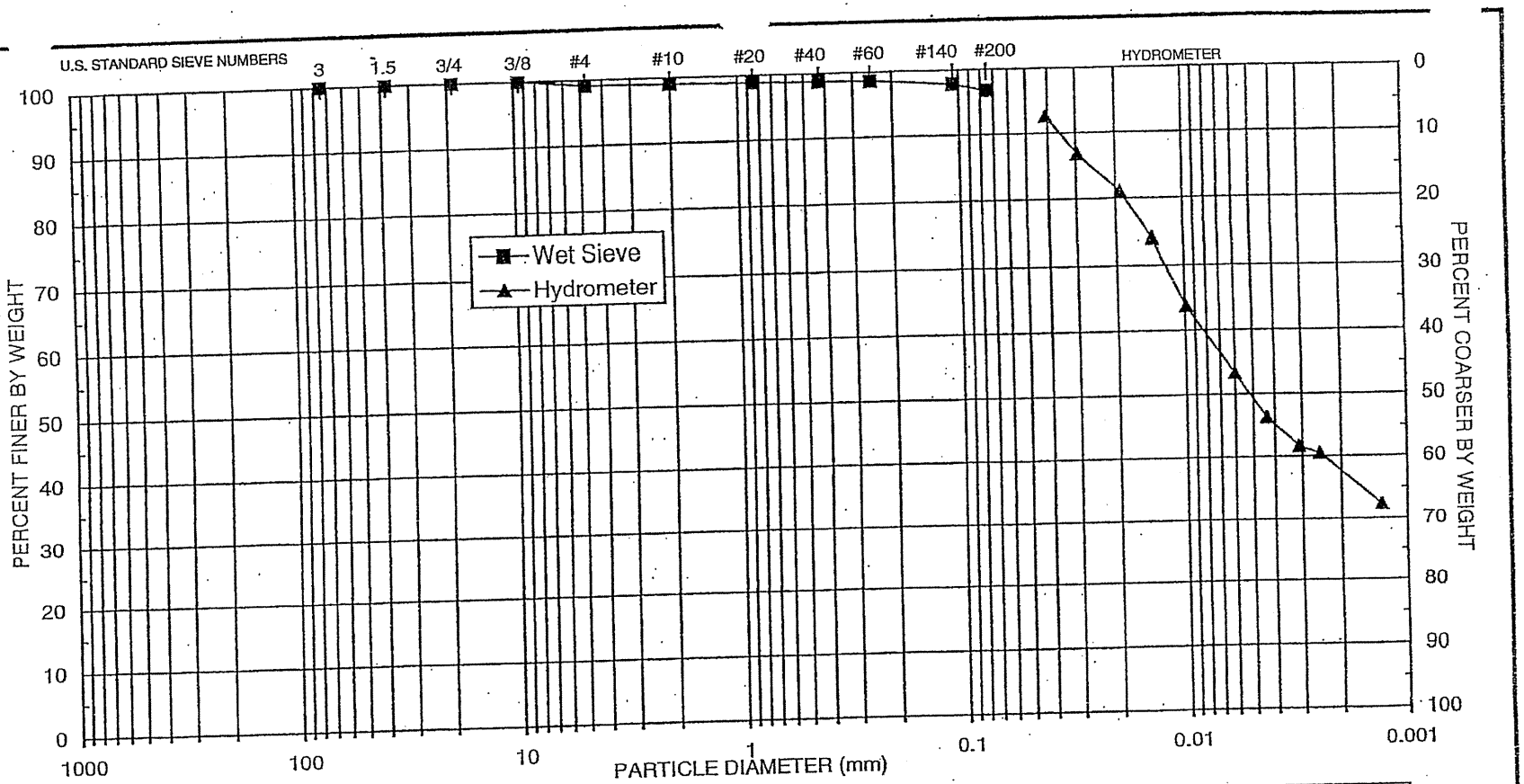
PARTICLE SIZE ANALYSIS
HYDROMETER DATA

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-2 74.8-75.3
Type of Water Used: DISTILLED
Reaction with H_2O_2: SLIGHT
Dispersant: $(NaPO_3)_6$
Particle Density: 2.65

Test Date: 11/14/95
Depth: 74.8-75.3 ft.
Initial Wt.: 42.74 (g)
Total Sample Wt.: 327.51 (g)
Wt. Passing #10: 324.26 (g)
Start Time: 1036

Date	Time (min)	Temp (°C)	R (g/L)	RI (g/L)	Rcorr (g/L)	L (cm)	D (mm)	P (%)	% Finer
11/15	1	21.0	43.0	3.0	40.0	9.3	0.04093	93.6	92.66
	2	21.0	40.5	3.0	37.5	9.7	0.02958	87.7	86.87
	5	21.0	38.0	3.0	35.0	10.1	0.01910	81.9	81.08
	10	21.0	35.0	3.0	32.0	10.6	0.01383	74.9	74.13
	21	21.0	30.5	3.0	27.5	11.3	0.00987	64.3	63.70
	60	21.0	26.0	3.0	23.0	12.0	0.00603	53.8	53.28
	120	21.0	23.0	3.0	20.0	12.5	0.00435	46.8	46.33
	240	21.0	21.0	3.0	18.0	12.9	0.00311	42.1	41.70
	369	21.5	20.5	3.0	17.5	12.9	0.00250	40.9	40.54
11/16	1393	22.0	17.0	3.0	14.0	13.5	0.00131	32.8	32.43

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL: Coarse	GRAVEL: Fine	SAND: Coarse	SAND: Medium	SAND: Fine	SILT OR CLAY
USDA	COBBLES	GRAVEL	SAND: Very coarse	SAND: Coarse	SAND: Medium	SAND: Fine	SAND: Very fine	SILT	CLAY

d_{10} = --	d_{30} = --	d_{50} = 0.0052	d_{60} = 0.0085	C_u = --	C_c = --
SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION			
SB-2 74.8-75.3	74.8-75.3 ft.	Atterberg required for complete classification			

PARTICLE SIZE ANALYSIS
DRY SIEVE DATA

Job Name: CAMINO-R
Job Number: 5800.20
Test Date: 11/09/95
Sample Number: SB-2 119.8-120.3
Depth: 119.8-120.3 ft.

Total Sample Weight: 335.43 (g)

Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
3"	75	0.00	0.00	335.43	100.00
1.5"	38.1	0.00	0.00	335.43	100.00
3/4"	19.0	17.06	17.06	318.37	94.91
3/8"	9.5	0.00	17.06	318.37	94.91
4	4.75	2.20	19.26	316.17	94.26
10	2.00	0.67	19.93	315.50	94.06
20	0.85	1.12	21.05	314.38	93.72
40	0.425	3.12	24.17	311.26	92.79
60	0.250	11.22	35.39	300.04	89.45
140	0.106	210.31	245.70	89.73	26.75
200	0.075	38.42	284.12	51.31	15.30
pan		50.98	335.10	0.33	

d_{10}:	0.047 (mm)	d_{50}:	0.16 (mm)
d_{16}:	0.077 (mm)	d_{60}:	0.18 (mm)
d_{30}:	0.11 (mm)	d_{84}:	0.24 (mm)

Median Particle Diameter (d_{50}): 0.16
Uniformity Coefficient, Cu (d_{60}/d_{10}): 3.9
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: 1.5
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: 0.16

Soil Classification: Atterberg required for complete classification

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson

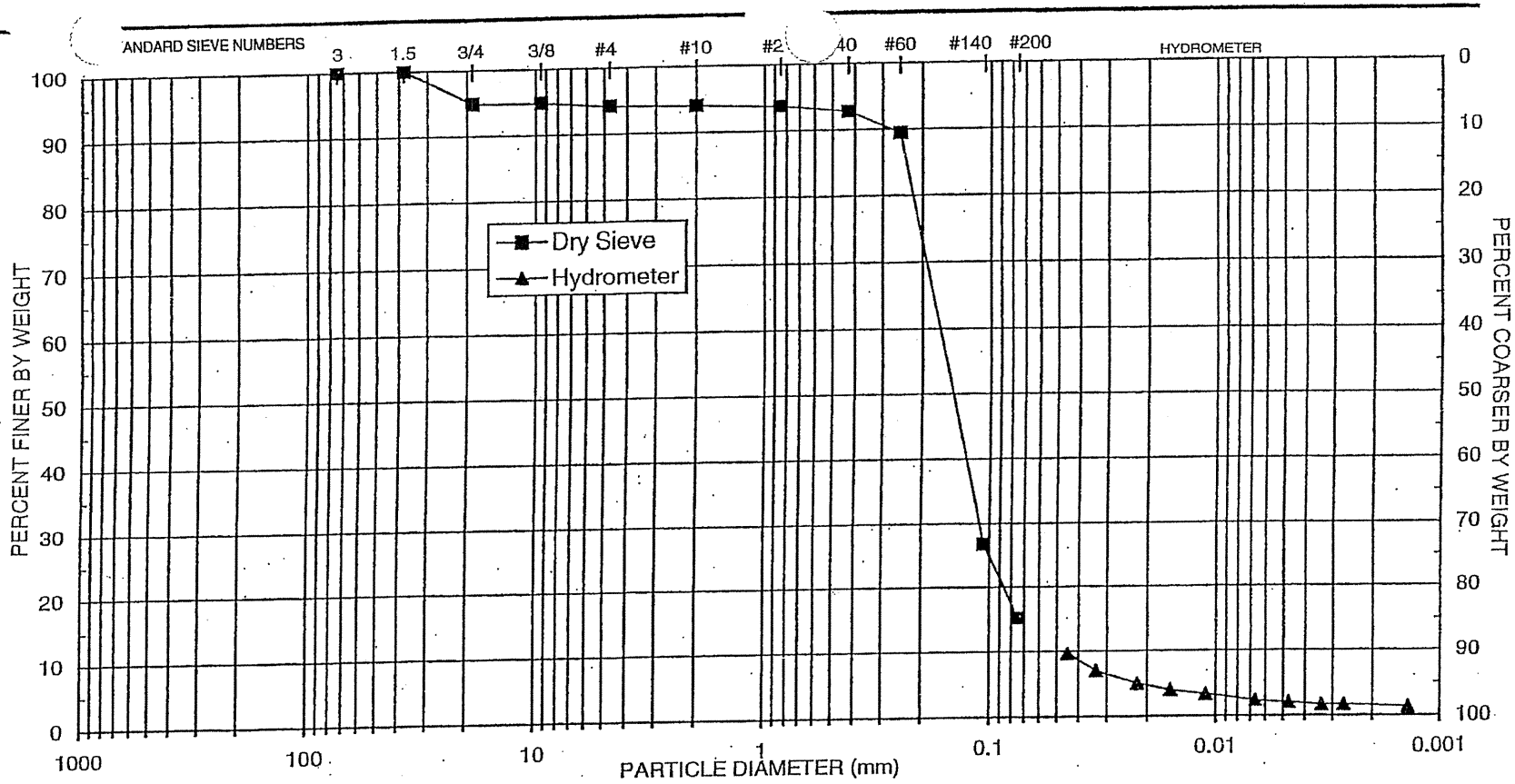
PARTICLE SIZE ANALYSIS
HYDROMETER DATA

Job Name: CAMINO-R
Job Number: 5800.20
Sample Number: SB-2 119.8-120.3
Type of Water Used: DISTILLED
Reaction with H_2O_2: NONE
Dispersant: $(NaPO_3)_6$
Particle Density: 2.65

Test Date: 11/14/95
Depth: 119.8-120.3 ft.
Initial Wt.: 45.95 (g)
Total Sample Wt.: 335.43 (g)
Wt. Passing #200: 51.31 (g)
Start Time: 1030

Date	Time (min)	Temp (°C)	R (g/L)	RI (g/L)	Rcorr (g/L)	L (cm)	D (mm)	P (%)	% Finer
11/15	1	21.0	32.0	3.0	29.0	11.1	0.04474	63.1	9.65
	2	21.0	24.0	3.0	21.0	12.4	0.03346	45.7	6.99
	5	21.0	18.0	3.0	15.0	13.3	0.02199	32.6	4.99
	10	21.0	15.0	3.0	12.0	13.8	0.01583	26.1	3.99
	21	21.0	13.0	3.0	10.0	14.2	0.01105	21.8	3.33
	60	21.0	10.0	3.0	7.0	14.7	0.00665	15.2	2.33
	120	21.0	9.0	3.0	6.0	14.8	0.00473	13.1	2.00
	240	21.0	8.0	3.0	5.0	15.0	0.00336	10.9	1.66
	374	21.5	8.0	3.0	5.0	15.0	0.00268	10.9	1.66
11/16	1398	22.0	7.0	3.0	4.0	15.2	0.00138	8.7	1.33

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND					SILT	CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = 0.047	d_{30} = 0.11	d_{50} = 0.16	d_{60} = 0.18	C_u = 3.9	C_c = 1.5

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-2 119.8-120.3	119.8-120.3 ft.	Atterberg required for complete classification

PARTICLE SIZE ANALYSIS
DRY SIEVE DATA

Job Name: CAMINO-R
Job Number: 5800.20
Test Date: 11/13/95
Sample Number: SB-3 10.5-11.0
Depth: 10.5-11.0 ft.

Total Sample Weight: 362.14 (g)

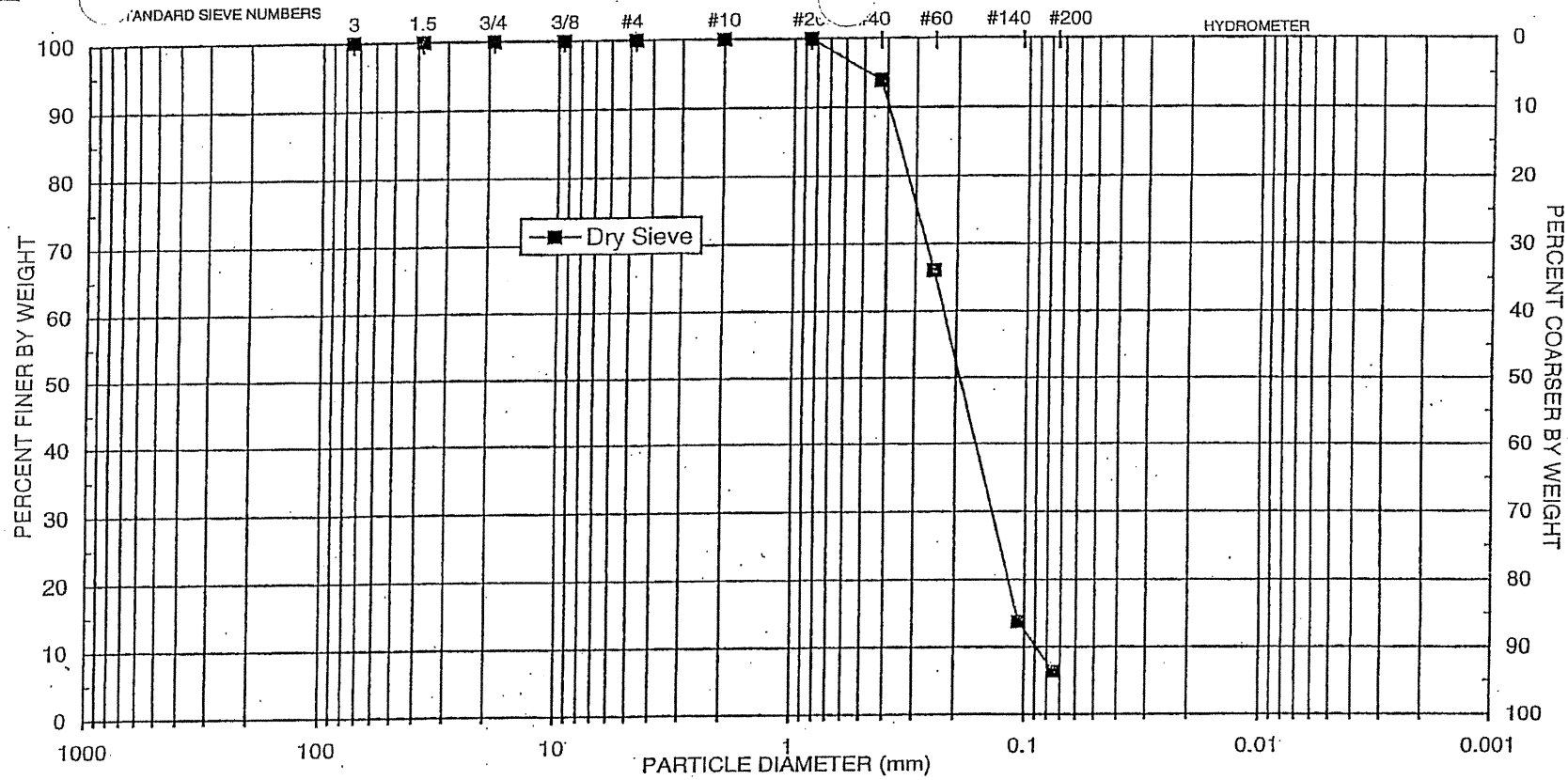
Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
3"	75	0.00	0.00	362.14	100.00
1.5"	38.1	0.00	0.00	362.14	100.00
3/4"	19.0	0.00	0.00	362.14	100.00
3/8"	9.5	0.00	0.00	362.14	100.00
4	4.75	0.00	0.00	362.14	100.00
10	2.00	0.00	0.00	362.14	100.00
20	0.85	0.28	0.28	361.86	99.92
40	0.425	21.42	21.70	340.44	94.01
60	0.250	101.02	122.72	239.42	66.11
140	0.106	190.04	312.76	49.38	13.64
200	0.075	26.41	339.17	22.97	6.34
pan		20.29	359.46	2.68	

d_{10}:	0.090 (mm)	d_{50}:	0.21 (mm)
d_{16}:	0.11 (mm)	d_{60}:	0.23 (mm)
d_{30}:	0.15 (mm)	d_{84}:	0.36 (mm)

Median Particle Diameter (d_{50}): 0.21
Uniformity Coefficient, Cu (d_{60}/d_{10}): 2.6
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: 1.1
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: 0.23

Soil Classification: Atterberg required for complete classification

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL: Coarse	GRAVEL: Fine	SAND: Coarse	SAND: Medium	SAND: Fine	SILT OR CLAY

USDA	COBBLES	GRAVEL	SAND: Very coarse	SAND: Coarse	SAND: Medium	SAND: Fine	SAND: Very fine	SILT	CLAY

d_{10} = 0.090	d_{30} = 0.15	d_{50} = 0.21	d_{60} = 0.23	C_u = 2.6	C_c = 1.1

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-3 10.5-11.0	10.5-11.0 ft.	Atterberg required for complete classification

PARTICLE SIZE ANALYSIS
WET SIEVE DATA

Job Name: CAMINO R
Job Number: 5800.20
Test Date: 11/09/95
Sample Number: SB-3 29.9-30.4
Depth: 29.9-30.4 ft.

Initial Dry Weight of Sample: 291.09 (g)
Weight Passing #10: 288.47 (g)
Weight Retained #10: 2.62 (g)
Weight of Hydrometer Sample: 46.60 (g)
Calculated Weight of Sieve Sample: 47.02 (g)

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	291.09	100.00
	1.5"	38.1	0.00	0.00	291.09	100.00
	3/4"	19.0	0.00	0.00	291.09	100.00
	3/8"	9.5	2.30	2.30	288.79	99.21
	4	4.75	0.19	2.49	288.60	99.14
	10	2.00	0.13	2.62	288.47	99.10
-10			(Based on calculated sieve wt.)			
	20	0.85	0.03	0.45	46.57	99.04
	40	0.425	0.32	0.77	46.25	98.36
	60	0.250	6.56	7.33	39.69	84.41
	140	0.106	22.60	29.93	17.09	36.34
	200	0.075	3.23	33.16	13.86	29.47
	dry pan		0.08	33.24	13.78	
	wet pan			13.78	0.00	

d_{10}: -- (mm)
d_{16}: 0.0017 (mm)
d_{30}: 0.077 (mm)
d_{50}: 0.15 (mm)
d_{60}: 0.18 (mm)
d_{84}: 0.25 (mm)

Median Particle Diameter (d_{50}): 0.15
Uniformity Coefficient, Cu (d_{60}/d_{10}): --
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: --
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: 0.13

Soil Classification: Silty sand

Laboratory analysis performed by: M. Trenchik/G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

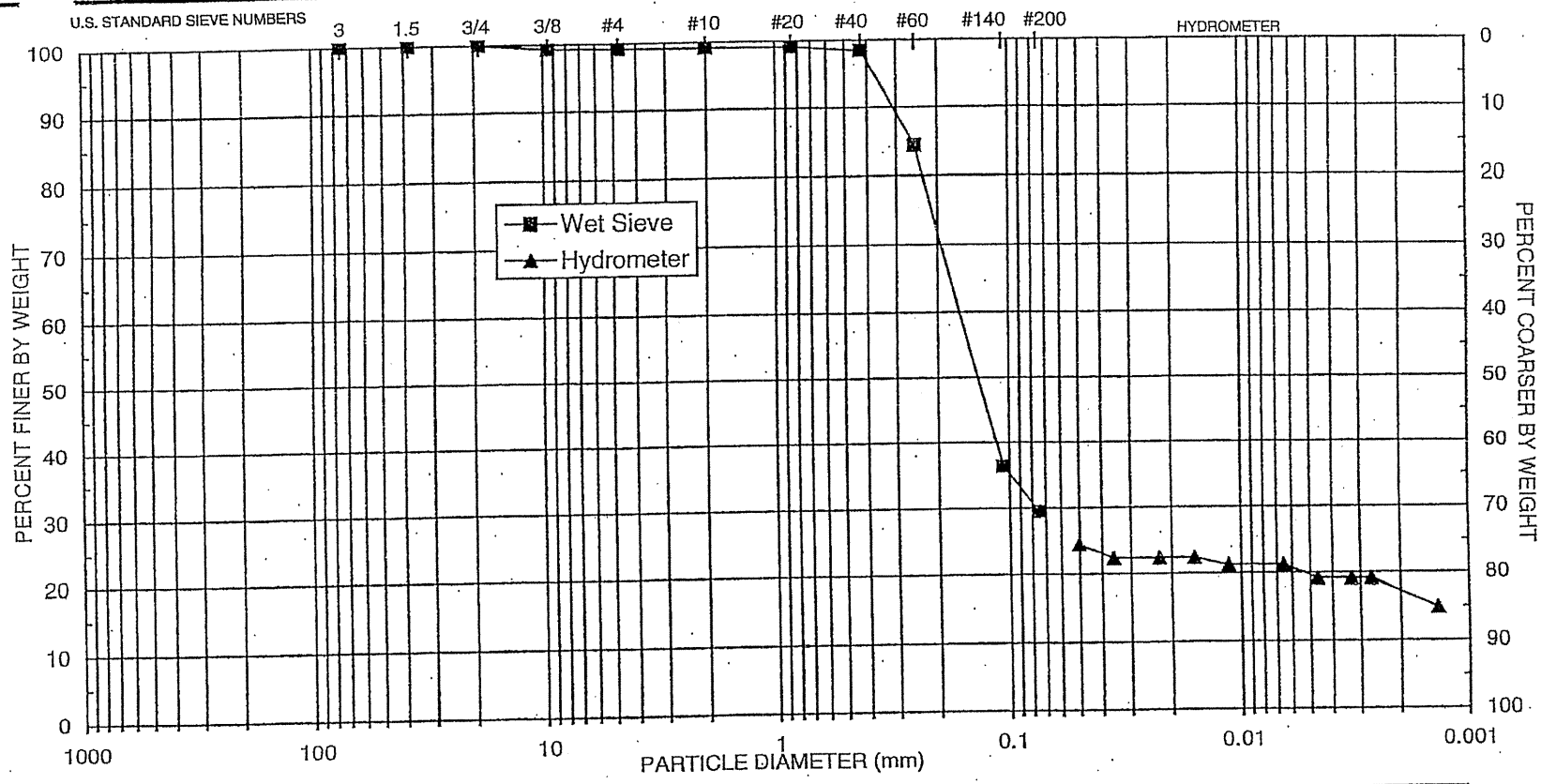
PARTICLE SIZE ANALYSIS
HYDROMETER DATA

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-3 29.9-30.4
Type of Water Used: DISTILLED
Reaction with H_2O_2: SLIGHT
Dispersant: $(NaPO_3)_6$
Particle Density: 2.65

Test Date: 11/14/95
Depth: 29.9-30.4 ft.
Initial Wt.: 46.60 (g)
Total Sample Wt.: 291.09 (g)
Wt. Passing #10: 288.47 (g)
Start Time: 1054

Date	Time (min)	Temp (°C)	R (g/L)	RI (g/L)	Rcorr (g/L)	L (cm)	D (mm)	P (%)	% Finer
11/15	1	21.0	14.5	3.0	11.5	13.9	0.05021	24.7	24.46
	2	21.0	13.5	3.0	10.5	14.1	0.03571	22.5	22.33
	5	21.0	13.5	3.0	10.5	14.1	0.02259	22.5	22.33
	10	21.0	13.5	3.0	10.5	14.1	0.01597	22.5	22.33
	20	21.0	13.0	3.0	10.0	14.2	0.01133	21.5	21.27
	60	21.0	13.0	3.0	10.0	14.2	0.00654	21.5	21.27
	120	21.0	12.0	3.0	9.0	14.3	0.00465	19.3	19.14
	240	21.0	12.0	3.0	9.0	14.3	0.00329	19.3	19.14
	355	21.5	12.0	3.0	9.0	14.3	0.00269	19.3	19.14
11/16	1378	22.0	10.0	3.0	7.0	14.7	0.00137	15.0	14.89

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL: Coarse, Fine		SAND: Coarse, Medium, Fine		SILT OR CLAY
USDA	COBBLES	GRAVEL	SAND: Very coarse, Coarse, Medium, Fine, Very fine			SILT / CLAY

d_{10} = --	d_{30} = 0.077	d_{50} = 0.15	d_{60} = 0.18	C_u = --	C_c = --

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-3 29.9-30.4	29.9-30.4 ft.	Silty sand

PARTICLE SIZE ANALYSIS
WET SIEVE DATA

Job Name: CAMINO R
Job Number: 5800.20
Test Date: 11/09/95
Sample Number: SB-4 25.5-26.0
Depth: 25.5-26.0 ft.

Initial Dry Weight of Sample: 294.89 (g)
Weight Passing #10: 293.55 (g)
Weight Retained #10: 1.34 (g)
Weight of Hydrometer Sample: 46.56 (g)
Calculated Weight of Sieve Sample: 46.77 (g)

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	294.89	100.00
	1.5"	38.1	0.00	0.00	294.89	100.00
	3/4"	19.0	0.00	0.00	294.89	100.00
	3/8"	9.5	0.00	0.00	294.89	100.00
	4	4.75	0.65	0.65	294.24	99.78
	10	2.00	0.69	1.34	293.55	99.55
-10			(Based on calculated sieve wt.)			
	20	0.85	0.10	0.31	46.46	99.33
	40	0.425	2.42	2.73	44.04	94.16
	60	0.250	15.57	18.30	28.47	60.87
	140	0.106	19.91	38.21	8.56	18.30
	200	0.075	2.26	40.47	6.30	13.47
	dry pan		0.07	40.54	6.23	
	wet pan			6.23	0.00	

d_{10}: 0.0085 (mm)
d_{16}: 0.091 (mm)
d_{30}: 0.15 (mm)
d_{50}: 0.21 (mm)
d_{60}: 0.25 (mm)
d_{84}: 0.37 (mm)

Median Particle Diameter (d_{50}): 0.21
Uniformity Coefficient, Cu (d_{60}/d_{10}): 29
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: 10
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: 0.23

Soil Classification: Silty sand

Laboratory analysis performed by: G. Stansifer/M. Trenchik
Calculations made by: R. Maranville
Checked by: J. Vinson

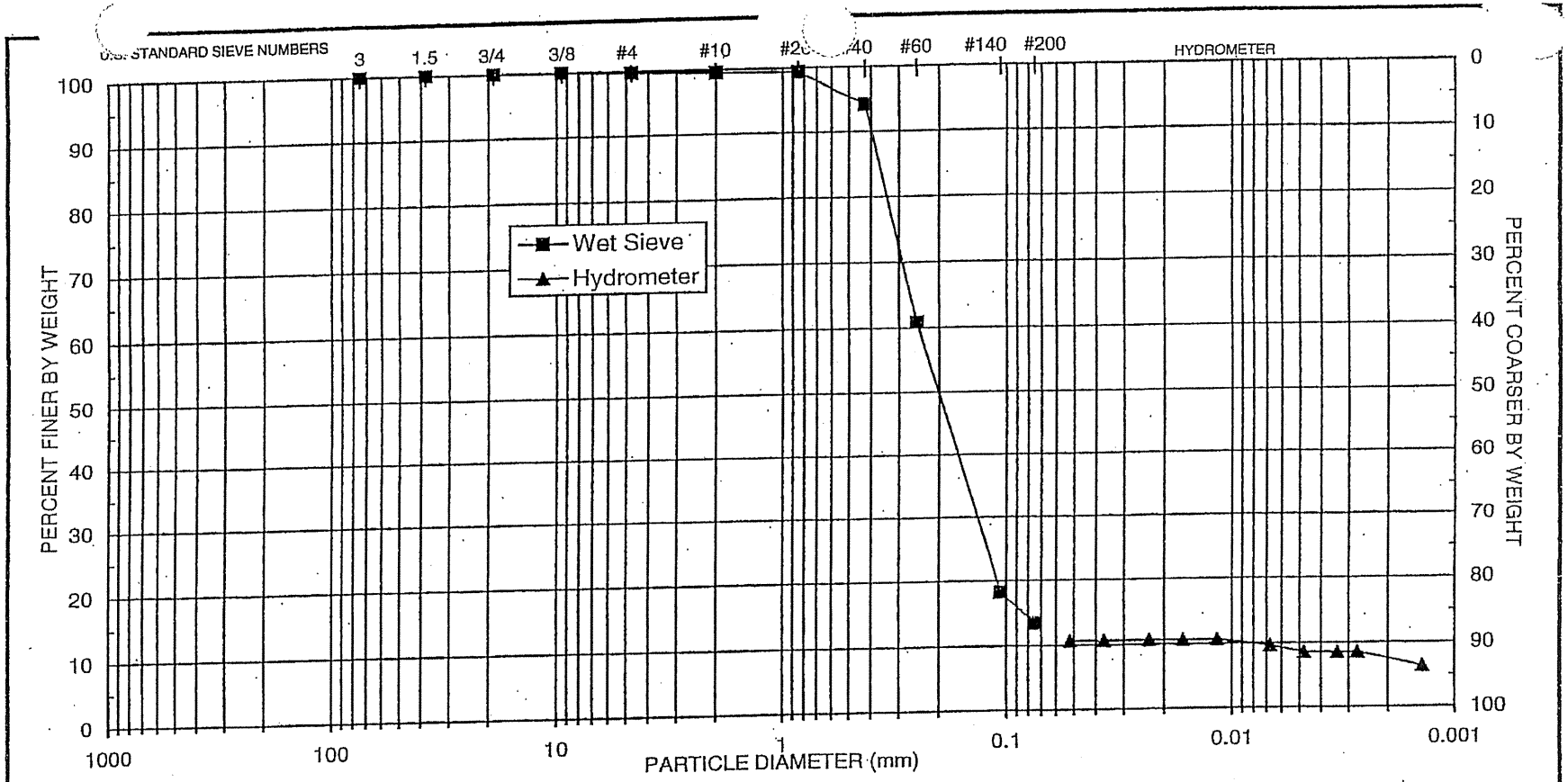
PARTICLE SIZE ANALYSIS
HYDROMETER DATA

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 25.5-26.0
Type of Water Used: DISTILLED
Reaction with H_2O_2: SLIGHT
Dispersant: $(NaPO_3)_6$
Particle Density: 2.65

Test Date: 11/14/95
Depth: 25.5-26.0 ft.
Initial Wt.: 46.56 (g)
Total Sample Wt.: 294.89 (g)
Wt. Passing #10: 293.55 (g)
Start Time: 1048

Date	Time (min)	Temp (°C)	R (g/L)	RI (g/L)	Rcorr (g/L)	L (cm)	D (mm)	P (%)	% Finer
11/15	1	21.0	8.0	3.0	5.0	15.0	0.0521C	10.7	10.69
	2	21.0	8.0	3.0	5.0	15.0	0.03684	10.7	10.69
	5	21.0	8.0	3.0	5.0	15.0	0.02330	10.7	10.69
	10	21.0	8.0	3.0	5.0	15.0	0.01648	10.7	10.69
	20	21.0	8.0	3.0	5.0	15.0	0.01165	10.7	10.69
	60	21.0	7.5	3.0	4.5	15.1	0.00674	9.7	9.62
	120	21.0	7.0	3.0	4.0	15.2	0.00478	8.6	8.55
	240	21.0	7.0	3.0	4.0	15.2	0.00338	8.6	8.55
	360	21.5	7.0	3.0	4.0	15.2	0.00274	8.6	8.55
11/16	1383	22.0	6.0	3.0	3.0	15.3	0.00140	6.4	6.41

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL		SAND		SILT OR CLAY
		Coarse	Fine	Coarse	Medium	Fine
USDA	COBBLES	GRAVEL	SAND			SILT	CLAY
			Very coarse	Coarse	Medium	Fine	Very fine		

d_{10} = 0.0085	d_{30} = 0.15	d_{50} = 0.21	d_{60} = 0.25	C_u = 29	C_c = 10

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-4 25.5-26.0	25.5-26.0 ft.	Silty sand

PARTICLE SIZE ANALYSIS
WET SIEVE DATA

Job Name: CAMINO R
Job Number: 5800.20
Test Date: 11/13/95
Sample Number: SB-4 114.8-115.3
Depth: 114.8-115.3 ft.

Initial Dry Weight of Sample: 142.01 (g)
Weight Passing #10: 142.01 (g)
Weight Retained #10: 0.00 (g)
Weight of Hydrometer Sample: 43.19 (g)
Calculated Weight of Sieve Sample: 43.19 (g)

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	142.01	100.00
	1.5"	38.1	0.00	0.00	142.01	100.00
	3/4"	19.0	0.00	0.00	142.01	100.00
	3/8"	9.5	0.00	0.00	142.01	100.00
	4	4.75	0.00	0.00	142.01	100.00
	10	2.00	0.00	0.00	142.01	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	43.18	99.98
	40	0.425	0.01	0.02	43.17	99.95
	60	0.250	0.02	0.04	43.15	99.91
	140	0.106	0.40	0.44	42.75	98.98
	200	0.075	1.09	1.53	41.66	96.46
	dry pan		0.22	1.75	41.44	
	wet pan			41.44	0.00	

d_{10}: -- (mm)
d_{16}: -- (mm)
d_{30}: -- (mm)
d_{50}: -- (mm)
d_{60}: -- (mm)
d_{84}: 0.010 (mm)

Median Particle Diameter (d_{50}): --
Uniformity Coefficient, Cu (d_{60}/d_{10}): --
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: --
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: --

Soil Classification: Atterberg required for complete classification

Laboratory analysis performed by: G. Stansifer
Calculations made by: R. Maranville
Checked by: J. Vinson

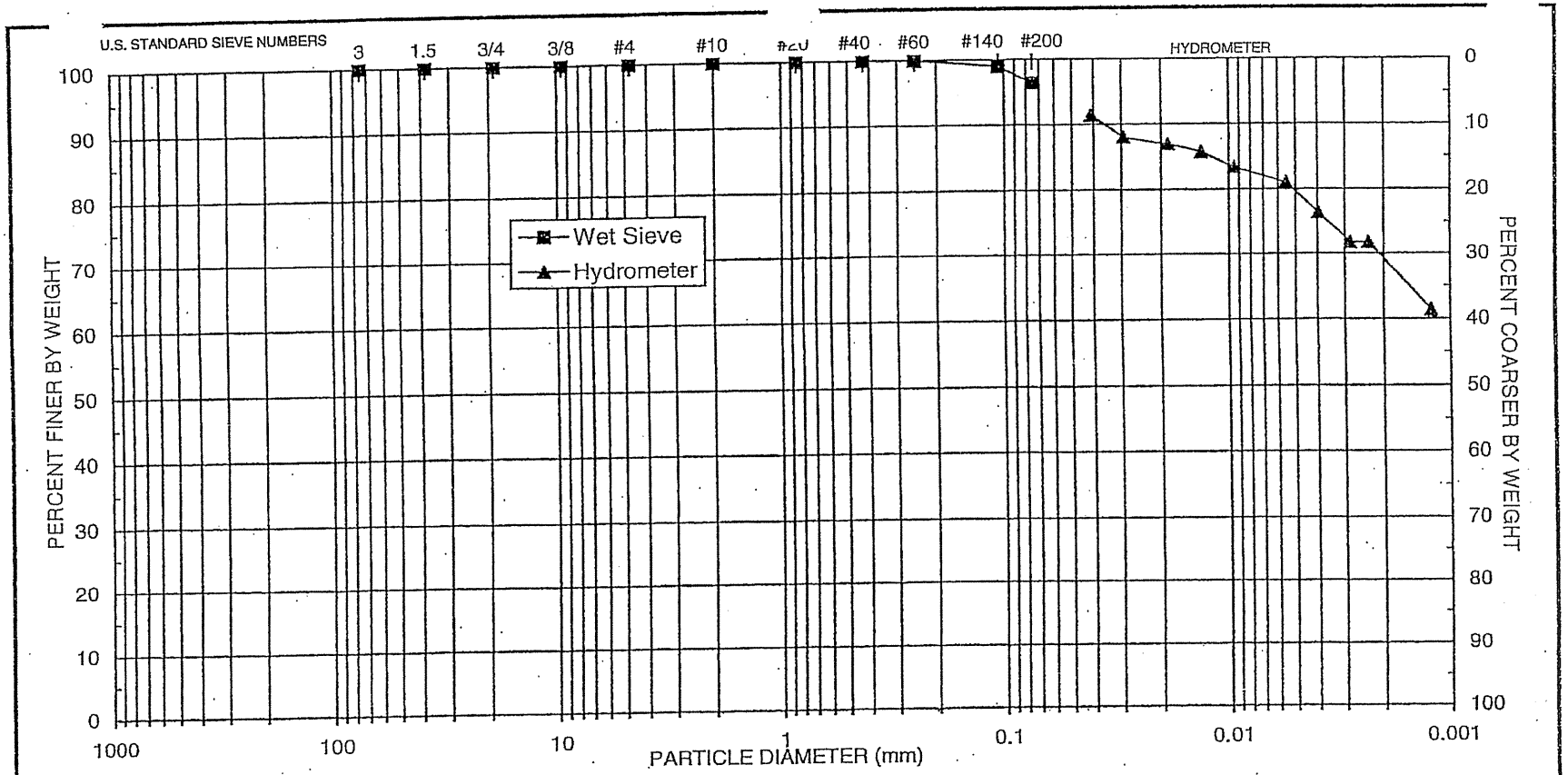
PARTICLE SIZE ANALYSIS
HYDROMETER DATA

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 114.8-115.3
Type of Water Used: DISTILLED
Reaction with H_2O_2: SLIGHT
Dispersant: $(NaPO_3)_6$
Particle Density: 2.65

Test Date: 11/14/95
Depth: 114.8-115.3 ft.
Initial Wt.: 43.19 (g)
Total Sample Wt.: 142.01 (g)
Wt. Passing #10: 142.01 (g)
Start Time: 1100

Date	Time (min)	Temp (°C)	R (g/L)	RI (g/L)	Rcorr (g/L)	L (cm)	D (mm)	P (%)	% Finer
11/15	1	21.0	42.5	3.0	39.5	9.3	0.04111	91.5	91.46
	2	21.0	41.0	3.0	38.0	9.6	0.02945	88.0	87.98
	5	21.0	40.5	3.0	37.5	9.7	0.01871	86.8	86.83
	10	21.0	40.0	3.0	37.0	9.7	0.01328	85.7	85.67
	20	21.0	39.0	3.0	36.0	9.9	0.00947	83.4	83.35
	60	21.0	38.0	3.0	35.0	10.1	0.00551	81.0	81.04
	120	21.0	36.0	3.0	33.0	10.4	0.00396	76.4	76.41
	240	21.0	34.0	3.0	31.0	10.7	0.00284	71.8	71.78
	350	21.5	34.0	3.0	31.0	10.7	0.00234	71.8	71.78
11/16	1373	22.0	29.5	3.0	26.5	11.5	0.00122	61.4	61.36

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL: Coarse	GRAVEL: Fine	SAND: Coarse	SAND: Medium	SAND: Fine	SILT OR CLAY
USDA	COBBLES	GRAVEL	SAND: Very coarse	SAND: Coarse	SAND: Medium	SAND: Fine	SAND: Very fine	SILT	CLAY

d_{10} = --	d_{30} = --	d_{50} = --	d_{60} = --	C_u = --	C_c = --

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-4 114.8-115.3	114.8-115.3 ft.	Atterberg required for complete classification

DANIEL B. STEPHENS & ASSOCIATES, INC.
ENVIRONMENTAL SCIENTISTS AND ENGINEERS

PARTICLE SIZE ANALYSIS
WET SIEVE DATA

Job Name:	CAMINO R	*Initial Dry Weight of Sample:*	178.21 (g)
Job Number:	5800.20	*Weight Passing #10:*	176.92 (g)
Test Date:	11/13/95	*Weight Retained #10:*	1.29 (g)
Sample Number:	SB-4 139.5-140.0	*Weight of Hydrometer Sample:*	40.71 (g)
Depth:	139.5-140.0 ft.	*Calculated Weight of Sieve Sample:*	41.01 (g)

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	178.21	100.00
	1.5"	38.1	0.00	0.00	178.21	100.00
	3/4"	19.0	0.00	0.00	178.21	100.00
	3/8"	9.5	0.00	0.00	178.21	100.00
	4	4.75	0.93	0.93	177.28	99.48
	10	2.00	0.36	1.29	176.92	99.28
-10			(Based on calculated sieve wt.)			
	20	0.85	0.03	0.33	40.68	99.20
	40	0.425	0.19	0.52	40.49	98.74
	60	0.250	1.49	2.01	39.00	95.11
	140	0.106	4.94	6.95	34.06	83.06
	200	0.075	1.22	8.17	32.84	80.08
	dry pan		0.07	8.24	32.77	
	wet pan			32.77	0.00	

d_{10}:	-- (mm)	d_{50}:	-- (mm)
d_{16}:	-- (mm)	d_{60}:	0.0023 (mm)
d_{30}:	-- (mm)	d_{84}:	0.12 (mm)

Median Particle Diameter (d_{50}): --
Uniformity Coefficient, Cu (d_{60}/d_{10}): --
Coefficient of Curvature, Cc $[(d_{30})^2/(d_{10}*d_{60})]$: --
Mean Particle Diameter $[(d_{16}+d_{50}+d_{84})/3]$: --

Soil Classification: Atterberg required for complete classification

Laboratory analysis performed by: G. Stansifer/H.T. Tran
Calculations made by: R. Maranville
Checked by: J. Vinson

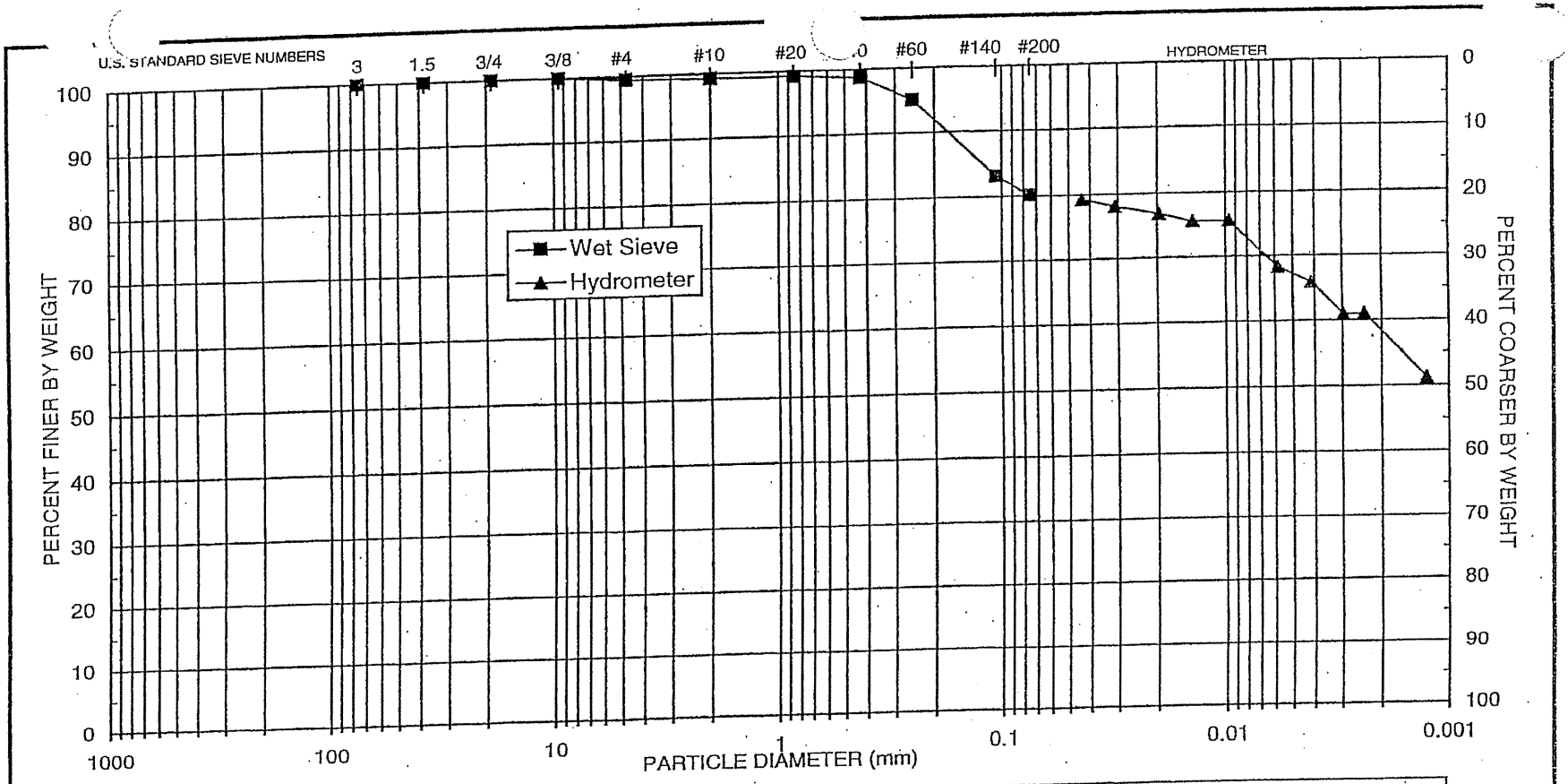
PARTICLE SIZE ANALYSIS
HYDROMETER DATA

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-4 139.5-140.0
Type of Water Used: DISTILLED
Reaction with H_2O_2: SLIGHT
Dispersant: $(NaPO_3)_6$
Particle Density: 2.65

Test Date: 11/14/95
Depth: 139.5-140.0 ft.
Initial Wt.: 40.71 (g)
Total Sample Wt.: 178.21 (g)
Wt. Passing #10: 176.92 (g)
Start Time: 1042

Date	Time (min)	Temp (°C)	R (g/L)	RI (g/L)	Rcorr (g/L)	L (cm)	D (mm)	P (%)	% Finer
11/15	1	21.0	35.5	3.0	32.5	10.5	0.04357	79.8	79.26
	2	21.0	35.0	3.0	32.0	10.6	0.03093	78.6	78.04
	5	21.0	34.5	3.0	31.5	10.6	0.01963	77.4	76.82
	10	21.0	34.0	3.0	31.0	10.7	0.01394	76.1	75.60
	21	21.0	34.0	3.0	31.0	10.7	0.00962	76.1	75.60
	60	21.0	31.0	3.0	28.0	11.2	0.00582	68.8	68.28
	120	21.0	30.0	3.0	27.0	11.4	0.00414	66.3	65.84
	240	21.0	28.0	3.0	25.0	11.7	0.00297	61.4	60.97
	365	21.5	28.0	3.0	25.0	11.7	0.00240	61.4	60.97
11/16	1388	22.0	24.0	3.0	21.0	12.4	0.00126	51.6	51.21

Laboratory analysis performed by: K. Copeland
Calculations made by: R. Maranville
Checked by: J. Vinson



UNIFIED	COBBLES	GRAVEL: Coarse	GRAVEL: Fine	SAND: Coarse	SAND: Medium	SAND: Fine	SILT OR CLAY
USDA	COBBLES	GRAVEL	SAND: Very coarse	SAND: Coarse	SAND: Medium	SAND: Fine	SAND: Very fine	SILT	CLAY

d_{10} = --	d_{30} = --	d_{50} = --	d_{60} = 0.0023	C_u = --	C_c = --

SAMPLE NUMBER	DEPTH	USCS CLASSIFICATION
SB-4 139.5-140.0	139.5-140.0 ft.	Atterberg required for complete classification

APPENDIX D

ATTERBERG LIMITS

SUMMARY OF ATTERBERG LIMITS

Sample Number	Liquid Limit (%, g/g)	Plastic Limit (%, g/g)	Plasticity Index (%, g/g)	Classification
SB-1 (5.5-6.0')	29	19	10	CL
SB-3 (29.9-30.4')	*	*	*	NP
SB-4 (25.5-26.0')	*	*	*	NP

* Not applicable; nonplastic sample

ATTERBERG LIMITS

Job Name: CAMINO R
Job Number: 5800.20
Sample Number: SB-1 5.5-6.0
Depth: 5.5-6.0 ft.
Test Date: 11/14/95

Liquid Limit

Trial Number:	1	2	3
Number of Drops:	34	22	16
Pan Number:	LL 1	LL 2	LL 3
Weight of Pan + Moist Soil (g):	21.57	18.59	19.22
Weight of Pan + Dry Soil (g):	18.65	16.32	16.73
Weight of Pan (g):	8.39	8.57	8.29
Gravimetric Moisture Content (%):	28.46	29.29	29.50

Liquid Limit (from flow curve): 29.0

Plastic Limit

Trial Number:	1	2
Pan Number:	1	2
Weight of Pan + Moist Soil (g):	9.60	9.47
Weight of Pan + Dry Soil (g):	9.39	9.20
Weight of Pan (g):	8.26	7.75
Gravimetric Moisture Content (%):	18.58	18.62

Plastic Limit: 18.6

Results

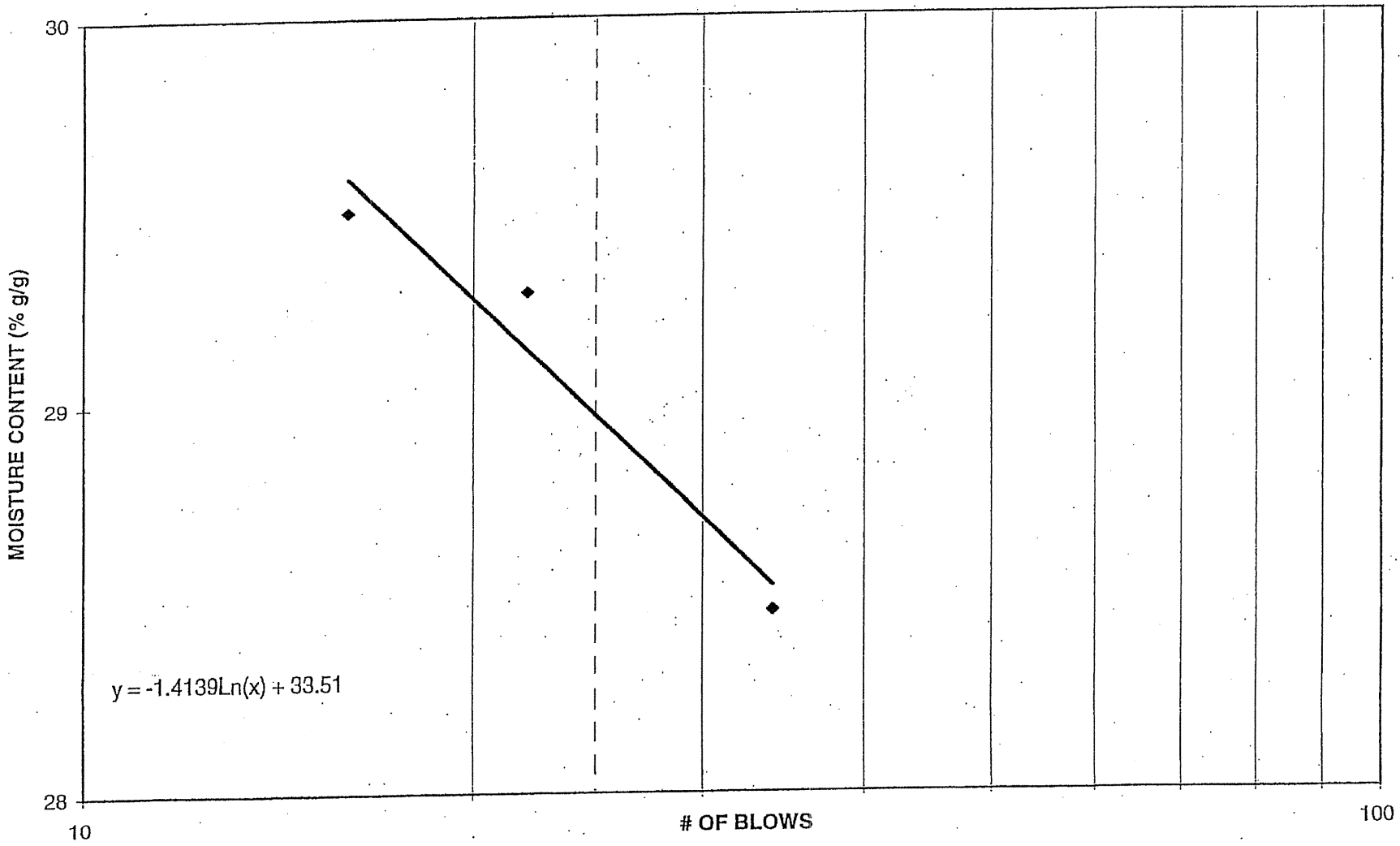
Liquid Limit: 29
Plastic Limit: 19
Plasticity Index: 10

Classification: CL

Laboratory Analysis Performed By: K. Copeland
Calculations Performed By: R. Maranville
Checked By: J. Vinson

FLOW CURVE FOR LIQUID LIMIT ANALYSIS

Sample Number: SB-1 5.5-6.0



APPENDIX E

PROCTOR COMPACTION TEST RESULTS

SUMMARY OF PROCTOR COMPACTION TEST RESULTS

Laboratory Sample Number	Maximum Dry Density (pcf)	Optimum Gravimetric Moisture Content (%, g/g)
SB-1 (2-5')	109.1	17.2
SB-1 (10-12')	112.8	12.8
SB-2 (20-23')	101.1	6.4
SB-3 (30-33')	104.4	8.9
SB-4 (15-17')	101.6	7.7
SB-4 (25-27')	103.7	9.2

F -TEST

November 17, 1995

Daniel B. Stephens & Associates, Inc.
6020 Academy Road NE
Albuquerque, NM 87109

Job No.: 3-51105
Lab No.: 1188

ATTN: Joe Vinson

PROJECT: Camino R

LOCATION OF SAMPLE: SB-1', 2.5' - 5'

SAMPLED BY: Client

MOISTURE - DENSITY RELATION (ASTM D-698)

Maximum Dry Density: 109.1 pcf
Optimum Moisture Content: 17.2%

Submitted By:

GEO-TEST, INC.

Angela M. Crider for

Greg D. Byres, P.E.

GDB/ac

)-TEST, INC.
) PARKWAY DRIVE
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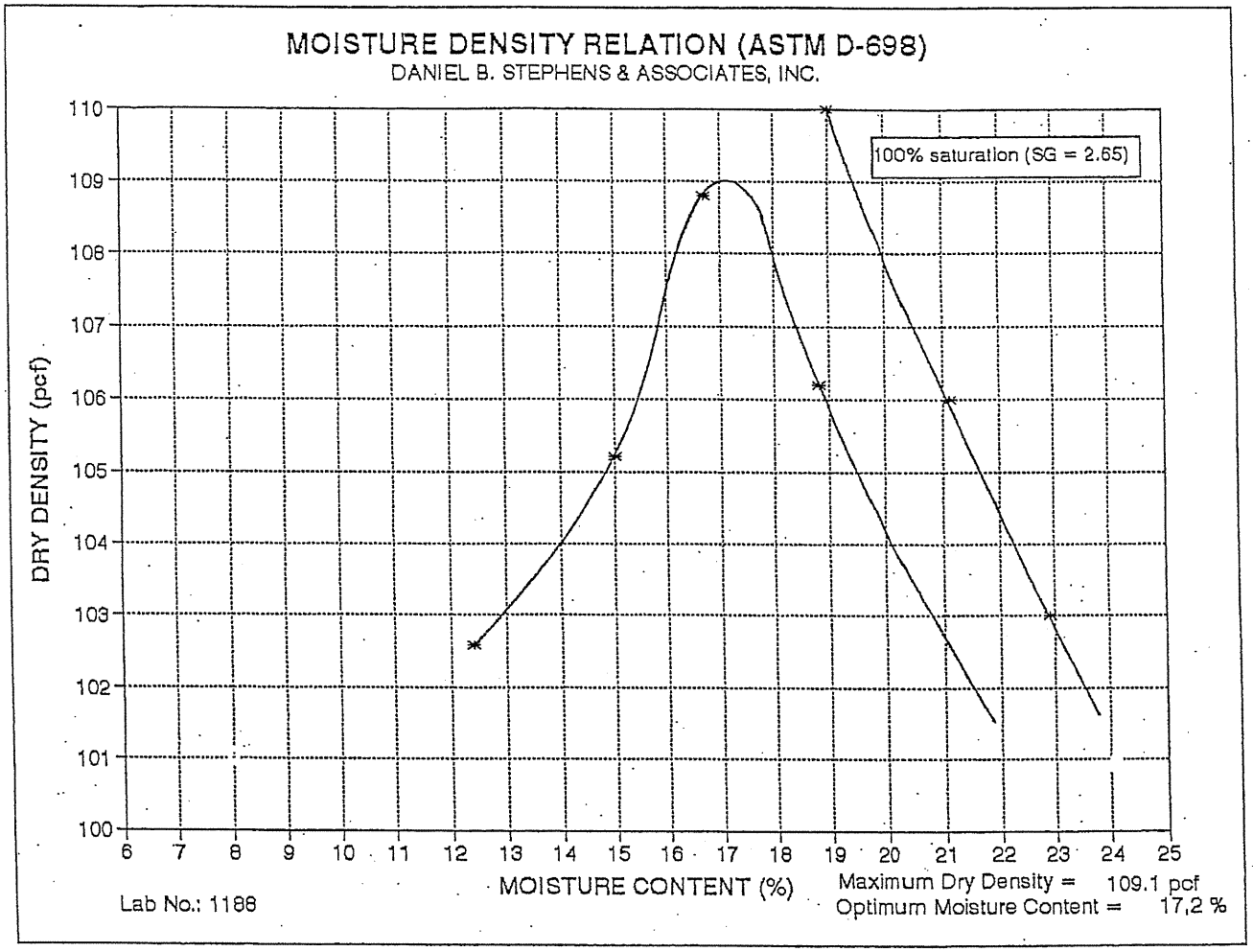
MOISTURE DENSITY RELATION (ASTM D-698)
DANIEL B. STEPHENS & ASSOCIATES, INC.
100% saturation (SG = 2.65)
DRY DENSITY (pcf)
110
109
108
107
106
105
104
103
102
101
100
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
MOISTURE CONTENT (%)
Lab No.: 1188
Maximum Dry Density = 109.1 pcf
Optimum Moisture Content = 17.2 %

GEO-TEST

November 17, 1995

Daniel B. Stephens & Associates, Inc.
6020 Academy Road NE
Albuquerque, NM 87109

Job No.: 3-51105
Lab No.: 1191

ATTN: Joe Vinson

PROJECT: Camino R

LOCATION OF SAMPLE: SB-1', 10' - 12'

SAMPLED BY: Client

MOISTURE - DENSITY RELATION (ASTM D-698)

Maximum Dry Density: 112.8 pcf
Optimum Moisture Content: 12.8%

Submitted By:

GEO-TEST, INC.

Angela M. Crider for

Greg D. Byres, P.E.

GDB/ac

O-TEST, INC.
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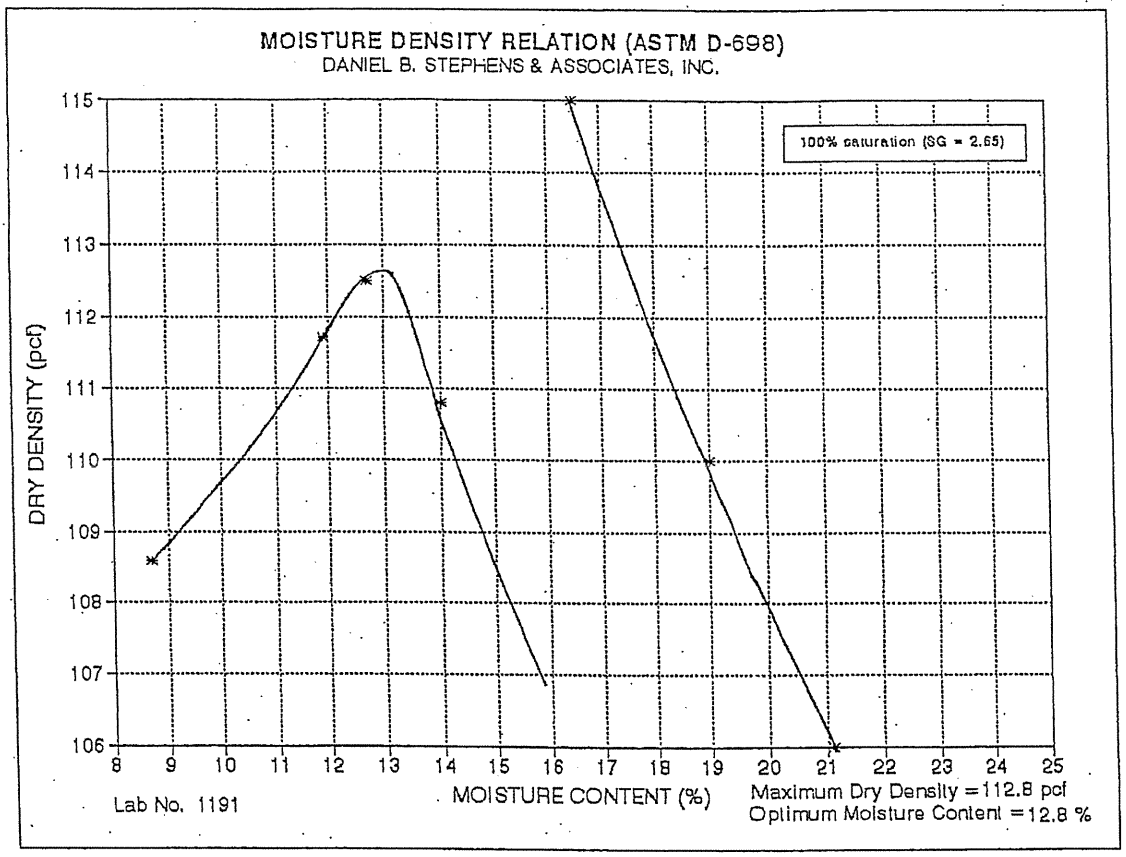
MOISTURE DENSITY RELATION (ASTM D-698)
DANIEL B. STEPHENS & ASSOCIATES, INC.
100% saturation (SG = 2.65)
DRY DENSITY (pcf)
115
114
113
112
111
110
109
108
107
106
8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
MOISTURE CONTENT (%)
Lab No. 1191
Maximum Dry Density = 112.8 pcf
Optimum Moisture Content = 12.8 %

GEO-TEST

November 17, 1995

Daniel B. Stephens & Associates, Inc.
6020 Academy Road NE
Albuquerque, NM 87109

Job No.: 3-51105
Lab No.: 1190

ATTN: Joe Vinson

PROJECT: Camino R

LOCATION OF SAMPLE: SB-2', 20' - 23'

SAMPLED BY: Client

MOISTURE - DENSITY RELATION (ASTM D-698)

Maximum Dry Density: 101.1 pcf
Optimum Moisture Content: 6.4%

Submitted By:

GEO-TEST, INC.

Angela M. Crider for

Greg D. Byres, P.E.

GDB/ac

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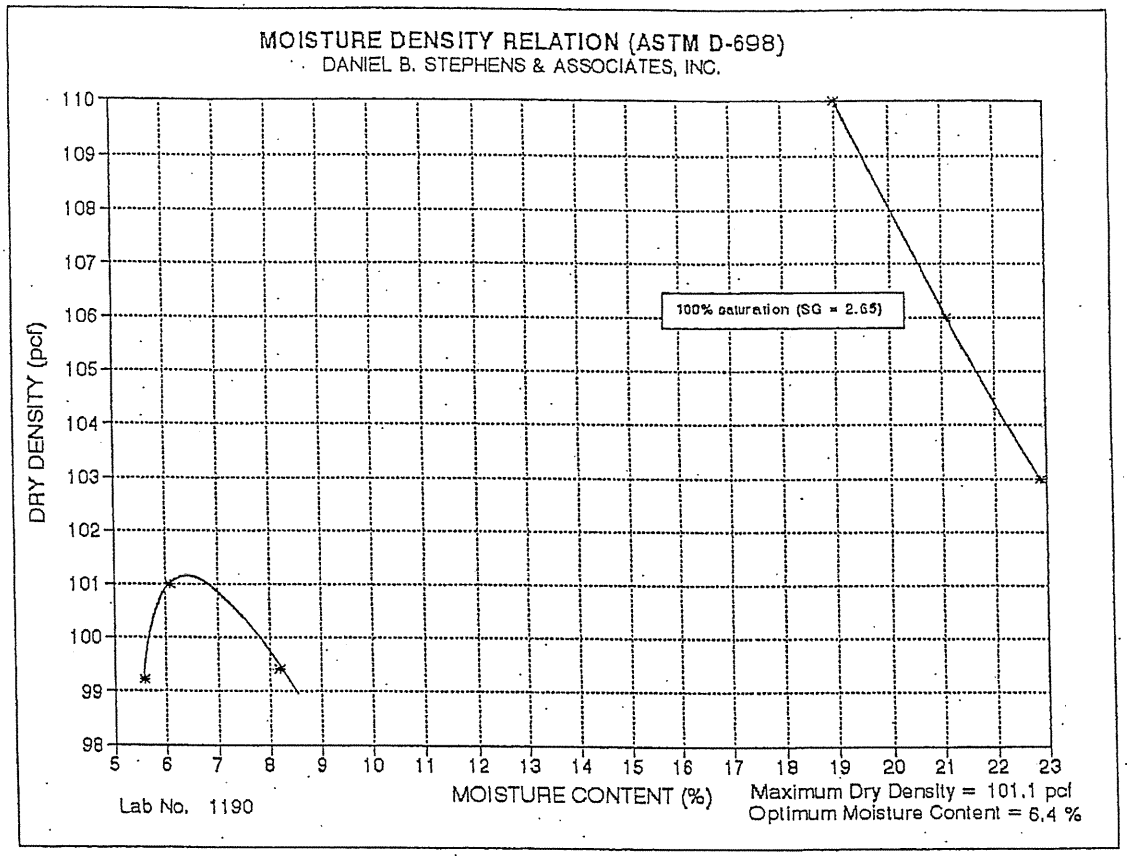
MOISTURE DENSITY RELATION (ASTM D-698)
DANIEL B. STEPHENS & ASSOCIATES, INC.
DRY DENSITY (pcf)
110
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99
98
100% saturation (SG = 2.65)
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
MOISTURE CONTENT (%)
Lab No. 1190
Maximum Dry Density = 101.1 pcf
Optimum Moisture Content = 6.4 %

EO-TEST

November 17, 1995

Daniel B. Stephens & Associates, Inc.
6020 Academy Road NE
Albuquerque, NM 87109

Job No.: 3-51105
Lab No.: 1194

ATTN: Joe Vinson

PROJECT: Camino R

LOCATION OF SAMPLE: SB-3', 30' - 32'

SAMPLED BY: Client

MOISTURE - DENSITY RELATION (ASTM D-698)

Maximum Dry Density: 104.4 pcf
Optimum Moisture Content: 8.9%

Submitted By:

GEO-TEST, INC.

Angela M. Crider for

Greg D. Byres, P.E.

GDB/ac

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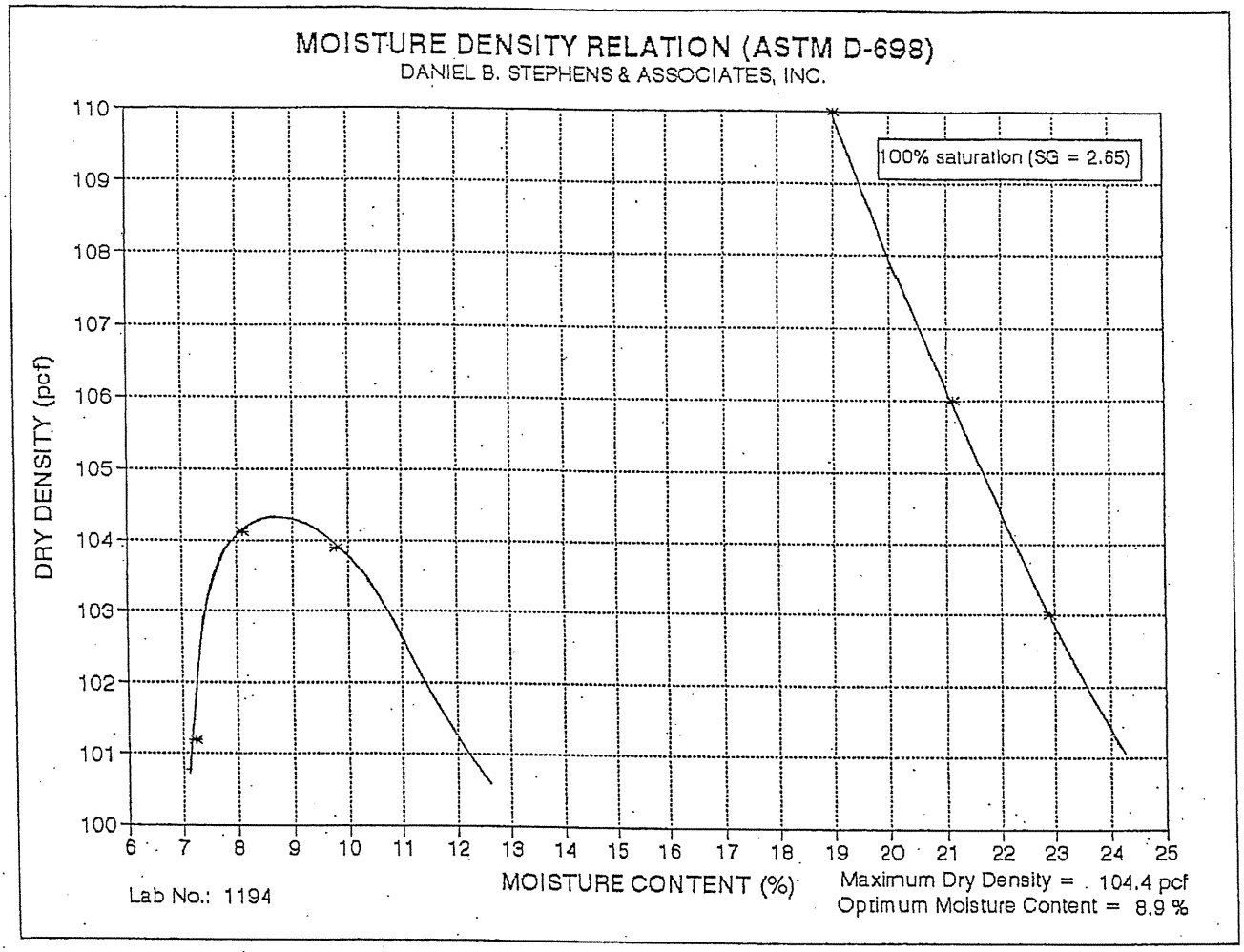
MOISTURE DENSITY RELATION (ASTM D-698)
DANIEL B. STEPHENS & ASSOCIATES, INC.
100% saturation (SG = 2.65)
DRY DENSITY (pcf)
110
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103
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101
100
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
MOISTURE CONTENT (%)
Lab No.: 1194
Maximum Dry Density = 104.4 pcf
Optimum Moisture Content = 8.9 %

-TEST

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November 17, 1995

Daniel B. Stephens & Associates, Inc.
6020 Academy Road NE
Albuquerque, NM 87109

Job No.: 3-51105
Lab No.: 1196

ATTN: **Joe Vinson**

PROJECT: Camino R

LOCATION OF SAMPLE: SB-4', 15' - 17'

SAMPLED BY: Client

MOISTURE - DENSITY RELATION (ASTM D-698)

Maximum Dry Density: 101.6 pcf
Optimum Moisture Content: 7.7%

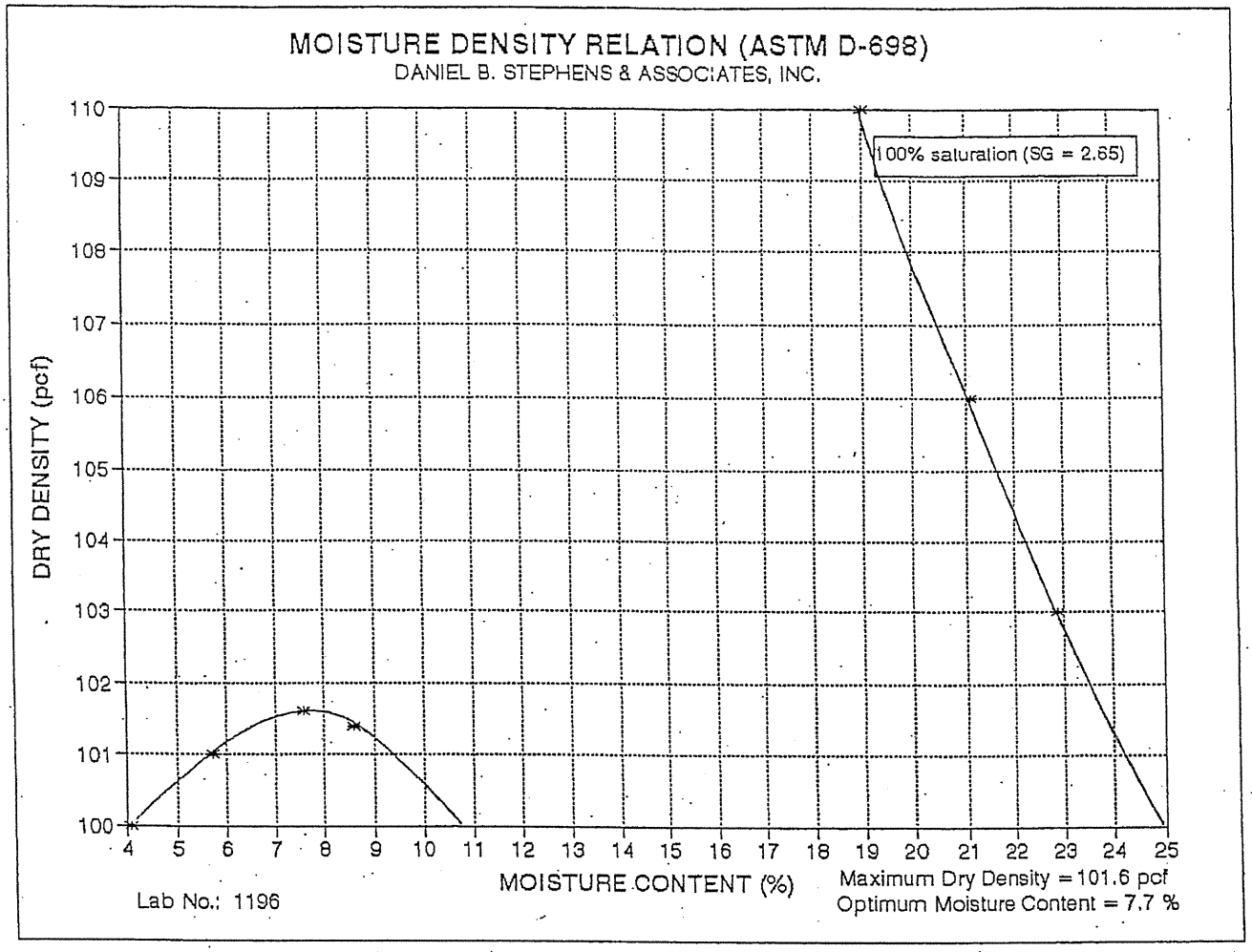
Submitted By:

GEO-TEST, INC.

Angela M. Crider for

Greg D. Byres, P.E.

GDB/ac


MOISTURE DENSITY RELATION (ASTM D-698)
DANIEL B. STEPHENS & ASSOCIATES, INC.
DRY DENSITY (pcf)
110
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104
103
102
101
100
100% saturation (SG = 2.65)
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
MOISTURE CONTENT (%)
Lab No.: 1196
Maximum Dry Density = 101.6 pcf
Optimum Moisture Content = 7.7 %

GEO-TEST

November 17, 1995

Daniel B. Stephens & Associates, Inc.
6020 Academy Road NE
Albuquerque, NM 87109

Job No.: 3-51105
Lab No.: 1189

ATTN: Joe Vinson

PROJECT: Camino R

LOCATION OF SAMPLE: SB-4', 25' - 27'

SAMPLED BY: Client

MOISTURE - DENSITY RELATION (ASTM D-698)

Maximum Dry Density: 103.7 pcf
Optimum Moisture Content: 9.2%

Submitted By:

GEO-TEST, INC.

Angela M. Crider for

Greg D. Byres, P.E.

GDB/ac

)-TEST, INC.
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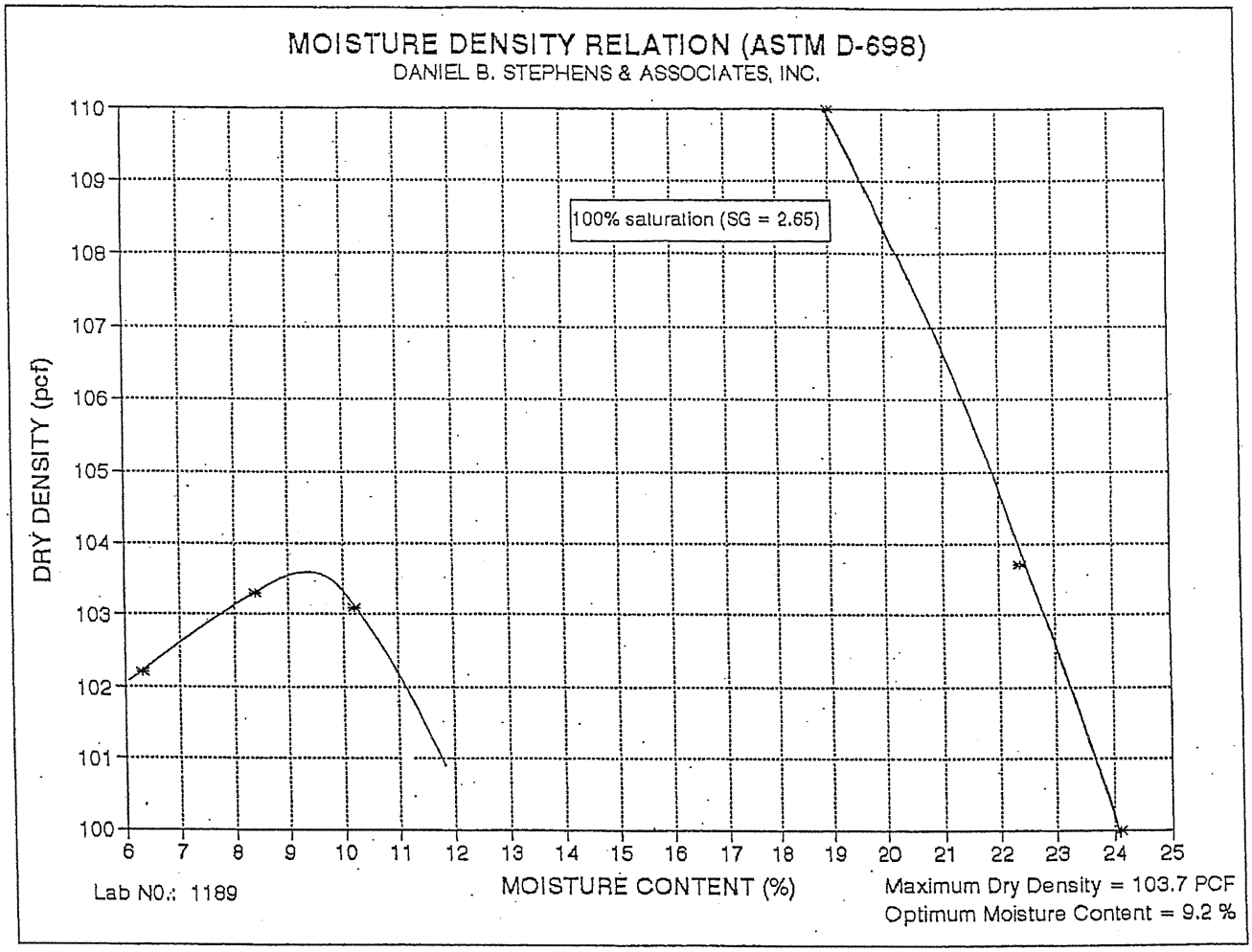

MOISTURE DENSITY RELATION (ASTM D-698)
DANIEL B. STEPHENS & ASSOCIATES, INC.
100% saturation (SG = 2.65)
DRY DENSITY (pcf)
110
109
108
107
106
105
104
103
102
101
100
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
MOISTURE CONTENT (%)
Lab NO.: 1189
Maximum Dry Density = 103.7 PCF
Optimum Moisture Content = 9.2 %

Cell Construction CQA (2000-2005)

EAVER BOOS AND GORDON, INC.
...NMENTAL AND GEOTECHNICAL ENGINEERS
...gan Ave., Suite 900, Chicago, IL 60604 (312) 922-1030
... Griffith Blvd., Unit A, Griffith, IN 46319 (219) 923-9609
...alt Ave., Glen Ellyn, IL 60137 (630) 858-2490
S. Camino Del Pueblo, Bernalillo, NM 87004 (505) 867-6990

PERMEABILITY TEST
CONSTANT HEAD METHOD
Data Sheet

ASTM D-2434

roject Name: Camino Real Landfill Cell 7A — Project No: 0016-01-10
ob Location: Albuquerque, New Mexico — Date Received: 5/5/00
lient Information: Camino Real — Report Date: 5/16/00

oring No. — Soil Description: Brown F/M Sand, Trace Silt
ample No.: DL-1 — USCS Classification: SP — AASHTO Classification: A-3
ample Depth — Remarks: — Pan No.

Mold Parameters: Sand L, cm = 7.62 Area, cm² = 45.60 Initial Height from top of mold (H_1), cm = 15.80
Gravel L, cm = 22.86 Area, cm² = 410.43 Initial Height from top of mold (H_1), cm = 45.72

Sample Parameters — Loose: 0.0 % Moisture
Wt. Sample + Pan Start, g: 3259 — Initial Height (H_1), cm = 15.80
Wt. Sample + Pan Finish, g: 2362 — Final Height (H_2), cm = 1.90

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
1-A	41.4	39.1	2.3	30	180	20.5	0.9999	0.30	1.21E-02
1-B	41.4	39.0	2.4	31	180	20.5	0.9999	0.31	1.20E-02
1-C	41.3	39.0	2.3	30	180	20.5	0.9999	0.30	1.21E-02
1-D	42.5	38.3	4.2	66	240	20.5	0.9999	0.55	1.09E-02
1-E	42.5	38.3	4.2	49	180	20.5	0.9999	0.55	1.08E-02
1-F	42.5	38.3	4.2	49	180	20.5	0.9999	0.55	1.08E-02

Sample Dry Density, PCF: 88.3 — Average Hydraulic Gradient: 0.43 — Average k, cm/sec: 1.15E-02

Sample Parameters — Densified: 10.0 % Moisture
Wt. Sample + Pan Start, g: 2417 — Initial Height (H_1), cm = 15.80
Wt. Sample + Pan Finish, g: 1504 — Final Height (H_2), cm = 3.95

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
2-A	72.6	70.2	2.4	23	420	20.5	0.9999	0.31	3.81E-03
2-B	72.6	70.2	2.4	33	600	20.5	0.9999	0.31	3.83E-03
2-C	72.6	70.2	2.4	25	480	20.5	0.9999	0.31	3.63E-03
2-D	71.8	66.7	5.1	33	300	20.5	0.9999	0.67	3.60E-03
2-E	71.8	66.7	5.1	37	330	20.5	0.9999	0.67	3.67E-03
2-F	71.8	66.7	5.1	34	300	20.5	0.9999	0.67	3.71E-03

Sample Dry Density, PCF: 95.9 — Average Hydraulic Gradient: 0.49 — Average k, cm/sec: 3.71E-03

Tested By: WSG

GRAIN SIZE DISTRIBUTION TEST DATA

Client: CAMINO REAL ENVIRONMENTAL CENTER, INC.
Project: CAMINO REAL LANDFILL
Project Number: 0016-01-10-05

Sample Data

Source:
Sample No.: DL-1
Elev. or Depth:
Location: ALBUQUERQUE, NM
Description: BRN F/M SAND, TR SILT
Date: 5-9-00 PL:
USCS Classification: SP
Testing Remarks:

Sample Length (in./cm.):

LL: PI:
AASHTO Classification: A-3

Mechanical Analysis Data

	Initial
Dry sample and tare=	295.90
Tare =	16.10
Dry sample weight =	279.80

Tare for cumulative weight retained= .00

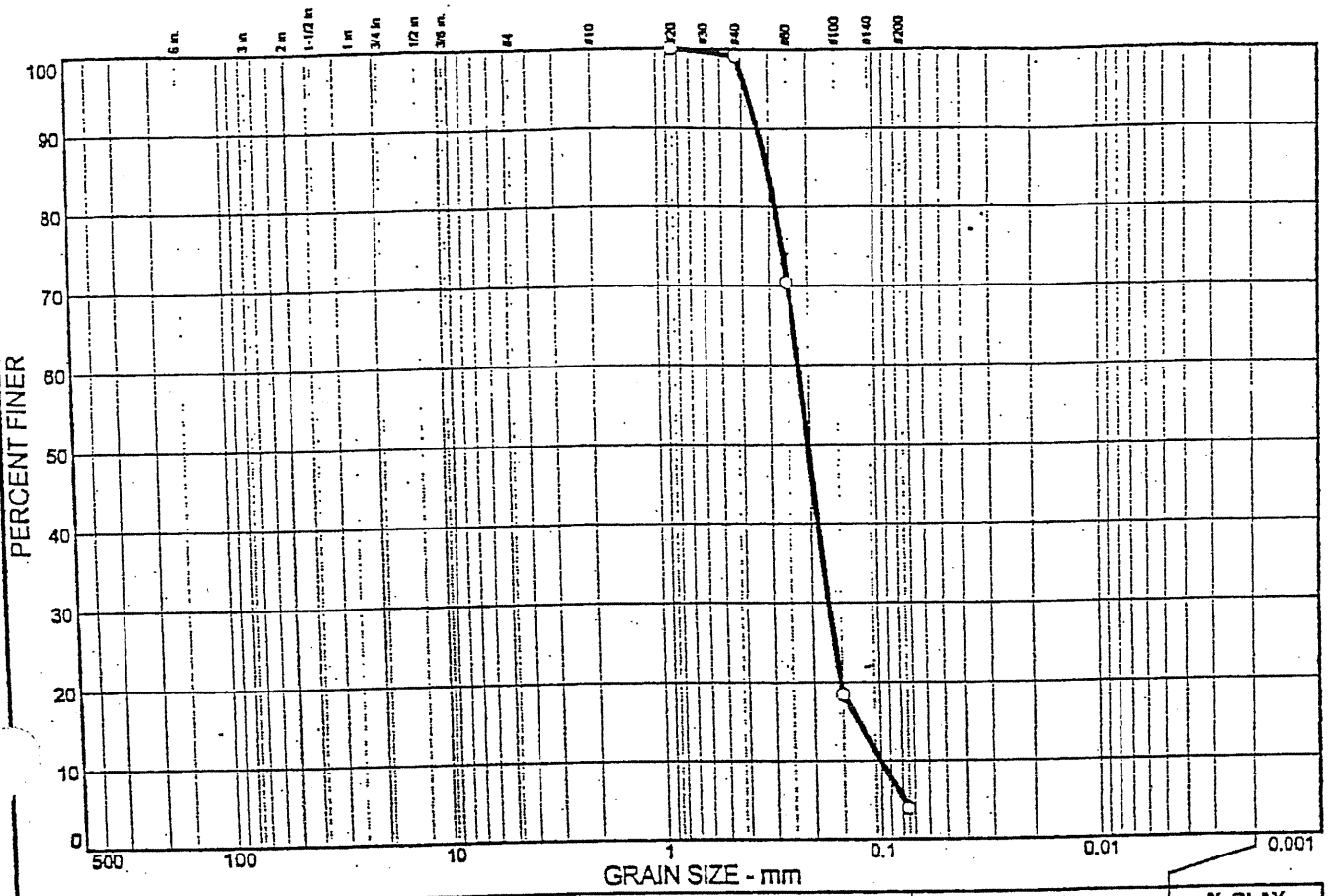
Sieve	Cumul. Wt. retained	Percent finer
# 20	0.00	100.0
# 40	2.60	99.1
# 60	82.80	70.4
# 100	228.40	18.4
# 200	268.80	3.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL = % SAND = 96.1
% FINES = 3.9

D_{85}= 0.31 D_{60}= 0.22 D_{50}= 0.21
D_{30}= 0.17 D_{15}= 0.13 D_{10}= 0.10
C_c= 1.2888 C_u= 2.239

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	96.1	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#20	100.0		
#40	99.1		
#60	70.4		
#100	18.4		
#200	3.9		

* (no specification provided)

Soil Description

BRN F/M SAND, TR SILT

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.307 D_{60}= 0.225 D_{50}= 0.205
D_{30}= 0.171 D_{15}= 0.127 D_{10}= 0.100
C_u= 2.24 C_c= 1.29

Classification

USCS= SP AASHTO= A-3

Remarks

Sample No.: DL-1 Source of Sample: Date: 5-9-00
Location: ALBUQUERQUE, NM Elev./Depth:

Weaver Boos & Gordon, Inc.

Client: CAMINO REAL ENVIRONMENTAL CENTER, INC.
Project: CAMINO REAL LANDFILL

V.1.F-131

Project No: 0016-01-10-05 Plate

ACS POB 1015 BERNALILLO NM 87004
Laboratory & Field Testing Services

PARTICLE SIZE DETERMINATION
ASTM C 136; AASHTO T 27

VISUAL DESCRIPTION: Sample: DL - 2 Tan SAND, Trace Silt

DATE 05 05 00
CLIENT Weaver, Boos & Gordon, Inc.
PROJECT

SAMPLE LOCATION: Camino Cell 7A

PERMIT
CONTRACT
JOB Soils Analyses
FILE 0420019

Sampled by Client

CLASSIFICATION
% PASSING # 200: 1.9%

SOURCE	-2 FF	LL/PI	PROCTOR N	SOUNDNESS	ABRASION	DESIGN N	PIT RUN
Client							

TOTAL Kilograms

Coarse	0	Kg
Fine excess	0.000	Kg
C+Fe+F	0.662	Kg

FINE Grams

DRY WGT. 662.0

	SIEVE SIZE	1 1/2" 38 mm	1" 25 mm	3/4" 19 mm	1/2" 12.5 mm	3/8" 9.5 mm
Kg	Cum Wgt	0.000	0.000	0.000	0.000	0.000
	Retained	0%	0%	0%	0%	0%
	Passing	100%	100%	100%	100%	100%
	Specified					

	SIEVE SIZE	No. 4 4.75 mm	No. 10 2.00 mm	No. 40 0.425 mm	No. 200 .075 mm	Pan	
g	Cum Wgt	0.0	0.2	16.0	649.3	659.8	
	Retained	0%	0%	2%	98.1%	10.5	grams
	Passing	100%	100%	98%	1.9%		
	Specified						

CS
P O B 1 0 1 5
B E R N A L I L L O N M 8 7 0 0 4
Laboratory & Field Testing Services
5 0 5 - 8 6 7 - 6 5 8 5
NICET Certified

PARTICLE SIZE DETERMINATION
ASTM C 136; AASHTO T 27

VISUAL DESCRIPTION: Sample: DL - 3
Tan SAND, Trace Silt

DATE 05 05 00
CLIENT Weaver, Boos & Gordon, Inc.
PROJECT

SAMPLE LOCATION: Camino Cell: 7A

PERMIT
CONTRACT
JOB Soils Analyses

Sampled by Client

CLASSIFICATION
% PASSING # 200: 1.8%

FILE 0420070

SOURCE	2 FF	LL/PI	PROCTOR N	SOUNDNESS	ABRASION	DESIGN N	PIT RUN
Client							

TOTAL Kilograms			FINE Grams
Coarse	0	Kg	
Fine excess	0.000	Kg	DRY WGT. 519.9
C+Fe+F	0.520	Kg	

	SIEVE SIZE	1 1/2" 38 mm	1" 25 mm	3/4" 19 mm	1/2" 12.5 mm	3/8" 9.5 mm
Kg	Cum Wgt	0.000	0.000	0.000	0.000	0.000
	Retained	0%	0%	0%	0%	0%
	Passing	100%	100%	100%	100%	100%
	Specified					

	SIEVE SIZE	No. 4 4.75 mm	No. 10 2.00 mm	No. 40 0.425 mm	No. 200 .075 mm	Pan
g	Cum Wgt	0.0	0.0	22.4	510.3	519.6
	Retained	0%	0%	4%	98.2%	9.3 grams
	Passing	100%	100%	96%	1.8%	
	Specified					

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PERMEABILITY TEST
CONSTANT HEAD METHOD
Data Sheet

ASTM D-2434

roject Name: Camino Real Landfill Cell 7A — Project No: 0016-01-10

ob Location: Albuquerque, New Mexico — Date Received: 5/5/00

lient Information: Camino Real — Report Date: 5/17/00

oring No. ____ Soil Description: Brown F/M Sand, Trace Silt

ample No.: DL-4 USCS Classification: SP AASHTO Classification: A-3

ample Depth ____ Remarks: ____ Pan No. ____

Mold Parameters: Sand L, cm = 7.62 Area, cm² = 45.60 Initial Height from top of mold (H_1), cm = 15.80

Gravel L, cm = 22.86 Area, cm² = 410.43 Initial Height from top of mold (H_1), cm = 45.72

Sample Parameters: Loose; 0.0 % Moisture

Wt. Sample + Pan Start, g: 3718 — Initial Height (H_1), cm = 15.80

Wt. Sample + Pan Finish, g: 2831 — Final Height (H_2), cm = 2.80

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
1-A	83.6	81.0	2.6	40	240	20.5	0.9999	0.34	1.07E-02
1-B	83.6	81.0	2.6	39	240	20.5	0.9999	0.34	1.04E-02
1-C	83.6	81.0	2.6	39	240	20.5	0.9999	0.34	1.04E-02
1-D	81.9	77.3	4.6	74	240	20.5	0.9999	0.60	1.12E-02
1-E	81.9	77.3	4.6	75	240	20.5	0.9999	0.60	1.14E-02
1-F	81.9	77.3	4.6	73	240	20.5	0.9999	0.60	1.10E-02

Sample Dry Density, PCF 93.4 Average Hydraulic Gradient 0.47 Average k, cm/sec 1.09E-02

Sample Parameters: Densified; 10.0 % Moisture

Wt. Sample + Pan Start, g: 2992 — Initial Height (H_1), cm = 15.80

Wt. Sample + Pan Finish, g: 2052 — Final Height (H_2), cm = 3.75

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
2-A	77.5	75.0	2.5	15	240	20.5	0.9999	0.33	4.18E-03
2-B	77.5	75.0	2.5	15	240	20.5	0.9999	0.33	4.18E-03
2-C	77.5	75.0	2.5	15	240	20.5	0.9999	0.33	4.18E-03
2-D	76.6	72.0	4.6	28	240	20.5	0.9999	0.60	4.24E-03
2-E	76.6	71.8	4.8	29	240	20.5	0.9999	0.63	4.21E-03
2-F	76.6	71.8	4.8	29	240	20.5	0.9999	0.63	4.21E-03

Sample Dry Density, PCF 97.1 Average Hydraulic Gradient 0.47 Average k, cm/sec 4.20E-03

WSG ... Manager

GRAIN SIZE DISTRIBUTION TEST DATA

ient: CAMINO REAL ENVIRONMENTAL CENTER, INC.
oject: CAMINO REAL LANDFILL
oject Number: 0016-01-10-05

Sample Data

urce:
mple No.: DL-4
ev. or Depth:
cation: ALBUQUERQUE, NM
scription: BRN F/M SAND, TR SILT
te: 5-9-00 PL:
CS Classification: SP
sting Remarks:

Sample Length (in./cm.):

LL: PI:
AASHTO Classification: A-3

Mechanical Analysis Data

	Initial
ry sample and tare=	243.10
are =	16.60
ry sample weight =	226.50

a for cumulative weight retained= .00

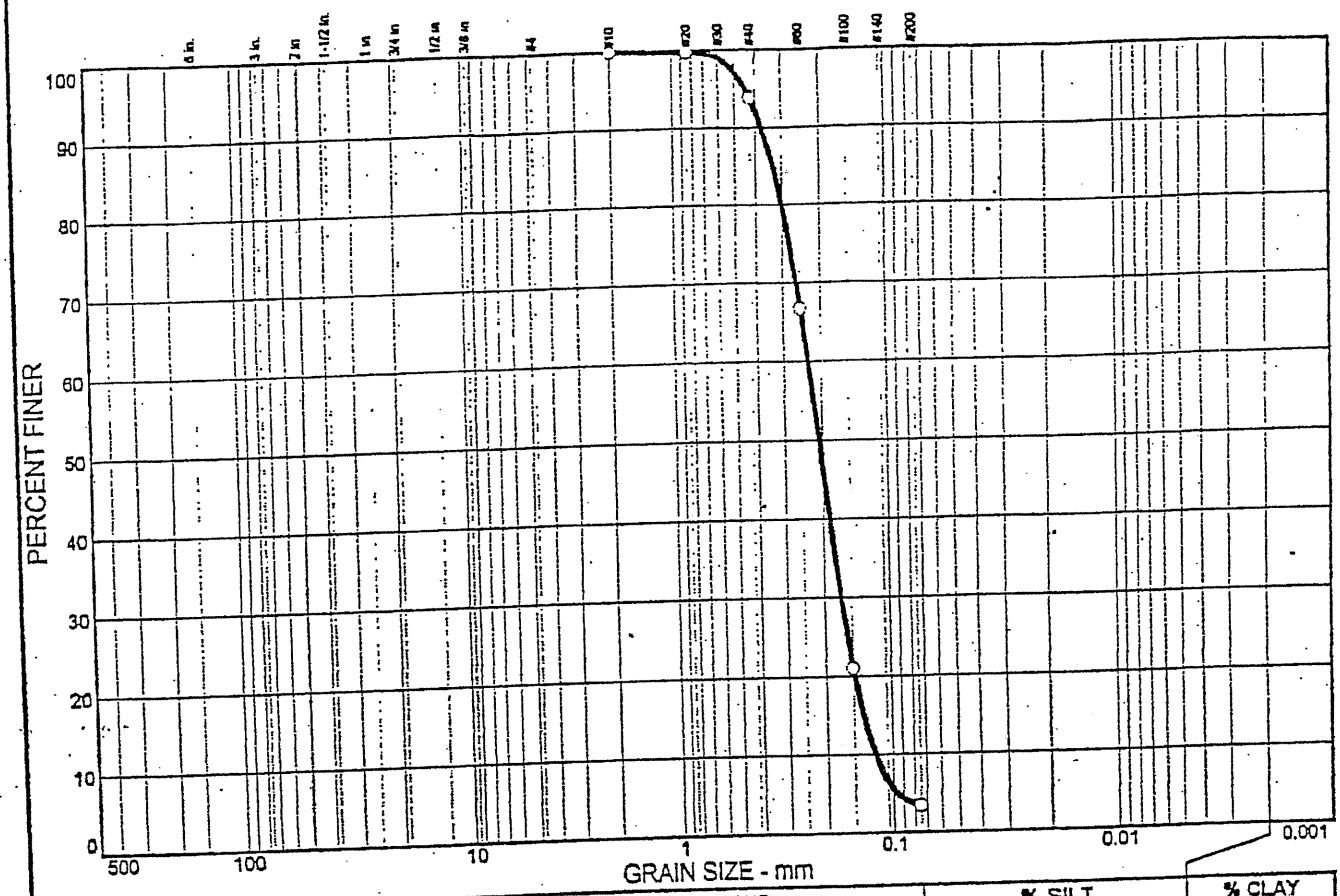
ve	Cumul. Wt. retained	Percent finer
10	0.00	100.0
20	0.60	99.7
# 40	14.10	93.8
# 60	75.50	66.7
# 100	178.90	21.0
# 200	218.90	3.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL = % SAND = 96.6
% FINES = 3.4

D_{85}= 0.33 D_{60}= 0.23 D_{50}= 0.21
D_{30}= 0.17 D_{15}= 0.14 D_{10}= 0.12
C_c= 1.013 C_u= 1.9168

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	96.6	3.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.7		
#40	93.8		
#60	66.7		
#100	21.0		
#200	3.4		

* (no specification provided)

Soil Description

BRN F/M SAND, TR SILT

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.333 D_{60}= 0.231 D_{50}= 0.208
D_{30}= 0.168 D_{15}= 0.136 D_{10}= 0.121
C_u= 1.92 C_c= 1.01

Classification

USCS= SP AASHTO= A-3

Remarks

Sample No.: DL-4 Source of Sample: Date: 5-9-00
Location: ALBUQUERQUE, NM Elev./Depth:

Weaver Boos & Gordon, Inc.

Client: CAMINO REAL ENVIRONMENTAL CENTER, INC.
Project: CAMINO REAL LANDFILL

V.1.F-136

Project No: 0016-01-10-05 Plate

ACS POB 1015 BERNALILLO NM 87004 505-867-6505
Laboratory & Field Testing Services NICET Certified

PARTICLE SIZE DETERMINATION
ASTM C 136; AASHTO T 27

VISUAL DESCRIPTION: Sample: DL - 5 Tan SAND, Trace Silt
DATE 05 05 00
CLIENT Weaver, Boos & Gordon, Inc.
PROJECT

SAMPLE LOCATION: Canino Cell: 7A
PERMIT
CONTRACT
JOB Soils Analyses

CLASSIFICATION
% PASSING # 200: 1.7%
FILE 0470021

SOURCE Client	2 FF	LL/PI	PROCTOR N	SOUNDNESS	ABRASION	DESIGN N	PIT RUN

TOTAL Kilograms			FINE Grams
Coarse	0	Kg	
Fine excess	0.000	Kg	DRY WGT. 504.4
C+Fe+F	0.504	Kg	

	SIEVE SIZE	1 1/2" 38 mm	1" 25 mm	3/4" 19 mm	1/2" 12.5 mm	3/8" 9.5 mm
Kg	Cum Wgt	0.000	0.000	0.000	0.000	0.000
	Retained	0%	0%	0%	0%	0%
	Passing	100%	100%	100%	100%	100%
	Specified					

	SIEVE SIZE	No. 4 4.75 mm	No. 10 2.00 mm	No. 40 0.425 mm	No. 200 .075 mm	Pan	
g	Cum Wgt	0.0	0.0	34.0	495.7	503.9	
	Retained	0%	0%	7%	98.3%	8.2	grams
	Passing	100%	100%	93%	1.7%		
	Specified						

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PERMEABILITY TEST
CONSTANT HEAD METHOD
Data Sheet

ASTM D-2434

Project Name: Camino Real Landfill Cell 7A
Project No: 0016-01-10

Job Location: Albuquerque, New Mexico
Date Received: 5/5/00

Client Information: Camino Real
Report Date: 5/17/00

Boring No. ____ Soil Description: Brown F/M Sand, Trace Silt

Sample No. DL-6 USCS Classification: SP AASHTO Classification: A-3

Sample Depth ____ Remarks: ____ Pan No. ____

Mold Parameters
Sand L, cm = 7.62 Area, cm² = 45.60 Initial Height from top of mold (H_1), cm = 15.80
Gravel L, cm = 22.86 Area, cm² = 410.43 Initial Height from top of mold (H_1), cm = 45.72

Sample Parameters: Loose, 0.0 % Moisture
Wt. Sample + Pan Start, g: 3353
Wt. Sample + Pan Finish, g: 2490
Initial Height (H_1), cm = 15.80
Final Height (H_2), cm = 2.70

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
1-A	83.6	81.0	2.6	62	240	20.5	0.9999	0.34	1.66E-02
1-B	83.6	81.0	2.6	62	240	20.5	0.9999	0.34	1.66E-02
1-C	83.6	81.0	2.6	60	240	20.5	0.9999	0.34	1.61E-02
1-D	81.9	77.3	4.6	99	240	20.5	0.9999	0.60	1.50E-02
1-E	81.9	77.3	4.6	74	180	20.5	0.9999	0.60	1.49E-02
1-F	81.9	77.3	4.6	75	180	20.5	0.9999	0.60	1.51E-02

Sample Dry Density, PCF 90.2 Average Hydraulic Gradient 0.47 Average k, cm/sec 1.57E-02

Sample Parameters: Densified, 10.0 % Moisture
Wt. Sample + Pan Start, g: 2602
Wt. Sample + Pan Finish, g: 1666
Initial Height (H_1), cm = 15.80
Final Height (H_2), cm = 3.70

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
2-A	80.0	77.4	2.6	18	240	20.5	0.9999	0.34	4.82E-03
2-B	80.0	77.4	2.6	17	240	20.5	0.9999	0.34	4.55E-03
2-C	80.0	77.4	2.6	17	240	20.5	0.9999	0.34	4.55E-03
2-D	79.3	74.6	4.7	30	240	20.5	0.9999	0.62	4.44E-03
2-E	79.3	74.6	4.7	29	240	20.5	0.9999	0.62	4.30E-03
2-F	79.3	74.6	4.7	30	240	20.5	0.9999	0.62	4.44E-03

Sample Dry Density, PCF 96.3 Average Hydraulic Gradient 0.48 Average k, cm/sec 4.52E-03

Tested By: WSG ____ Laboratory Manager

GRAIN SIZE DISTRIBUTION TEST DATA

Client: CAMINO REAL ENVIRONMENTAL CENTER, INC.
Project: CAMINO REAL LANDFILL
Project Number: 0016-01-10-05

Sample Data

Source:
Sample No.: DL-6
Elev. or Depth:
Location: ALBUQUERQUE, NM
Description: BRN F/M SAND, TR SILT
Date: 5-9-00 PL:
USCS Classification: SP
Testing Remarks:

Sample Length (in./cm.):

LL: PI:
AASHTO Classification: A-3

Mechanical Analysis Data

	Initial
Dry sample and tare=	289.60
Tare =	16.40
Dry sample weight =	273.20

Data for cumulative weight retained= .00

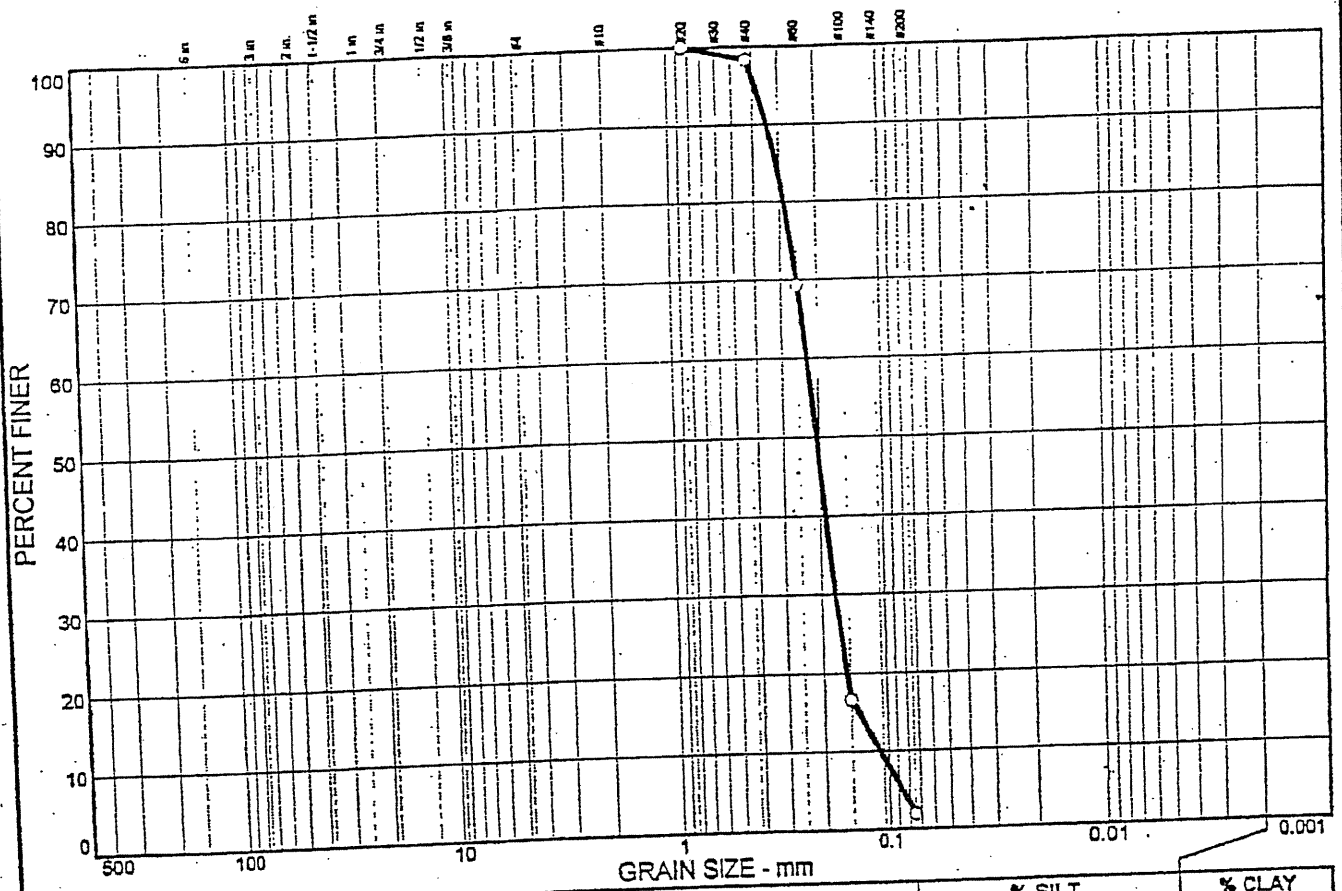
Sieve	Cumul. Wt. retained	Percent finer
# 20	0.00	100.0
# 40	4.70	98.3
# 60	83.90	69.3
# 100	227.90	16.6
# 200	268.00	1.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL = % SAND = 98.1
% FINES = 1.9

D_{85}= 0.31 D_{60}= 0.23 D_{50}= 0.21
D_{30}= 0.17 D_{15}= 0.14 D_{10}= 0.11
C_C= 1.2012 C_u= 2.0696

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.1	1.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#20	100.0		
#40	98.3		
#60	69.3		
#100	16.6		
#200	1.9		

* (no specification provided)

Soil Description

BRN F/M SAND, TR SILT

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.312 D_{60}= 0.227 D_{50}= 0.208
D_{30}= 0.173 D_{15}= 0.139 D_{10}= 0.110
C_u= 2.07 C_c= 1.20

Classification

USCS= SP AASHTO= A-3

Remarks

Date: 5-9-00

Sample No.: DL-6 Source of Sample: Elev./Depth:

Location: ALBUQUERQUE, NM

Weaver Boos & Gordon, Inc.

Client: CAMINO REAL ENVIRONMENTAL CENTER, INC.

Project: CAMINO REAL LANDFILL

Project No: 0016-01-10-05

V.1.F-140

Plate

ACS POB 1015 BERNALILLO NM 87004 505-867-6585
Laboratory & Field Testing Services NICET Certified

PARTICLE SIZE DETERMINATION
ASTM C 136; AASHTO T 27

VISUAL DESCRIPTION: Sample: DL - 7
Tan SAND, Trace Silt

DATE 05 05 00
CLIENT Weaver, Boos & Gordon, Inc.
PROJECT

SAMPLE LOCATION: Camino Cell: 7A

PERMIT
CONTRACT
JOB Soils Analyses

Sampled by Client

CLASSIFICATION
% PASSING # 200: 1.9%

FILE 0420022

SOURCE	2 FF	LL/PI	PROCTOR N	SOUNDNESS	ABRASION	DESIGN N	PIT RUN
Client							

TOTAL Kilograms			FINE Grams	
Coarse	0	Kg		
Fine excess	0.000	Kg	DRY WGT.	578.6
C+Fe+F	0.579	Kg		

	SIEVE SIZE	1 1/2" 38 mm	1" 25 mm	3/4" 19 mm	1/2" 12.5 mm	3/8" 9.5 mm
Kg	Cum Wgt	0.000	0.000	0.000	0.000	0.000
	Retained	0%	0%	0%	0%	0%
	Passing	100%	100%	100%	100%	100%
	Specified					

	SIEVE SIZE	No. 4 4.75 mm	No. 10 2.00 mm	No. 40 0.425 mm	No. 200 .075 mm	Pan	
g	Cum Wgt	0.0	0.5	74.1	567.5	578.6	
	Retained	0%	0%	1.6%	98.1%	11.0	grams
	Passing	100%	100%	87%	1.9%		
	Specified						

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lt Ave., Glen Ellyn, IL 60137 (630) 858-2490
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PERMEABILITY TEST
CONSTANT HEAD METHOD
Data Sheet

ASTM D-2434

roject Name: Camino Real Landfill Cell 7A — Project No: 0016-01-10
ob Location: Albuquerque, New Mexico — Date Received: 5/5/00
lient Information: Camino Real — Report Date: 5/17/00

oring No. — Soil Description: Brown F/M Sample, Trace Silt
ample No.: DL-8 — USCS Classification: SP — AASHTO Classification: A-3
ample Depth — Remarks: — Pan No.

Mold Parameters: Sand L, cm = 7.62 — Area, cm² = 45.60 — Initial Height from top of mold (H_1), cm = 15.80
Gravel L, cm = 22.86 — Area, cm² = 410.43 — Initial Height from top of mold (H_1), cm = 45.72

Sample Parameters: Loose — 0.0 % Moisture
Wt. Sample + Pan Start, g: 4590 — Wt. Sample + Pan Finish, g: 3676
Initial Height (H_1), cm = 15.80 — Final Height (H_2), cm = 2.10

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, ° C	Temp. Corr. Factor	h/L	k, cm/sec
1-A	87.9	85.4	2.5	32	240	20.5	0.9999	0.33	8.91E-03
1-B	87.9	85.4	2.5	32	240	20.5	0.9999	0.33	8.91E-03
1-C	87.9	85.4	2.5	32	240	20.5	0.9999	0.33	8.91E-03
1-D	87.0	82.3	4.7	59	240	20.5	0.9999	0.62	8.74E-03
1-E	87.0	82.3	4.7	58	240	20.5	0.9999	0.62	8.59E-03
1-F	87.0	82.3	4.7	59	240	20.5	0.9999	0.62	8.74E-03

Sample Dry Density, PCF: 91.3 — Average Hydraulic Gradient: 0.47 — Average k, cm/sec: 8.80E-03

Sample Parameters: Densified — 10.0 % Moisture
Wt. Sample + Pan Start, g: 3906 — Wt. Sample + Pan Finish, g: 2958
Initial Height (H_1), cm = 15.80 — Final Height (H_2), cm = 3.50

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, ° C	Temp. Corr. Factor	h/L	k, cm/sec
2-A	92.7	90.3	2.4	16	240	20.5	0.9999	0.31	4.64E-03
2-B	92.7	90.3	2.4	16	240	20.5	0.9999	0.31	4.64E-03
2-C	92.7	90.3	2.4	15	240	20.5	0.9999	0.31	4.35E-03
2-D	92.2	87.8	4.4	29	240	20.5	0.9999	0.58	4.59E-03
2-E	92.2	87.8	4.4	29	240	20.5	0.9999	0.58	4.59E-03
2-F	92.2	87.8	4.4	29	240	20.5	0.9999	0.58	4.59E-03

Sample Dry Density, PCF: 95.9 — Average Hydraulic Gradient: 0.45 — Average k, cm/sec: 4.57E-03

Tested By: SS\WSG — William Scott Greer, Laboratory Manager

GRAIN SIZE DISTRIBUTION TEST DATA

ant: CAMINO REAL ENVIRONMENTAL CENTER, INC.
oject: CAMINO REAL LANDFILL
oject Number: 0016-01-10-05

Sample Data

urce:
mple No.: DL-8
ev. or Depth:
cation: ALBUQUERQUE, NM
scription: BRN F/M SAND, TR SILT
te: 5-9-00 PL:
CS Classification: SP
sting Remarks:

Sample Length (in./cm.):

LL: PI:
AASHTO Classification: A-3

Mechanical Analysis Data

	Initial
ry sample and tare=	263.70
are =	16.50
ry sample weight =	247.20

are for cumulative weight retained= .00

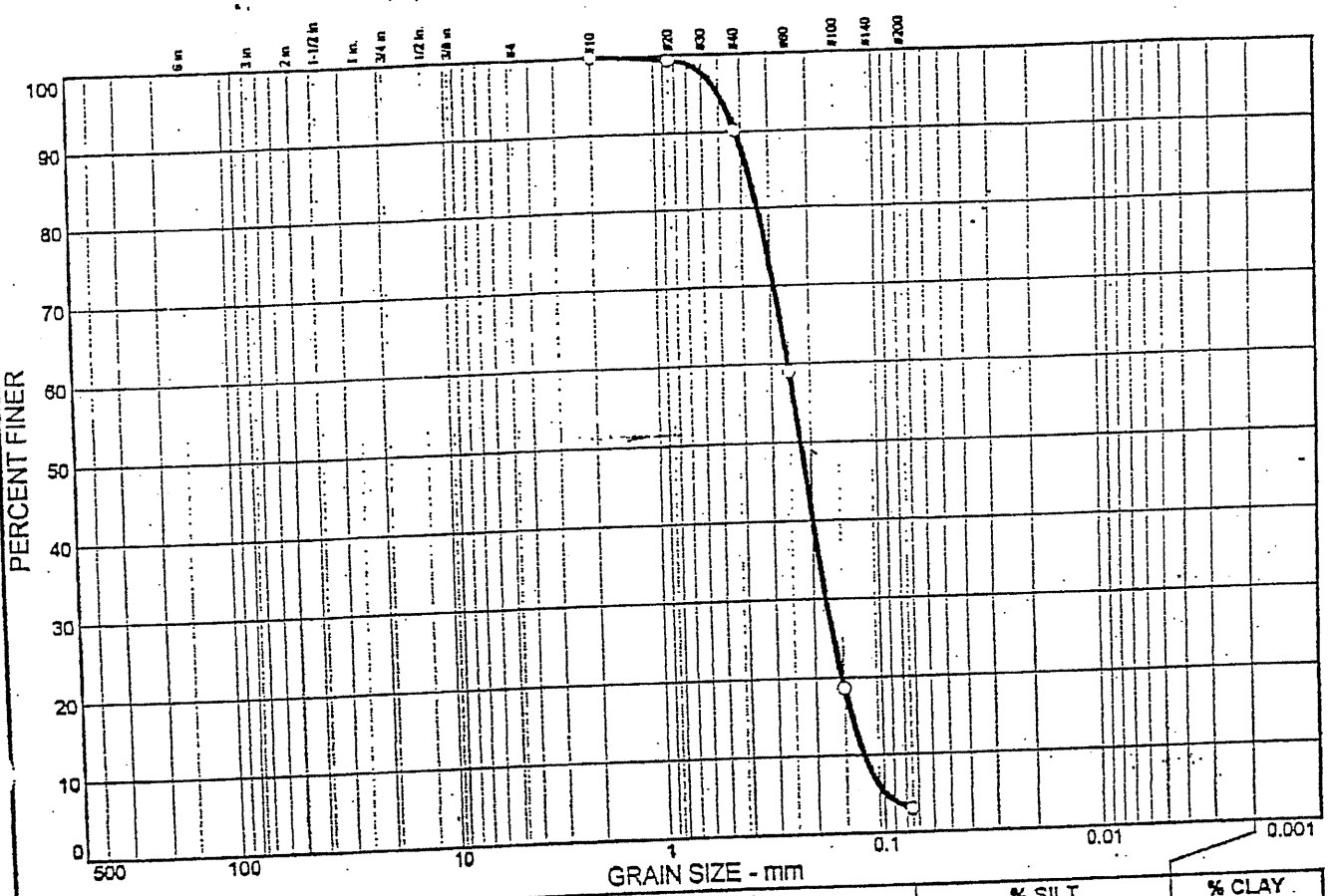
ve	Cumul. Wt. retained	Percent finer
10	0.00	100.0
20	1.70	99.3
# 40	24.30	90.2
# 60	101.40	59.0
# 100	201.30	18.6
# 200	239.80	3.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL = % SAND = 97.0
% FINES = 3.0

D_{85}= 0.37 D_{60}= 0.25 D_{50}= 0.22
D_{30}= 0.18 D_{15}= 0.14 D_{10}= 0.12
C_C= 0.9956 C_u= 2.0424

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	97.0	3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.3		
#40	90.2		
#60	59.0		
#100	18.6		
#200	3.0		

* (no specification provided)

Soil Description

BRN F/M SAND, TR SILT

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.375 D_{60}= 0.253 D_{50}= 0.224
D_{30}= 0.177 D_{15}= 0.140 D_{10}= 0.124
C_u= 2.04 C_c= 1.00

Classification

USCS= SP AASHTO= A-3

Remarks

Sample No.: DL-8 Source of Sample: Date: 5-9-00
Location: ALBUQUERQUE, NM Elev./Depth:

Weaver Boos & Gordon Inc

Client: CAMINO REAL ENVIRONMENTAL CENTER, INC.
Project: CAMINO REAL LANDFILL

V.1.F-144

Project No: 0016-01-10-05 Plate

ACS POB 1015 BERNALILLO NM 87004
Laboratory & Field Testing Services
505-867-6505
NICET Certified

PARTICLE SIZE DETERMINATION
ASTM C 136; AASHTO T 27

VISUAL DESCRIPTION: Sample: DI. - 9
Tan SAND, Trace Silt

DATE 05 25 00
CLIENT Weaver, Boos & Gordon, Inc.
PROJECT

SAMPLE LOCATION: Camino Cali 7A

PERMIT
CONTRACT
JOB Soils Analyses

Sampled by Client

CLASSIFICATION
% PASSING # 200: 1.0%

FILE 0420023

SOURCE	2 FF	LL/PI	PROCTOR N	SOUNDNESS	ABRASION	DESIGN N	PIT RUN
Client							

TOTAL Kilograms			FINE Grams	
Coarse	0	Kg		
Fine excess	0.000	Kg	DRY WGT.	528.8
C+Fe+F	0.529	Kg		

	SIEVE SIZE	1 1/2" 38 mm	1" 25 mm	3/4" 19 mm	1/2" 12.5 mm	3/8" 9.5 mm
Kg	Cum Wgt	0.000	0.000	0.000	0.000	0.000
	Retained	0%	0%	0%	0%	0%
	Passing	100%	100%	100%	100%	100%
	Specified					

	SIEVE SIZE	No. 4 4.75 mm	No. 10 2.00 mm	No. 40 0.425 mm	No. 200 .075 mm	Pan	
g	Cum Wgt	0.0	0.0	74.0	523.3	528.6	
	Retained	0%	0%	14%	99.0%	5.3	grams
	Passing	100%	100%	86%	1.0%		
	Specified						

WEAVER BOOS AND GORDON, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERS

ichigan Ave., Suite 900, Chicago, IL 60604 (312) 922-1030
Griffith Blvd., Unit A, Griffith, IN 46319 (219) 923-9609
dt Ave., Glen Ellyn, IL 60137 (630) 858-2490
13 S. Camino Del Pueblo, Bernalillo, NM 87004 (505) 867-6990

PERMEABILITY TEST
CONSTANT HEAD METHOD
Data Sheet

ASTM D-2434

Project Name: Camino Real Landfill Cell 7A
Project No: 0016-01-10

Job Location: Albuquerque, New Mexico
Date Received: 5/5/00

Client Information: Camino Real
Report Date: 5/18/00

Boring No. ____ Soil Description: Brown F/M Sand, Trace Silt

Sample No. DL-10 USCS Classification: SP AASHTO Classification: A-3

Sample Depth ____ Remarks: ____ Pan No. ____

Mold Parameters: Sand L, cm = 7.62 Area, cm² = 45.60 Initial Height from top of mold (H_1), cm = 15.80
Gravel L, cm = 22.86 Area, cm² = 410.43 Initial Height from top of mold (H_1), cm = 45.72

Sample Parameters: Loose, 0.0 % Moisture
Wt. Sample + Pan Start, g: 3349 Initial Height (H_1), cm = 15.80
Wt. Sample + Pan Finish, g: 2467 Final Height (H_2), cm = 1.50

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
1-A	41.4	39.1	2.3	64	120	20.5	0.9999	0.30	3.87E-02
1-B	41.3	38.9	2.4	65	120	20.5	0.9999	0.31	3.77E-02
1-C	41.3	38.9	2.4	64	120	20.5	0.9999	0.31	3.71E-02
1-D	44.3	39.4	4.9	97	120	20.5	0.9999	0.64	2.76E-02
1-E	44.3	39.4	4.9	50	60	20.5	0.9999	0.64	2.84E-02
1-F	44.3	39.4	4.9	49	60	20.5	0.9999	0.64	2.78E-02

Sample Dry Density, PCF = 84.4 Average Hydraulic Gradient 0.48 Average k, cm/sec 3.29E-02

Sample Parameters: Densified, 10.0 % Moisture
Wt. Sample + Pan Start, g: 2583 Initial Height (H_1), cm = 15.80
Wt. Sample + Pan Finish, g: 1575 Final Height (H_2), cm = 2.75

Run No.	h_1	h_2	Head h, cm	Q, cm³	t, sec	Temp, °C	Temp. Corr. Factor	h/L	k, cm/sec
2-A	39.0	36.2	2.8	23	180	20.5	0.9999	0.37	7.62E-03
2-B	39.0	36.1	2.9	23	180	20.5	0.9999	0.38	7.36E-03
2-C	39.0	36.1	2.9	23	180	20.5	0.9999	0.38	7.36E-03
2-D	41.4	36.5	4.9	41	180	20.5	0.9999	0.64	7.77E-03
2-E	41.4	36.5	4.9	48	210	20.5	0.9999	0.64	7.79E-03
2-F	41.4	36.5	4.9	41	180	20.5	0.9999	0.64	7.77E-03

Sample Dry Density, PCF 96.1 Average Hydraulic Gradient 0.51 Average k, cm/sec 7.61E-03

V.1.F-146

Tested By: WSG

Results Submitted By: William Scott Greer, Laboratory Manager

GRAIN SIZE DISTRIBUTION TEST DATA

nt: CAMINO REAL ENVIRONMENTAL CENTER, INC.
oject: CAMINO REAL LANDFILL
oject Number: 0016-01-10-05

Sample Data

urce:
mple No.: DL-10
ev. or Depth:
cation: ALBUQUERQUE, NM
scription: BRN F/M SAND, TR SILT
te: 5-9-00 PL:
CS Classification: SP
sting Remarks:

Sample Length (in./cm.):

LL: PI:
AASHTO Classification: A-3

Mechanical Analysis Data

	Initial
ry sample and tare=	235.20
are =	16.30
ry sample weight =	218.90

are for cumulative weight retained= .00

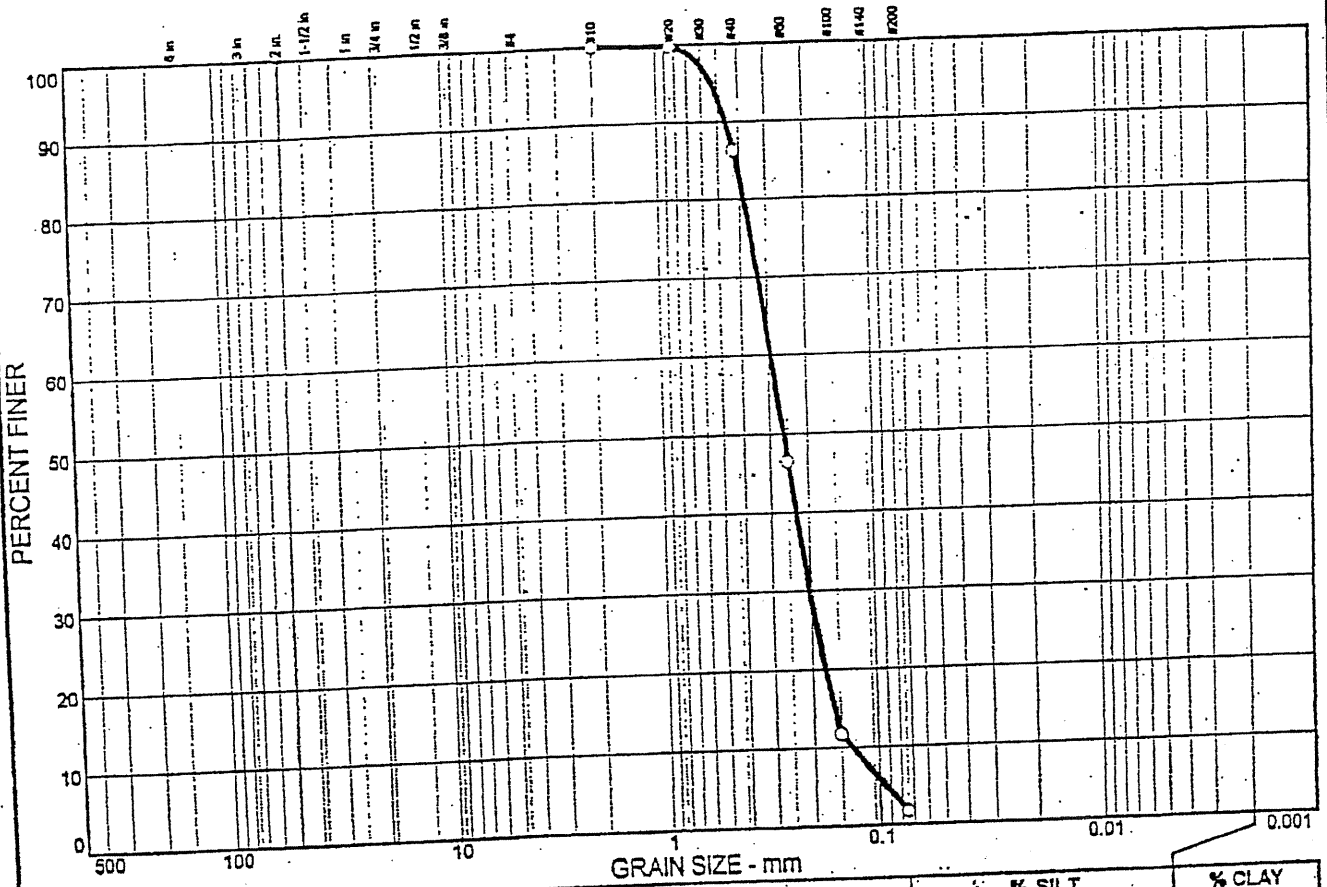
ze	Cumul. Wt. retained	Percent finer
.0	0.00	100.0
20	0.70	99.7
# 40	29.90	86.3
# 60	117.20	46.5
# 100	193.20	11.7
# 200	215.20	1.7

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = % GRAVEL = % SAND = 98.3
% FINES = 1.7

D_{85}= 0.41 D_{60}= 0.29 D_{50}= 0.26
D_{30}= 0.20 D_{15}= 0.16 D_{10}= 0.13
C_C= 1.0524 C_u= 2.2027

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	98.3	1.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.7		
#40	86.3		
#60	46.5		
#100	11.7		
#200	1.7		

* (no specification provided)

Soil Description

BRN F/M SAND, TR SILT

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.415 D_{60}= 0.294 D_{50}= 0.261
D_{30}= 0.203 D_{15}= 0.161 D_{10}= 0.133
C_u= 2.20 C_c= 1.05

Classification

USCS= SP AASHTO= A-3

Remarks

Date: 5-9-00

Sample No.: DL-10 Source of Sample: Elev./Depth:

Location: ALBUQUERQUE, NM

Weaver Boos & Gordon, Inc.

Client: CAMINO REAL ENVIRONMENTAL CENTER, INC.

Project: CAMINO REAL LANDFILL

Project No: 0016-01-10-05 V.1.F-148 Plate

VEAVER BOOS & GORDON, INC.
200 S. Michigan, Suite 900 • Chicago, IL 60604 • (312) 922-1030
1944 N. Griffith Blvd., Unit C • Griffith, IN 46319 • (219) 923-9609
[illegible]amino Del Pueblo • Bernalillo, NM 87004 • (505) 867-6990

JFF Date 5/11/00 Subject CAMINO REAL CELL 7A Sheet ____ of ____

200 SIEVES

[illegible]kd By ____ Date ____ File No. ____

PL-1

WEIGHT - 300.0 g
WEIGHT RET - 291.1 g
WEIGHT PASS - 8.2 g
% PASS - 2.7

PL-2

WEIGHT - 300.0 g
WEIGHT RET. - 293.5
WEIGHT PASS - 6.4 g
% PASS. - 2.1

PL-3

WEIGHT - 300.0 g
WEIGHT RET - 293.1
WEIGHT PASS. - 6.6 g
% PASS. - 2.2

PL-4

WEIGHT - 300.0 g
WEIGHT RET. - 293.6 g
WEIGHT PASS - 6.2 g
% PASS. - 2.1

PL-5

WEIGHT - 300.0 g
WEIGHT RET. - 296.1
WEIGHT PASS. - 3.7
% PASS - 1.2

PL-6

WEIGHT - 300.0 g
WEIGHT RET. - 292.7 g
WEIGHT PASS - 6.9 g
% PASS. - 2.3

PL-7

WEIGHT - 300.0 g
WEIGHT RET - 292.7 g
WEIGHT PASS. - 7.2 g
% PASS - 2.4

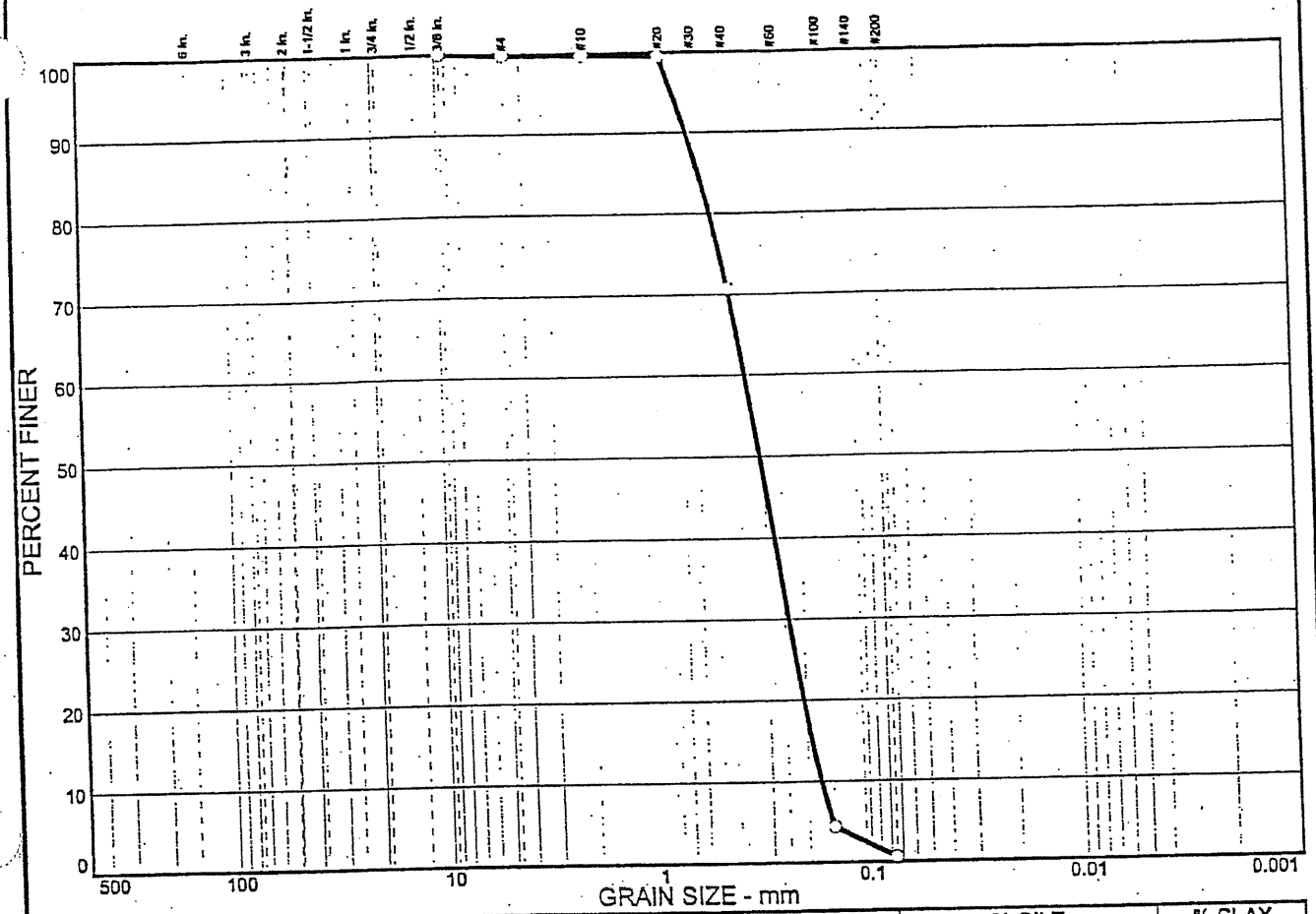
PL-8

WEIGHT - 300.0 g
WEIGHT RET. - 293.8 g
WEIGHT PASS. - 5.8 g
% PASS - 1.9

PL-9

WEIGHT - 300.0 g
WEIGHT RET. - 293.5 g
WEIGHT PASS - 4.4 g
% PASS - 1.4

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.2	99.2	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	100.0		
#4	99.8		
#10	99.7		
#20	99.5		
#40	70.7		
#100	4.4		
#200	0.6		

* (no specification provided)

Soil Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.567 D_{60}= 0.360 D_{50}= 0.313
D_{30}= 0.238 D_{15}= 0.189 D_{10}= 0.172
C_u= 2.10 C_c= 0.92

Classification

USCS= SW AASHTO=

Remarks

Composite of the sieve analysis for the protective soil layer.
Specification Requirements: 100% passing 3/8" dia. sieve
<5% passing #200 dia. sieve

Sample No.: Composite Source of Sample: Date:
Location: Camino Real Landfill Average of Protective Soil Layer Cell 7B/8A Elev./Depth:

WEAVER BOOS & GORDON

Client: Camino Real Environmental Center
Project: Camino Real Landfill CQA Cell 7B/*A

Project No: 16-01-10 Figure

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 1 - Stockpile 1

Date: 10/26/2001

Total Weight in Grams of Sample = 307.0 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.4	0.4	99.9%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.2	0.6	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.2	0.8	99.7%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	39.4	40.2	86.9%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	237.6	277.8	9.5%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	25.3	303.1	1.3%
		Pan	3.9		
		Total Weight in Grams	307		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 2 - Stockpile 1

Date: 10/26/2001

Total Weight in Grams of Sample = 302.1 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.1	0.1	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.5	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.4	0.9	99.7%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	122.4	123.3	59.2%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	168.6	291.9	3.4%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	7.4	299.3	0.9%
		Pan	2.8		
		Total Weight in Grams	302.1		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 3 - Stockpile 1

Date: 10/26/2001

Total Weight in Grams of Sample = 306.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.5	0.5	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.9	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.4	1.3	99.6%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	34.2	35.5	88.4%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	250.6	286.1	6.7%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	18.2	304.3	0.8%
		Pan	2.5		
		Total Weight in Grams	306.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 4 - Stockpile 1

Date: 10/26/2001

Total Weight in Grams of Sample = 305.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.4	0.4	99.9%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.8	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.4	1.2	99.6%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	47.2	48.4	84.2%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	238.6	287.0	6.1%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	16.6	303.6	0.7%
		Pan	2.2		
		Total Weight in Grams	305.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 5 - Stockpile 1

Date: 10/26/2001

Total Weight in Grams of Sample = 320.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Selve Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.5	0.5	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.3	0.8	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.3	1.1	99.7%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	39.2	40.3	87.4%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	256.0	296.3	7.6%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	22.3	318.6	0.7%
		Pan	2.2		
		Total Weight in Grams	320.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 6 - Stockpile 1

Date: 10/26/2001

Total Weight in Grams of Sample = 305.2 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	1.8	1.8	99.4%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	2.2	99.3%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.4	2.6	99.1%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	73.1	75.7	75.2%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	216.9	292.6	4.1%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	10.7	303.3	0.6%
		Pan	1.9		
		Total Weight in Grams	305.2		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 7 - Stockpile 1

Date: 10/26/2001

Total Weight in Grams of Sample = 308.4 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	1.1	1.1	99.6%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.6	1.7	99.4%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.5	2.2	99.3%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	67.9	70.1	77.3%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	226.0	296.1	4.0%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	9.2	305.3	1.0%
		Pan	3.1		
		Total Weight in Grams	308.4		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 8 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 309.5 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.2	0.2	99.9%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.2	0.4	99.9%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.4	0.8	99.7%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	58.4	59.2	80.9%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	235.0	294.2	4.9%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	13.3	307.5	0.6%
		Pan	2.0		
		Total Weight in Grams	309.5		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 9 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 316.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.8	0.8	99.7%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.6	1.4	99.6%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.7	2.1	99.3%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	142.3	144.4	54.4%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	164.5	308.9	2.5%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	7.4	316.3	0.2%
		Pan	0.5		
		Total Weight in Grams	316.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 10 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 309.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.1	0.1	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.3	0.4	99.9%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.6	1.0	99.7%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	69.7	70.7	77.2%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	227.1	297.8	3.9%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	10.1	307.9	0.6%
		Pan	1.9		
		Total Weight in Grams	309.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 11 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 321.1 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.8	0.8	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.2	1.0	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.5	1.5	99.5%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	93.0	94.5	70.6%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	215.6	310.1	3.4%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	9.2	319.3	0.6%
		Pan	1.8		
		Total Weight in Grams	321.1		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 12 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 306.4 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.2	0.2	99.9%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.6	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.5	1.1	99.6%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	238.8	239.9	21.7%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	62.1	302.0	1.4%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	3.5	305.5	0.3%
		Pan	0.9		
		Total Weight in Grams	306.4		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 13 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 316.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.5	0.5	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.6	1.1	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.7	1.8	99.4%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	113.1	114.9	63.7%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	195.6	310.5	2.0%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	5.2	315.7	0.3%
		Pan	1.1		
		Total Weight in Grams	316.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 14 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 326.4 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.5	0.5	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.7	1.2	99.6%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.8	2.0	99.4%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	78.4	80.4	75.4%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	234.9	315.3	3.4%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	9.7	325.0	0.4%
		Pan	1.4		
		Total Weight in Grams	326.4		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 15 - Stockpile 1

Date: 10/29/2001

Total Weight in Grams of Sample = 314.1 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.4	0.4	99.9%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.8	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	0.6	1.4	99.6%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	131.0	132.4	57.8%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	172.8	305.2	2.8%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	7.5	312.7	0.4%
		Pan	1.4		
		Total Weight in Grams	314.1		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 1 - Stockpile 2

Date: 10/26/2001

Total Weight in Grams of Sample = 309.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.7	0.7	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	1.1	99.6%
0.047	1.19	No. 16			
0.033	0.84	No. 20	2.1	3.2	99.0%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	100.8	104.0	66.4%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	197.5	301.5	2.7%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	5.8	307.3	0.8%
		Pan	2.5		
		Total Weight in Grams	309.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 2 - Stockpile 2

Date: 10/26/2001

Total Weight in Grams of Sample = 309.3 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.2	0.2	99.9%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.6	0.8	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	5.0	5.8	98.1%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	190.8	196.6	36.4%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	109	305.6	1.2%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	1.1	306.7	0.8%
		Pan	2.6		
		Total Weight in Grams	309.3		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 3 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 303.7 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.0	0.0	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.2	0.2	99.9%
0.047	1.19	No. 16			
0.033	0.84	No. 20	2.4	2.6	99.1%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	128.7	131.3	56.8%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	166.6	297.9	1.9%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	4.8	302.7	0.3%
		Pan	1.0		
		Total Weight in Grams	303.7		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 4 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 310.3 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	2.1	2.1	99.3%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	1.0	3.1	99.0%
0.047	1.19	No. 16			
0.033	0.84	No. 20	5.5	8.6	97.2%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	117	125.6	59.5%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	177.4	303.0	2.4%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	6.2	309.2	0.4%
		Pan	1.1		
		Total Weight in Grams	310.3		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 5 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 319.2 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.1	0.1	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.5	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	2.5	3.0	99.1%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	239.1	242.1	24.2%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	73.7	315.8	1.1%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	1.9	317.7	0.5%
		Pan	1.5		
		Total Weight in Grams	319.2		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 6 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 308.3 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.0	0.0	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.8	0.8	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	4.1	4.9	98.4%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	156.7	161.6	47.6%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	142.2	303.8	1.5%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	3.9	307.7	0.2%
		Pan	0.6		
		Total Weight in Grams	308.3		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 7 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 319.7 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.1	0.1	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.5	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	3.5	4.0	98.7%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	205.0	209.0	34.6%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	105.7	314.7	1.6%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	3.5	318.2	0.5%
		Pan	1.5		
		Total Weight in Grams	319.7		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 8 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 305.2 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.4	0.4	99.9%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.5	0.9	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	3.5	4.4	98.6%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	66.9	71.3	76.6%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	226.9	298.2	2.3%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	5.6	303.8	0.5%
		Pan	1.4		
		Total Weight in Grams	305.2		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 9 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 315.4 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.0	0.0	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.7	0.7	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	4.0	4.7	98.5%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	147.9	152.6	51.6%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	156.9	309.5	1.9%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	4.4	313.9	0.5%
		Pan	1.5		
		Total Weight in Grams	315.4		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 10 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 312.6 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.5	0.5	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.5	1.0	99.7%
0.047	1.19	No. 16			
0.033	0.84	No. 20	3.6	4.6	98.5%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	190.5	195.1	37.6%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	113.9	309.0	1.2%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	3.2	312.2	0.1%
		Pan	0.4		
		Total Weight in Grams	312.6		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 11 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 320.7 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.0	0.0	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.4	0.4	99.9%
0.047	1.19	No. 16			
0.033	0.84	No. 20	3.6	4.0	98.8%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	66.7	70.7	78.0%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	240.1	310.8	3.1%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	8.5	319.3	0.4%
		Pan	1.4		
		Total Weight in Grams	320.7		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 12 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 309.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.6	0.6	99.8%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.7	1.3	99.6%
0.047	1.19	No. 16			
0.033	0.84	No. 20	4.1	5.4	98.3%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	214.5	219.9	29.0%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	86.5	306.4	1.1%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	2.6	309.0	0.3%
		Pan	0.9		
		Total Weight in Grams	309.9		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 13 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 304.4 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.0	0.0	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.5	0.5	99.8%
0.047	1.19	No. 16			
0.033	0.84	No. 20	4.3	4.8	98.4%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	221.6	226.4	25.6%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	75.8	302.2	0.7%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	2.1	304.3	0.0%
		Pan	0.1		
		Total Weight in Grams	304.4		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 14 - Stockpile 2

Date: 10/29/2001

Total Weight in Grams of Sample = 303.8 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	1.4	1.4	99.5%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.3	1.7	99.4%
0.047	1.19	No. 16			
0.033	0.84	No. 20	3.4	5.1	98.3%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	110.8	115.9	61.8%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	180.3	296.2	2.5%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	5.9	302.1	0.6%
		Pan	1.7		
		Total Weight in Grams	303.8		

Weaver Boos & Gordon, Inc.

ASTM - 136
STANDARD TEST METHOD FOR SIEVE ANALYSIS
OF FINE AND COARSE AGGREGATES

Project: Camino Real Landfill - Cell 7B/8A Construction

Material: Protective Cover Soil Layer (Sand)

Sample Number: Sample 15 - Stockpile 2

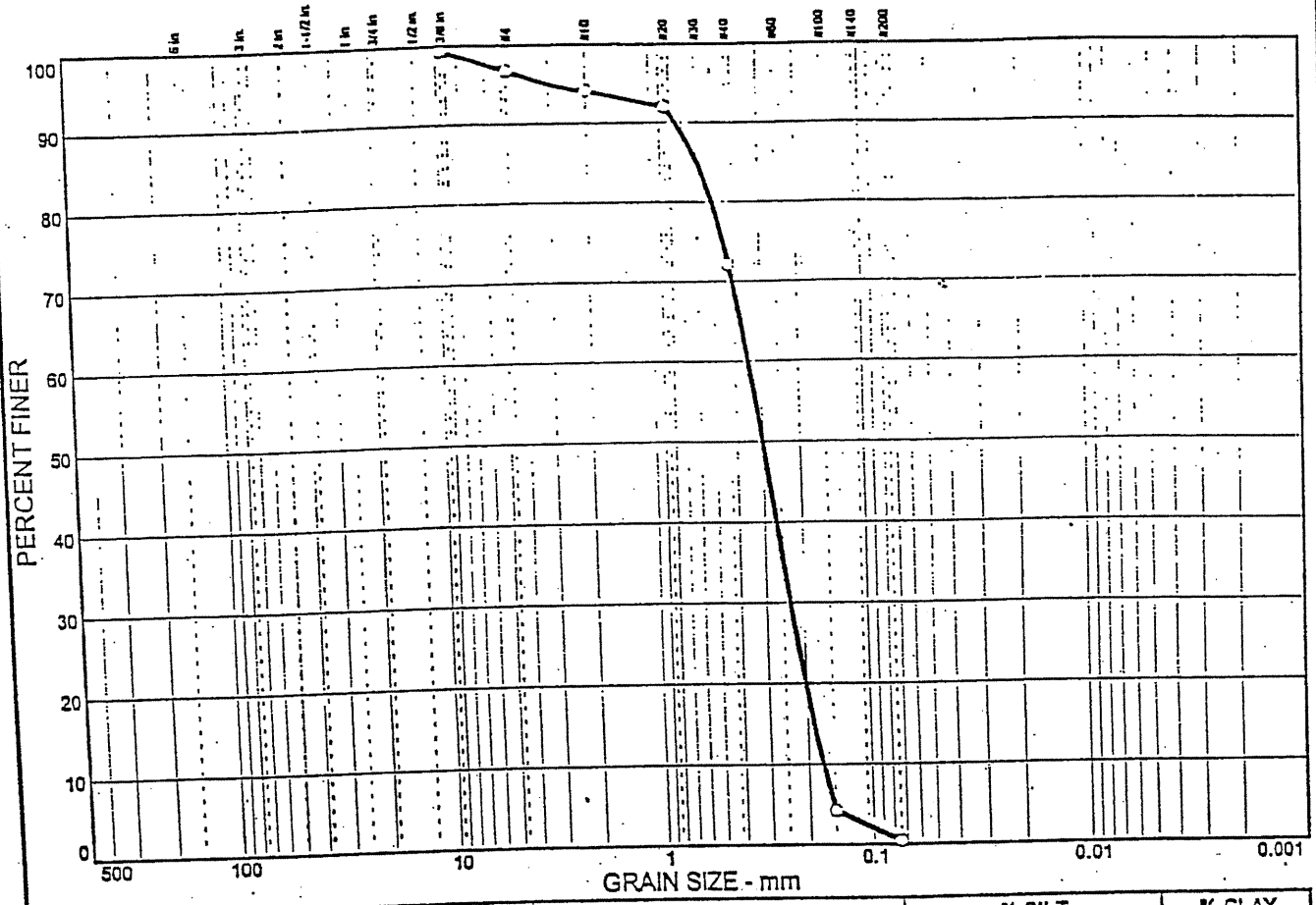
Date: 10/29/2001

Total Weight in Grams of Sample = 318.5 grams

Analysis Completed By: Mike Heinstein
Computed By: Mike Heinstein
Checked By: _____

Sieve Opening Sizes		U.S. Standard Seive Size or Number	Weight Retained in Grams	Cumulative Retained By Weight in Grams	Percent Finer By Weight
Inches	Millimeters				
3.00		3-in.			
2.00		2-in.			
1.50		1-1/2-in.			
1.00	25.4	1-in.			
0.750	19.1	3/4-in.			
0.500	12.7	1/2-in.			
0.375	9.52	3/8-in.	0.0	0.0	100.0%
0.250	6.35	No. 3			
0.187	4.76	No. 4	0.1	0.1	100.0%
0.132	3.36	No. 6			
0.094	2.38	No. 8			
0.079	2.00	No. 10	0.2	0.3	99.9%
0.047	1.19	No. 16			
0.033	0.84	No. 20	3.9	4.2	98.7%
0.023	0.59	No. 30			
0.0165	0.42	No. 40	187.1	191.3	39.9%
0.0117	0.297	No. 50			
0.0083	0.210	No. 70			
0.0059	0.149	No. 100	121.8	313.1	1.7%
0.0041	0.105	No. 140			
0.0029	0.074	No. 200	4.1	317.2	0.4%
		Pan	1.3		
		Total Weight in Grams	318.5		

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		96.3	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	99.3		
#4	96.7		
#10	94.1		
#20	92.0		
#40	72.1		
#100	4.2		
#200	0.4		

* (no specification provided)

Soil Description

Cell 8B borrow area full sieve

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.598 D_{60}= 0.349 D_{50}= 0.304
D_{30}= 0.233 D_{15}= 0.187 D_{10}= 0.171
C_u= 2.04 C_c= 0.91

Classification

USCS= AASHTO=

Remarks

Sample No.: #5 Source of Sample: Cell 8b Date: 10/23/03
Location: Elev./Depth:

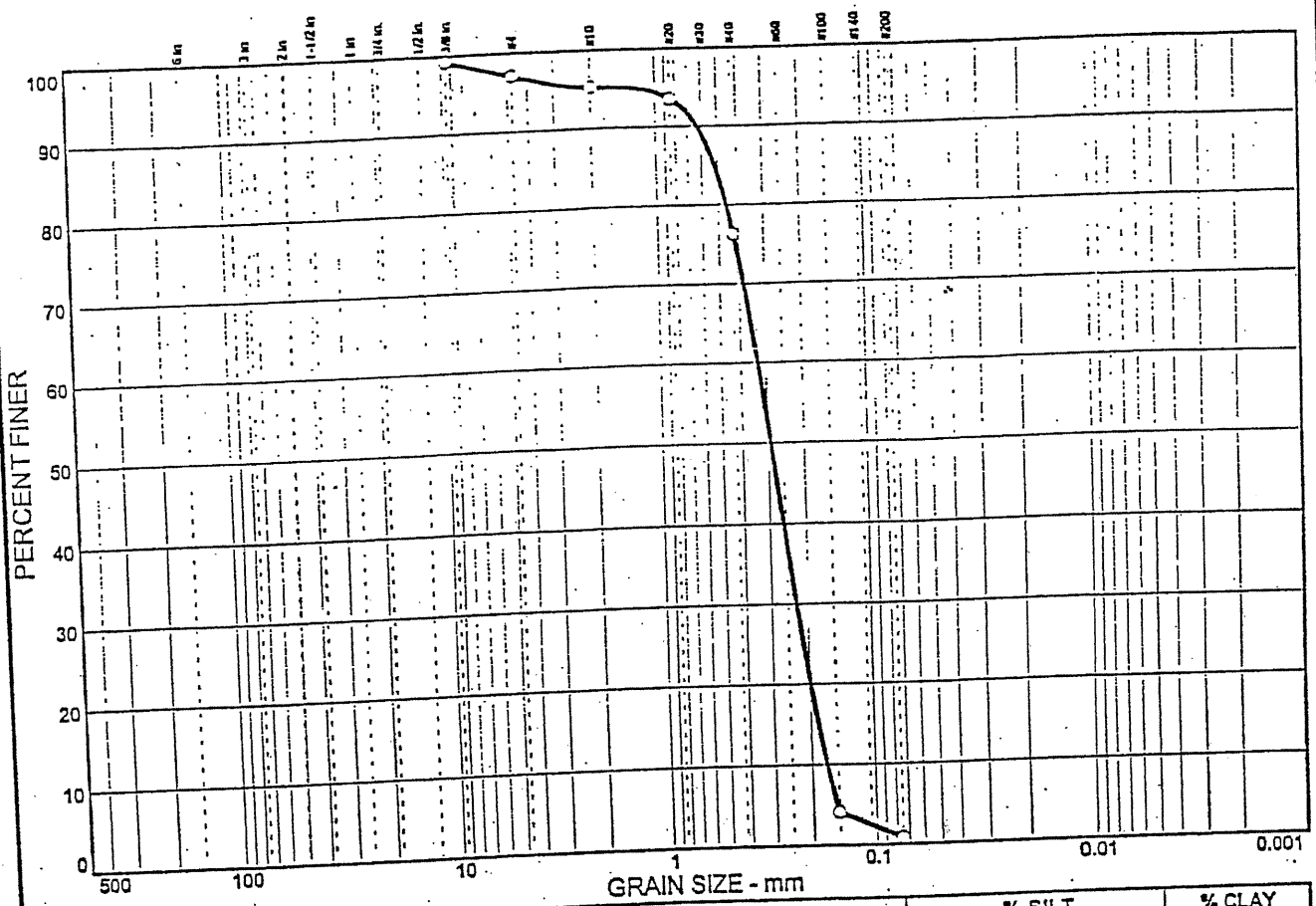
Gordon Environmental, Inc.
Consulting Engineers

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

V.1.F-183

Project No: 111.01.01/05 Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		96.2	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	99.2		
#4	97.0		
#10	95.2		
#20	93.5		
#40	76.3		
#100	4.1		
#200	0.8		

* (no specification provided)

Soil Description

Cell 8B borrow area full sieve

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.520 D_{60}= 0.332 D_{50}= 0.292
D_{30}= 0.228 D_{15}= 0.185 D_{10}= 0.170
C_u= 1.95 C_c= 0.92

Classification

USCS= AASHTO=

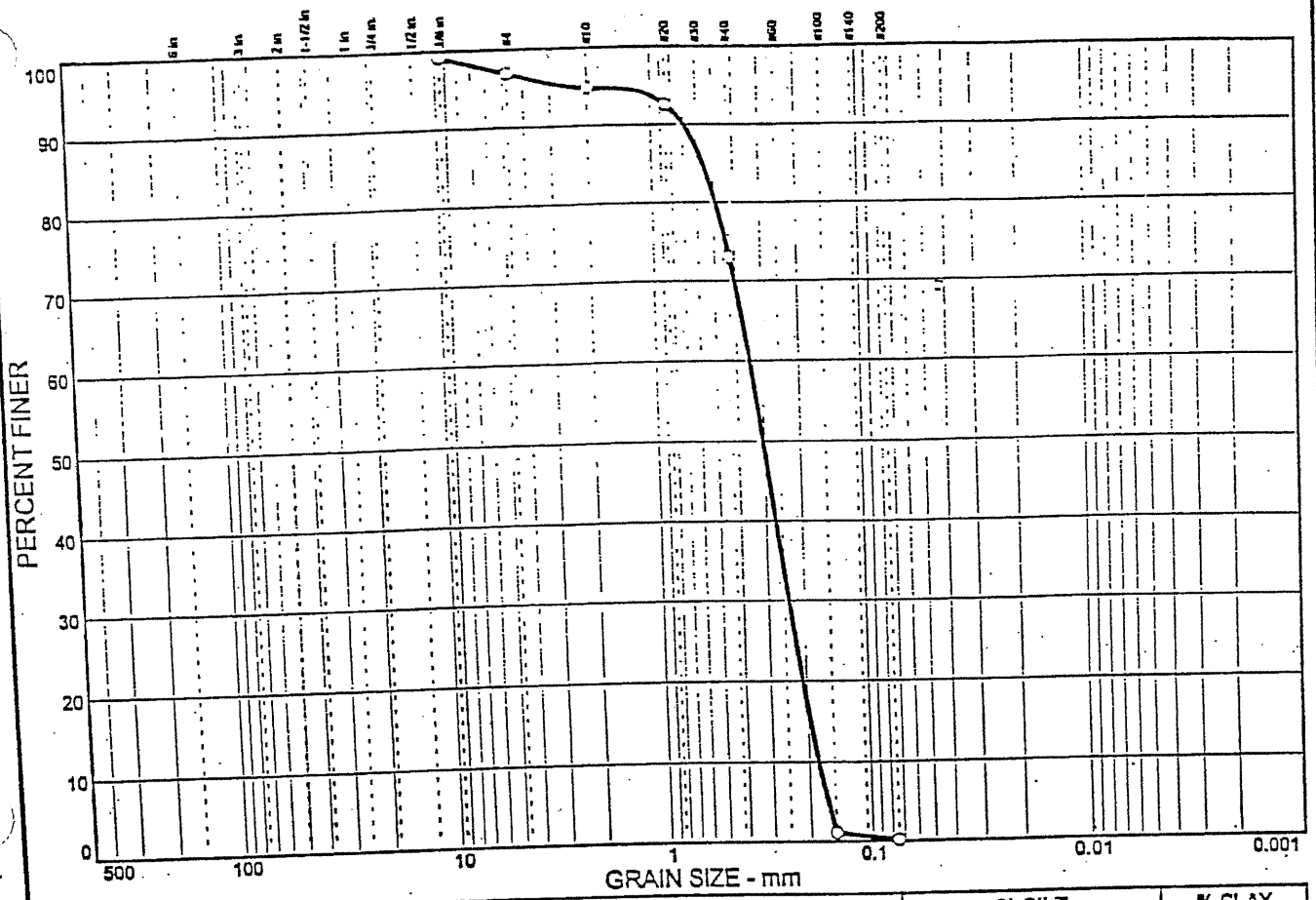
Remarks

Sample No.: #6 Source of Sample: Cell 8b Date: 10/23/03
Location: Elev./Depth:

Gordon Environmental, Inc.
Consulting Engineers

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction
Project No: 111.01.01/05 Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		96.8	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8 in.	99.1		
#4	96.9		
#10	94.8		
#20	92.5		
#40	73.0		
#100	1.1		
#200	0.1		

* (no specification provided)

Soil Description

Cell 8B borrow area full sieve

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.563 D_{60}= 0.349 D_{50}= 0.306
D_{30}= 0.239 D_{15}= 0.195 D_{10}= 0.180
C_u= 1.94 C_c= 0.91

Classification

USCS= AASHTO=

Remarks

Sample No.: #15 Source of Sample: Cell 8b Date: 10/23/03

Location: Elev./Depth:

Gordon Environmental, Inc.
Consulting Engineers

Client: Camino Real Environmental Center, Inc.

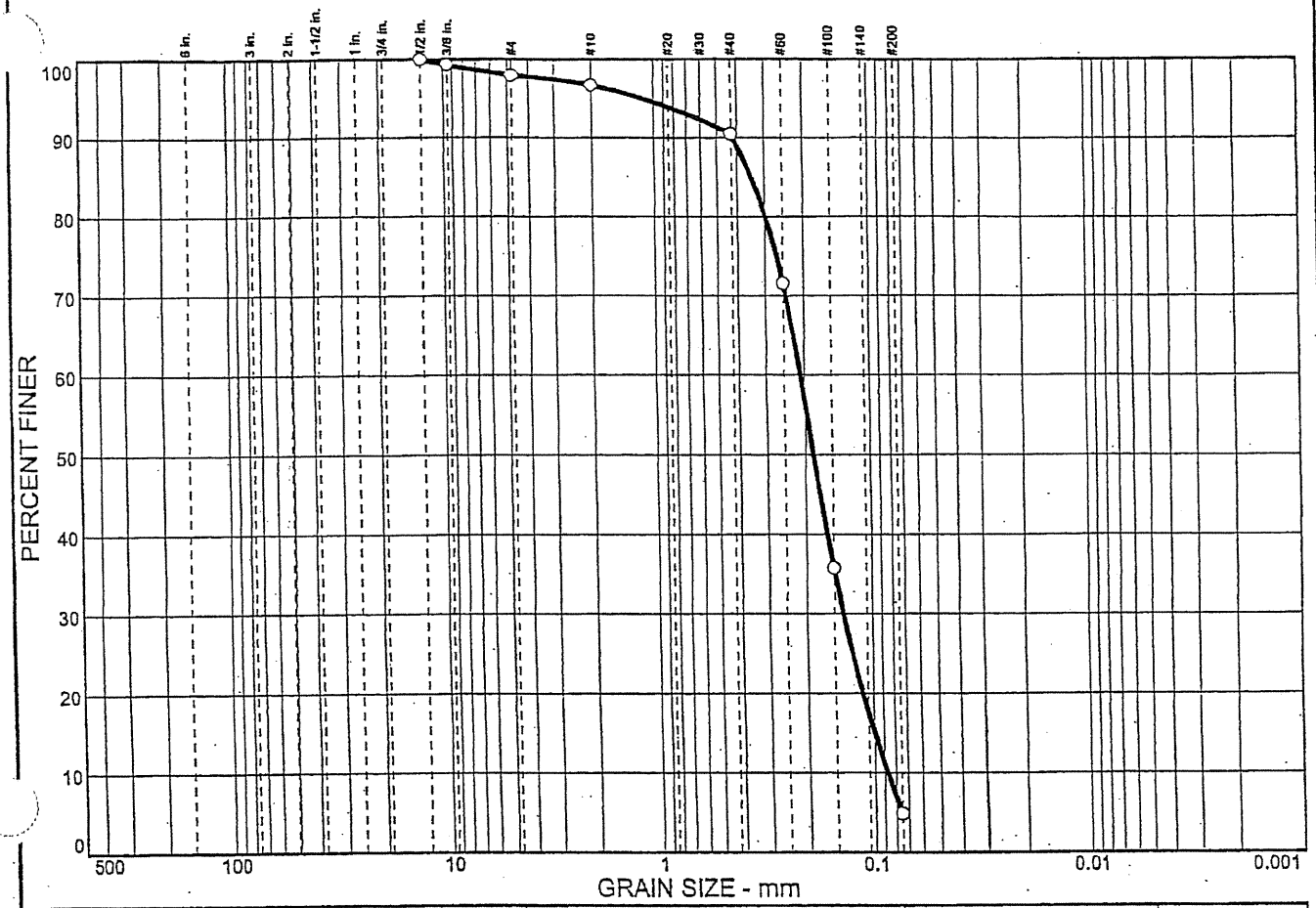
Project: Cell 8b construction

Project No: 111.01.01/05

V.1.F-185

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.1	93.0	4.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.3		
#4	97.9		
#10	96.7		
#40	90.5		
#60	71.6		
#100	35.8		
#200	4.9		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.345 D_{60}= 0.210 D_{50}= 0.183
D_{30}= 0.136 D_{15}= 0.0993 D_{10}= 0.0869
C_u= 2.41 C_c= 1.02

Classification

USCS= SP AASHTO=

Remarks

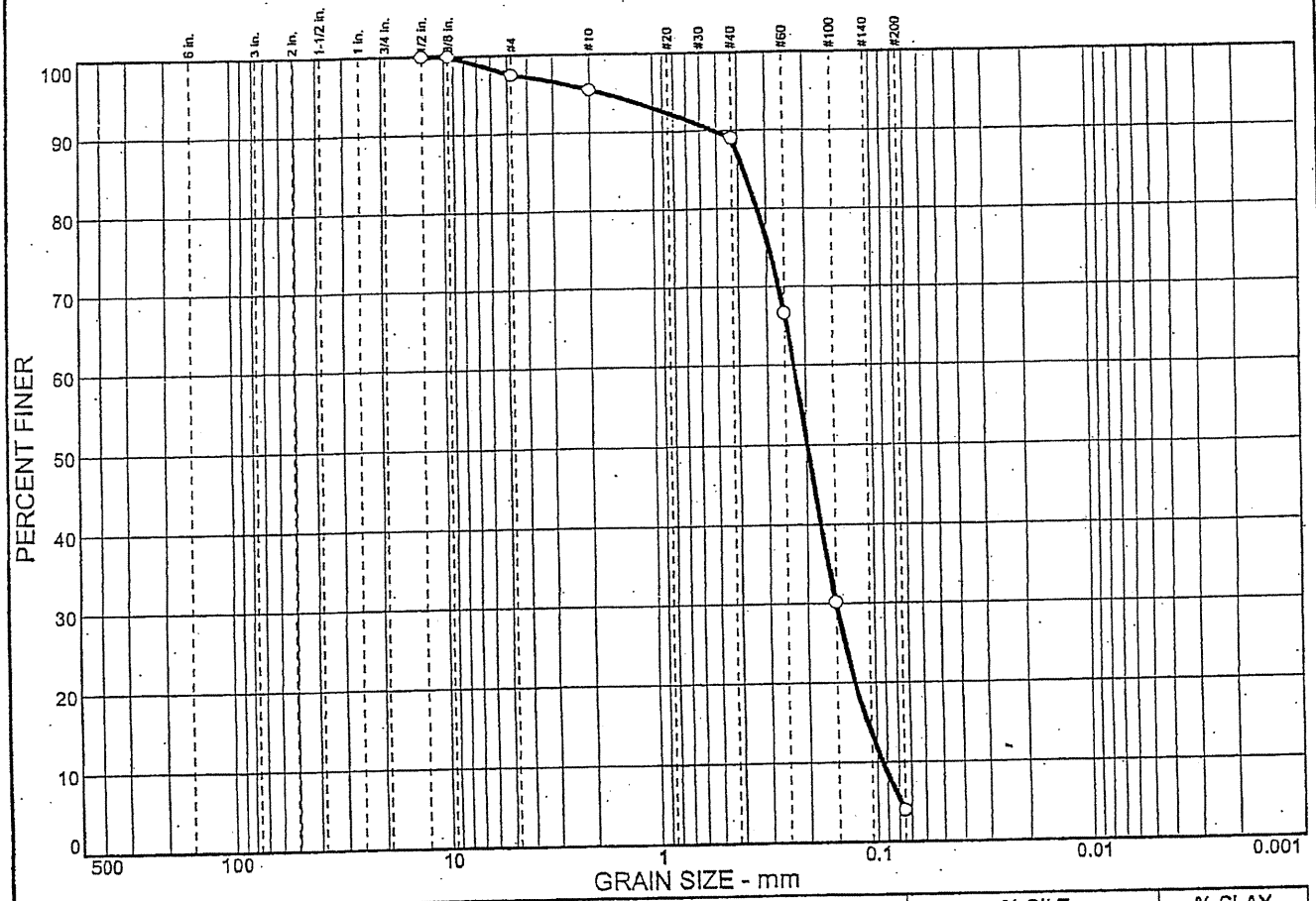
Sample No.: PSL1 Source of Sample: Cell 9 Date: 10/09/05
Location: Elev./Depth: Stockpile

V.1.F-187

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.5	93.5	4.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	97.5		
#10	95.5		
#40	89.0		
#60	66.7		
#100	30.2		
#200	4.0		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.376 D_{60}= 0.226 D_{50}= 0.197
D_{30}= 0.150 D_{15}= 0.109 D_{10}= 0.0939
C_u= 2.41 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

Sample No.: PSL2 Source of Sample: Cell 9 Date: 10/09/05
Location: Elev./Depth: Stockpile

V.1.F-188

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction
Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		93.5	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	98.4		
3/8 in.	98.2		
#4	97.3		
#10	96.4		
#20	89.9		
#60	68.4		
#100	30.7		
#200	3.8		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.590 D_{60}= 0.225 D_{50}= 0.198
D_{30}= 0.148 D_{15}= 0.107 D_{10}= 0.0926
C_u= 2.43 C_c= 1.05

Classification

USCS= SP AASHTO=

Remarks

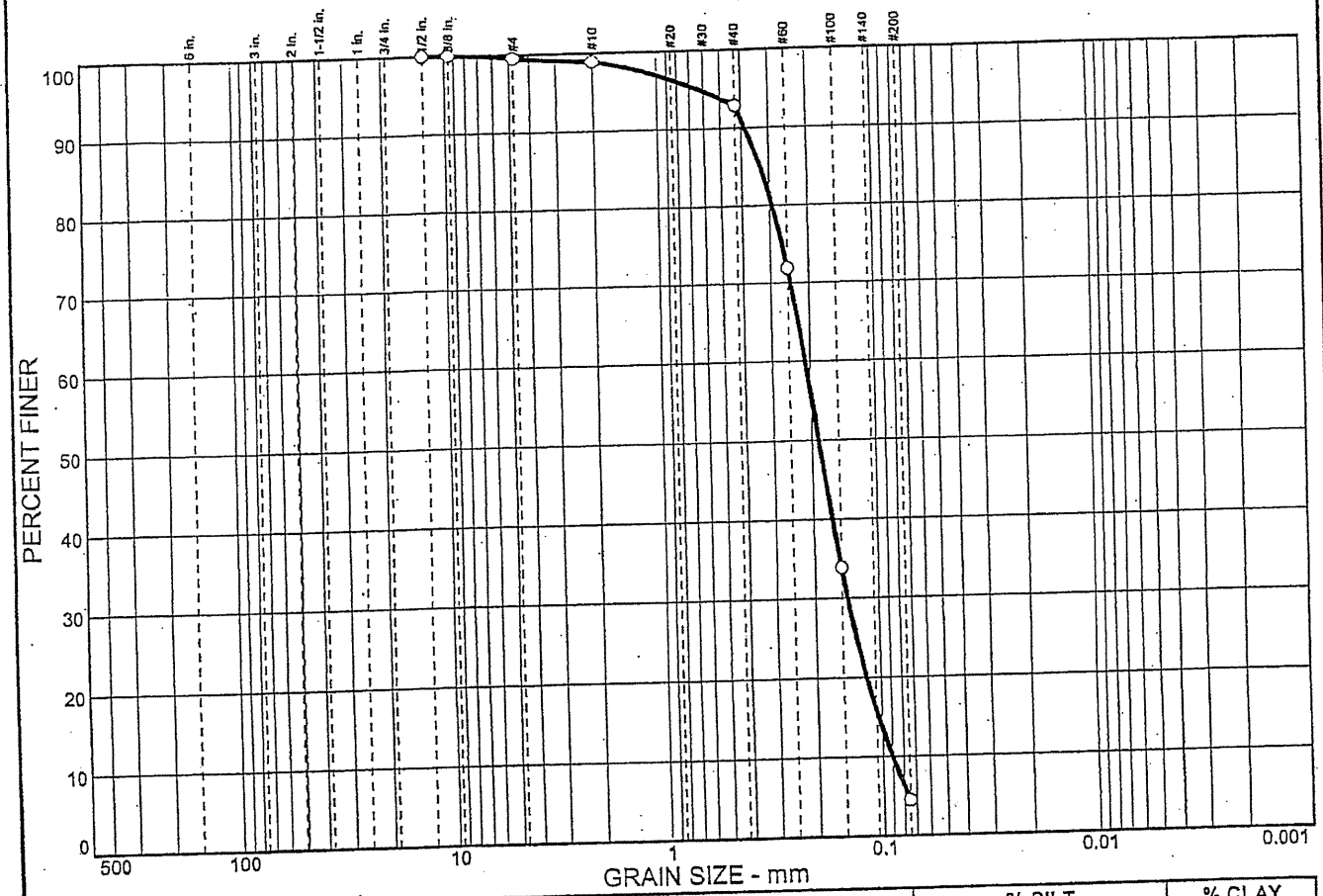
Sample No.: PSL3 Source of Sample: Cell 9 Date: 11/01/05
Location: Elev./Depth: Stockpile

V.1.F-189

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.5	95.0	4.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	99.5		
#10	98.9		
#40	92.9		
#60	71.9		
#100	33.9		
#200	4.5		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.329 D_{60}= 0.211 D_{50}= 0.186
D_{30}= 0.141 D_{15}= 0.103 D_{10}= 0.0896
C_u= 2.36 C_c= 1.05

Classification

USCS= SP AASHTO=

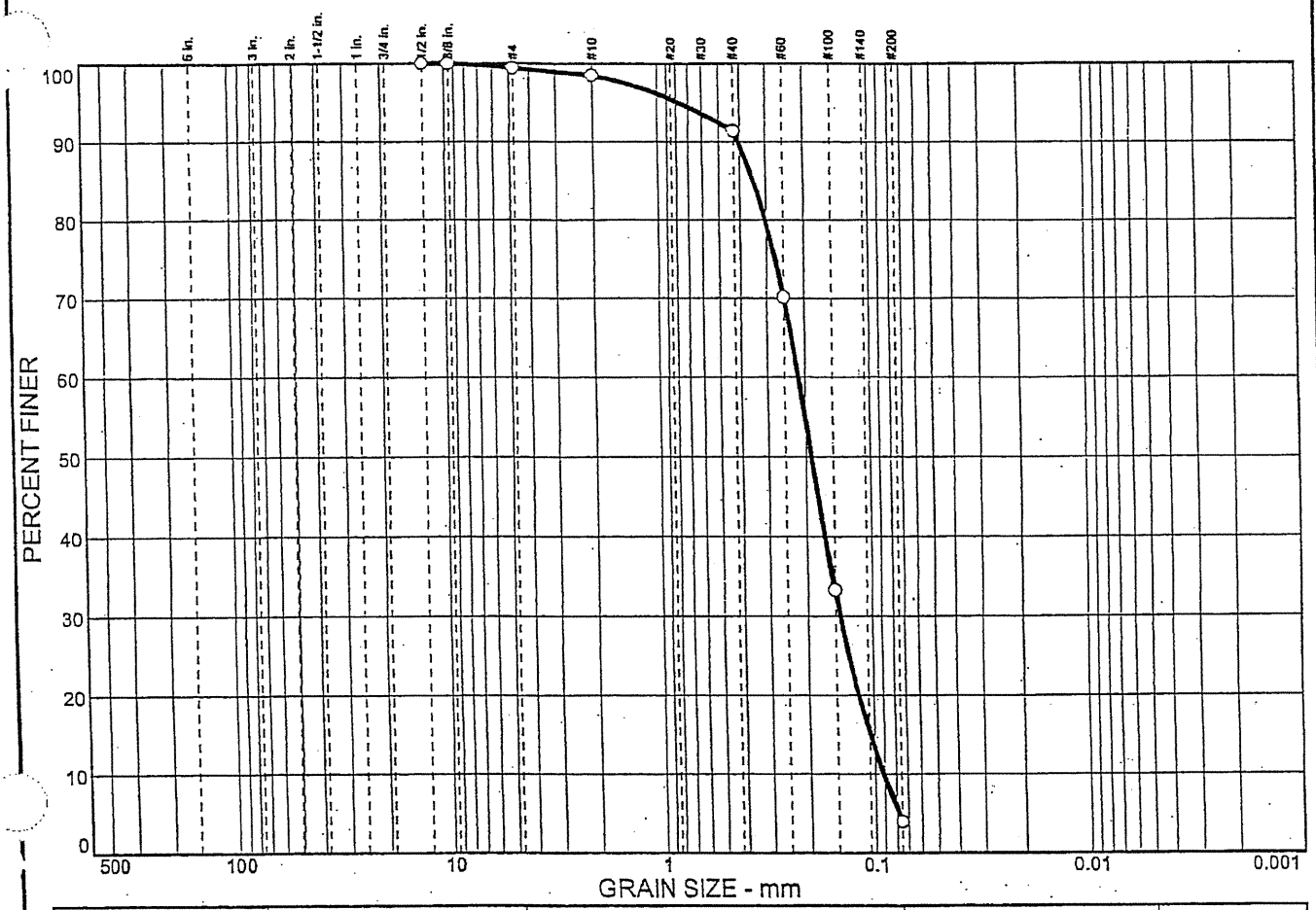
Remarks

Sample No.: PSL4 Source of Sample: Cell 9 Date: 11/03/05
Location: Elev./Depth: Stockpile

V.1.F-190

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction
Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.6	95.4	4.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	99.4		
#10	98.5		
#40	91.4		
#60	70.2		
#100	33.3		
#200	4.0		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.346 D_{60}= 0.215 D_{50}= 0.189
D_{30}= 0.142 D_{15}= 0.104 D_{10}= 0.0907
C_u= 2.37 C_c= 1.04

Classification

USCS= SP AASHTO=

Remarks

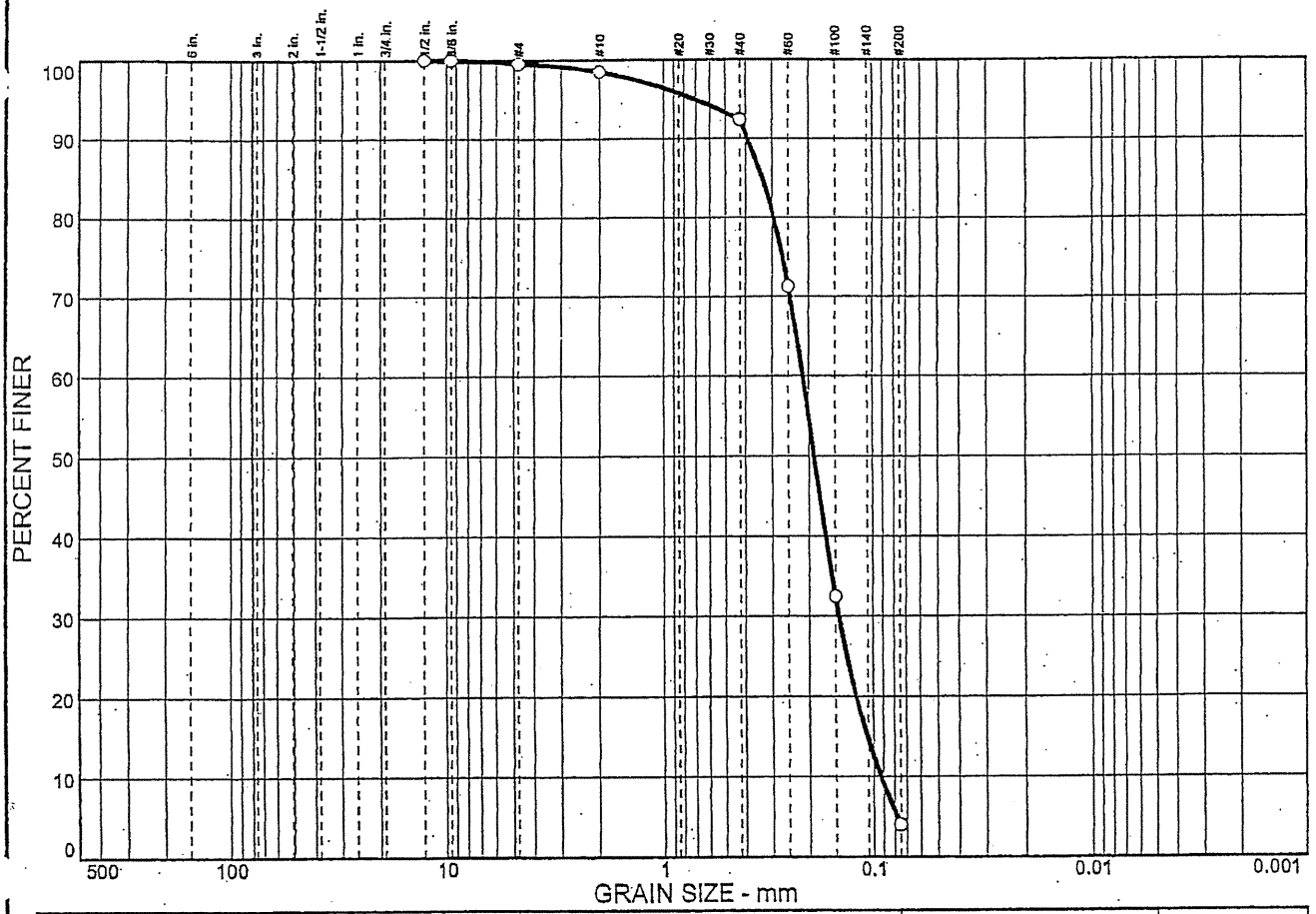
Sample No.: PSL5 Source of Sample: Cell 9 Date: 11/03/05
Location: Elev./Depth: Stockpile

V.1.F-191

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.5	95.5	4.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	99.5		
#10	98.5		
#40	92.4		
#60	71.3		
#100	32.5		
#200	4.0		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.333 D_{60}= 0.214 D_{50}= 0.189
D_{30}= 0.144 D_{15}= 0.107 D_{10}= 0.0922
C_u= 2.32 C_c= 1.06

Classification

USCS= SP AASHTO=

Remarks

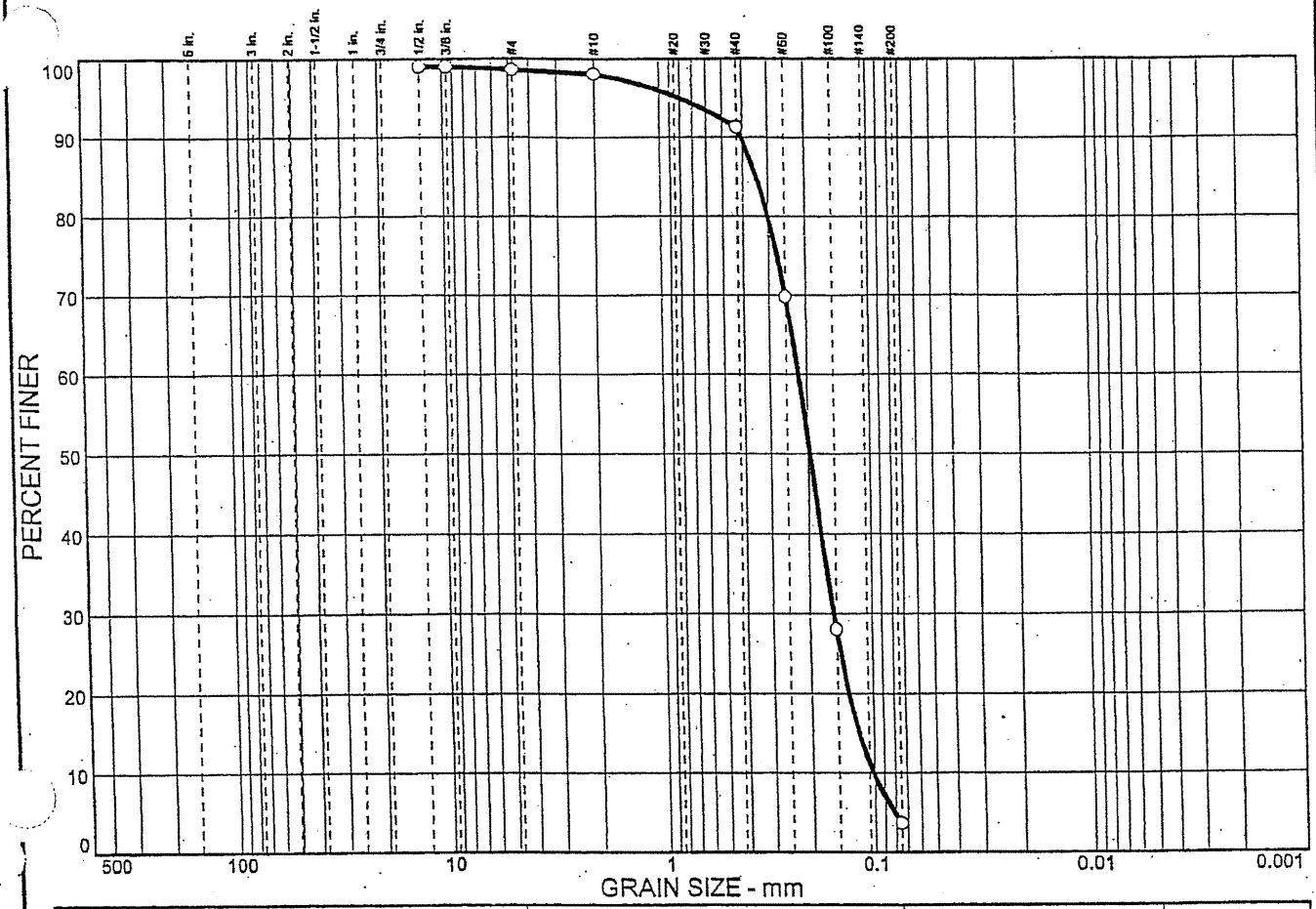
Sample No.: PSL6 Source of Sample: Cell 9 Date: 11/03/05
Location: Elev./Depth: Stockpile

V.1.F-192

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		94.9	3.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	99.0		
3/8 in.	99.0		
#4	98.6		
#10	98.1		
#40	91.3		
#60	69.8		
#100	28.1		
#200	3.7		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.342 D_{60}= 0.220 D_{50}= 0.196
D_{30}= 0.154 D_{15}= 0.117 D_{10}= 0.101
C_u= 2.18 C_c= 1.07

Classification

USCS= SP AASHTO=

Remarks

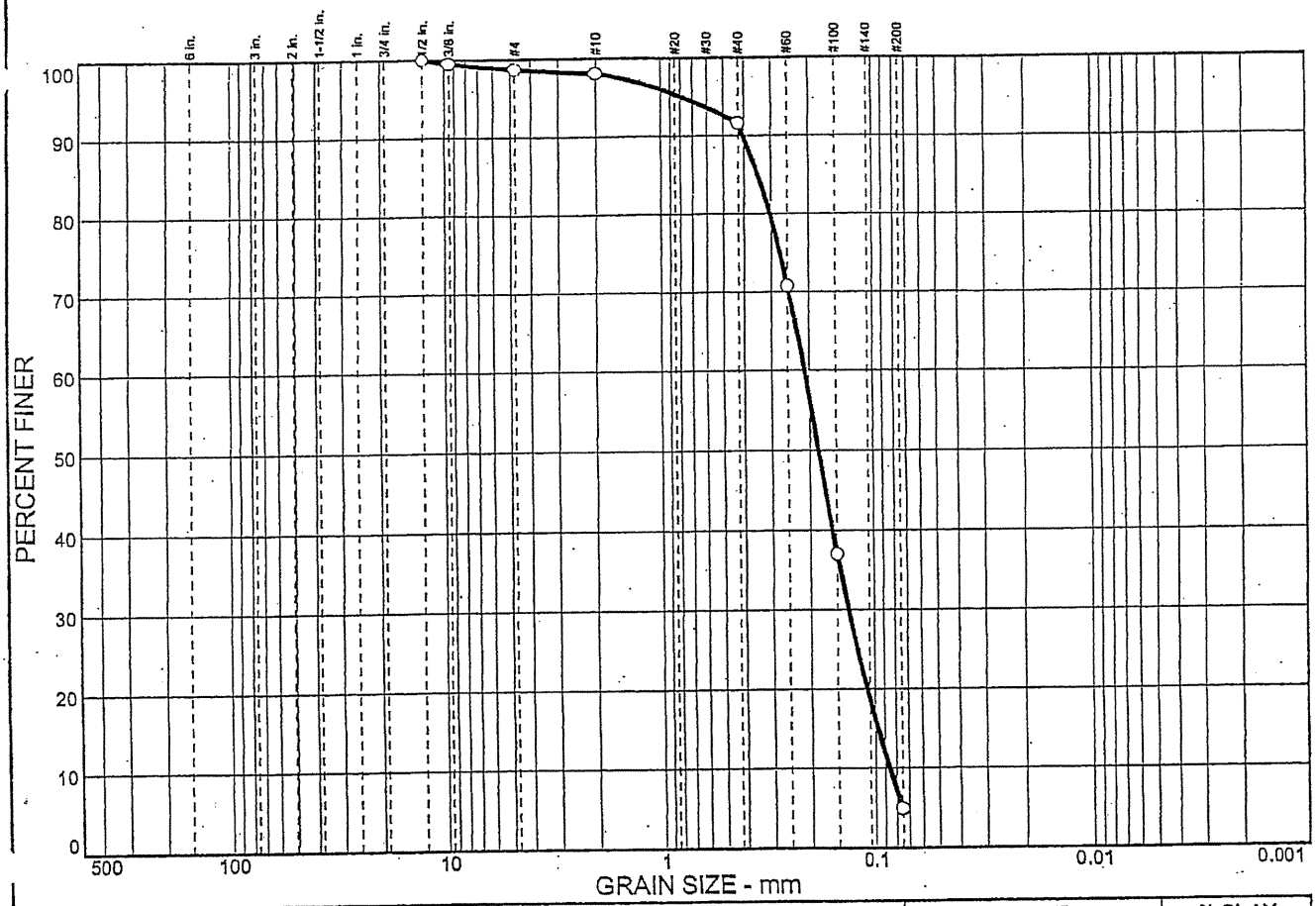
Sample No.: PSL7 Source of Sample: Cell 9 Date: 11/03/05
Location: Elev./Depth: Stockpile

V.1.F-193

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.3	93.8	4.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.5		
#4	98.7		
#10	98.1		
#40	91.6		
#60	70.8		
#100	37.1		
#200	4.9		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.346 D_{60}= 0.210 D_{50}= 0.182
D_{30}= 0.133 D_{15}= 0.0968 D_{10}= 0.0855
C_u= 2.46 C_c= 0.98

Classification

USCS= SP AASHTO=

Remarks

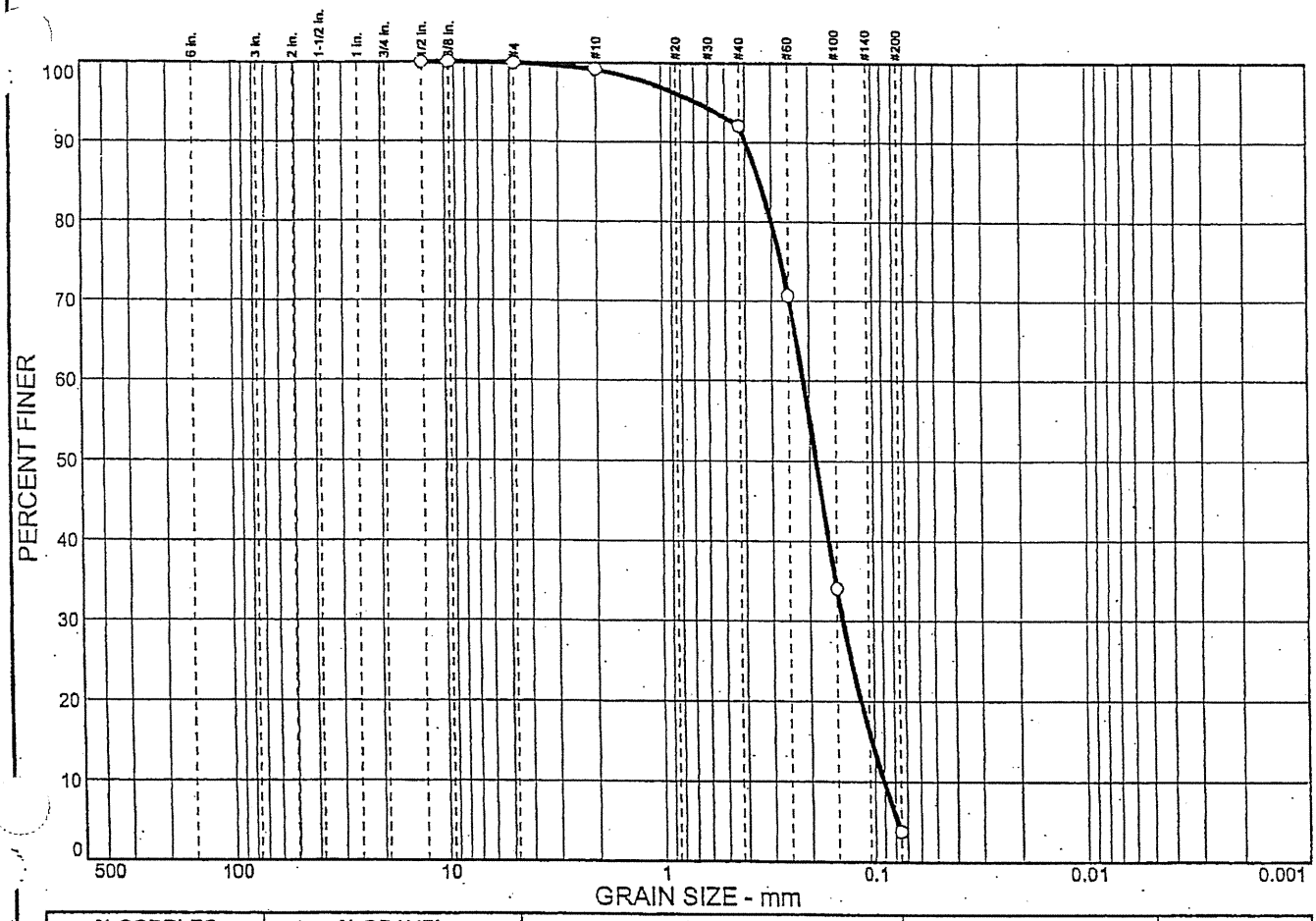
Sample No.: PSL8 Source of Sample: Cell 9 Date: 11/03/05
Location: Elev./Depth: Stockpile

V.1.F-194

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.1	96.1	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	99.9		
#10	99.2		
#40	92.1		
#60	70.7		
#100	34.1		
#200	3.8		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.340 D_{60}= 0.213 D_{50}= 0.187
D_{30}= 0.140 D_{15}= 0.103 D_{10}= 0.0902
C_u= 2.37 C_c= 1.03

Classification

USCS= SP AASHTO=

Remarks

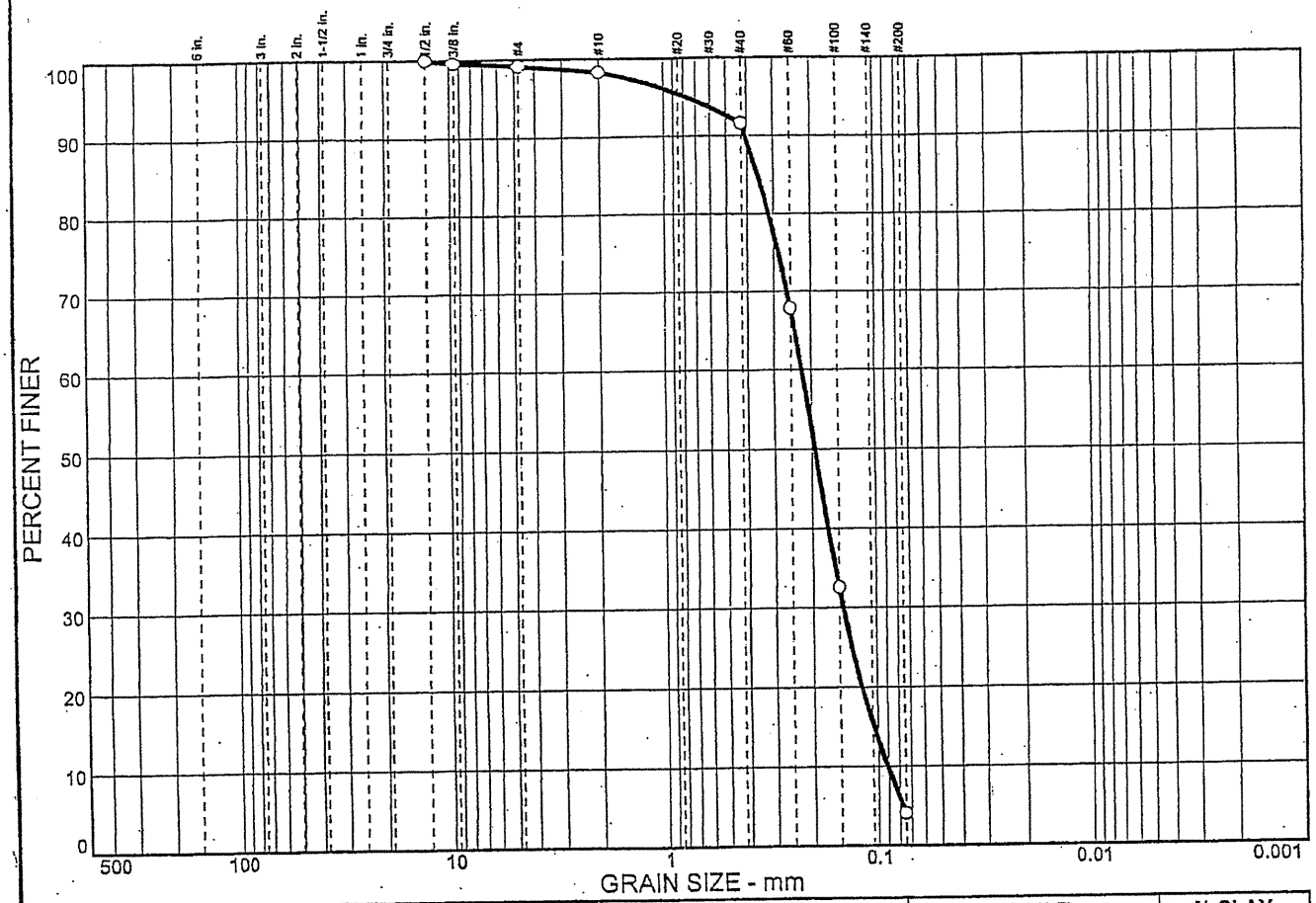
Sample No.: PSL9 Source of Sample: Cell 9 Date: 11/03/05
Location: Elev./Depth: Stockpile

V.1.F-195

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.9	95.0	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.6		
#4	99.1		
#10	98.3		
#40	91.6		
#60	67.9		
#100	32.6		
#200	4.1		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.356 D_{60}= 0.222 D_{50}= 0.193
D_{30}= 0.144 D_{15}= 0.104 D_{10}= 0.0904
C_u= 2.45 C_c= 1.03

Classification

USCS= SP AASHTO=

Remarks

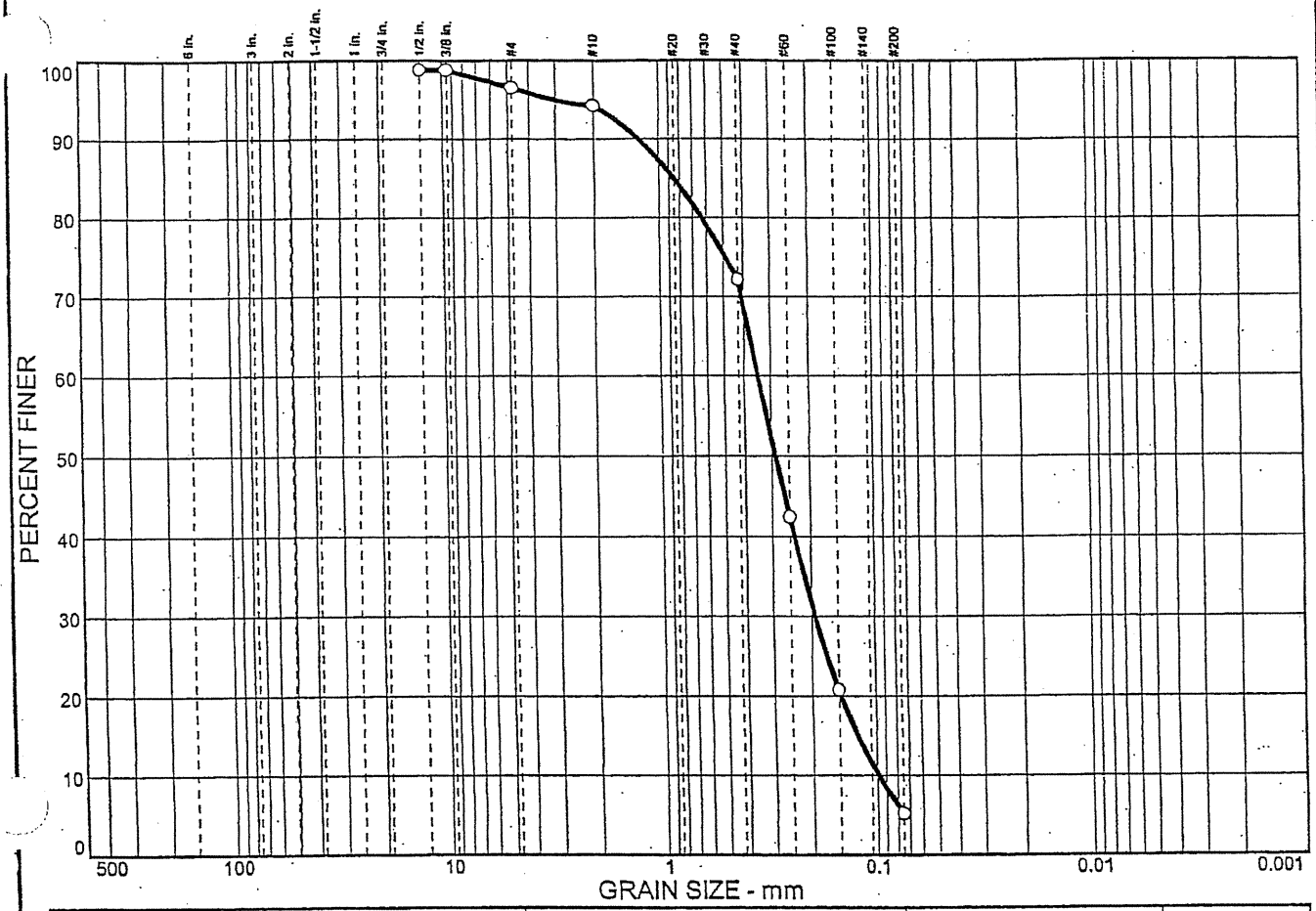
Sample No.: PSL10 Source of Sample: Cell 9 Date: 11/07/05
Location: Elev./Depth: Stockpile

V.1.F-196

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		91.3	5.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	98.8		
3/8 in.	98.8		
#4	96.5		
#10	94.3		
#40	72.2		
#60	42.5		
#100	20.8		
#200	5.2		

* (no specification provided)

Soil Description

Poorly graded sand with silt

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.852 D_{60}= 0.344 D_{50}= 0.288
D_{30}= 0.192 D_{15}= 0.122 D_{10}= 0.0976
C_u= 3.52 C_c= 1.10

Classification

USCS= SP-SM AASHTO=

Remarks

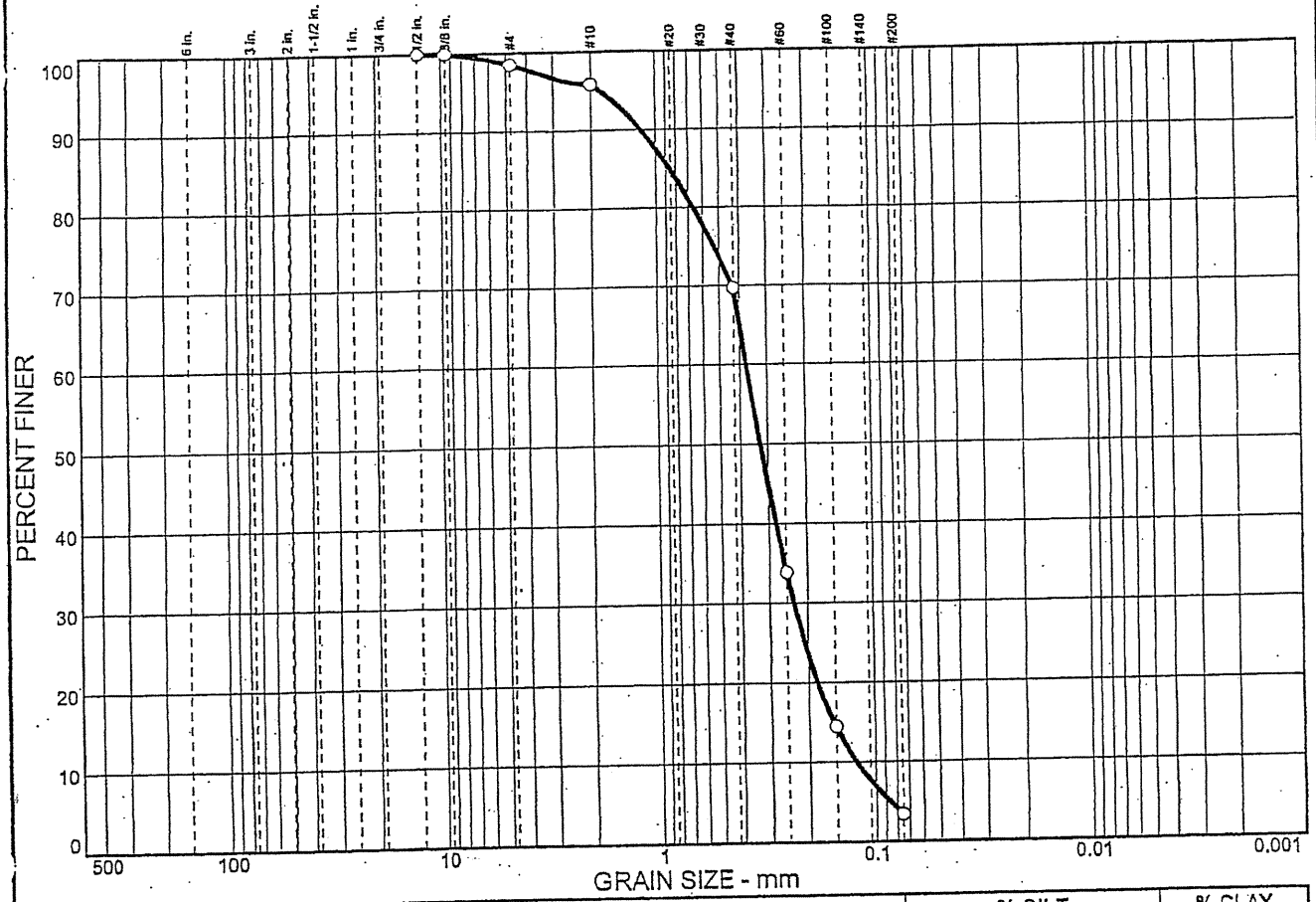
Sample No.: PSL11 Source of Sample: Cell 9 Date: 11/07/05
Location: Elev./Depth: Stockpile

V.1.F-197

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.5	95.1	3.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.5		
#10	95.9		
#40	69.7		
#60	33.9		
#100	14.5		
#200	3.4		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.858 D_{60}= 0.372 D_{50}= 0.323
D_{30}= 0.232 D_{15}= 0.153 D_{10}= 0.121
C_u= 3.07 C_c= 1.19

Classification

USCS= SP AASHTO=

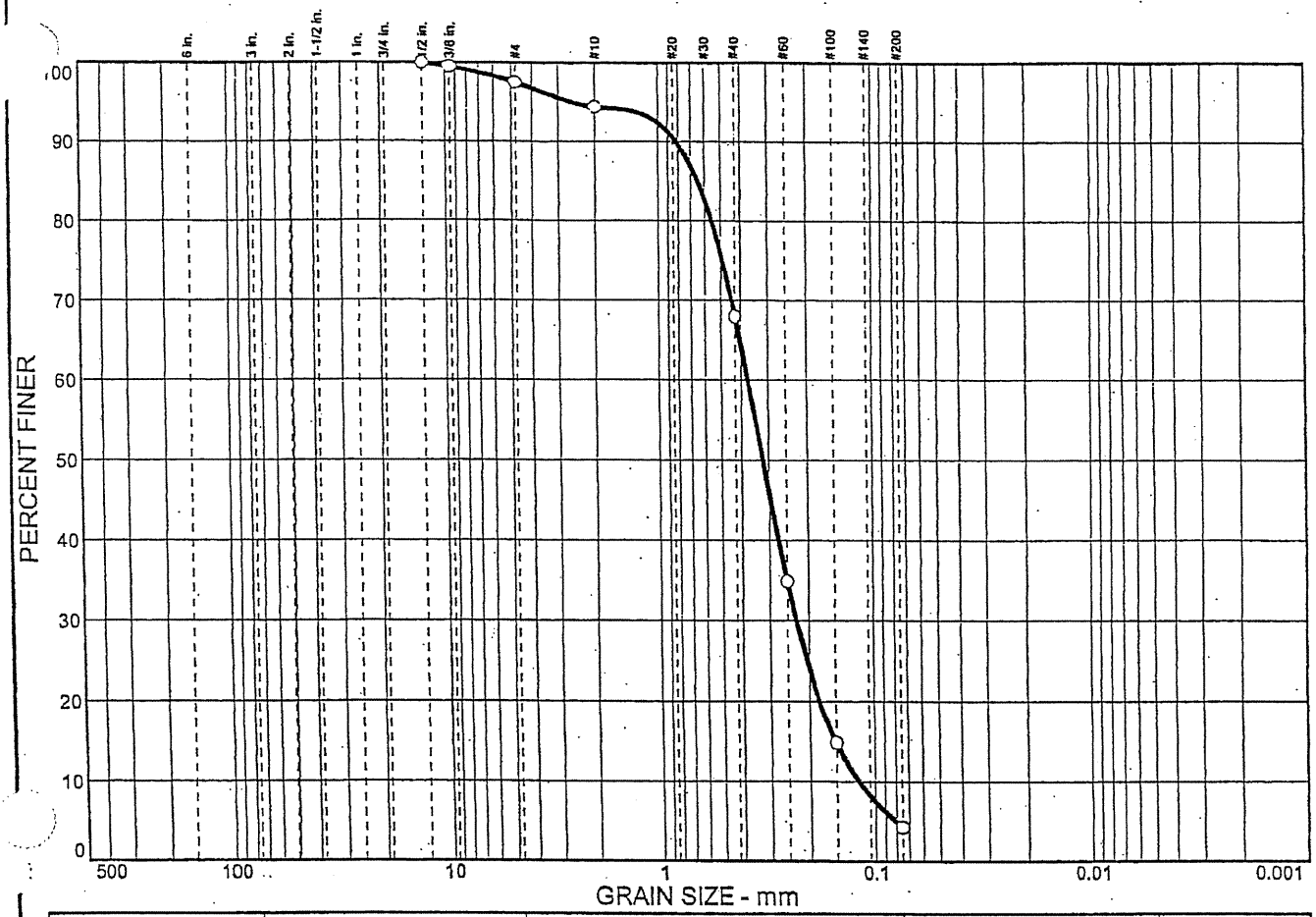
Remarks

Sample No.: PSL12 Source of Sample: Cell 9 Date: 11/07/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.5	93.2	4.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.5		
#4	97.5		
#10	94.4		
#40	68.0		
#60	34.9		
#100	14.9		
#200	4.3		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.647 D_{60}= 0.372 D_{50}= 0.319
D_{30}= 0.228 D_{15}= 0.151 D_{10}= 0.118
C_u= 3.14 C_c= 1.18

Classification

USCS= SP AASHTO=

Remarks

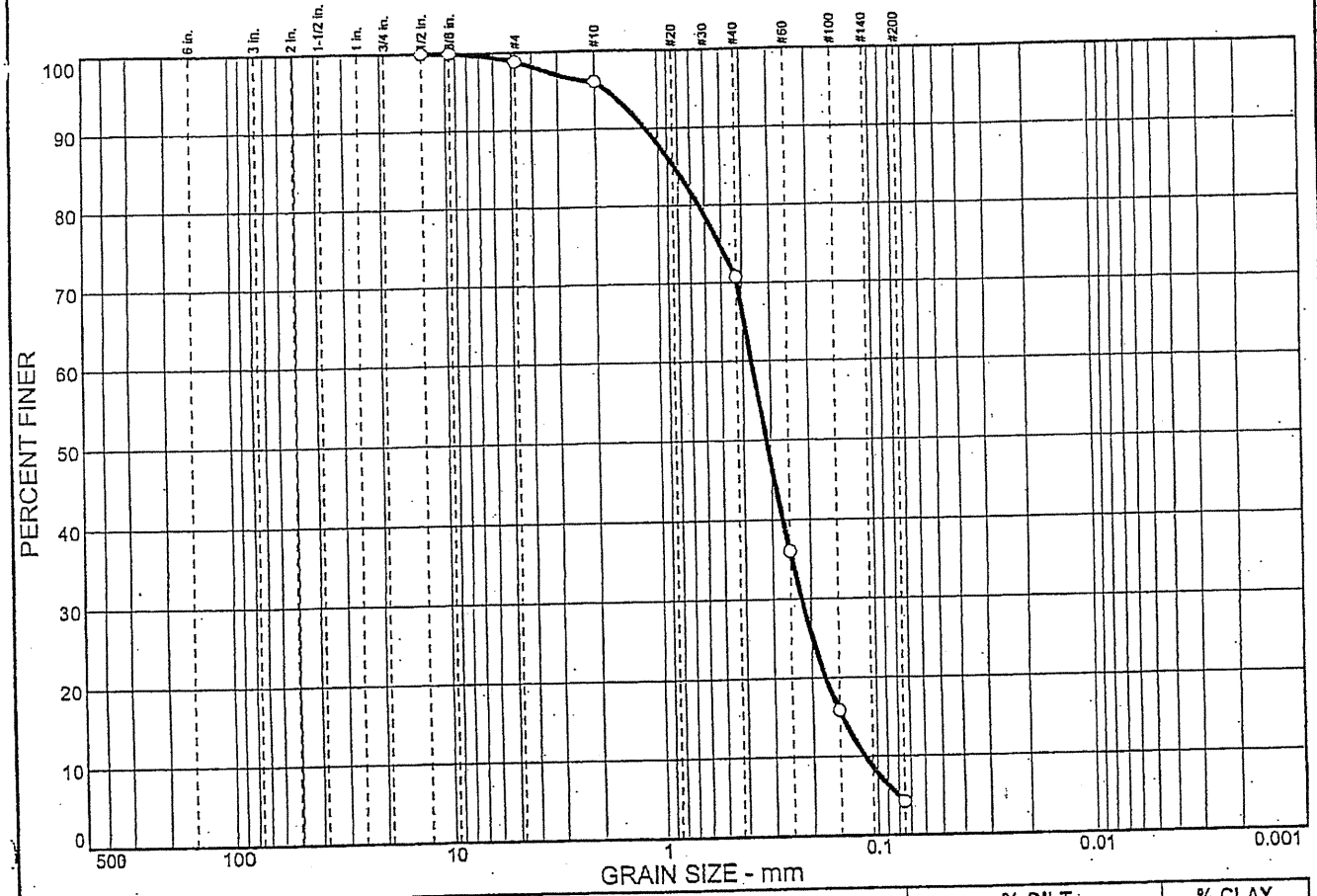
Sample No.: PSL13 Source of Sample: Cell 9 Date: 11/07/05
Location: Elev./Depth: Stockpile

V.1.F-199

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.2	94.6	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.8		
#10	96.1		
#40	70.8		
#60	36.1		
#100	15.9		
#200	4.2		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.832 D_{60}= 0.364 D_{50}= 0.314
D_{30}= 0.222 D_{15}= 0.145 D_{10}= 0.114
C_u= 3.19 C_c= 1.18

Classification

USCS= SP AASHTO=

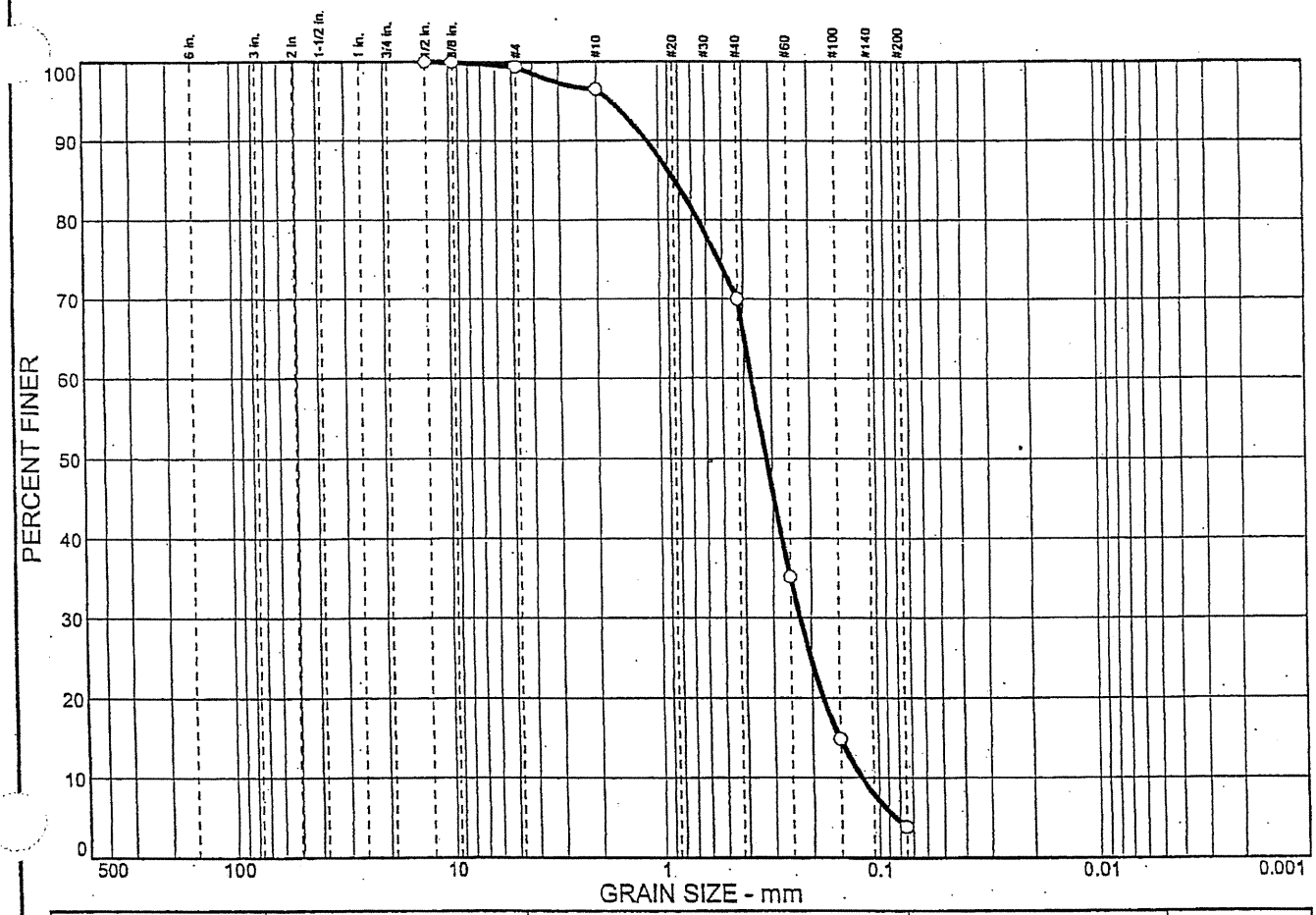
Remarks

Sample No.: PSL14 Source of Sample: Cell 9 Date: 11/07/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.6	95.5	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	99.4		
#10	96.5		
#40	70.0		
#60	35.2		
#100	14.9		
#200	3.9		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.839 D_{60}= 0.368 D_{50}= 0.318
D_{30}= 0.226 D_{15}= 0.151 D_{10}= 0.120
C_u= 3.07 C_c= 1.16

Classification

USCS= SP AASHTO=

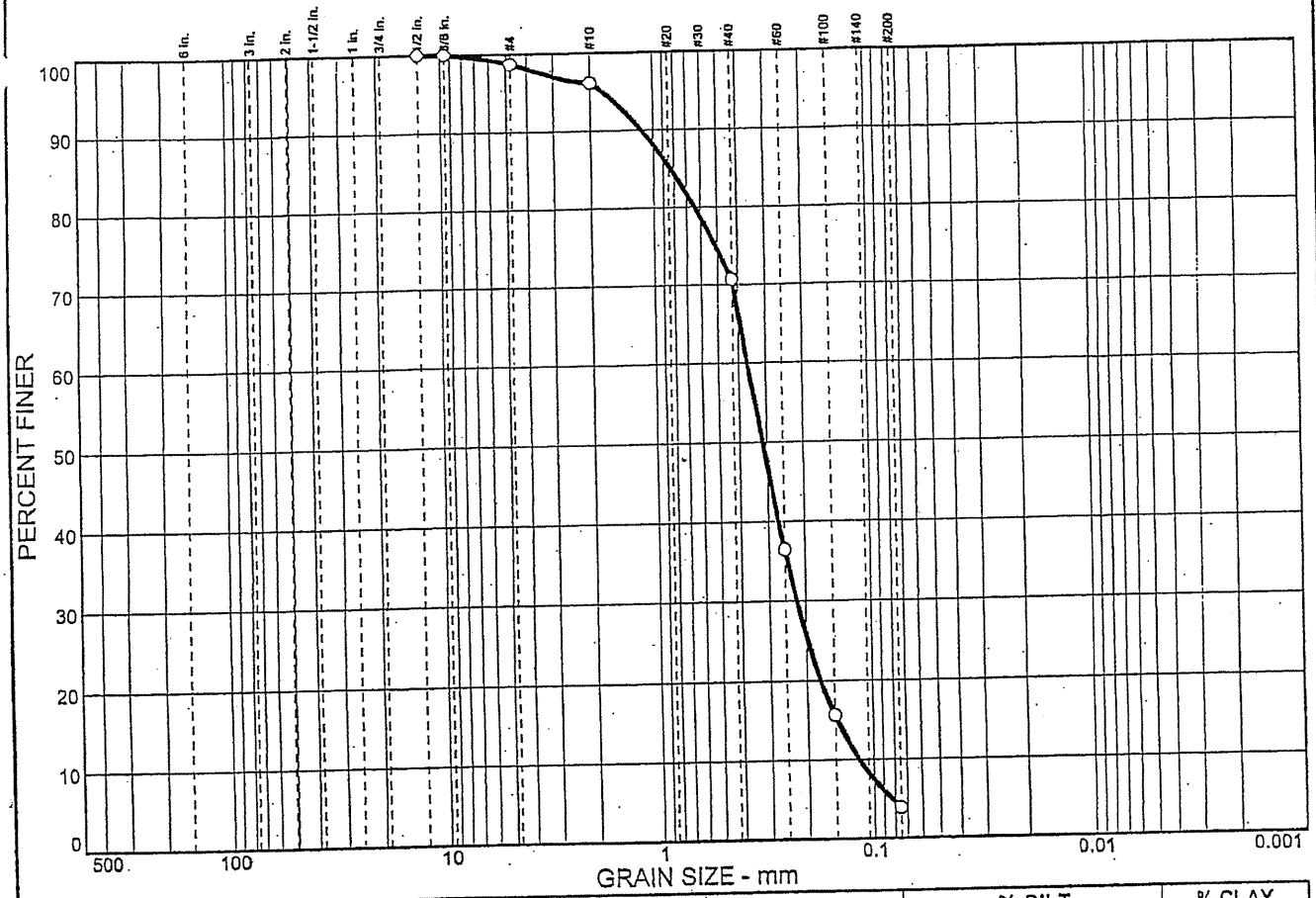
Remarks

Sample No.: PSL15 Source of Sample: Cell 9 Date: 11/07/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.3	94.8	3.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.7		
#10	96.2		
#40	70.7		
#60	36.5		
#100	15.7		
#200	3.9		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.829 D_{60}= 0.363 D_{50}= 0.313
D_{30}= 0.220 D_{15}= 0.146 D_{10}= 0.117
C_u= 3.12 C_c= 1.14

Classification

USCS= SP AASHTO=

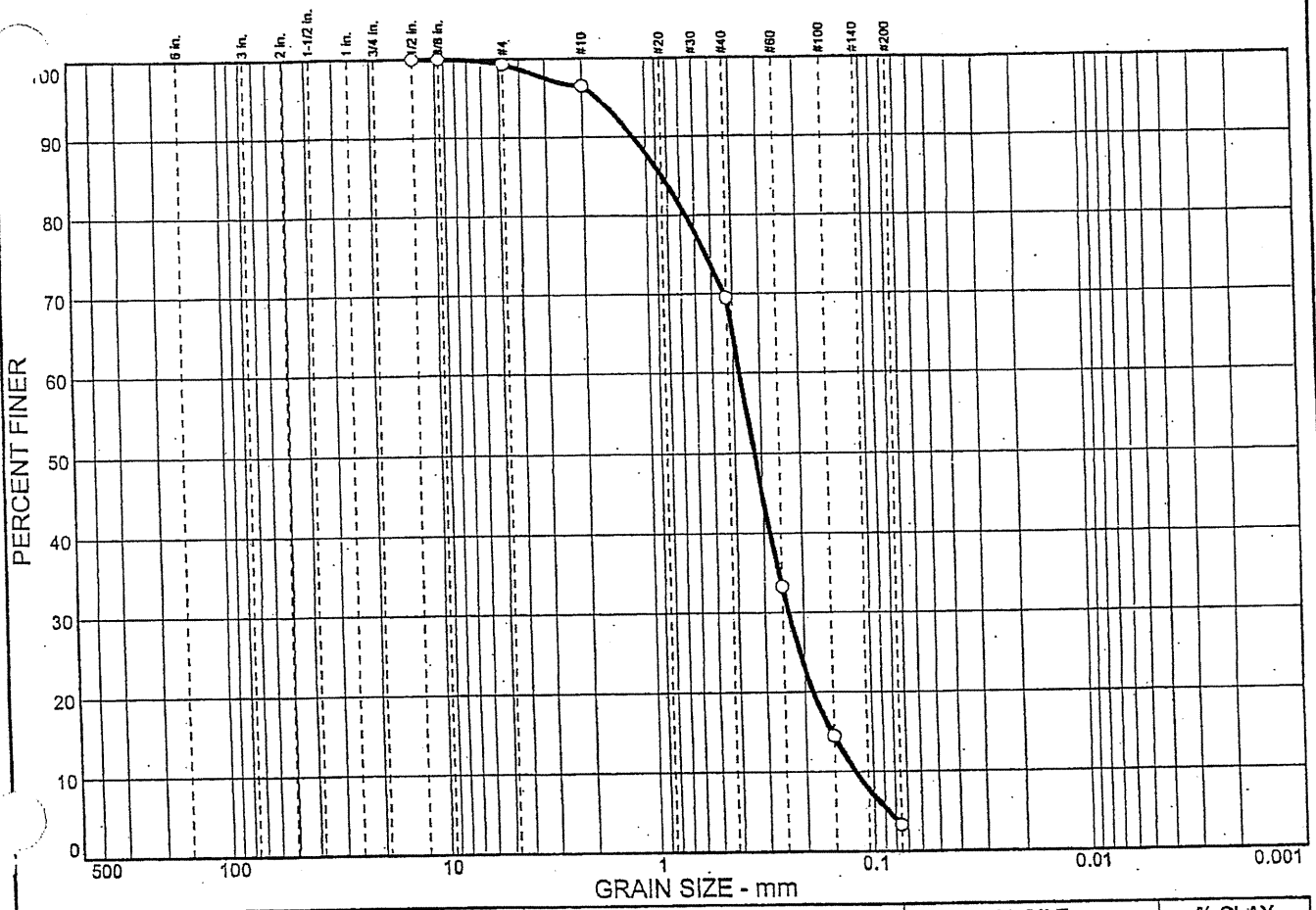
Remarks

Sample No.: PSL16 Source of Sample: Cell 9 Date: 11/07/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.7	96.0	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	99.3		
#10	96.5		
#40	69.5		
#60	33.3		
#100	14.5		
#200	3.3		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.847 D_{60}= 0.374 D_{50}= 0.325
D_{30}= 0.234 D_{15}= 0.153 D_{10}= 0.121
C_u= 3.10 C_c= 1.22

Classification

USCS= SP AASHTO=

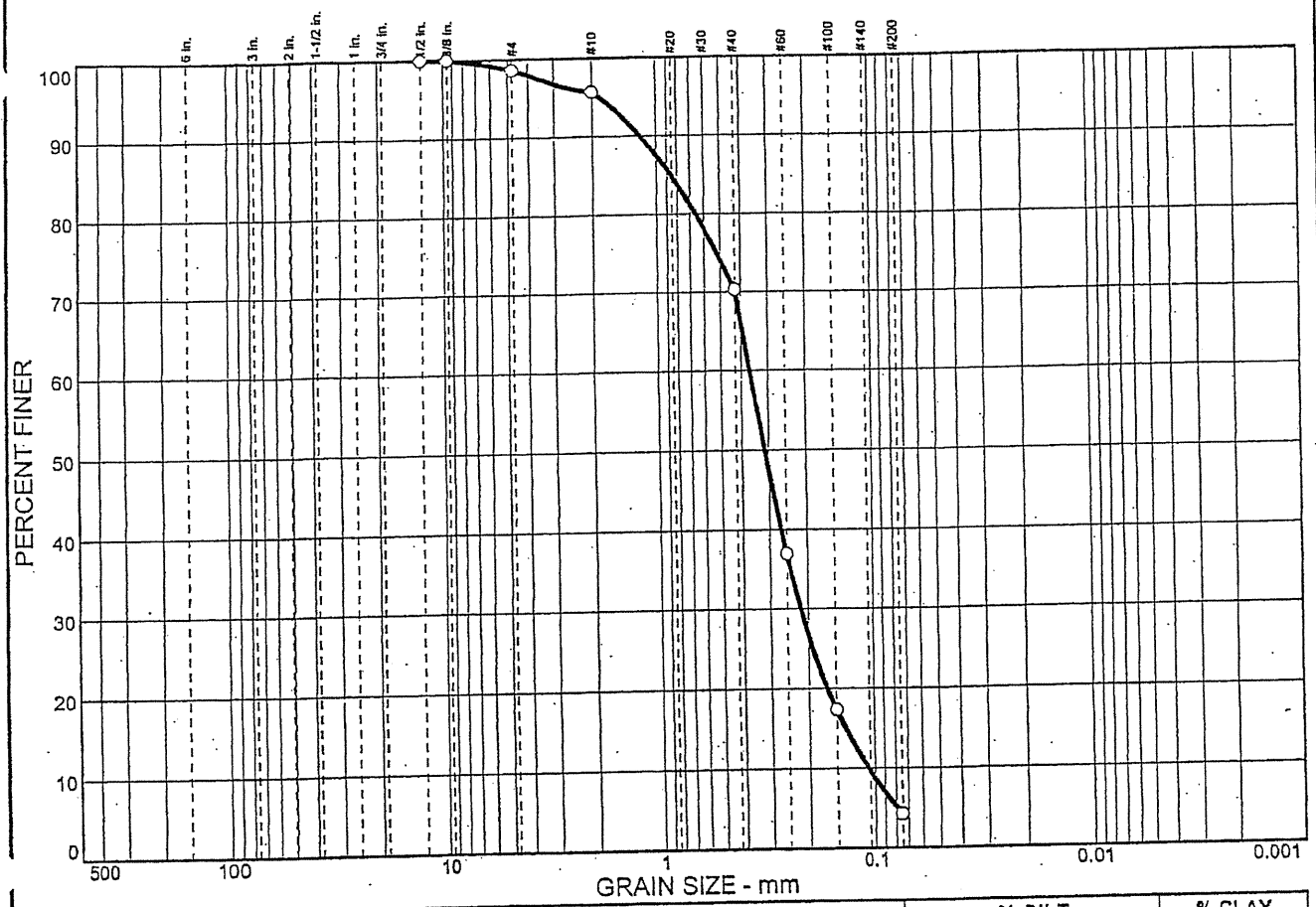
Remarks

Sample No.: PSL17 Source of Sample: Cell 9 Date: 11/08/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.4	94.3	4.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.6		
#10	95.7		
#40	70.3		
#60	37.0		
#100	17.4		
#200	4.3		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.856 D_{60}= 0.364 D_{50}= 0.312
D_{30}= 0.216 D_{15}= 0.136 D_{10}= 0.107
C_u= 3.40 C_c= 1.19

Classification

USCS= SP AASHTO=

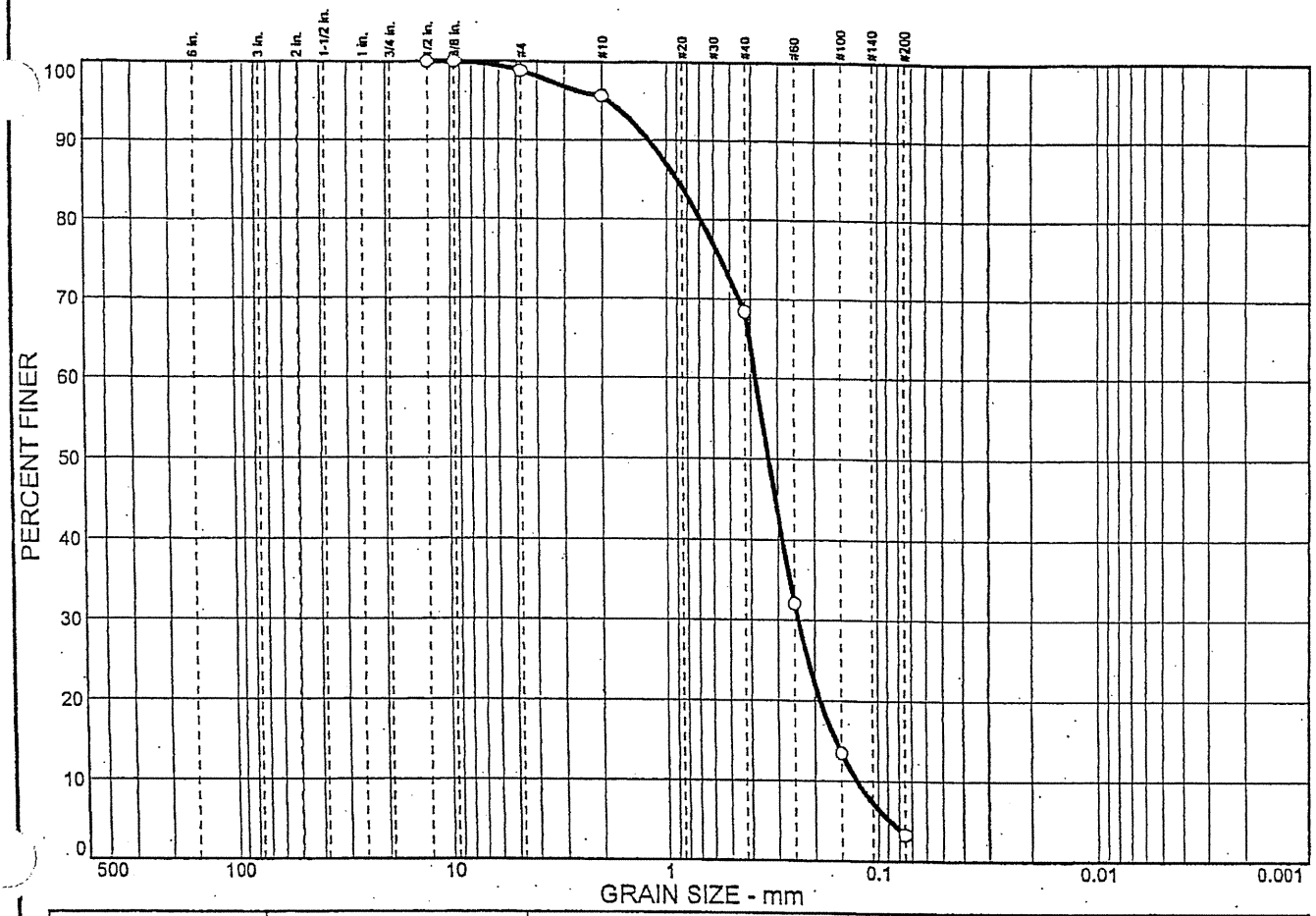
Remarks

Sample No.: PSL18 Source of Sample: Cell 9 Date: 11/08/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.2	95.5	3.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.8		
#10	95.7		
#40	68.4		
#60	32.1		
#100	13.5		
#200	3.3		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.894 D_{60}= 0.380 D_{50}= 0.331
D_{30}= 0.240 D_{15}= 0.160 D_{10}= 0.126
C_u= 3.01 C_c= 1.21

Classification

USCS= SP AASHTO=

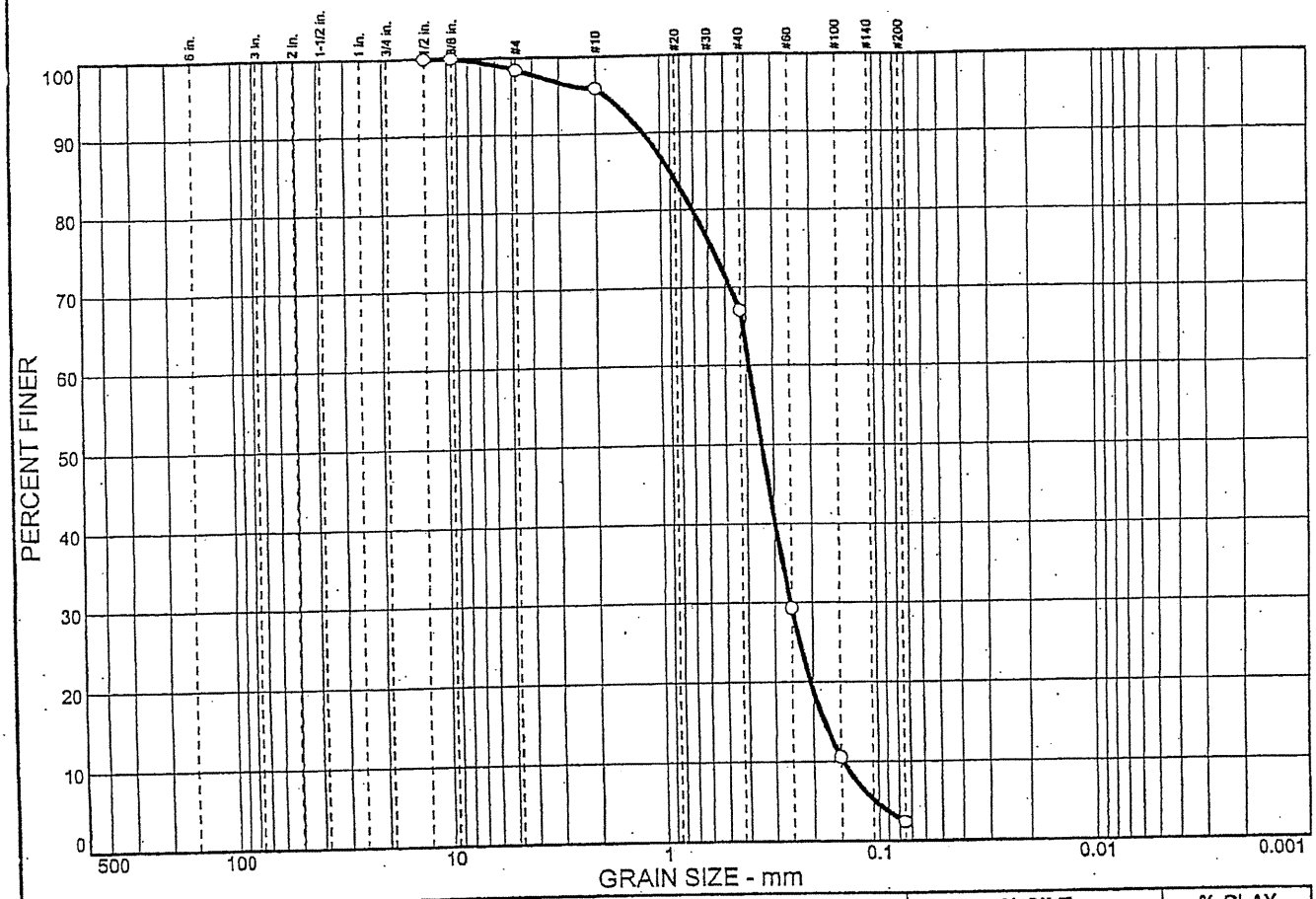
Remarks

Sample No.: PSL19 Source of Sample: Cell 9 Date: 11/08/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.6	96.0	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.4		
#10	95.9		
#40	67.1		
#60	29.3		
#100	10.6		
#200	2.4		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.902 D_{60}= 0.388 D_{50}= 0.340
D_{30}= 0.253 D_{15}= 0.178 D_{10}= 0.146
C_u= 2.66 C_c= 1.13

Classification

USCS= SP AASHTO=

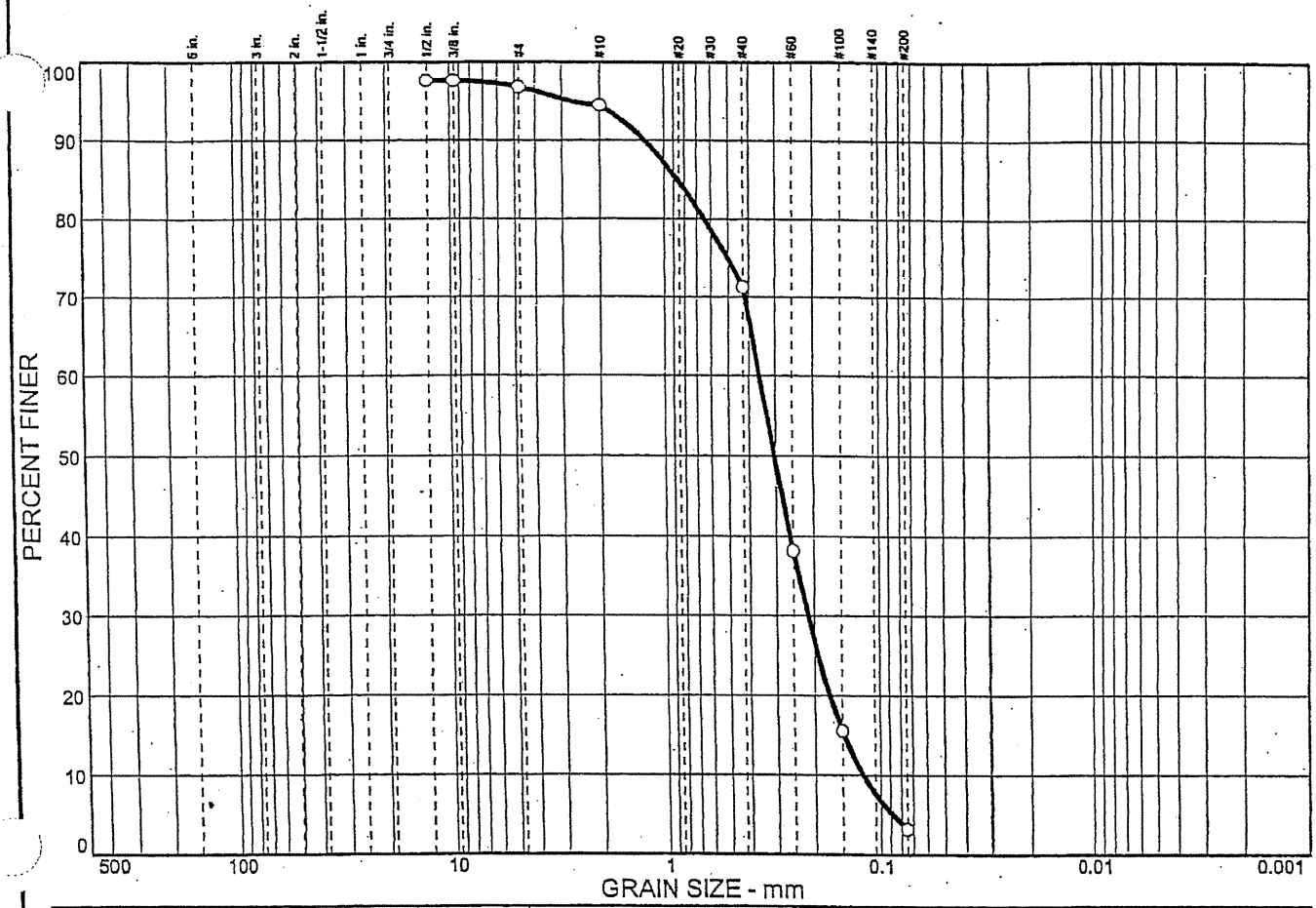
Remarks

Sample No.: PSL20 Source of Sample: Cell 9 Date: 11/09/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		93.6	3.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	97.6		
3/8 in.	97.6		
#4	96.8		
#10	94.5		
#40	71.3		
#60	38.2		
#100	15.6		
#200	3.2		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.866 D_{60}= 0.357 D_{50}= 0.305
D_{30}= 0.214 D_{15}= 0.147 D_{10}= 0.120
C_u= 2.96 C_c= 1.07

Classification

USCS= SP AASHTO=

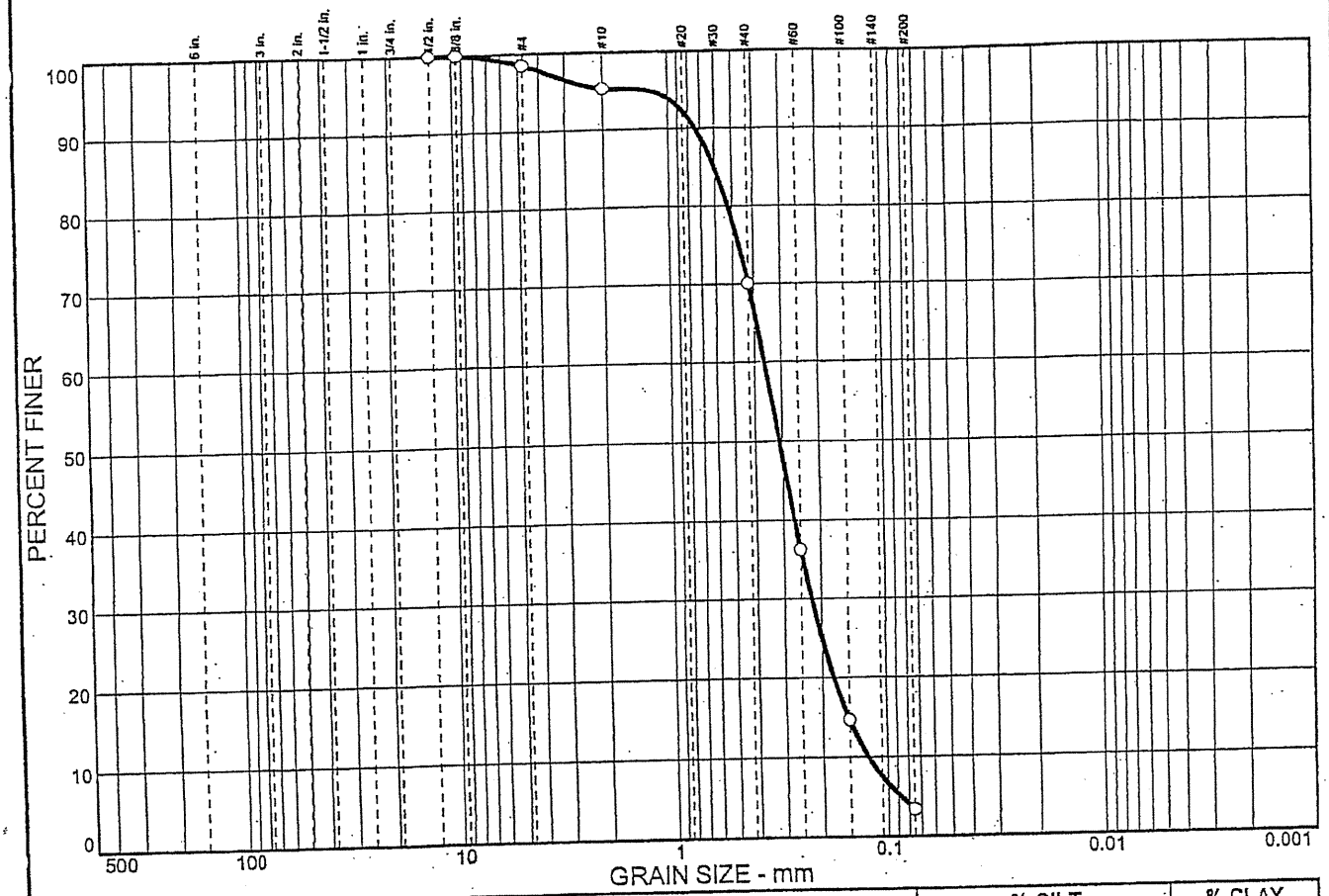
Remarks

Sample No.: PSL21 Source of Sample: Cell 9 Date: 11/09/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.5	95.1	3.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	98.5		
#10	95.3		
#40	70.1		
#60	36.3		
#100	14.7		
#200	3.4		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.604 D_{60}= 0.360 D_{50}= 0.310
D_{30}= 0.223 D_{15}= 0.152 D_{10}= 0.123
C_u= 2.94 C_c= 1.12

Classification

USCS= SP AASHTO=

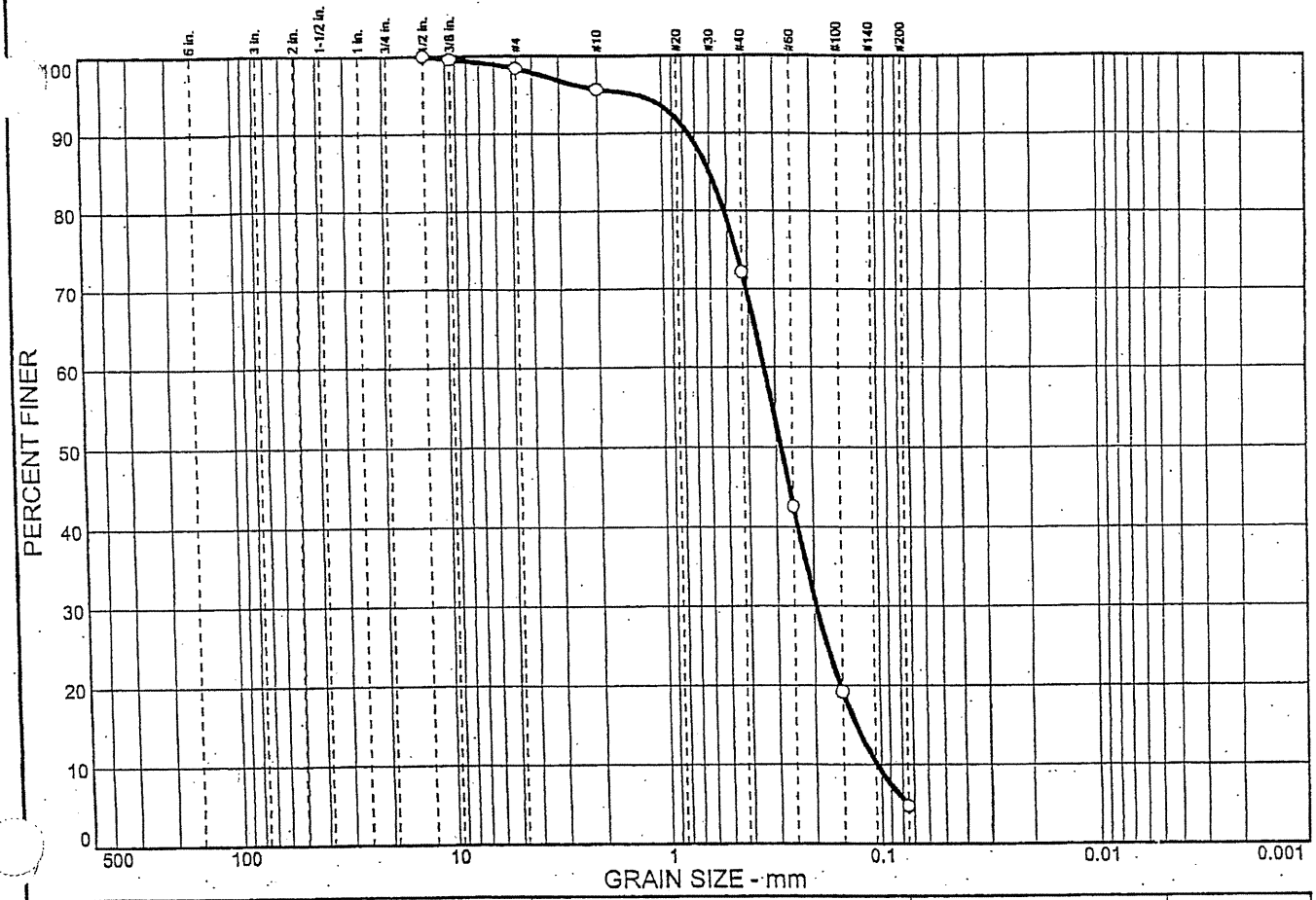
Remarks

Sample No.: PSL22 Source of Sample: Cell 9 Date: 11/09/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.6	93.6	4.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	99.6		
#4	98.4		
#10	95.7		
#40	72.2		
#60	42.6		
#100	19.2		
#200	4.8		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.603 D_{60}= 0.338 D_{50}= 0.284
D_{30}= 0.196 D_{15}= 0.130 D_{10}= 0.104
C_u= 3.24 C_c= 1.09

Classification

USCS= SP AASHTO=

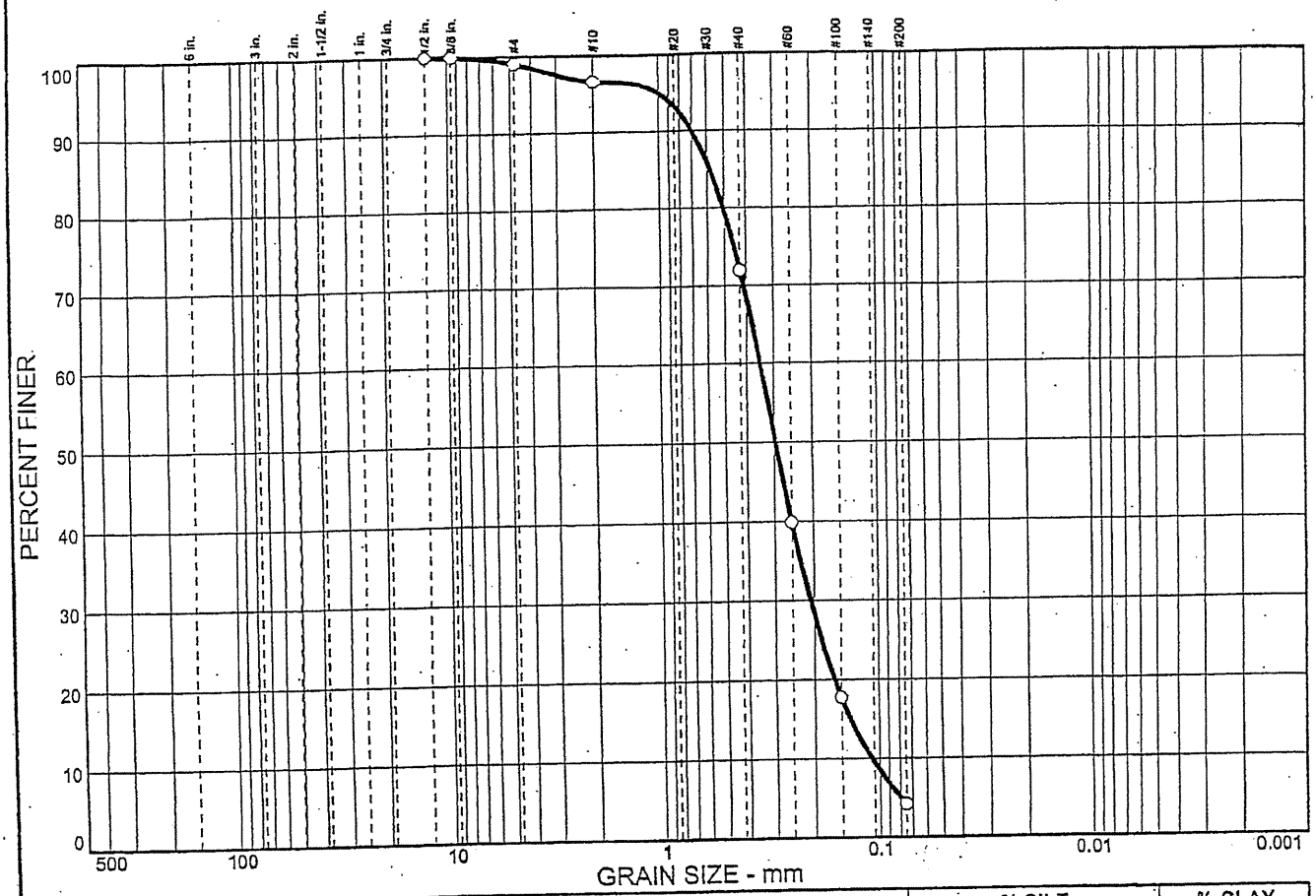
Remarks

Sample No.: PSL23 Source of Sample: Cell 9 Date: 11/09/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No. _____

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.0	94.8	4.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	100.0		
#4	99.0		
#10	96.6		
#40	72.0		
#60	39.9		
#100	17.8		
#200	4.2		

* (no specification provided)

Soil Description

Poorly graded sand

Atterberg Limits

PL= NV LL= PI=

Coefficients

D_{85}= 0.582 D_{60}= 0.346 D_{50}= 0.295
D_{30}= 0.206 D_{15}= 0.136 D_{10}= 0.108
C_u= 3.19 C_c= 1.14

Classification

USCS= SP AASHTO=

Remarks

Sample No.: PSL24 Source of Sample: Cell 9 Date: 11/09/05
Location: Elev./Depth: Stockpile

Client: Camino Real Environmental Center, Inc.
Project: Cell 8b construction

Project No: 111.01.01/05 Figure No.

Geotechnical Investigation (2005/2006)

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Project Camino Real Landfill File No. 05-126 Date 12/27/2005

			Sieve Analysis %Passing														Atterberg Limits		Moisture	Unit Wt.	Classification	
Boring No.	PEI Lab No.	Depth ft.	3"	2"	1½"	1"	3/4"	1/2"	3/8"	#4	#10	#20	#40	#60	#140	#200	LL	PI	%M	PCF	USCS	AASHTO
5	48428	60-65								100	100	99	95	68	12	6.7		N/P			SP-SM	A-3
6	48429	40-45							100	100	100	98	89	62	6	2.9		N/P			SP	A-3
7	48430	60-65							100	100	99	96	83	51	10	7.2		N/P			SP-SM	A-3
8	48431	65-70							100	100	98	92	70	35	6	3.8		N/P			SP	A-3
5	48432	5-6.5			100	97	93	91	83	72	61	54	47	27	20	19.8		N/P	9.4		SM	A-1-b
5	48433	10-11.5						100	98	97	94	92	89	82	56	46.0	42	23	24.9		SC	A-7-6
5	48434	15-16.5							100	99	98	95	89	78	46	36.0		N/P	14.7		SM	A-4
5	48435	20-21.5							100	99	98	95	90	79	39	27.2		N/P	10.6		SM	A-2-4
5	48436	25-26.5								100	100	99	97	86	28	18.0		N/P	3.7		SM	A-2-4
5	48437	30-31.5							100	100	99	99	96	88	47	31.9		N/P	7.8		SM	A-2-4
5	48438	35-36.5				100	94	94	94	93	92	91	85	73	44	35.2		N/P	10.0		SM	A-7-6
5	48440	50-51.5							100	100	99	99	97	76	11	5.1		N/P	1.3		SP-SM	A-3
6	48441	15-16.5							100	98	98	96	78	41	6	3.7		N/P	2.4		SP	A-3
6	48442	20-21.5						100	98	94	91	88	73	42	9	6.6		N/P	3.9		SP-SM	A-3
6	48443	25-26.5						100	97	95	92	90	84	66	34	28.2		N/P	7.3		SM	A-2-4
6	48444	30-31.5							100	98	96	92	76	48	7	3.5		N/P	2.4		SP	A-3
7	48445	5-6.5					100	98	97	96	92	89	86	82	47	31.9		N/P	10.9		SM	A-2-4
7	48446	10-11.5						100	99	96	92	87	79	67	34	26.1		N/P	8.2		SM	A-2-4
7	48447	15-16.5						100	99	99	97	95	83	56	23	16.4		N/P	4.5		SM	A-2-4
7	48448	35-36.5								100	100	99	88	36	8	5.5		N/P	3.3		SP-SM	A-3
7	48449	50-51.5							100	99	98	96	89	57	18	16.1		N/P	3.4		SM	A-2-4
7	48450	60-61.5					100	93	90	88	83	72	45	22	10	8.8		N/P	2.9		SP-SM	A-1-b
8	48451	20-21.5							100	100	99	98	91	53	10	5.9		N/P	1.9		SP-SM	A-3
8	48452	50-51.5								100	100	99	94	87	73	68.1	57	33	21.7		CH	A-7-6
8	48453	55-56.5						100	94	89	84	76	45	23	11	9.0		N/P	2.9		SP-SM	A-1-b
8	48454	60-61.5					100	94	91	84	82	79	61	38	16	13.8		N/P	4.3		SM	A-2-4
8	48455	95-96.5								100	100	100	96	88	69	62.8	64	42	25.2		CH	A-7-6
8	48456	100-101.5									100	100	99	97	82	56.5		N/P	9.5		ML	A-4
8	48457	115-116.5				100	97	97	96	96	96	96	93	80	59	53.6		N/P	22.7		ML	A-4
8	48458	125-126.5							100	100	100	99	91	81	59	54.4		N/P	22.9		ML	A-4

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Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Project Camino Real Landfill File No. 05-126 Date 12/27/2006

			Sieve Analysis %Passing														Atterberg Limits		Moisture	Unit Wt.	Classification	
Boring No.	PEI Lab No.	Depth ft.	3"	2"	1½"	1"	3/4"	1/2"	3/8"	#4	#10	#20	#40	#60	#140	#200	LL	PI	%M	PCF	USCS	AASHTO
8	48459	130-131.5							100	100	99	99	96	87	67	56.0		N/P	7.7		ML	A-4
14	48593	40-41.5																	3.6	106.0		
13	48594	70-71.5																	14.4	102.0		

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Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Project Camino Real Landfill File No. 05-126 Date January 24, 2006

			Sieve Analysis %Passing														Atterberg Limits		Moisture	Unit Wt.	Classification	
Boring No.	PEI Lab No.	Depth ft.	3"	2"	1½"	1"	3/4"	1/2"	3/8"	#4	#10	#20	#40	#60	#140	#200	LL	PI	%M	PCF	USCS	AASHTO
9	48558	50-51.5								100	100	100	95	81	16	9.0		N/P	1.4		SP-SM	A-3
9	48559	60-61.5							100	99	96	85	43	17	7	5.8		N/P	2.0		SP-SM	A-1-b
9	48560A	80-81.5															45	19	17.4			
9	48560B	80-81.5							100	99	98	97	97	96	94	90.3		N/P	12.3		ML	A-4
9	48561	85-86.5							100	99	99	98	91	74	28	20.2		N/P	4.0		SM	A-2-4
9	48562	100-101.5							100	100	99	99	88	48	6	3.6		N/P	2.2		SP	A-3
9	48563	110-111.5															40	23	20.7			
10	48564A	45-46.5															78	61	20.8			
10	48564B	45-46.5						100	99	99	98	98	96	79	18	12.9		N/P	3.7		SM	A-2-4
10	48565A	50-51.5															44	25	19.9			
10	48565B	50-51.5								100	100	100	99	95	28	21.4		N/P	5.3		SM	A-2-4
10	48566	65-66.5										100	100	95	14	8.7		N/P	2.0		SP-SM	A-3
10	48567	80-81.5									100	100	97	58	9	6.1		N/P	2.9		SP-SM	A-3
10	48568	95-96.5								100	100	100	98	91	71	65.7	57	36	25.1		CH	A-7-6
10	48569	100-101.5							100	100	99	99	99	99	28	23.6		N/P	4.3		SM	A-2-4
11	48570	10-11.5							100	100	99	93	50	14	2	1.8		N/P	1.2		SP	A-1-b
11	48571	20-21.5						100	100	99	99	94	33	10	4	3.3		N/P	1.6		SP	A-1-b
11	48572	25-26.5															39	25	13.3			
11	48573	35-36.5						100	100	99	99	98	91	47	9	6.3		N/P	2.1		SP-SM	A-3
11	48574	40-41.5										100	97	85	60	53.4	47	32	21.9		CL	A-7-6
11	48575	60-61.5								100	100	100	93	52	5	3.0		N/P	5.3		SP	A-3
11	48576	75-76.5								100	100	100	80	54	4	0.6		N/P	3.5		SP	A-3
11	48577	90-91.5															28	12	19.3			
11	48578	95-96.5						100	100	99	98	98	97	94	40	22.8		N/P	6.8		SM	A-2-4
11	48579	100-101.5									100	100	90	69	50	45.8	50	32	26.6		SC	A-7-6
12	48580	10-11.5							100	99	98	94	76	44	10	9.2		N/P	2.6		SP-SM	A-3
12	48581	20-21.5					100	99	99	98	98	97	95	86	15	7.8		N/P	1.7		SP-SM	A-3
12	48582	35-36.5						100	98	97	97	97	87	39	5	2.9		N/P	1.8		SP	A-3
12	48583	45-46.5						100	99	98	98	97	77	41	9	6.3		N/P	3.0		SP-SM	A-3
13	48584	10-11.5						100	99	98	97	97	84	55	7	4.1		N/P	1.3		SP	A-3

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Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Project Camino Real Landfill File No. 05-126 Date January 24, 2006

			Sieve Analysis %Passing														Atterberg Limits		Moisture	Unit Wt.	Classification	
Boring No.	PEI Lab No.	Depth ft.	3"	2"	1½"	1"	3/4"	1/2"	3/8"	#4	#10	#20	#40	#60	#140	#200	LL	PI	%M	PCF	USCS	AASHTO
13	48585A	20-21.5															31	18	15.6			
13	48585B	20-21.5							100	99	97	94	77	46	24	22.3		N/P	5.5		SM	A-2-4
13	48586	30-31.5							100	100	100	100	99	82	9	4.9		N/P	2.3		SP	A-3
13	48587A	40-41.5															39	23	23.0			
13	48587B	40-41.5								100	100	99	98	76	22	17.9		N/P	5.0		SM	A-2-4
13	48588A	45-46.5															34	18	16.4			
13	48588B	45-46.5						100	99	96	93	91	90	81	32	23.7		N/P	4.1		SM	A-2-4
13	48589	60-61.5									100	100	100	99	28	14.8		N/P	2.4		SM	A-2-4
13	48590	65-66.5								100	100	99	96	78	28	13.1	23	3	5.5		SM	A-2-4
12	48591	35-40						100	99	99	98	97	85	51	8	4.7		N/P			SP	A-3
14	48592	15-20							100	99	99	99	92	65	25	21.8		N/P			SM	A-2-4
14	48611	10-11.5							100	99	99	99	92	67	17	10.1		N/P	3.0		SP-SM	A-2-4
14	48612	15-16.5															33	7	15.8			
14	48613	30-31.5										100	99	74	5	3.3		N/P	3.6		SP	A-3
14	48614	40-41.5								100	100	100	100	99	83	68.6	43	26	11.2		CL	A-7-6
14	48615	45-46.5							100	100	98	96	94	93	79	60.6	32	9	3.0		CL	A-4

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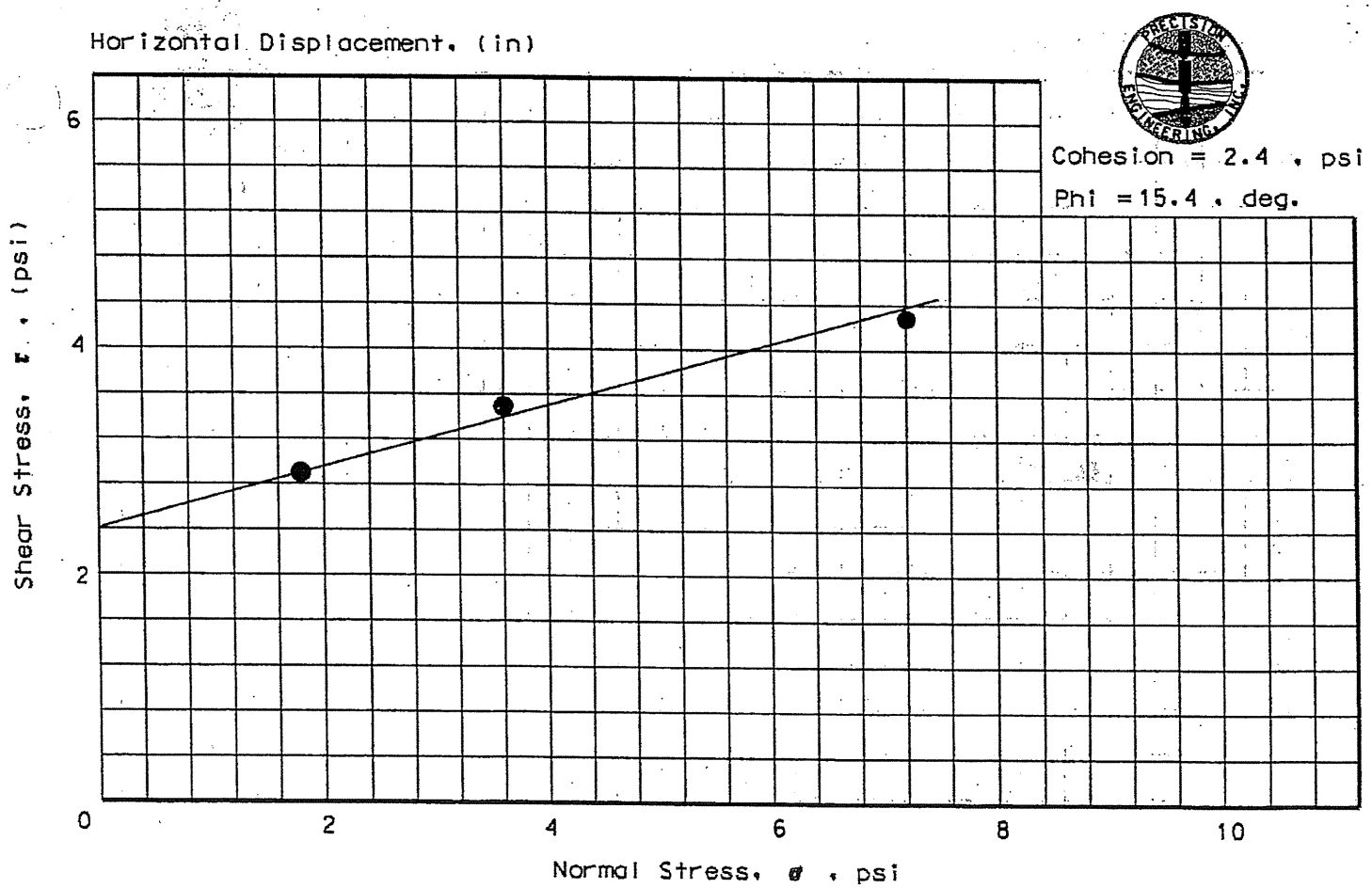
Precision Engineering, Inc.

P.O. Box 422, Las Cruces, New Mexico 88004
ph 505-523-7674, fax 505-523-7248, e-mail werpei@aol.com

Soil Type: Silty Clay Boring No.: 14
Depth: 40' to 41.5 Lab No. 48593 Test Type: CD
Moisture Condition: saturated Performed by: WHK
Date 02/23/06 Project No.: 05-126
Project Title or Description: Camino Real Landfill

Test Number	1	2	3	4
Natural Moisture Content, (%)	3.6	3.6	3.6	
Dry Unit Weight (pcf)	106	106	106	
Normal Stress (psi)	1.8	3.6	7.2	
Maximum Shear Stress (psi)	2.9	3.6	4.3	
Residual Shear Stress (psi)	---	---	---	
Strain Rate (in/min)	0.05	0.05	0.05	
Sample Area (sq in)	4.91	4.91	4.91	

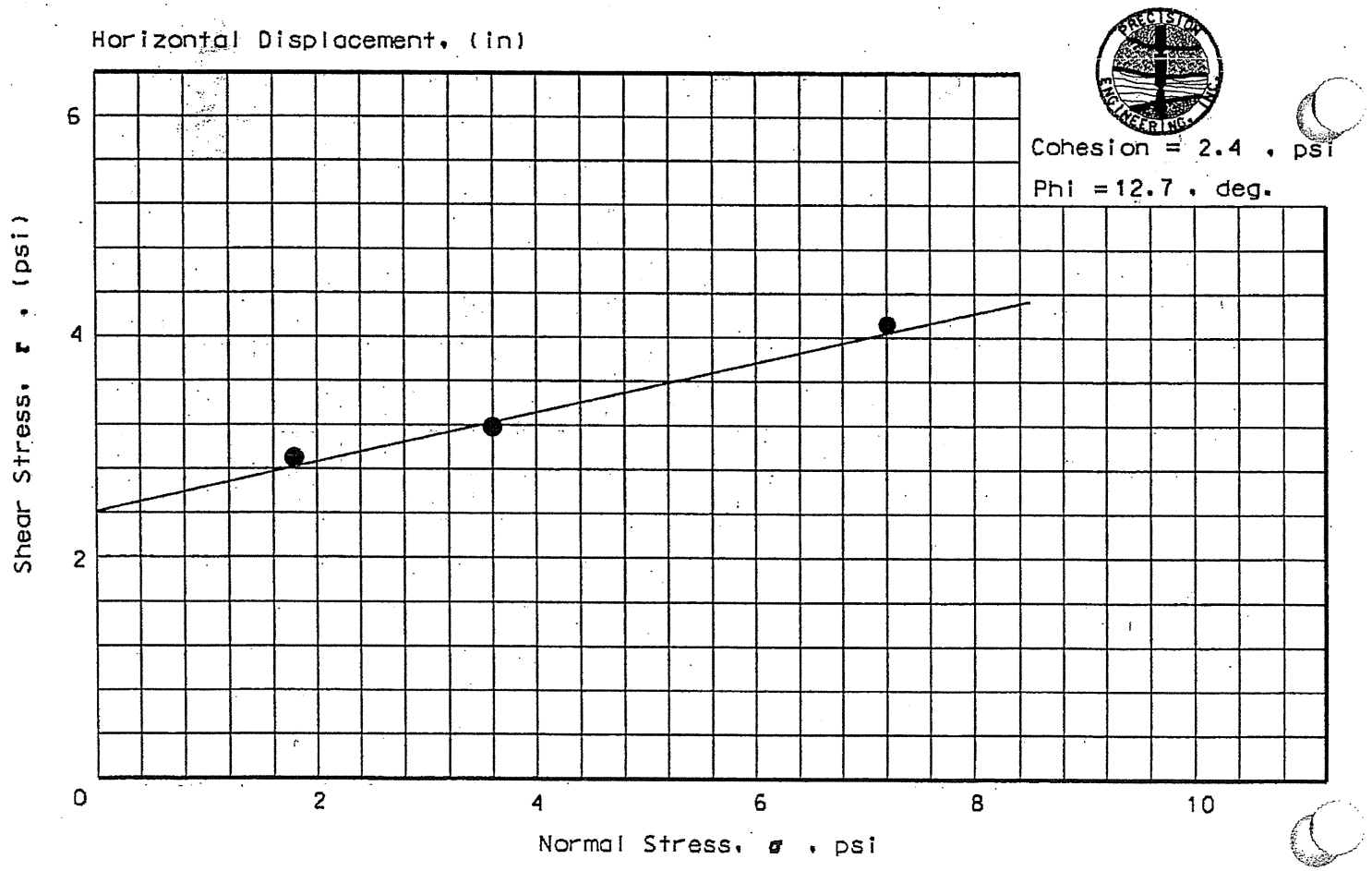


Precision Engineering, Inc.

P.O. Box 422, Las Cruces, New Mexico 88004
ph 505-523-7674, fax 505-523-7248, e-mail werpei@aol.com

Soil Type: Silty Clay Boring No.: 13
Depth: 70' to 71.5 Lab No. 48594 Test Type: CD
Moisture Condition: saturated Performed by: WHK
Date 02/24/06 Project No.: 05-126
Project Title or Description: Camino Real Landfill

Test Number	1	2	3	4
Natural Moisture Content (%)	14.4	14.4	14.4	
Dry Unit Weight (pcf)	102	102	102	
Normal Stress (psi)	1.8	2.1	7.2	
Maximum Shear Stress (psi)	2.9	3.2	4.1	
Residual Shear Stress (psi)	---	---	---	
Strain Rate (in/min)	0.05	0.05	0.05	
Sample Area (sq in)	4.91	4.91	4.91	



Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

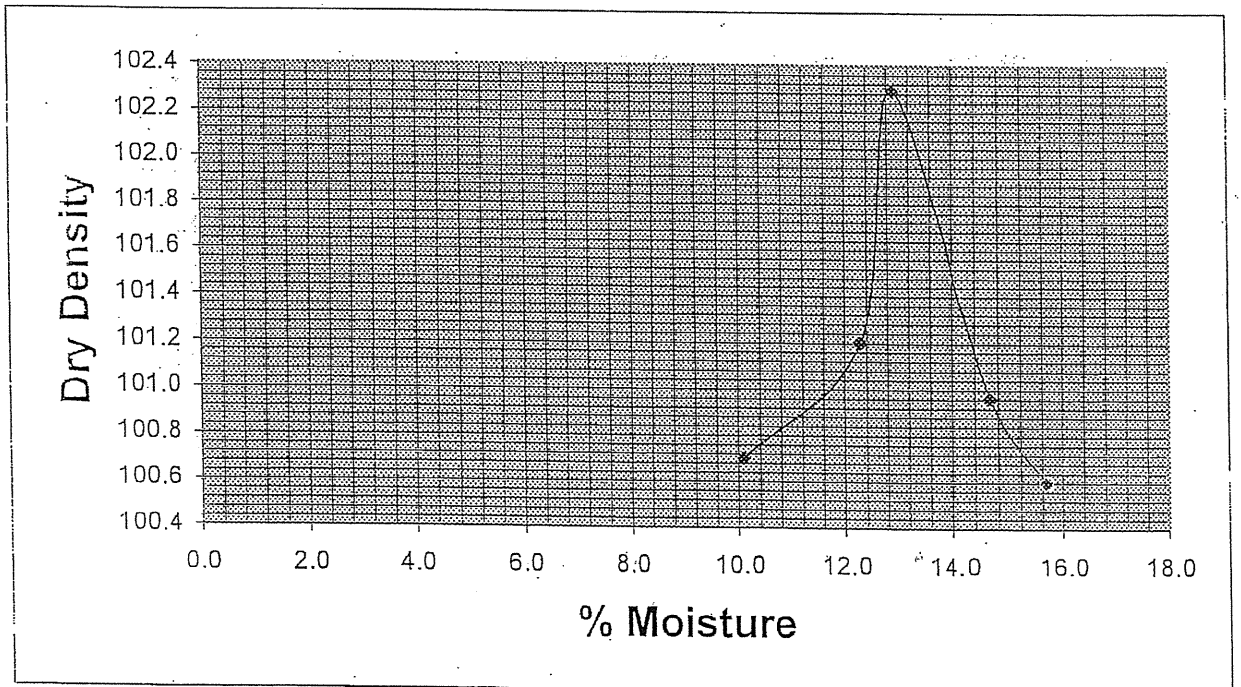
Moisture-Density Relations of Soils

ATTN:

Project: Camino Real Landfill File No.: 05-126
Soil Type: sand SB5 60-65' Date: July 27, 2006 Lab No.: 48428
Method: ASTM D-1557-B Performed By: mwk

Can + Wet Soil	1256.8	735.0	1366.0	1310.1	1271.6
Can + Dry Soil	1155.2	676.4	1233.3	1168.2	1128.1
Wt. Of Can	149.5	199.5	205.2	200.5	213.0
Wt. Of Water	101.6	58.6	132.7	141.9	143.5
Wt. Dry Soil	1005.7	476.9	1028.1	967.7	915.1
% Moisture	10.1	12.3	12.9	14.7	15.7
Soil + Mold	3674.3	3716.1	3744.2	3748.3	3757.5
Wt. Of Mold	1997.9	1997.9	1997.9	1997.9	1997.9
Wt. Of Soil	1676.4	1718.2	1746.3	1750.4	1759.6
Wet Density	110.9	113.6	115.5	115.8	116.4
Dry Density	100.7	101.2	102.3	101.0	100.6

Maximum Dry Density 102.3 **Optimum Moisture** 12.9



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Reviewed By: Reviewed By: Certified By:

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

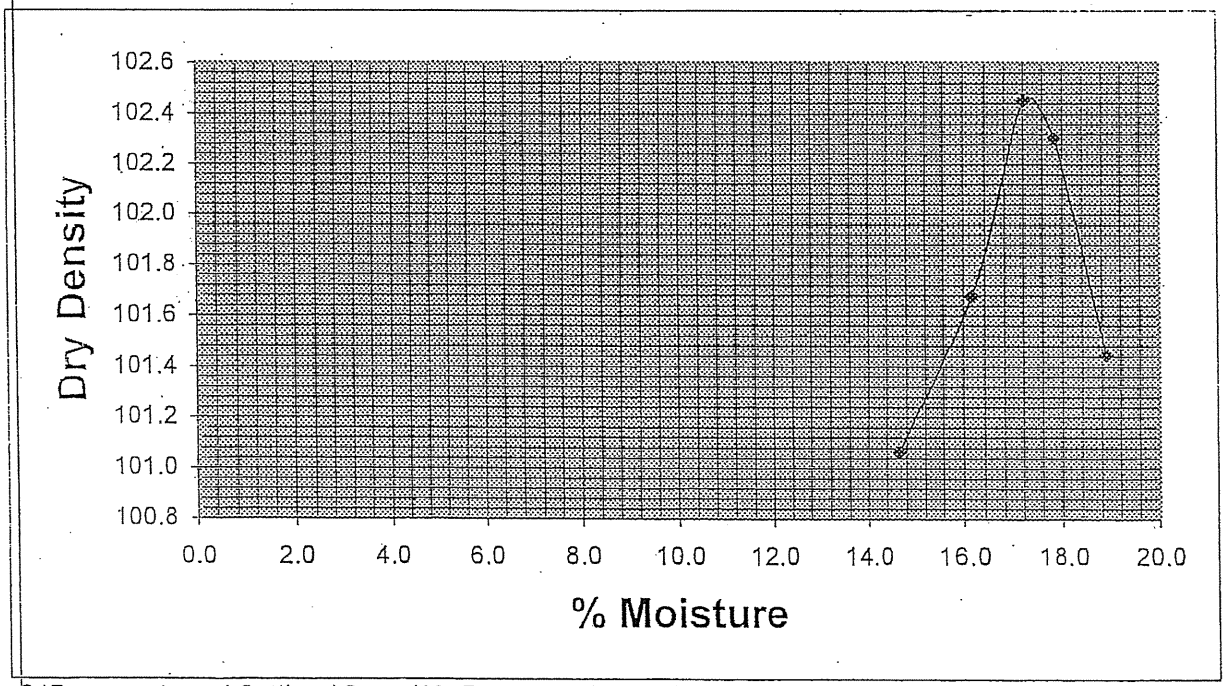
Moisture-Density Relations of Soils

ATTN:

Project: Camino Real Landfill File No.: 5122
Soil Type: sand SB6 40-45' Date: July 27, 2006 Lab No.: 48429
Method: ASTM D-698 Performed By: mwk

Can + Wet Soil	1497.9	1349.5	1542.7	1076.1	1416.8
Can + Dry Soil	1333.5	1189.9	1346.9	945.4	1224.1
Wt. Of Can	211.1	202.2	209.3	212.8	203.6
Wt. Of Water	164.4	159.6	195.8	130.7	192.7
Wt. Dry Soil	1122.4	987.7	1137.6	732.6	1020.5
% Moisture	14.6	16.2	17.2	17.8	18.9
Soil + Mold	3749.3	3783.2	3813.1	3820.2	3820.9
Wt. Of Mold	1997.4	1997.4	1997.4	1997.4	1997.4
Wt. Of Soil	1751.9	1785.8	1815.7	1822.8	1823.5
Wet Density	115.9	118.1	120.1	120.6	120.6
Dry Density	101.1	101.7	102.5	102.3	101.4

Maximum Dry Density 102.5 **Optimum Moisture** 17.2



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505-523-7674

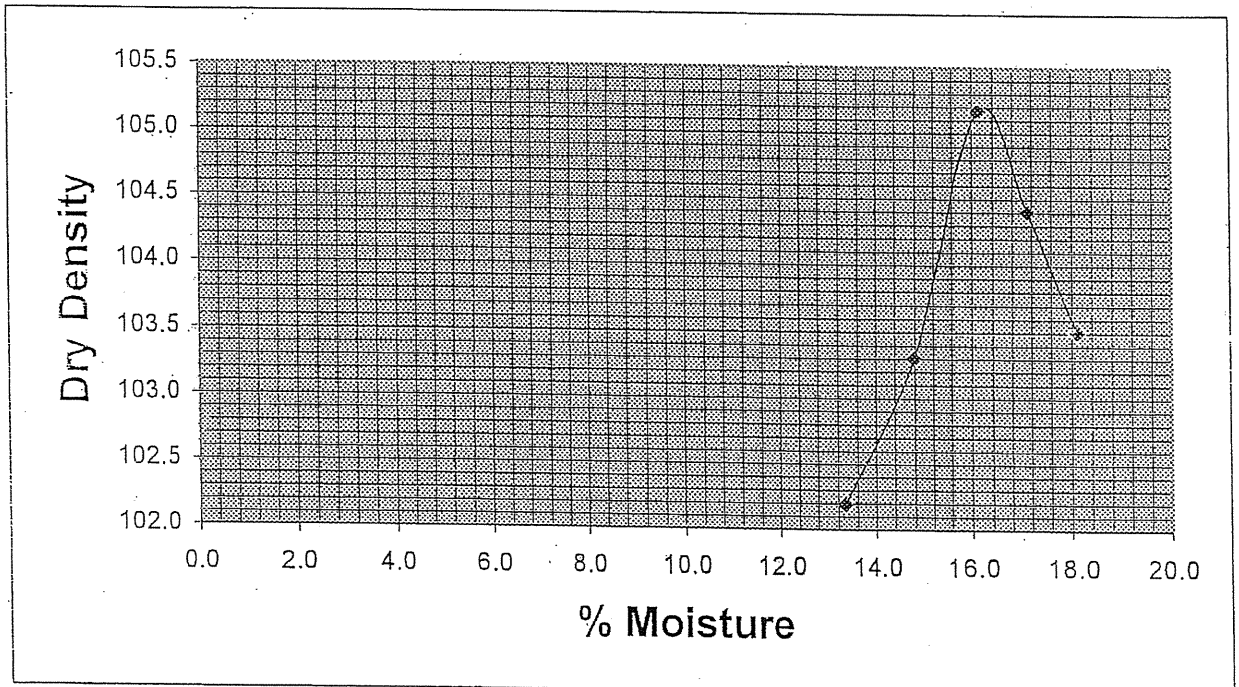
Moisture-Density Relations of Soils

ATTN:

Project: Camino Real Landfill File No.: 05-126
Soil Type: sand SB7 60-65' Date: July 27, 2006 Lab No.: 48430
Method: ASTM D-698 Performed By: mwk

Can + Wet Soil	1282.8	1170.7	1438.5	1372.4	1267.0
Can + Dry Soil	1156.4	1045.2	1265.4	1201.7	1103.7
Wt. Of Can	209.0	197.0	191.5	203.7	202.7
Wt. Of Water	126.4	125.5	173.1	170.7	163.3
Wt. Dry Soil	947.4	848.2	1073.9	998	901
% Moisture	13.3	14.8	16.1	17.1	18.1
Soil + Mold	3749.2	3790.9	3844.4	3846.5	3846.5
Wt. Of Mold	1997.9	1997.9	1997.9	1997.9	1997.9
Wt. Of Soil	1751.3	1793.0	1846.5	1848.6	1848.6
Wet Density	115.8	118.6	122.1	122.3	122.3
Dry Density	102.2	103.3	105.2	104.4	103.5

Maximum Dry Density 105.2 Optimum Moisture 16.1



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505-523-7674

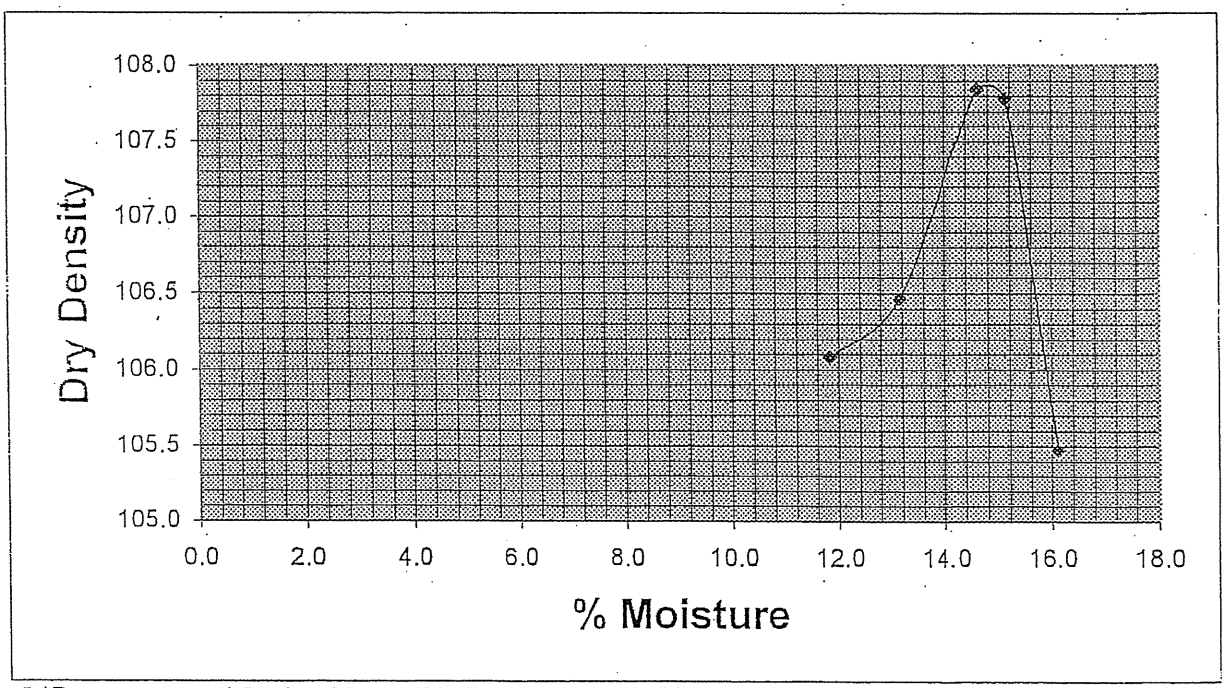
Moisture-Density Relations of Soils

ATTN:

Project: Camino Real Landfill File No.: 05-126
Soil Type: sand SB8 65-70' Date: July 27, 2006 Lab No.: 48431
Method: ASTM D-698 Performed By: mwk

Can + Wet Soil	1203.6	1306.8	1330.3	859.6	993.1
Can + Dry Soil	1097.4	1178.3	1187.9	773.7	877.9
Wt. Of Can	200.6	200.9	213.4	205.6	162.9
Wt. Of Water	106.2	128.5	142.4	85.9	115.2
Wt. Dry Soil	896.8	977.4	974.5	568.1	715
% Moisture	11.8	13.1	14.6	15.1	16.1
Soil + Mold	3791.8	3819.3	3866.8	3874.0	3849.6
Wt. Of Mold	1997.9	1997.9	1997.9	1997.9	1997.9
Wt. Of Soil	1793.9	1821.4	1868.9	1876.1	1851.7
Wet Density	118.6	120.5	123.6	124.1	122.5
Dry Density	106.1	106.5	107.8	107.8	105.5

Maximum Dry Density 107.8 **Optimum Moisture** 14.6



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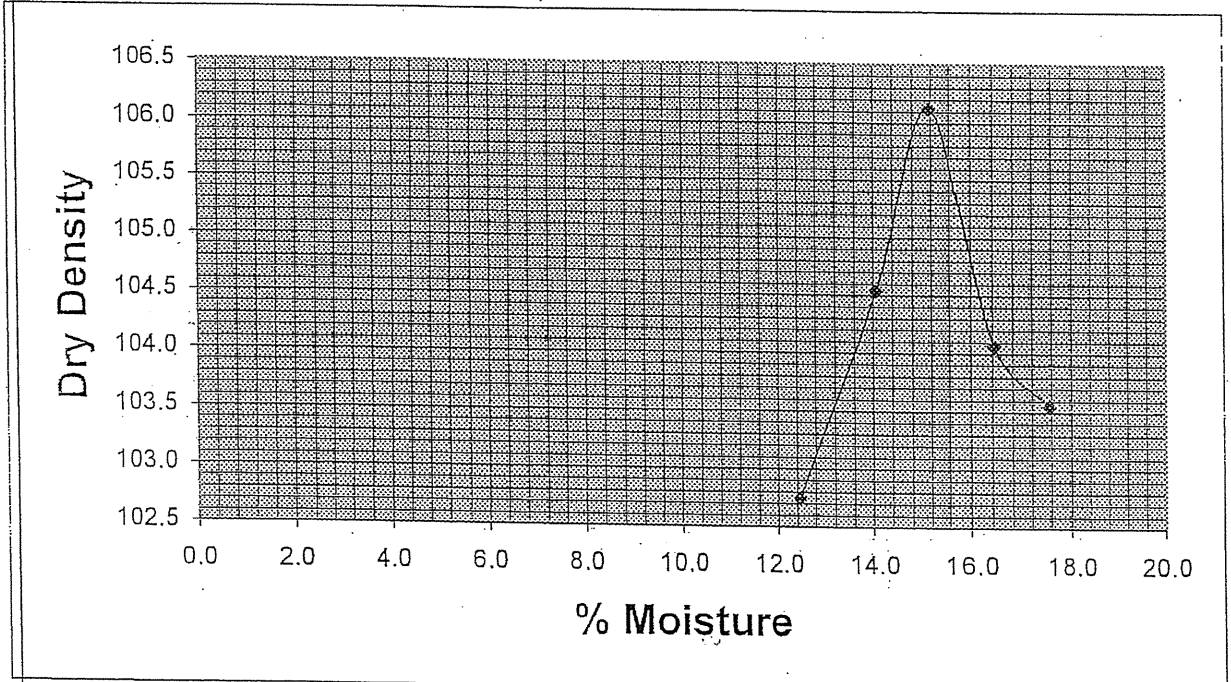
Moisture-Density Relations of Soils

ATTN:

Project: Camino Real Landfill File No.: 050-126
Soil Type: sand SB12 35-40' Date: July 27, 2006 Lab No.: 48591
Method: ASTM D-1557-B Performed By: mwk

Can + Wet Soil	893.0	1044.2	944.8	756.4	881.8
Can + Dry Soil	817.5	939.4	842.0	678.0	780.0
Wt. Of Can	211.5	194.2	164.2	201.1	200.7
Wt. Of Water	75.5	104.8	102.8	78.4	101.8
Wt. Dry Soil	606	745.2	677.8	476.9	579.3
% Moisture	12.5	14.1	15.2	16.4	17.6
Soil + Mold	3740.2	3796.0	3841.1	3825.2	3833.9
Wt. Of Mold	1993.1	1993.1	1993.1	1993.1	1993.1
Wt. Of Soil	1747.1	1802.9	1848.0	1832.1	1840.8
Wet Density	115.5	119.2	122.2	121.2	121.7
Dry Density	102.7	104.5	106.1	104.1	103.6

Maximum Dry Density 106.1 **Optimum Moisture** 15.2



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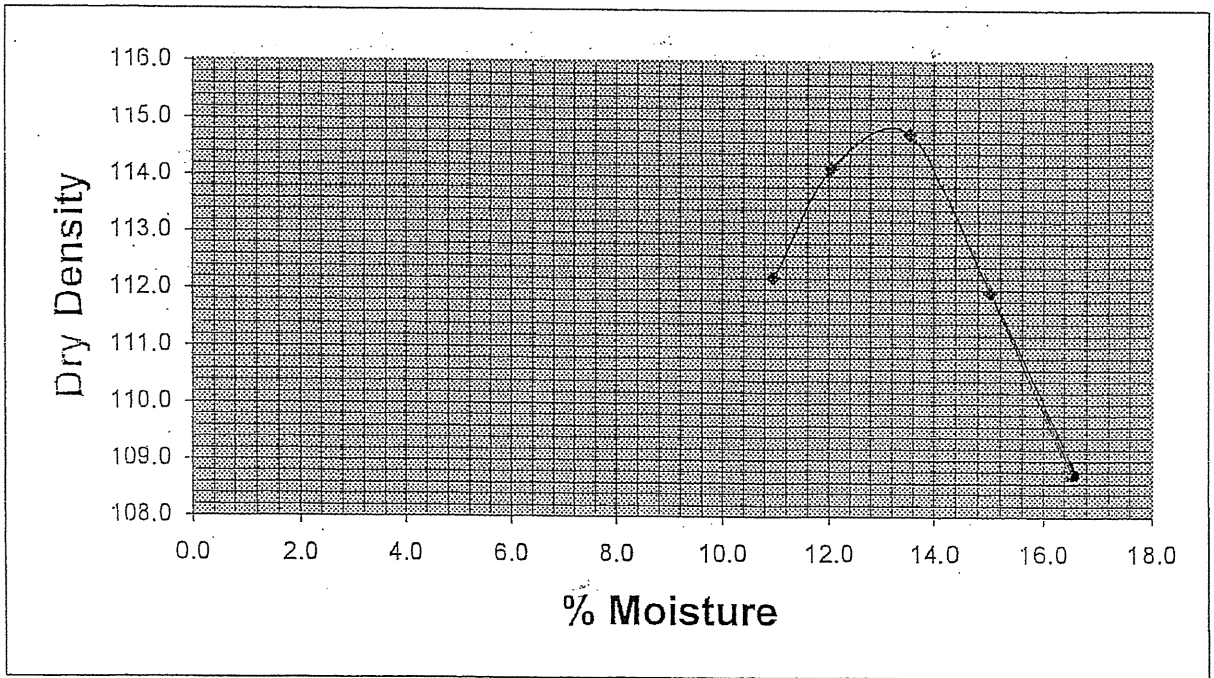
Moisture-Density Relations of Soils

ATTN: James Bonner
Gordon Environmental

Project: Camino Real Landfill File No.: 05-126
Soil Type: sand SB14 15-20' Date: August 29, 2006 Lab No.: 48592
Method: ASTM D-1557-B Performed By: mwk

Can + Wet Soil	997.2	1154.3	1103.4	1028.0	856.8
Can + Dry Soil	918.3	1051.3	994.7	920.5	762.6
Wt. Of Can	199.4	197.0	192.2	204.4	191.8
Wt. Of Water	78.9	103.0	108.7	107.5	94.2
Wt. Dry Soil	718.9	854.3	802.5	716.1	570.8
% Moisture	11.0	12.1	13.5	15.0	16.5
Soil + Mold	3876.2	3927.4	3963.5	3940.3	3909.4
Wt. Of Mold	1993.5	1993.5	1993.5	1993.5	1993.5
Wt. Of Soil	1882.7	1933.9	1970.0	1946.8	1915.9
Wet Density	124.5	127.9	130.3	128.8	126.7
Dry Density	112.2	114.1	114.7	112.0	108.8

Maximum Dry Density 114.7 **Optimum Moisture** 13.5



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Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Sand — Date: March 2, 2006 — Lab No.: 48428
Sampled From: B-5, 60.0'-65.0' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 72.1 pcf
Dry Unit Weight: 70.0 pcf

% Moisture: 3.0
% Compaction:
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: 102.3 pcf
Optimum Moisture Content: 12.9 %

Coefficient of Permeability, k_{20}: 2.3×10^{-2} cm/sec.

Remarks: Requested % Compaction: "Loose as Possible" (per Jim Bonner, Gordon Environmental, Inc.)

Reviewed By:

Reviewed By:

Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48428

Text in **BOLD** is user input.

Temperature (Tw)= 14.0 C
Enter H1= 43 cm
Enter H2= 19 cm
Enter Standpipe Area: 9.098 cm^2

If you know the total test time in seconds, Enter Here: 63.75 (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 63.75

Can + Wet Soil	**188.76**
Can + Dry Soil	**184.59**
Wt. Of Can	**46.41**
Wt. Of Water	4.17
Wt. Dry Soil	138.18
% Moisture	3.0

Enter sample length (L): 1.68 in
Enter sample diameter (D): 2.25 in
The sample length is: 4.27 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: 126.46 g
The sample area is: 3.976 in^2
The sample volume is: 6.680 in^3
The sample volume is: 3.8656E-03 ft^3

Wet Density: 72.1 lb/ft^3
Dry Density: 70.0 lb/ft^3

Density of Water at (T) is: 0.99927
Viscosity Correction of Water (R_T): 1.165
Hydraulic Conductivity (k_{20})= 2.26E-02 cm/sec

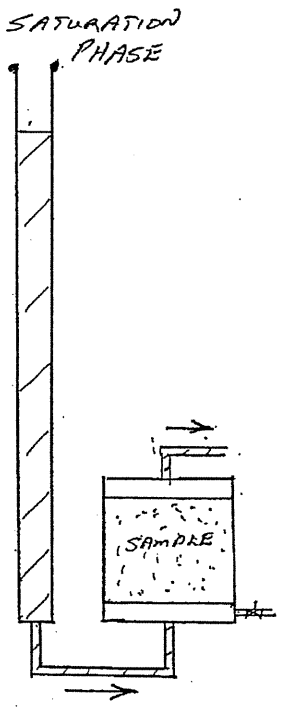
FILE 05-126 HYDRAULIC CONDUCTIVITY

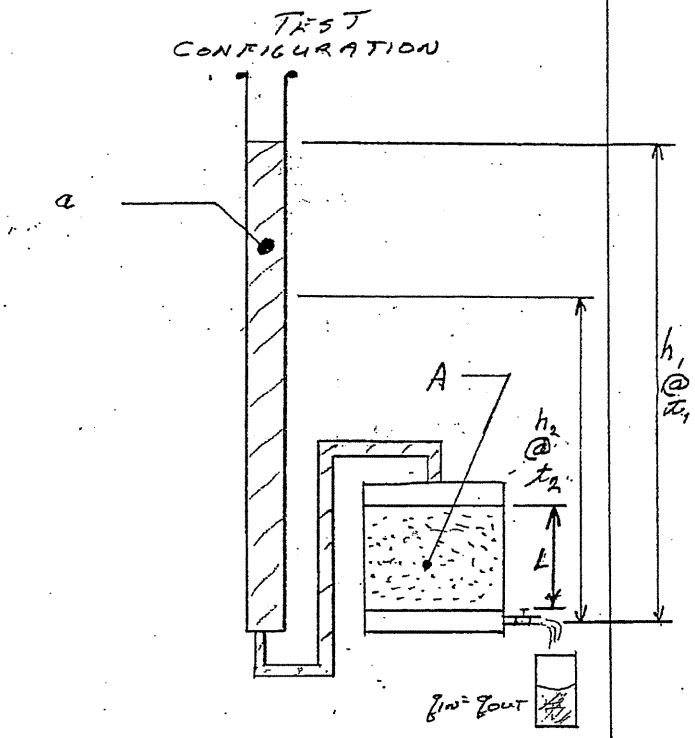
(FALLING HEAD METHOD – RIGID WALL SETUP)

HYDRAULIC CONDUCTIVITY FOR VERIFICATION OF SPREADSHEET CALCULATION

SAMPLE ID: 48428 (SOIL BORING B-5, 60.0-65.0')

ILLUSTRATION





$$k_T = \left[\frac{aL}{At} \ln\frac{h_1}{h_2}\right] r_t$$

t = ELAPSED TIME IN SECONDS ($t_2 - t_1$)
a = BURETTE AREA (cm)
A = AREA OF SAMPLE (cm^2)
L = LENGTH OF SAMPLE (cm)
h_1 = HYDRAULIC HEAD ACROSS SAMPLE AT BEGINNING OF TEST (t_1)
h_2 = HYDRAULIC HEAD ACROSS SAMPLE AT END OF TEST (t_2)
r_t = VISCOSITY CORRECTION FOR η_T/η_{20}
T = WATER TEMPERATURE @ TIME OF TEST

SAMPLE 48428

DIAMETER = 2.25" $\Rightarrow A = 25.652\ cm^2$
$a = 9.098\ cm^2$
$L = 1.68" = 4.267\ cm$
$h_1 = 43\ cm$
$h_2 = 19\ cm$
$T = 14°$
t = AVG OF 4 TESTS $\Rightarrow \frac{65+61+69+60}{4} = 63.75$

$$k_{20} = \left[\frac{(9.098)(4.267)}{(25.652)(63.75)} \ln\left(\frac{43}{19}\right)\right](1.165)$$

$= 2.26 \times 10^{-2}$ cm/sec

$\Rightarrow 2.3 \times 10^{-2}$ cm/sec ←

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Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Fine Sand — Date: March 2, 2006 — Lab No.: 48442
Sampled From: B-6, 20.0'-21.5' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 93.6 pcf
Dry Unit Weight: 90.1 pcf
% Moisture: 3.9
% Compaction: _____
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: _____ pcf
Optimum Moisture Content: _____ %

Coefficient of Permeability, k_{20}: 1.3E-02 cm/sec.

Remarks:

Reviewed By:

Reviewed By:

Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48442

Text in **BOLD** is user input.

Temperature (Tw)= 18.0 C
Enter H1= 43 cm
Enter H2= 19 cm
Enter Standpipe Area: 9.098 cm^2

If you know the total test time in seconds, Enter Here: 101.75 (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 101.75

Can + Wet Soil	**317.21**	
Can + Dry Soil	**307.20**	
Wt. Of Can	**50.94**	
Wt. Of Water	10.01	
Wt. Dry Soil	256.26	
% Moisture	3.9	

Enter sample length (L): 1.75 in
Enter sample diameter (D): 2.25 in
The sample length is: 4.45 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: 170.96 g
The sample area is: 3.976 in^2
The sample volume is: 6.958 in^3
The sample volume is: 4.0267E-03 ft^3

Wet Density: 93.6 lb/ft^3
Dry Density: 90.1 lb/ft^3

Density of Water at (T) is: 0.99862
Viscosity Correction of Water (R_T): 1.051
Hydraulic Conductivity (k_{20})= 1.33E-02 cm/sec

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Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Fine Sand — Date: March 2, 2006 — Lab No.: 48430
Sampled From: B-7, 60.0'-65.0' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 98.4 pcf
Dry Unit Weight: 95.2 pcf
% Moisture: 3.4
% Compaction: 90.5
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: 105.2 pcf
Optimum Moisture Content: 16.1 %

Coefficient of Permeability, k_{20}: 1.1E-02 cm/sec.

Remarks: Requested % Compaction: "Loose as Possible" (per Jim Bonner, Gordon Environmental, Inc.)

Reviewed By: Reviewed By: Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48430

Text in **BOLD** is user input.

Temperature (Tw)=	**19.0**	**C**
Enter H1=	**43**	**cm**
Enter H2=	**19**	**cm**
Enter Standpipe Area:	**9.098**	**cm^2**

If you know the total test time in seconds, Enter Here: **120.5** (Leave blank if you don't)

Otherwise:

Time entry format is **HH:MM:SS (MILITARY TIME)**

Date entry format is **MO/DA/YR**

Enter t1 time= :
Enter t1 date=

Enter t2 time= :
Enter t2 date=

Date Difference: 0

Calculate elapsed seconds:

The elapsed test time in seconds is: 120.5

Can + Wet Soil	**192.41**	
Can + Dry Soil	**187.65**	
Wt. Of Can	**45.98**	
Wt. Of Water	4.76	
Wt. Dry Soil	141.67	
% Moisture	3.4	

Enter sample length (L):	**1.70**	**in**
Enter sample diameter (D):	**2.25**	**in**
The sample length is:	4.32	cm
The sample area is:	25.65	cm^2

Enter Sample Weight:	**174.6**	**g**
The sample area is:	3.976	in^2
The sample volume is:	6.759	in^3
The sample volume is:	3.9117E-03	ft^3

Wet Density:	98.4	lb/ft^3
Dry Density:	95.2	lb/ft^3

Density of Water at (T) is: 0.99843

Viscosity Correction of Water (R_T): 1.025

Hydraulic Conductivity (k_{20})= 1.06E-02 cm/sec

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Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Fine Sand — Date: March 2, 2006 — Lab No.: 48451
Sampled From: B-8, 20.0'-21.5' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 111.4 pcf
Dry Unit Weight: 109.4 pcf
% Moisture: 1.9
% Compaction:
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 1.2E-02 cm/sec.

Remarks:

Reviewed By: Reviewed By: Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48451

Text in **BOLD** is user input.

Temperature (Tw)= 17.0 C
Enter H1= 43 cm
Enter H2= 25 cm
Enter Standpipe Area: 9.098 cm^2

If you know the total test time in seconds, Enter Here: 67 (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 67

Can + Wet Soil	**236.49**
Can + Dry Soil	**233.09**
Wt. Of Can	**50.71**
Wt. Of Water	3.4
Wt. Dry Soil	182.38
% Moisture	1.9

Enter sample length (L): 1.50 in
Enter sample diameter (D): 2.25 in
The sample length is: 3.81 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: 174.44 g
The sample area is: 3.976 in^2
The sample volume is: 5.964 in^3
The sample volume is: 3.4515E-03 ft^3

Wet Density: 111.4 lb/ft^3
Dry Density: 109.4 lb/ft^3

Density of Water at (T) is: 0.99880
Viscosity Correction of Water (R_T): 1.077
Hydraulic Conductivity (k_{20})= 1.18E-02 cm/sec

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Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Fine Sand — Date: March 2, 2006 — Lab No.: 48558
Sampled From: B-9, 50.0'-51.5' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 93.6 pcf
Dry Unit Weight: 92.4 pcf
% Moisture: 1.4
% Compaction:
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 6.2E-03 cm/sec.

Remarks:

Reviewed By: Reviewed By: Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48558

Text in **BOLD** is user input.

Temperature (Tw)= 17.0 C
Enter H1= 43 cm
Enter H2= 25 cm
Enter Standpipe Area: 9.098 cm^2

If you know the total test time in seconds, Enter Here: 153 (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 153

Can + Wet Soil	**606.80**
Can + Dry Soil	**601.20**
Wt. Of Can	**192.30**
Wt. Of Water	5.6
Wt. Dry Soil	408.9
% Moisture	1.4

Enter sample length (L): 1.80 in
Enter sample diameter (D): 2.25 in
The sample length is: 4.57 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: 175.9 g
The sample area is: 3.976 in^2
The sample volume is: 7.157 in^3
The sample volume is: 4.1417E-03 ft^3

Wet Density: 93.6 lb/ft^3
Dry Density: 92.4 lb/ft^3

Density of Water at (T) is: 0.99880
Viscosity Correction of Water (R_T): 1.077
Hydraulic Conductivity (k_{20})= 6.19E-03 cm/sec

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Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
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213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Fine Sand — Date: March 2, 2006 — Lab No.: 48567
Sampled From: B-10, 80.0'-81.5' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 88.5 pcf
Dry Unit Weight: 86.0 pcf
% Moisture: 2.9
% Compaction:
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 8.1E-03 cm/sec.

Remarks:

Reviewed By: Reviewed By: Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48567

Text in **BOLD** is user input.

Temperature (Tw)= 18.0 C
Enter H1= 43 cm
Enter H2= 25 cm
Enter Standpipe Area: 9.098 cm^2

If you know the total test time in seconds, Enter Here: 128 (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 128

Can + Wet Soil	**651.90**
Can + Dry Soil	**639.60**
Wt. Of Can	**210.00**
Wt. Of Water	12.3
Wt. Dry Soil	429.6
% Moisture	2.9

Enter sample length (L): 2.02 in
Enter sample diameter (D): 2.25 in
The sample length is: 5.13 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: 186.59 g
The sample area is: 3.976 in^2
The sample volume is: 8.032 in^3
The sample volume is: 4.6480E-03 ft^3

Wet Density: 88.5 lb/ft^3
Dry Density: 86.0 lb/ft^3

Density of Water at (T) is: 0.99862
Viscosity Correction of Water (R_T): 1.051
Hydraulic Conductivity (k_{20})= 8.10E-03 cm/sec

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Fine Sand — Date: March 2, 2006 — Lab No.: 48573
Sampled From: B-11, 35.0'-36.5' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 93.4 pcf
Dry Unit Weight: 91.5 pcf
% Moisture: 2.1
% Compaction:
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 4.9E-03 cm/sec.

Remarks:

Reviewed By: Reviewed By: Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48573

Text in **BOLD** is user input.

Temperature (Tw)= 18.0 C
Enter H1= 43 cm
Enter H2= 25 cm
Enter Standpipe Area: 9.098 cm^2

If you know the total test time in seconds, Enter Here: 186 (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 186

Can + Wet Soil	**537.30**	
Can + Dry Soil	**529.40**	
Wt. Of Can	**148.50**	
Wt. Of Water	7.9	
Wt. Dry Soil	380.9	
% Moisture	2.1	

Enter sample length (L): 1.79 in
Enter sample diameter (D): 2.25 in
The sample length is: 4.55 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: 174.46 g
The sample area is: 3.976 in^2
The sample volume is: 7.117 in^3
The sample volume is: 4.1187E-03 ft^3

Wet Density: 93.4 lb/ft^3
Dry Density: 91.5 lb/ft^3

Density of Water at (T) is: 0.99862
Viscosity Correction of Water (R_T): 1.051
Hydraulic Conductivity (k_{20})= 4.94E-03 cm/sec

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
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Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Fine Sand — Date: March 2, 2006 — Lab No.: 48583
Sampled From: B-12, 45.0'-46.5' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 96.1 pcf
Dry Unit Weight: 93.2 pcf
% Moisture: 3.0
% Compaction:
% Compaction Requested: Loose

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 1.6E-02 cm/sec.

Remarks:

Reviewed By: Reviewed By: Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48583

Text in **BOLD** is user input.

Temperature (Tw)= **18.0** **C**
Enter H1= **43** **cm**
Enter H2= **25** **cm**
Enter Standpipe Area: **9.098** **cm^2**

If you know the total test time in seconds, Enter Here: **56** (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= **:** **:**
Enter t1 date=

Enter t2 time= **:** **:**
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 56

Can + Wet Soil	**584.80**	
Can + Dry Soil	**573.60**	
Wt. Of Can	**205.30**	
Wt. Of Water	11.2	
Wt. Dry Soil	368.3	
% Moisture	3.0	

Enter sample length (L): **1.75** **in**
Enter sample diameter (D): **2.25** **in**
The sample length is: 4.45 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: **175.46** **g**
The sample area is: 3.976 in^2
The sample volume is: 6.958 in^3
The sample volume is: 4.0267E-03 ft^3

Wet Density: 96.1 lb/ft^3
Dry Density: 93.2 lb/ft^3

Density of Water at (T) is: 0.99862
Viscosity Correction of Water (R_T): 1.051
Hydraulic Conductivity (k_{20})= **1.60E-02** **cm/sec**

Precision Engineering, Inc.
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505-523-7674

Rigid Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Silty Fine Sand — Date: March 2, 2006 — Lab No.: 48590
Sampled From: B-13, 65.0'-66.5' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 79.5 pcf
Dry Unit Weight: 75.3 pcf

% Moisture: 5.5
% Compaction:
% Compaction Requested: Loose*

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 8.2E-04 cm/sec.

Remarks: * Requested compaction "loose as possible" per Jim Bonner

Reviewed By:

Reviewed By:

Certified By:

PARAMETERS
H1 - Initial reading of the standpipe at the begining of the test
H2 - Initial reading of the standpipe at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab No.: 48590

Text in **BOLD** is user input.

Temperature (Tw)= 18.0 C
Enter H1= 43 cm
Enter H2= 18 cm
Enter Standpipe Area: 9.098 cm^2

If you know the total test time in seconds, Enter Here: 2105 (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 2105

Can + Wet Soil	**456.10**	
Can + Dry Soil	**443.40**	
Wt. Of Can	**212.30**	
Wt. Of Water	12.7	
Wt. Dry Soil	231.1	
% Moisture	5.5	

Enter sample length (L): 2.10 in
Enter sample diameter (D): 2.25 in
The sample length is: 5.33 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: 174.16 g
The sample area is: 3.976 in^2
The sample volume is: 8.350 in^3
The sample volume is: 4.8320E-03 ft^3

Wet Density: 79.5 lb/ft^3
Dry Density: 75.3 lb/ft^3

Density of Water at (T) is: 0.99862
Viscosity Correction of Water (R_T): 1.051
Hydraulic Conductivity (k_{20})= 8.23E-04 cm/sec

Precision Engineering, Inc.
P.O. Box 422
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505-523-7674

Flexible Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Clay, sandy — Date: March 2, 2006 — Lab No.: 48594
Sampled From: B-13, 70' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 129.9 pcf
Dry Unit Weight: 113.6 pcf

% Moisture: 14.4
% Compaction:
% Compaction Requested: Insitu

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 2.1×10^{-7} cm/sec.

Remarks:

Reviewed By:

Reviewed By:

Certified By:

PARAMETERS
Hp1 - Initial reading of the pipette (small tube) at the begining of the test
Ha1 - Initial reading of the annulus tube (large tube) at the begining of the test
Hp2 - Final reading of the pipette (small tube) at the end of the test
Ha2 - Final reading of the annuls (large tube) at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab Number: 48594

Text in **BOLD** is user input.

Temperature (Tw)= **17.0** **C**
Enter Hp1= **28** **cm**
Enter Ha1= **0.7** **cm**
Enter Hp2= **18** **cm**
Enter Ha2= **cm** where required

If you know the total test time in seconds, Enter Here: **622** (Leave blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= **:** **:**
Enter t1 date=

Enter t2 time= **:** **:**
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 622

Can + Wet Soil	**176.66**	
Can + Dry Soil	**160.66**	
Wt. Of Can	**49.33**	
Wt. Of Water	16	
Wt. Dry Soil	111.33	
% Moisture	14.4	

Enter sample length (L): **0.99** **in**
Enter sample diameter (D): **2.25** **in**
The sample length is: 2.51 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: **134.2** **g**
The sample area is: 3.976 in^2
The sample volume is: 3.936 in^3
The sample volume is: 2.27796E-03 ft^3

Density of Mercury at (T) is: 13.5536
Density of Water at (T) is: 0.99880
Viscosity Correction of Water (R_T): 1.077
Hydraulic Conductivity (k_{20})= **2.13E-07** **cm/sec**

Wet Density: 129.9 lb/ft^3
Dry Density: 113.6 lb/ft^3

Precision Engineering, Inc.
P.O. Box 422
Las Cruces, NM 88004
505-523-7674

Flexible Wall Hydraulic Conductivity
Falling Head

ATTN: Mr. Dan Schopp
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Project: Camino Real Landfill — File No.: 05-126
Soil Type: Clay, sandy — Date: March 2, 2006 — Lab No.: 48593
Sampled From: B-14, 40' — Performed By: GWG

TEST SPECIMEN CONDITIONS AT BEGINING OF TEST:

Wet Unit Weight: 126.9 pcf
Dry Unit Weight: 121.9 pcf
% Moisture: 4.1
% Compaction:
% Compaction Requested: Insitu

PROCTOR INFORMATION:

Proctor Method:
Maximum Dry Density: na pcf
Optimum Moisture Content: na %

Coefficient of Permeability, k_{20}: 1.7×10^{-7} cm/sec.

Remarks:

Reviewed By: Reviewed By: Certified By:

PARAMETERS

Hp1 - Initial reading of the pipette (small tube) at the begining of the test
Ha1 - Initial reading of the annulus tube (large tube) at the begining of the test
Hp2 - Final reading of the pipette (small tube) at the end of the test
Ha2 - Final reading of the annuls (large tube) at the end of the test
t1 - Initial time (begining of test)
t2 - Final time (end of test)
Tw - Temperature of the water (C)

Lab Number: **48593**

Text in **BOLD** is user input.

Temperature (Tw)=	**18.0**	**C**	
Enter Hp1=	**28**	**cm**	
Enter Ha1=	**0.7**	**cm**	
Enter Hp2=	**18**	**cm**	
Enter Ha2=		**cm**	where required

If you know the total test time in seconds, Enter Here: **702** (Leave blank if you don't)

Otherwise:

Time entry format is **HH:MM:SS (MILITARY TIME)**
Date entry format is **MO/DA/YR**

Enter t1 time= : :
Enter t1 date=

Enter t2 time= : :
Enter t2 date=

Date Difference: 0
Calculate elapsed seconds:
The elapsed test time in seconds is: 702

Can + Wet Soil	**155.24**	
Can + Dry Soil	**151.12**	
Wt. Of Can	**51.16**	
Wt. Of Water	4.12	
Wt. Dry Soil	99.96	
% Moisture	4.1	

Enter sample length (L): **0.92** **in**
Enter sample diameter (D): **2.25** **in**
The sample length is: 2.34 cm
The sample area is: 25.65 cm^2

Enter Sample Weight: **121.9** **g**
The sample area is: 3.976 in^2
The sample volume is: 3.658 in^3
The sample volume is: 2.11689E-03 ft^3

Density of Mercury at (T) is: 13.5512
Density of Water at (T) is: 0.99862
Viscosity Correction of Water (R_T): 1.051
Hydraulic Conductivity (k_{20})= **1.71E-07** **cm/sec**

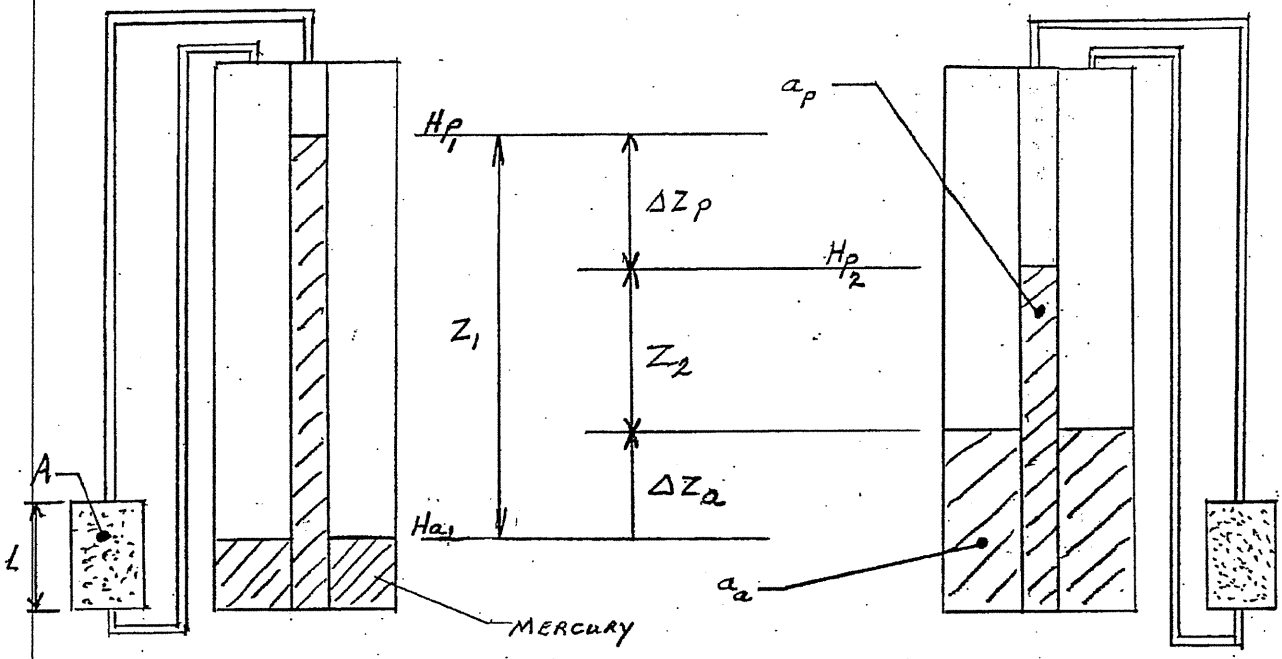
Wet Density: 126.9 lb/ft^3
Dry Density: 121.9 lb/ft^3

HYDRAULIC CONDUCTIVITY SETUP AND SPREADSHEET VERIFICATION

ASTM D-5084

FLEXIBLE WALL HYDRAULIC CONDUCTIVITY TEST

PERMOMETER IS A WELL TYPE / USING MERCURY TO PROVIDE HEAD FOR THE PERMEAMETER.



$t = t_1$ $\qquad$ $t = t_2$

t_1 = INITIAL TIME (TEST BEGINS)
t_2 = FINAL TIME (TEST ENDS)

T = TEMPERATURE
H_{p_1} = PIPETE READING @ t_1

H_{p_2} = PIPETE READING @ t_2

L = LENGTH OF SPECIMEN (cm)
A = AREA OF SPECIMEN (cm^2)
a_a = AREA OF ANNULUS (cm^2)
a_p = AREA OF CENTER PIPET (cm^2)
Z_1 = HEIGHT DIFFERENCE IN MERCURY MENISCI AT t_1
Z_2 = HEIGHT DIFFERENCE IN MERCURY MENISCI AT t_2

γ_w = DENSITY OF WATER AT T

γ_{Hg} = DENSITY OF MERCURY AT T

$$k = \frac{(a_a a_p)L}{(a_a + a_p)A(t_2 - t_1)(\gamma_{Hg} - \gamma_w)} \ln\left[\frac{Z_1(\gamma_{Hg} - \gamma_w)}{\left[Z_1 - \Delta Z_p\left(1 + \frac{a_p}{a_a}\right)\right](\gamma_{Hg} - \gamma_w)}\right]$$

$$Z_1 = H_{p_1} - H_{a_1}$$

$$\Delta Z_p = H_{p_1} - H_{p_2}$$

ABOVE DERIVED FROM DARCY'S LAW REQUIRING:

$$\frac{dQ}{dt} = k\frac{h}{L}(A)$$

FULL DERIVATION PROVIDED UPON REQUEST.

SAMPLE 48593 (8-14, 40')

$a_a = 0.7671\ cm^2$

$a_p = 0.03142\ cm^2$

$L = 0.92\ IN. = 2.34\ cm$

$A = \frac{[(2.25)(2.54)]^2[3.1416]}{4} = 25.65\ cm^2$

$t_{AVE\ OF\ 4} = \frac{(706 + 698 + 702 + 702)}{4} = 702$

$H_{p_1} = 28\ cm$

$H_{p_2} = 18\ cm$

$H_{a_1} = 0.7\ cm$

$Z_1 = 28 - 0.7 = 27.3\ cm$

$\Delta Z_p = 28 - 18 = 10\ cm$

$T = 18°C$

$\gamma_w = 0.9986$

$\gamma_{Hg} = 13.5512$

$$\frac{(.7671)(.0314)(2.34)}{(0.7671 - 0.0314)(25.65)(702)(13.5512 - 0.9986)} \cdot \ln\left[\frac{(27.3)(13.5512 - 0.9986)}{\left[27.3 - \left(10\left(1 + \frac{.03142}{0.7671}\right)\right)\right](13.5512 - .9986)}\right]$$

$$(3.3913 \times 10^{-7})(.4801)$$

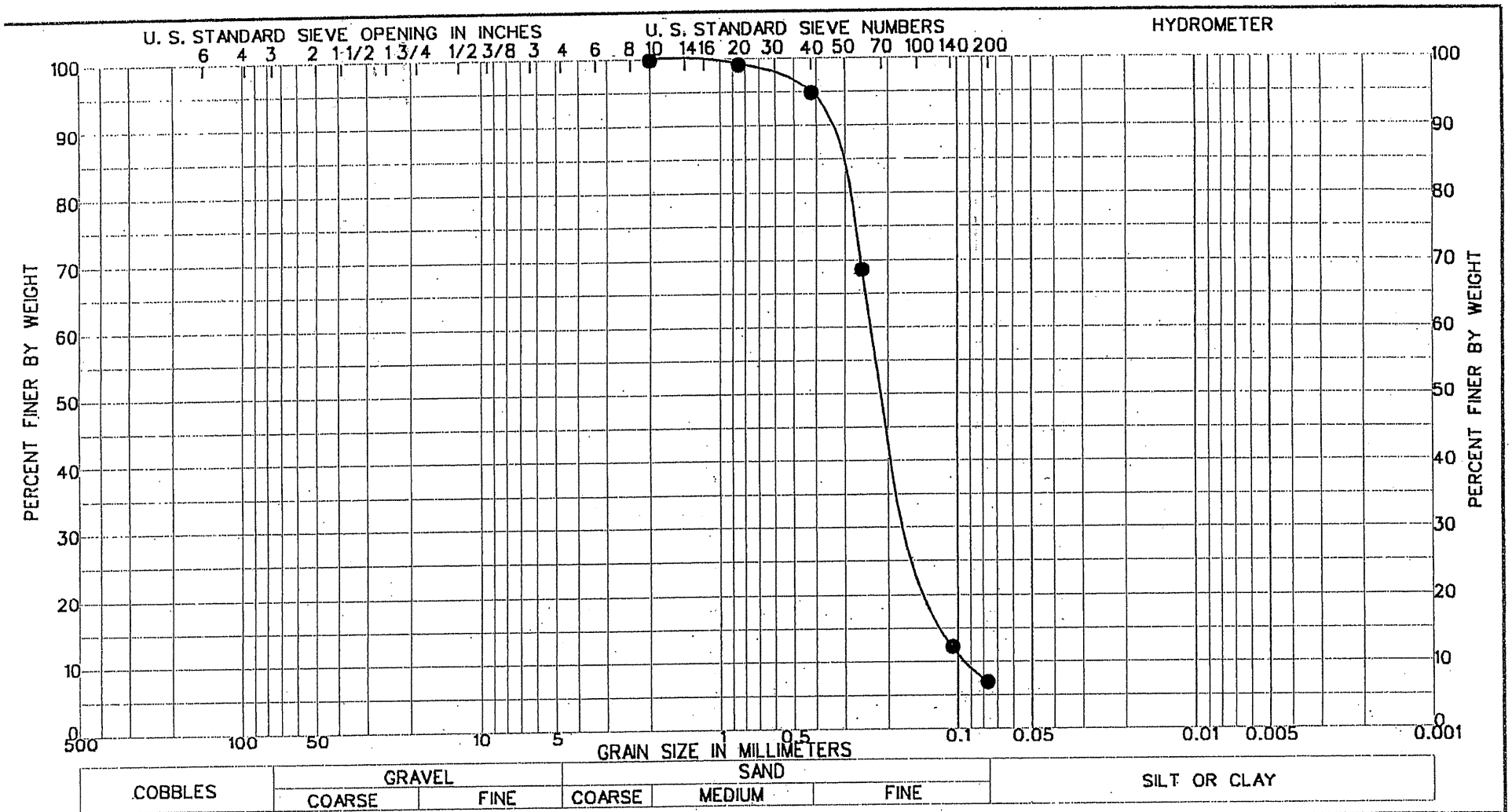
$$= 1.6282 \times 10^{-7}\ @18°C\ cm/sec$$

CORRECT TO 20°C

VISCOSITY CORRECTION FOR WATER = 1.051

$$k_{20} = (1.051)(1.6282 \times 10^{-7}) = 1.711 \times 10^{-7}$$

$$\Rightarrow 1.7 \times 10^{-7}\ cm/sec$$



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

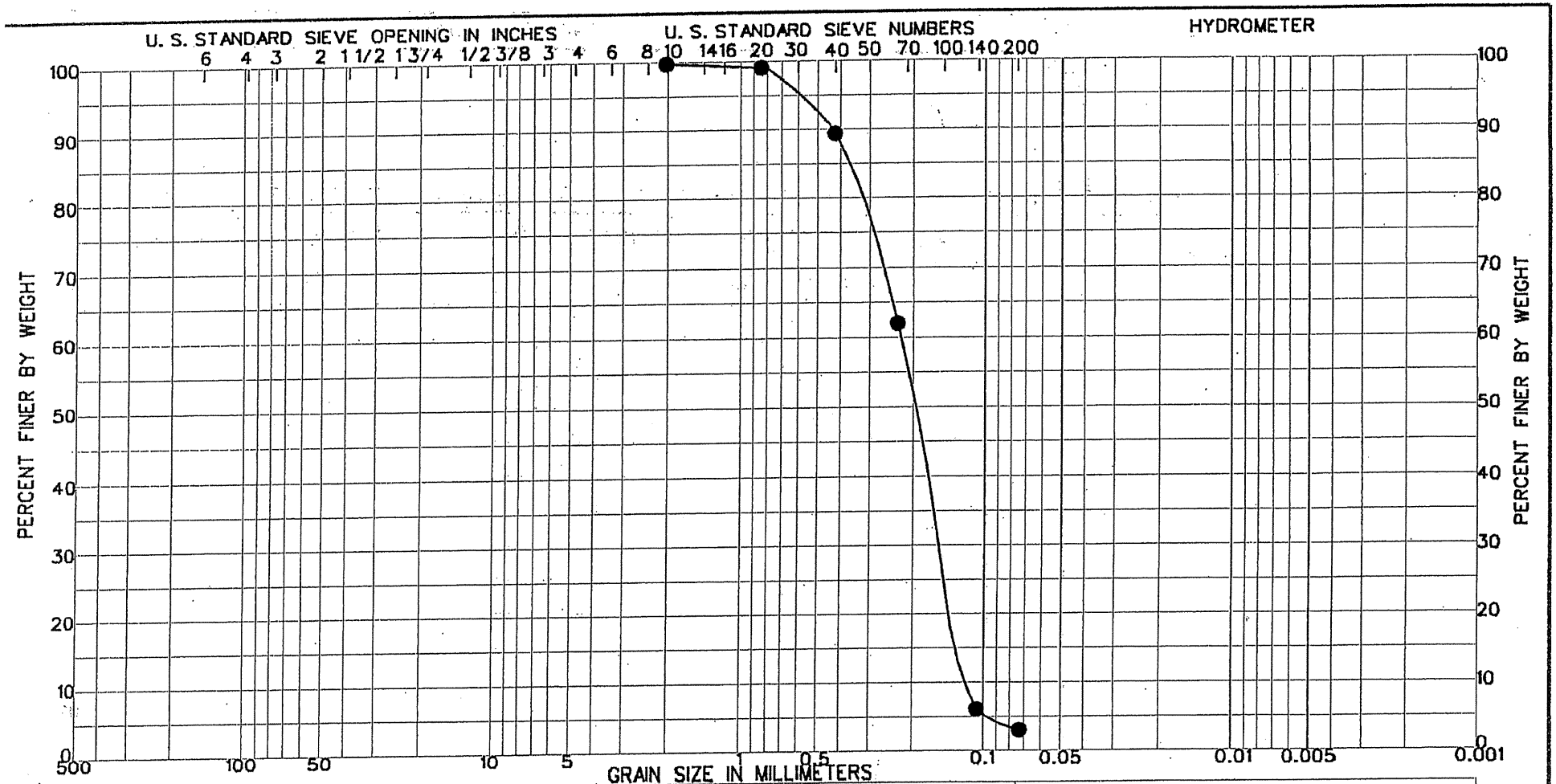
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48428

BORING NO. 5, 60-65'

DATE 2/28/06



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

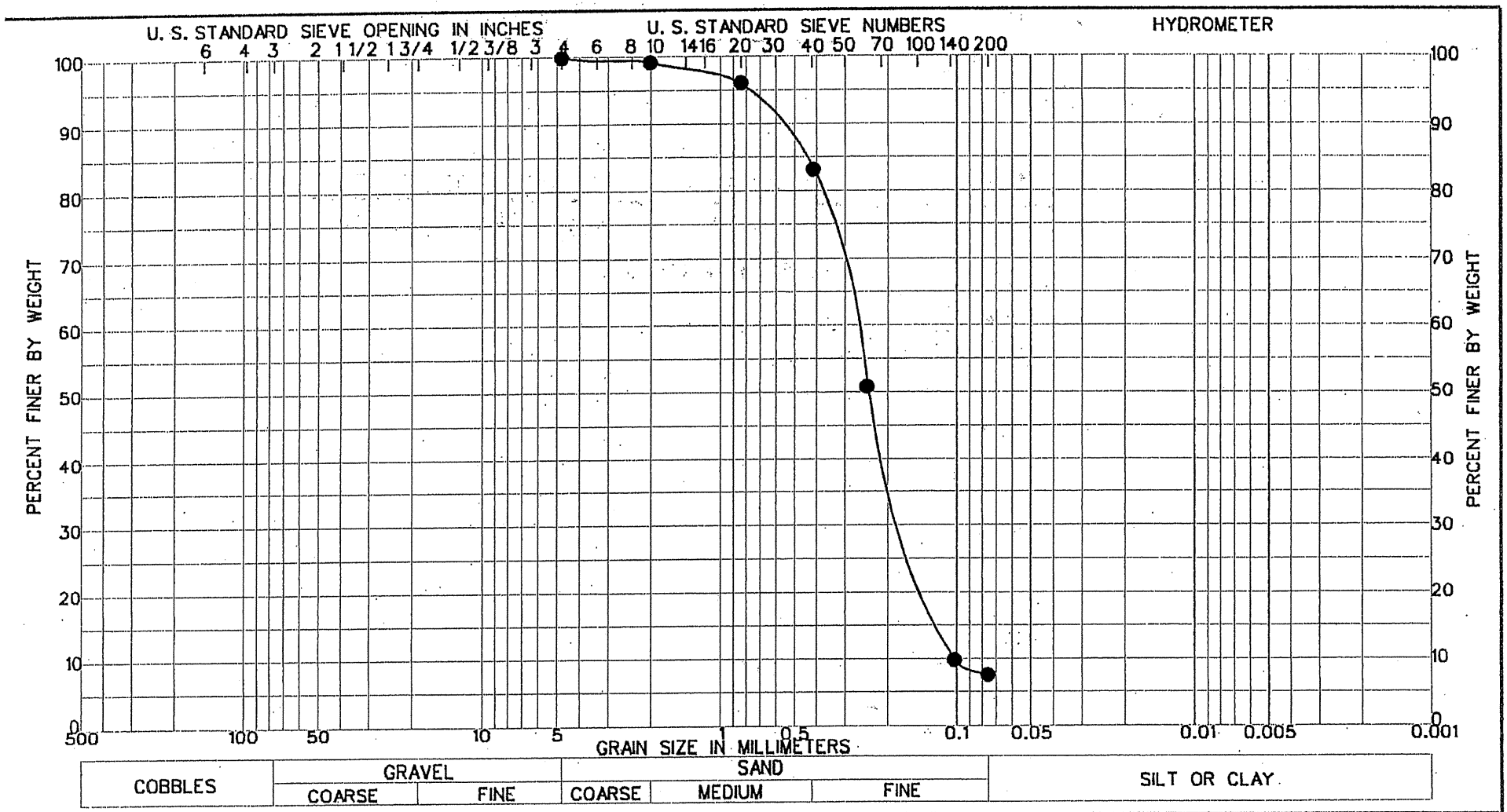
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48429

BORING NO. 6, 40-45'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

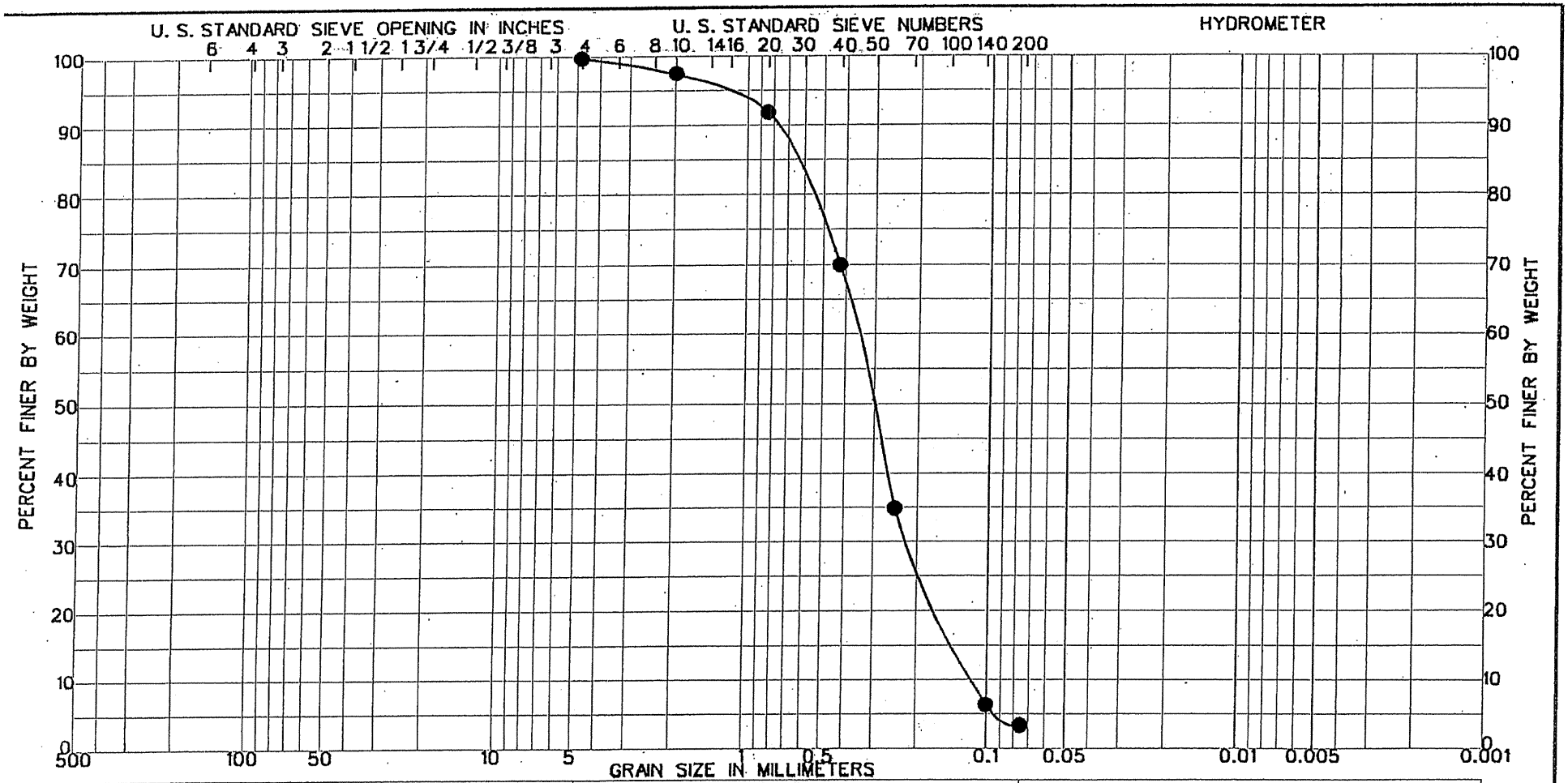
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48430

BORING NO. 7, 60-65'

DATE 2/28/06



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

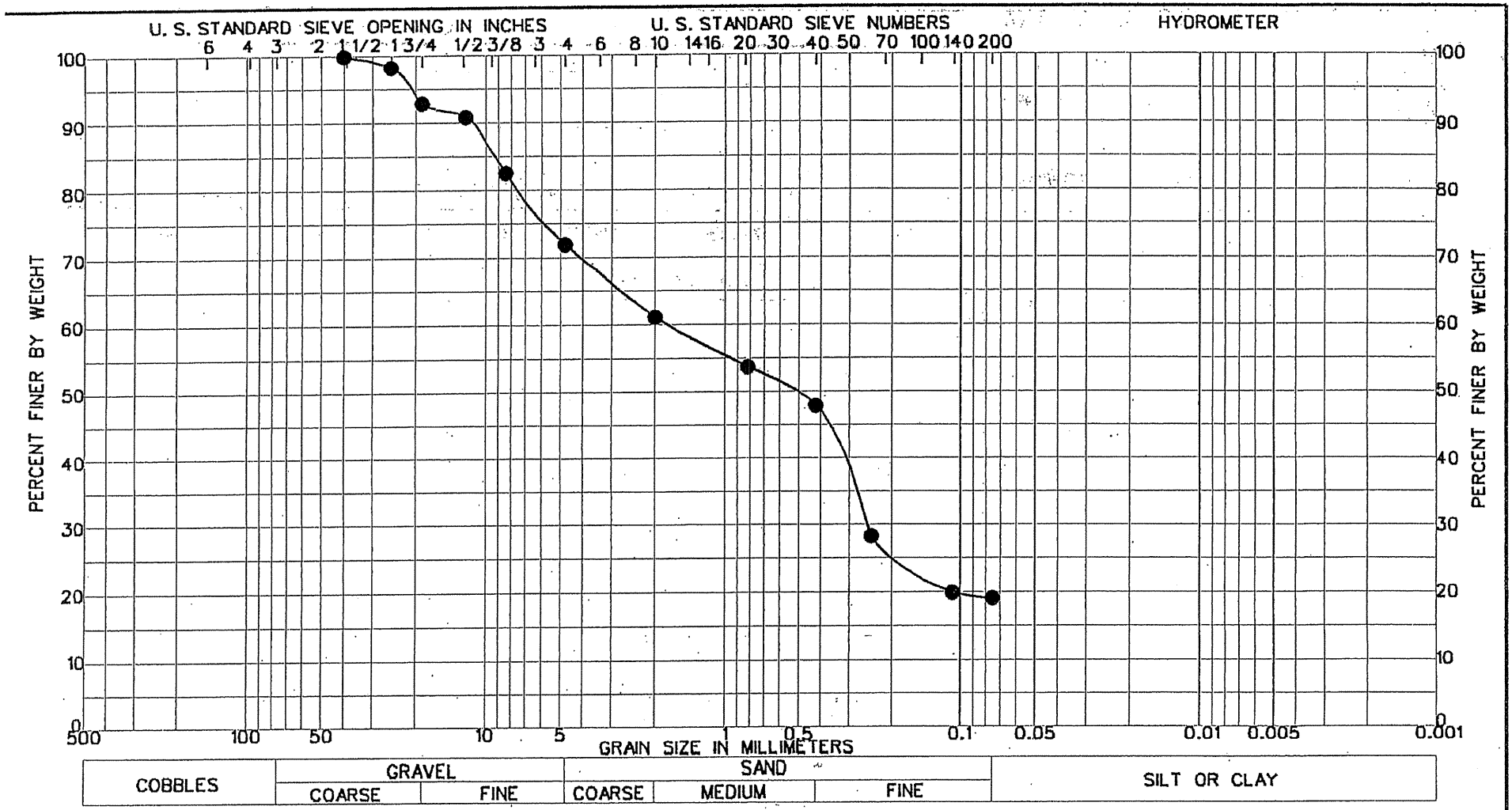
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48431

BORING NO. 8, 65-70'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

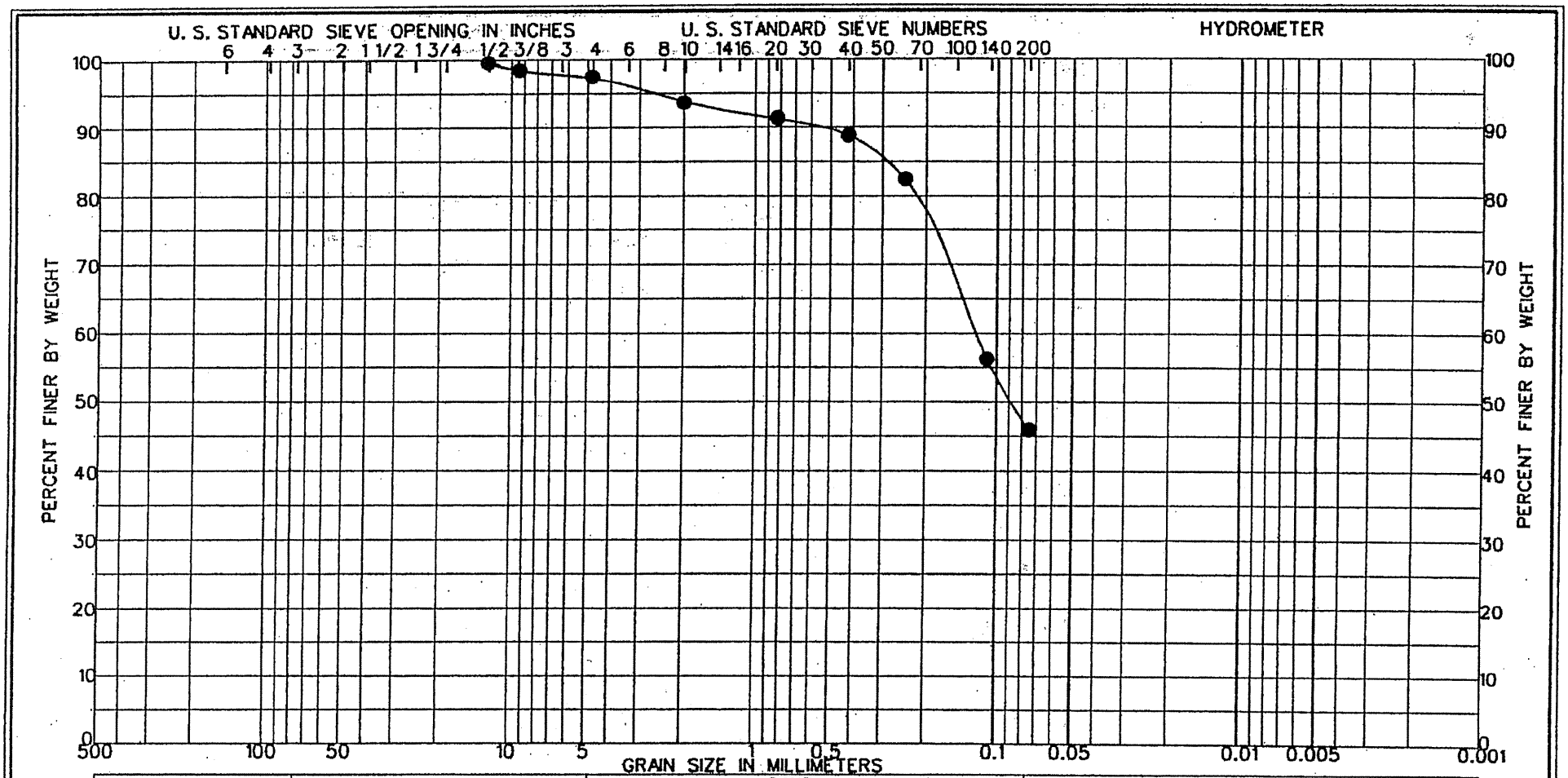
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48432

BORING NO. 5, 5-6.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				42	19	23

GRADATION CURVES

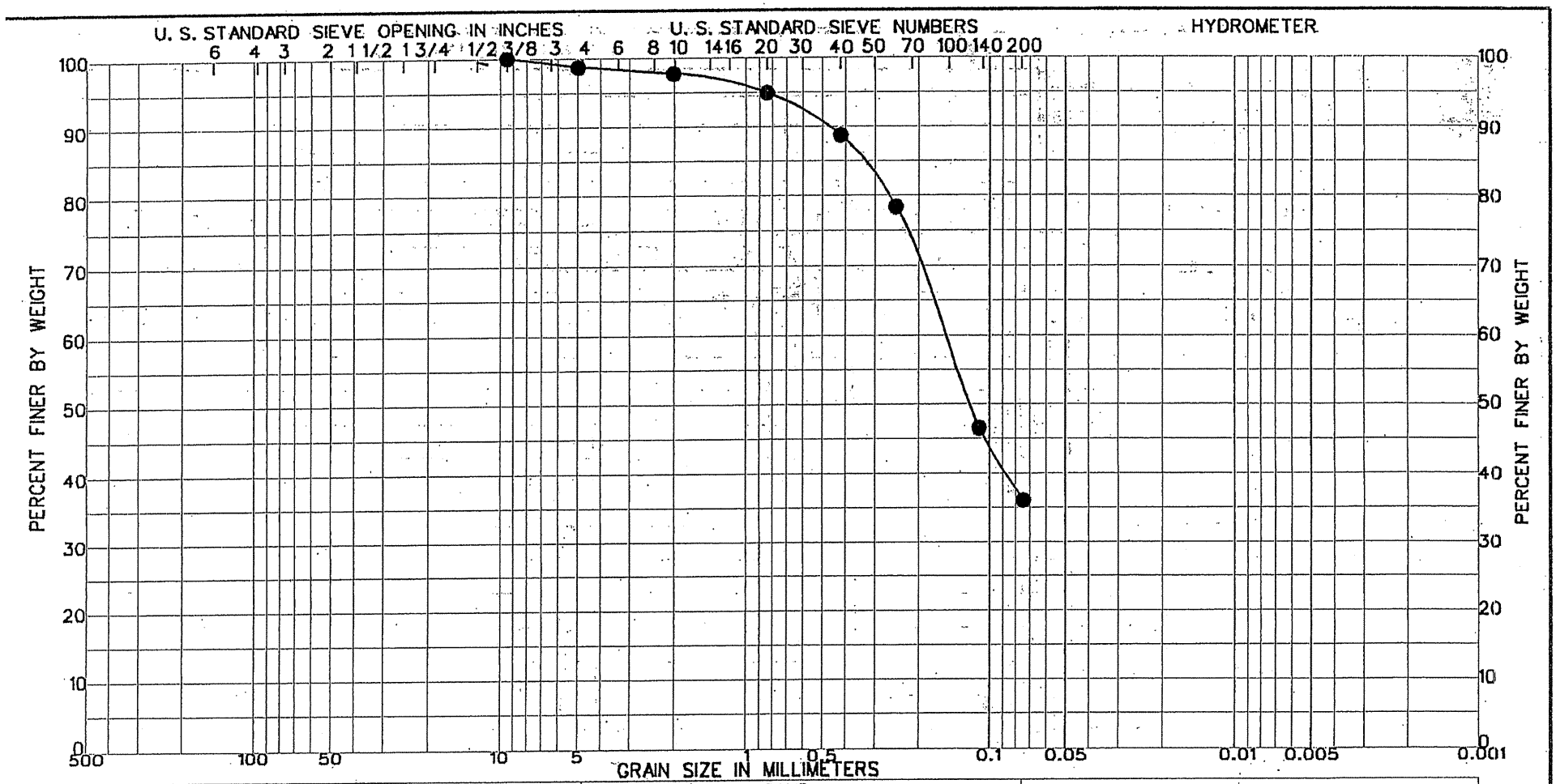
PROJECT Camino Real Landfill

Lab No. 48433

BORING NO. 5. 10-11.5'

DATE 12/27/2005

L:\curves\48433sieve.dgn 8/29/2006 2:53:02 PM



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

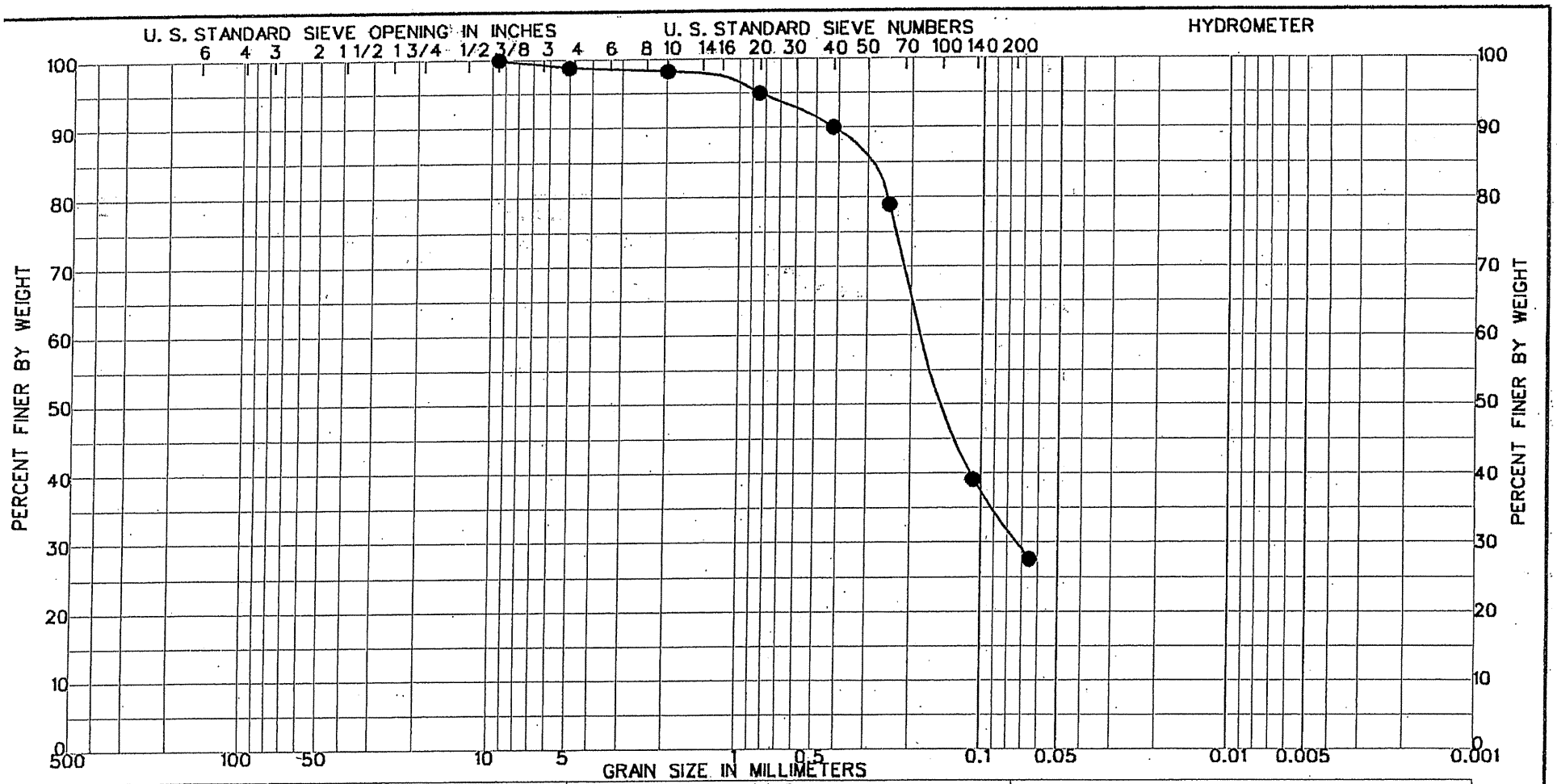
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48434

BORING NO. 5, 15-16.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

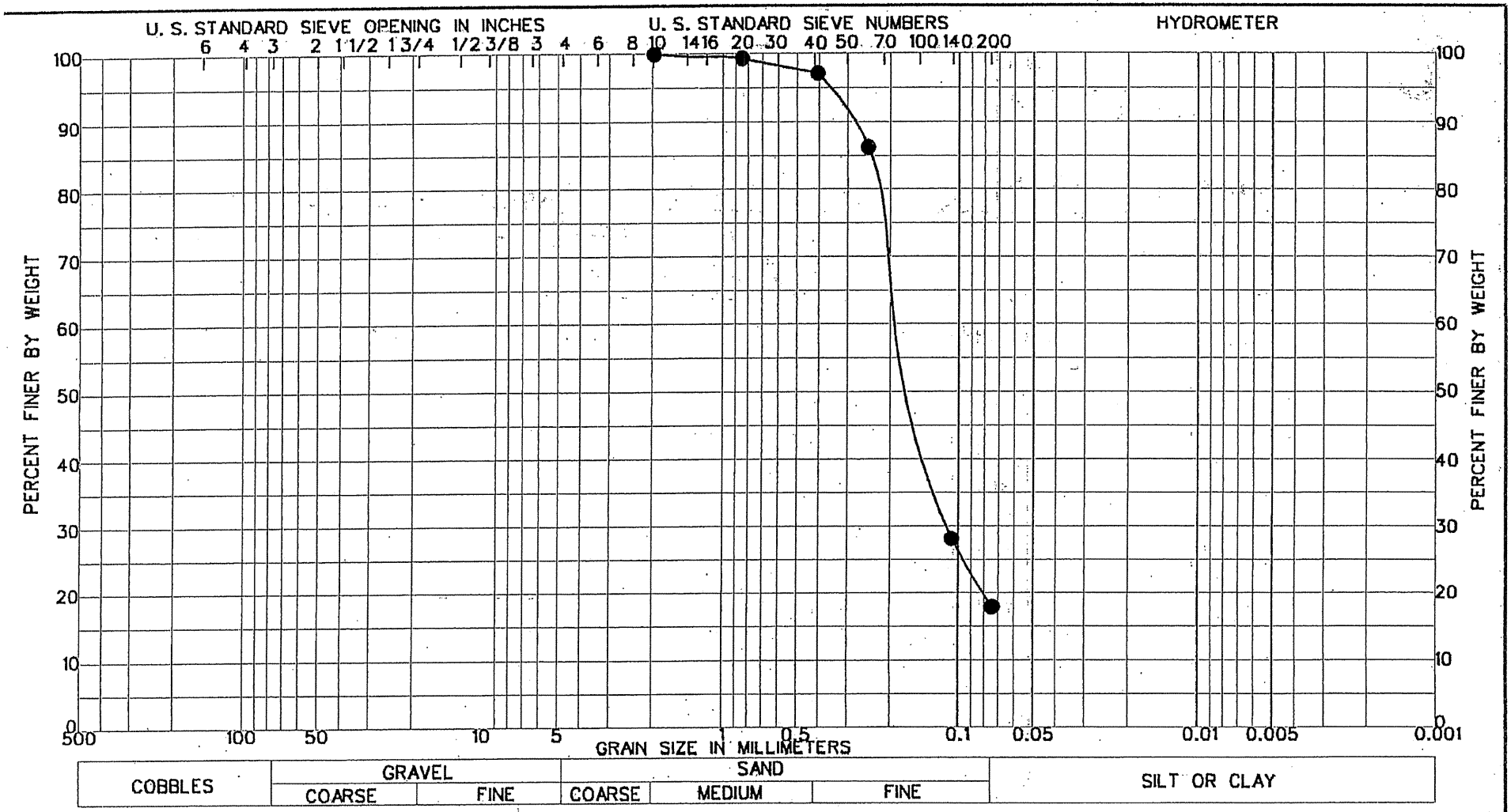
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48435

BORING NO. 5, 20-21.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

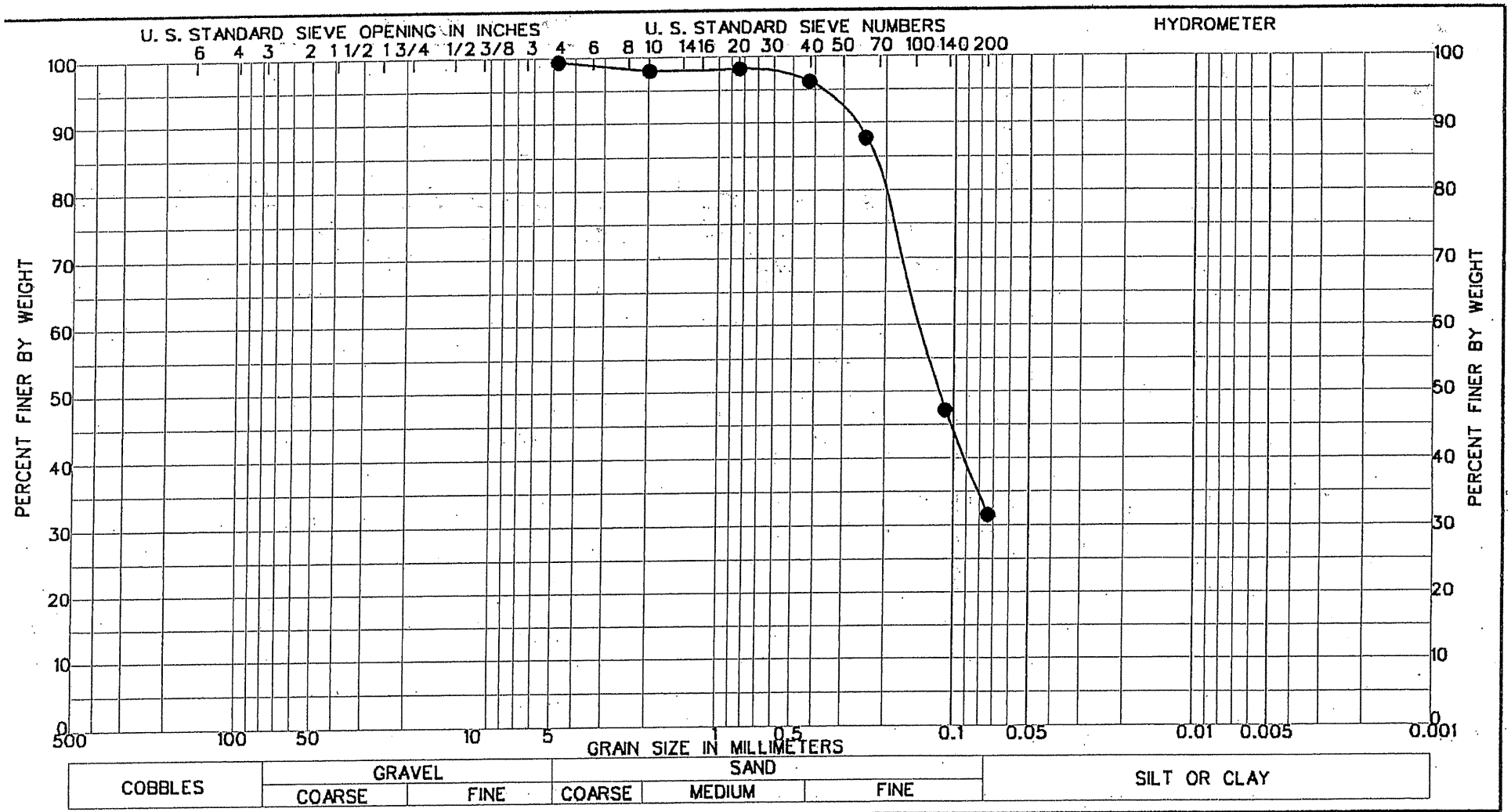
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48436

BORING NO. 5, 25-26.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

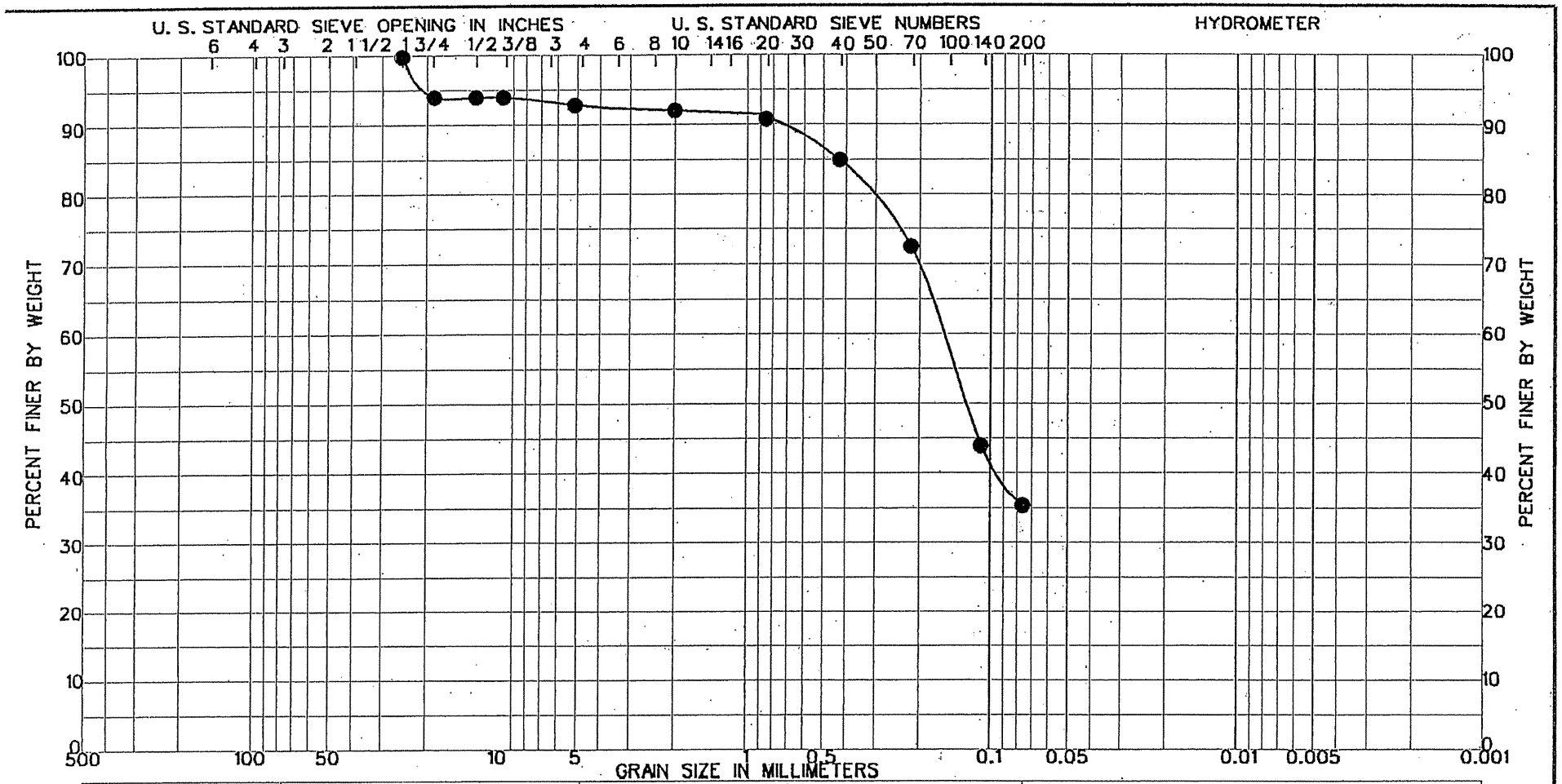
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48437

BORING NO. 5, 30-31.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

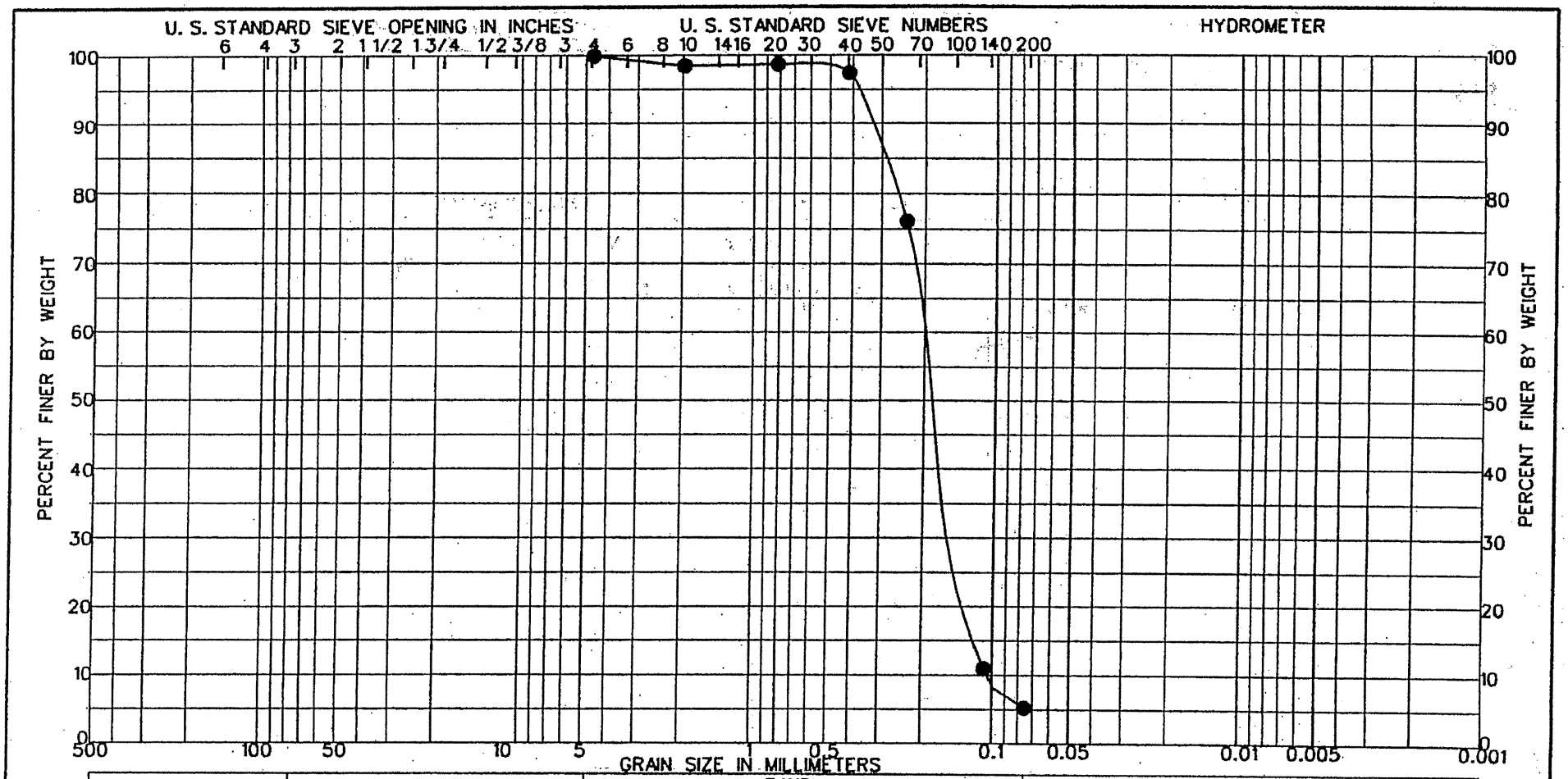
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48438

BORING NO. 5, 35-36.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

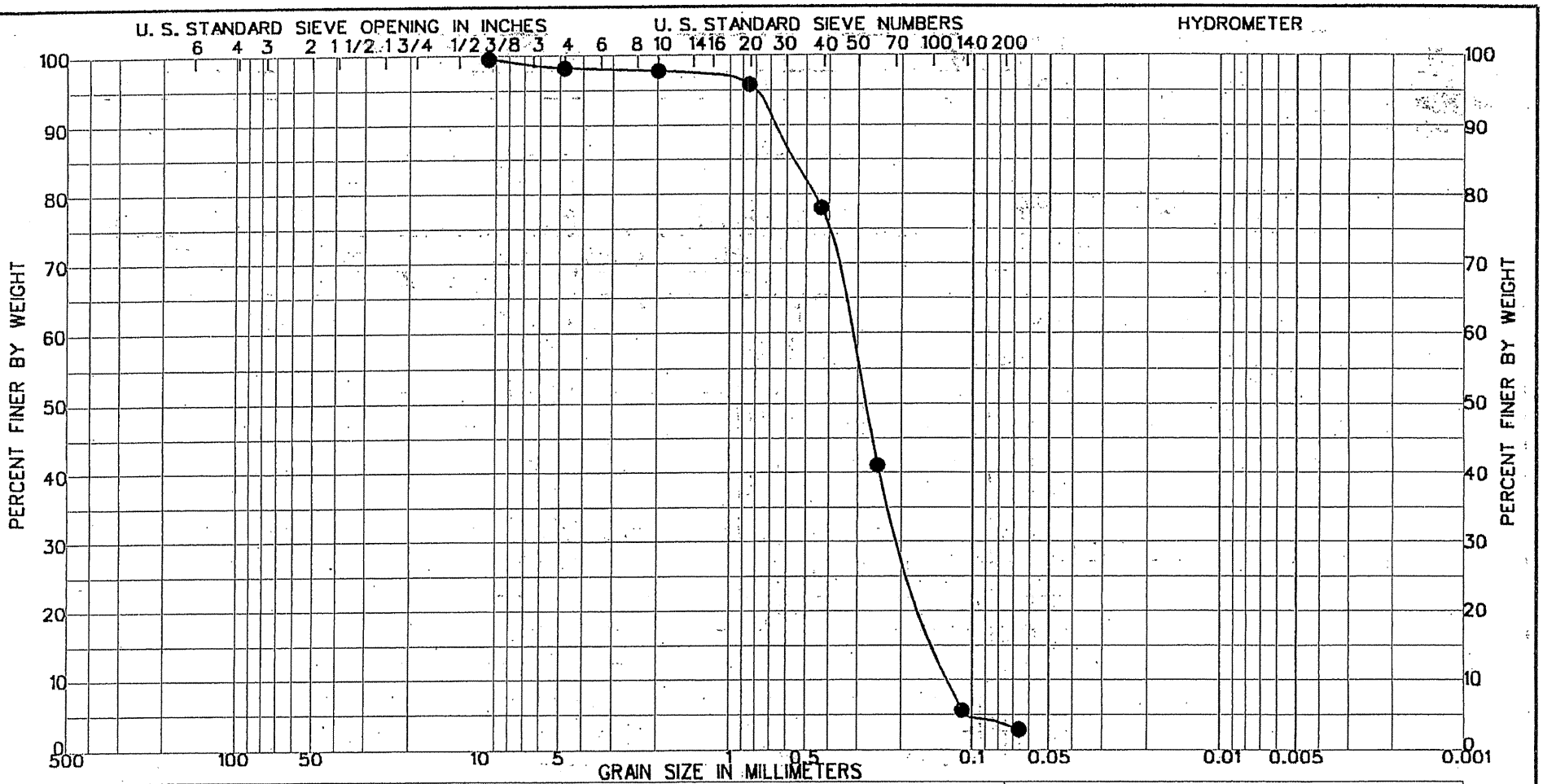
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48440

BORING NO. 5, 50-51.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

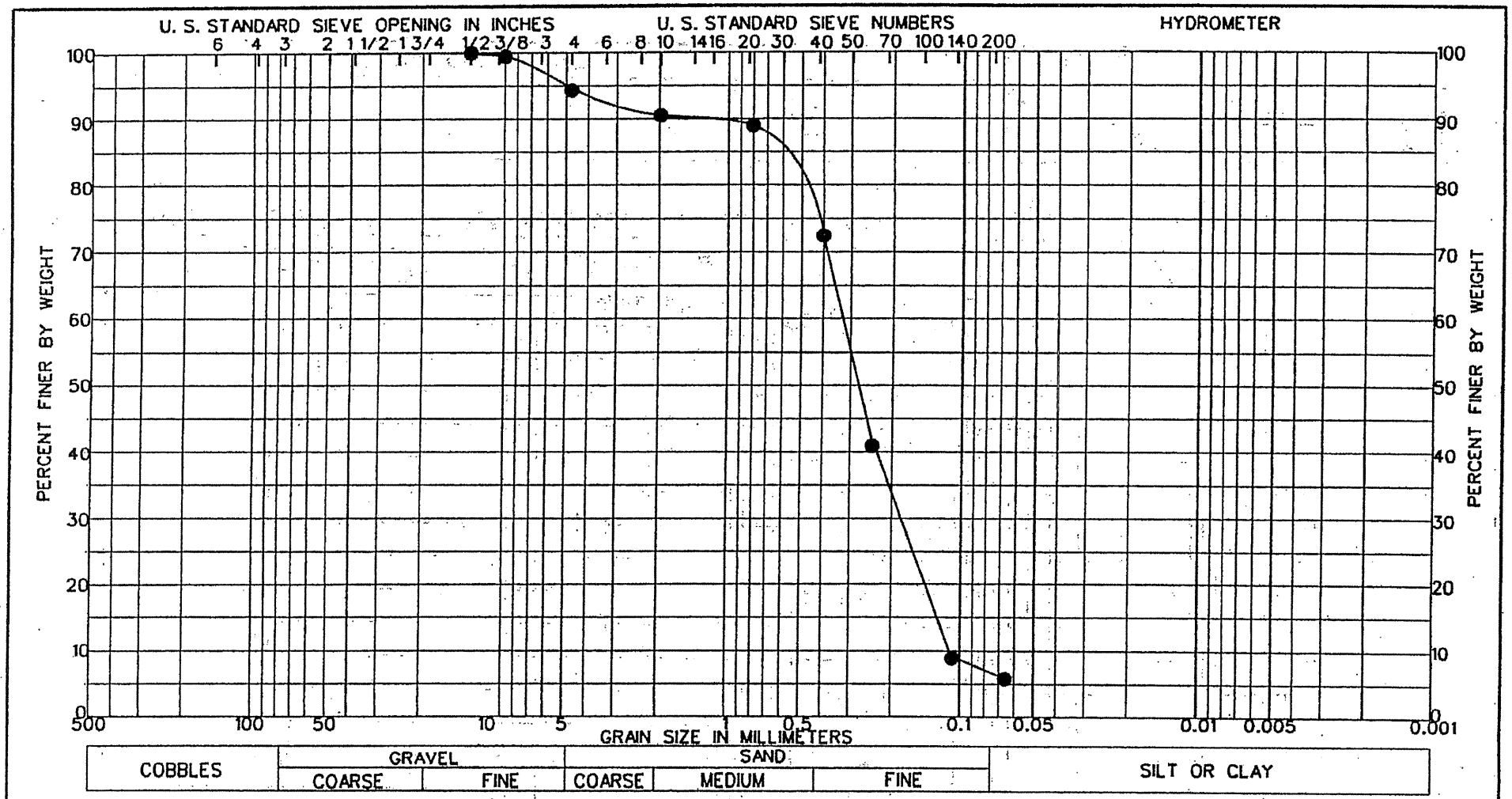
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48441

BORING NO. 6, 15-16.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

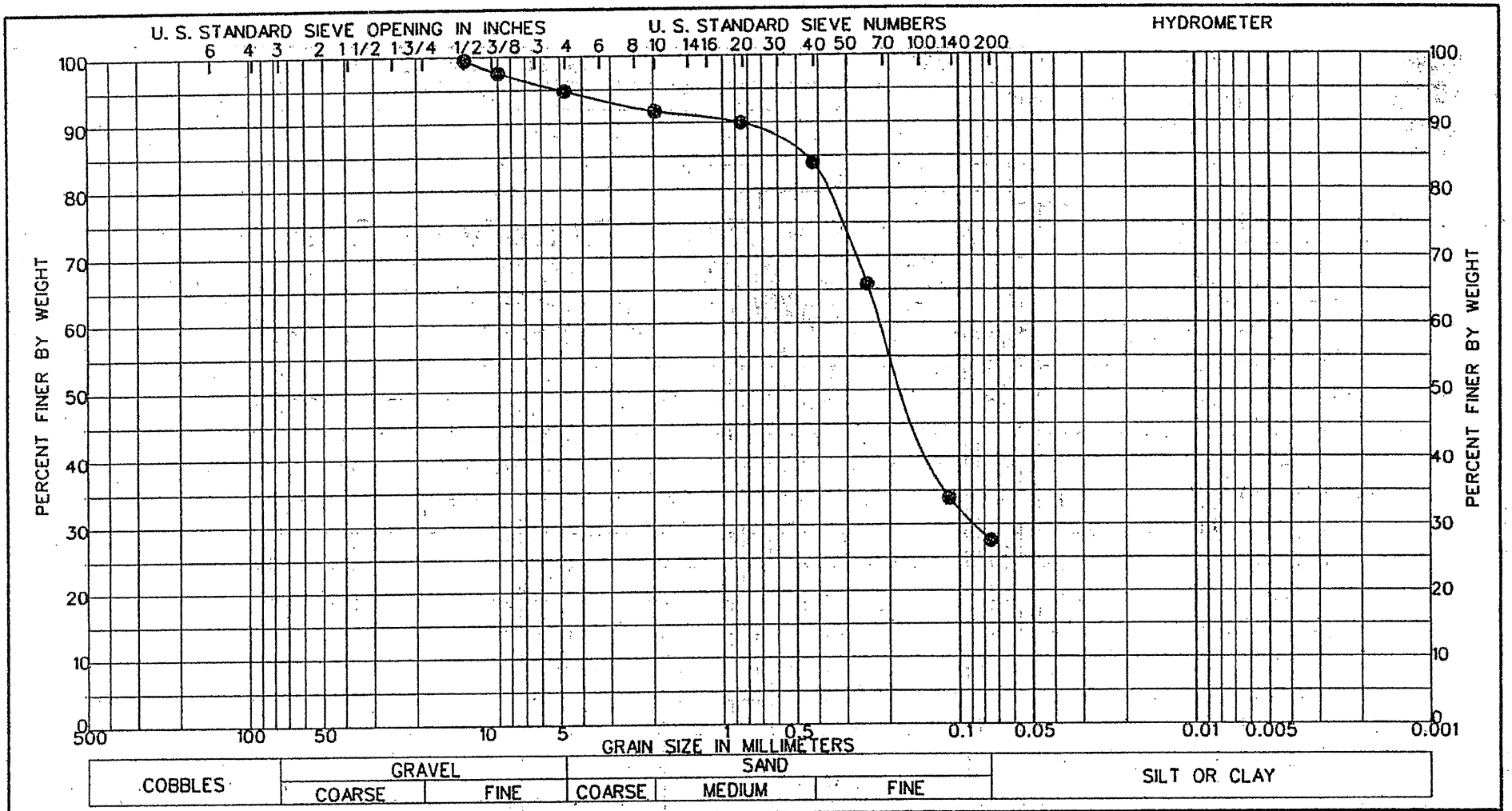
wHK

PROJECT Camino Real Landfill

Lab No. 48442

BORING NO. 6, 20-21.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

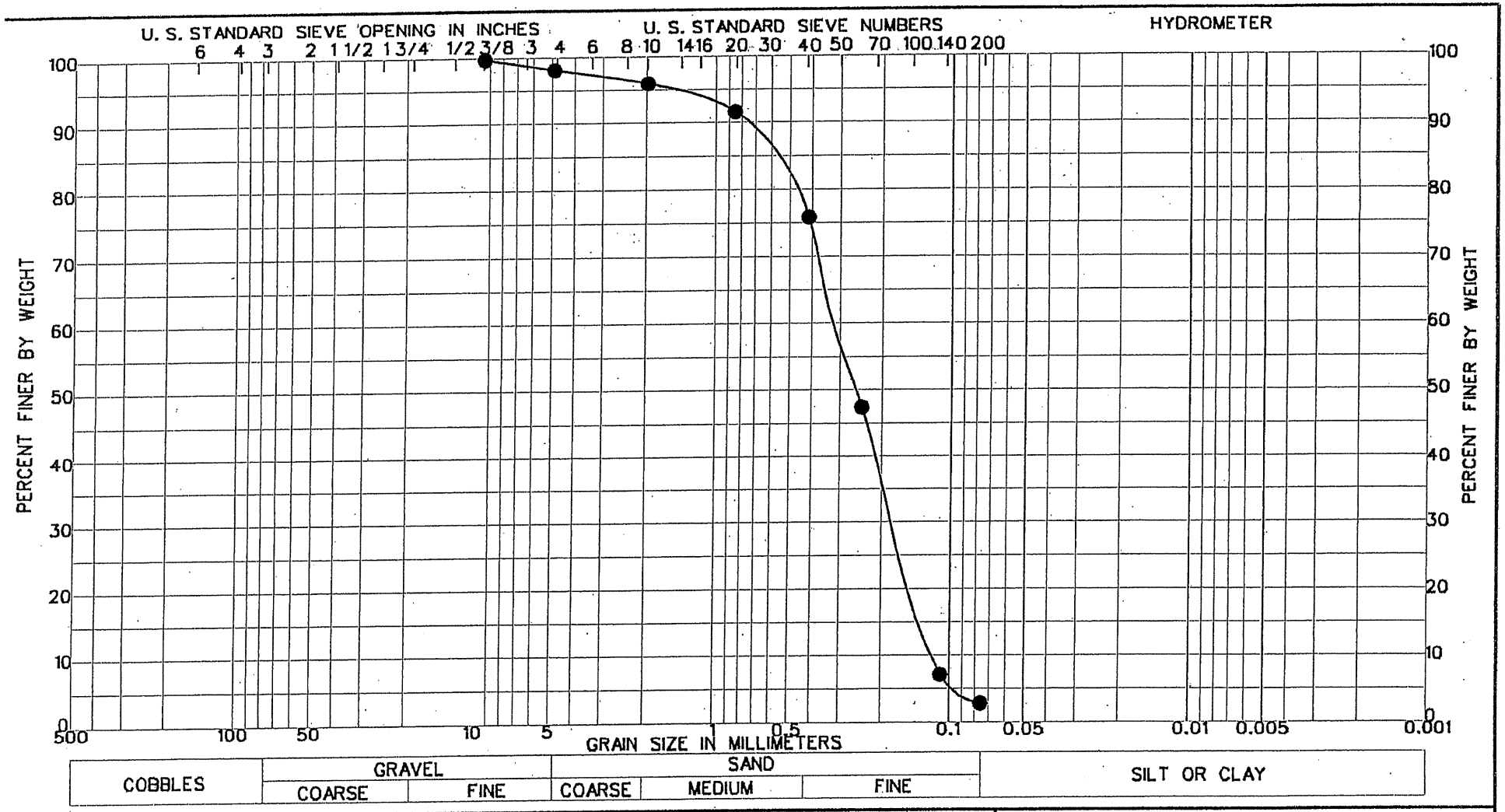
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48443

BORING NO. 6. 25-26.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

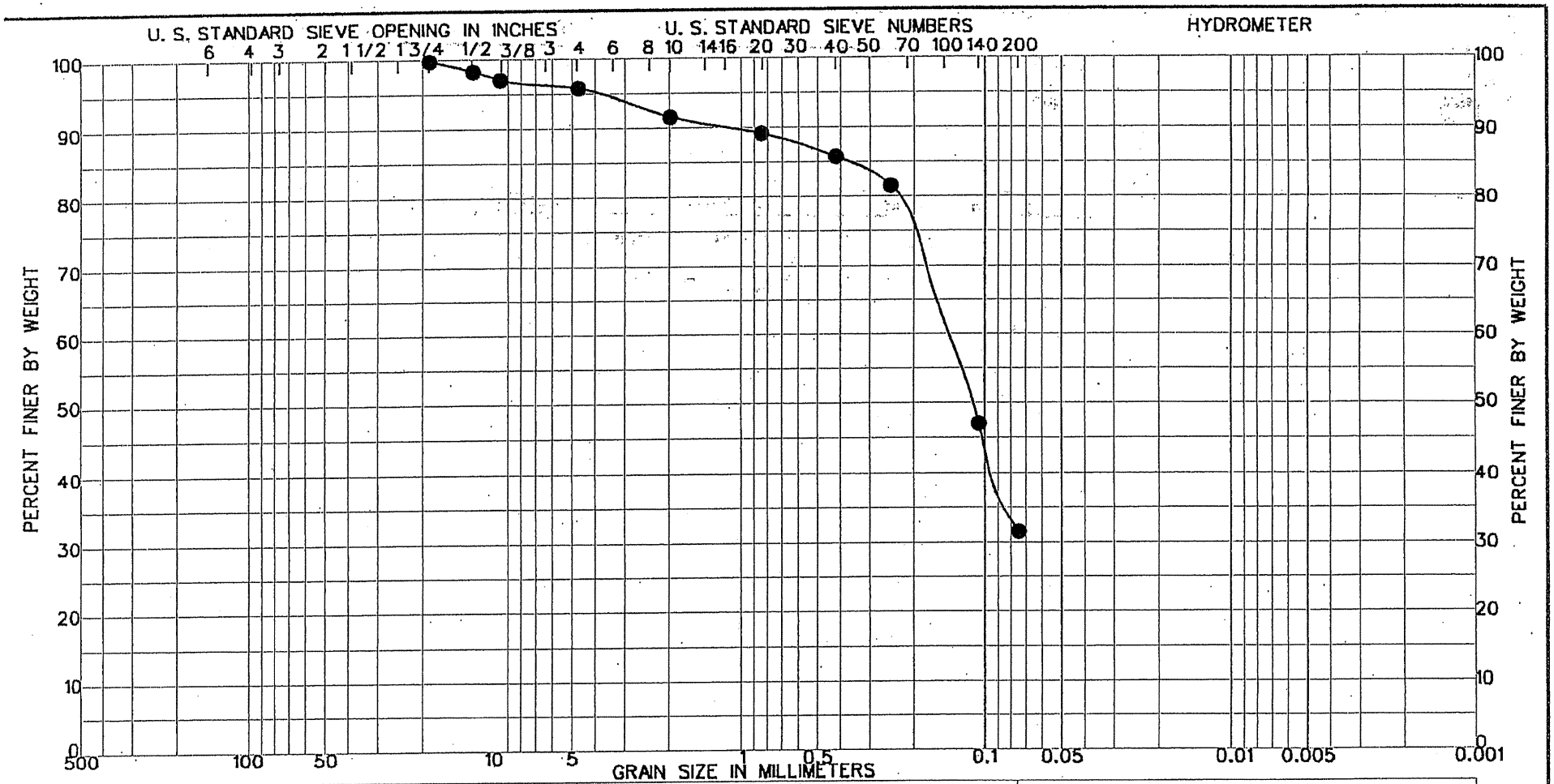
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48444

BORING NO. 6, 30-31.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

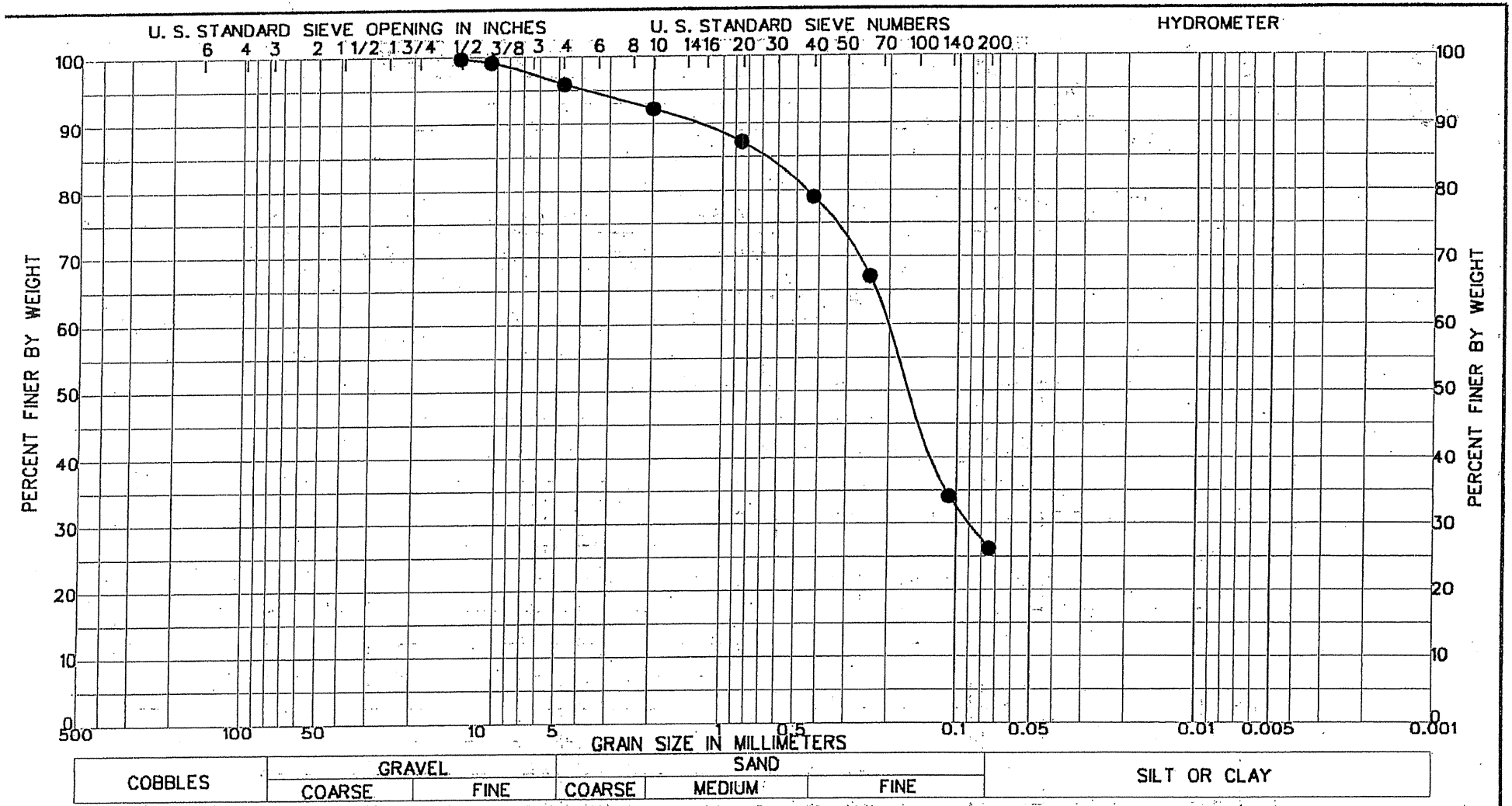
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48445

BORING NO. 7, 5-6.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

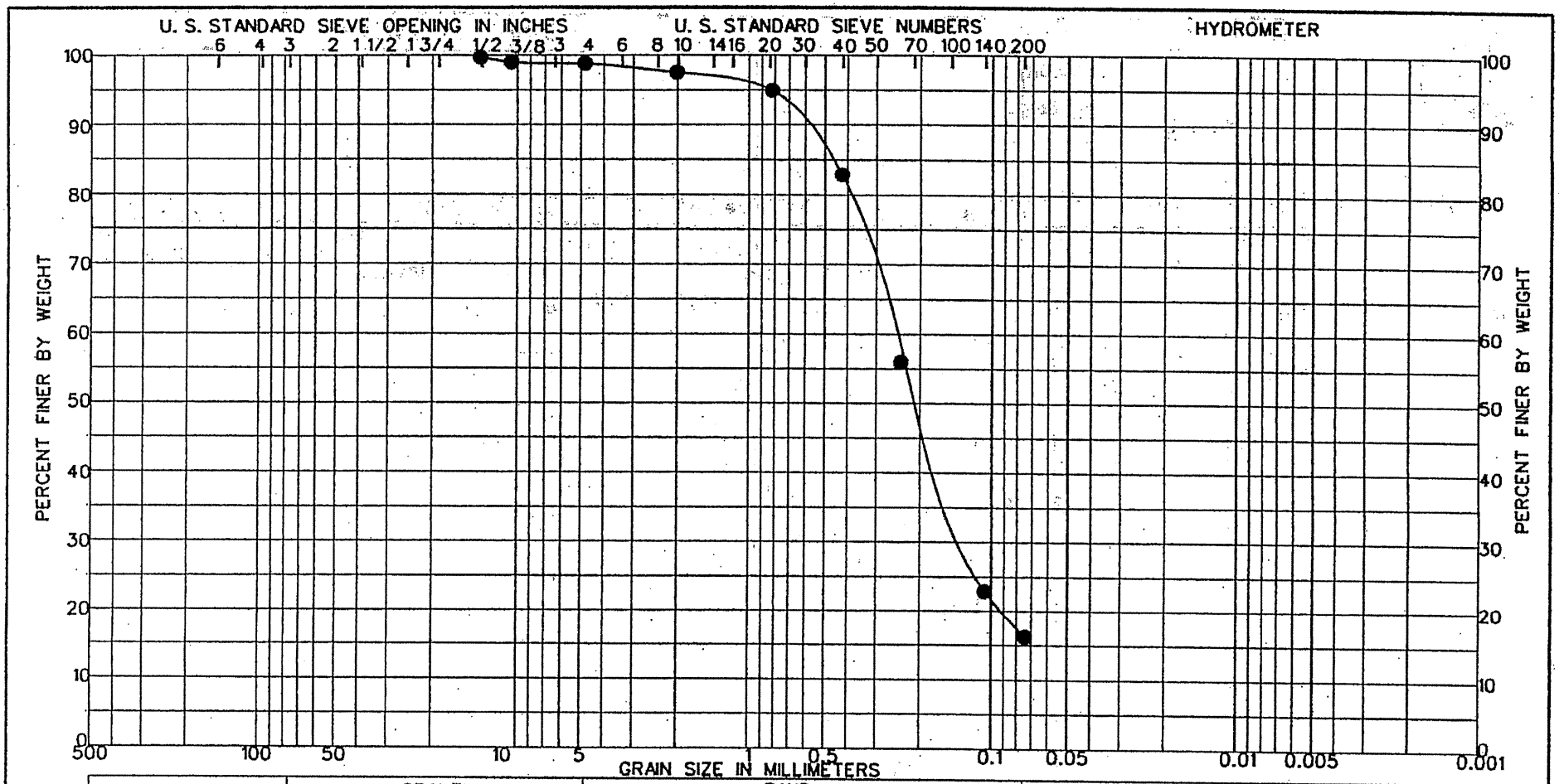
PROJECT Camino Real Landfill

Lab No. 48446

BORING NO. 7, 10-11.5'

DATE 12/27/2005

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

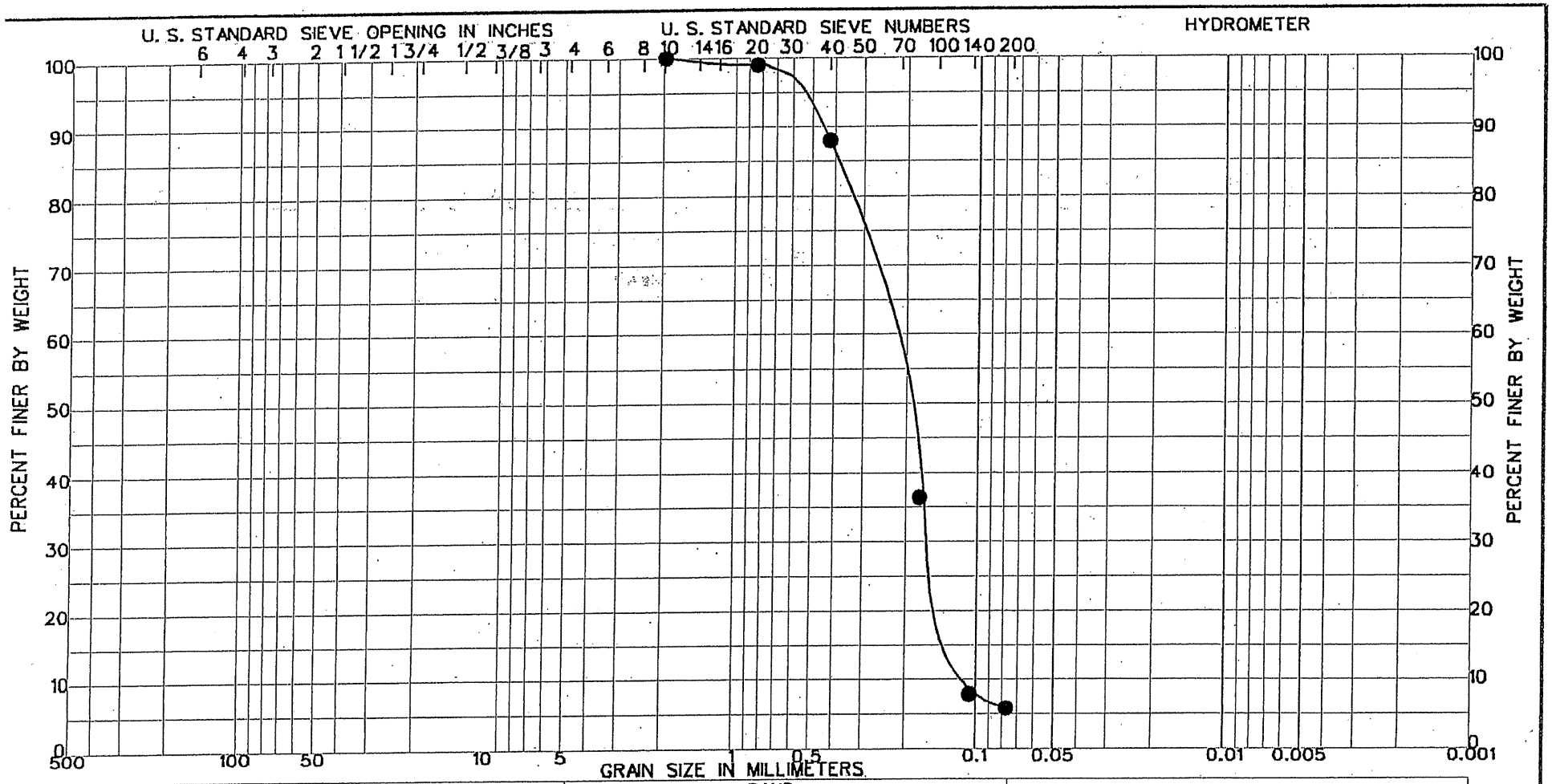
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48447

BORING NO. 7, 15-16.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

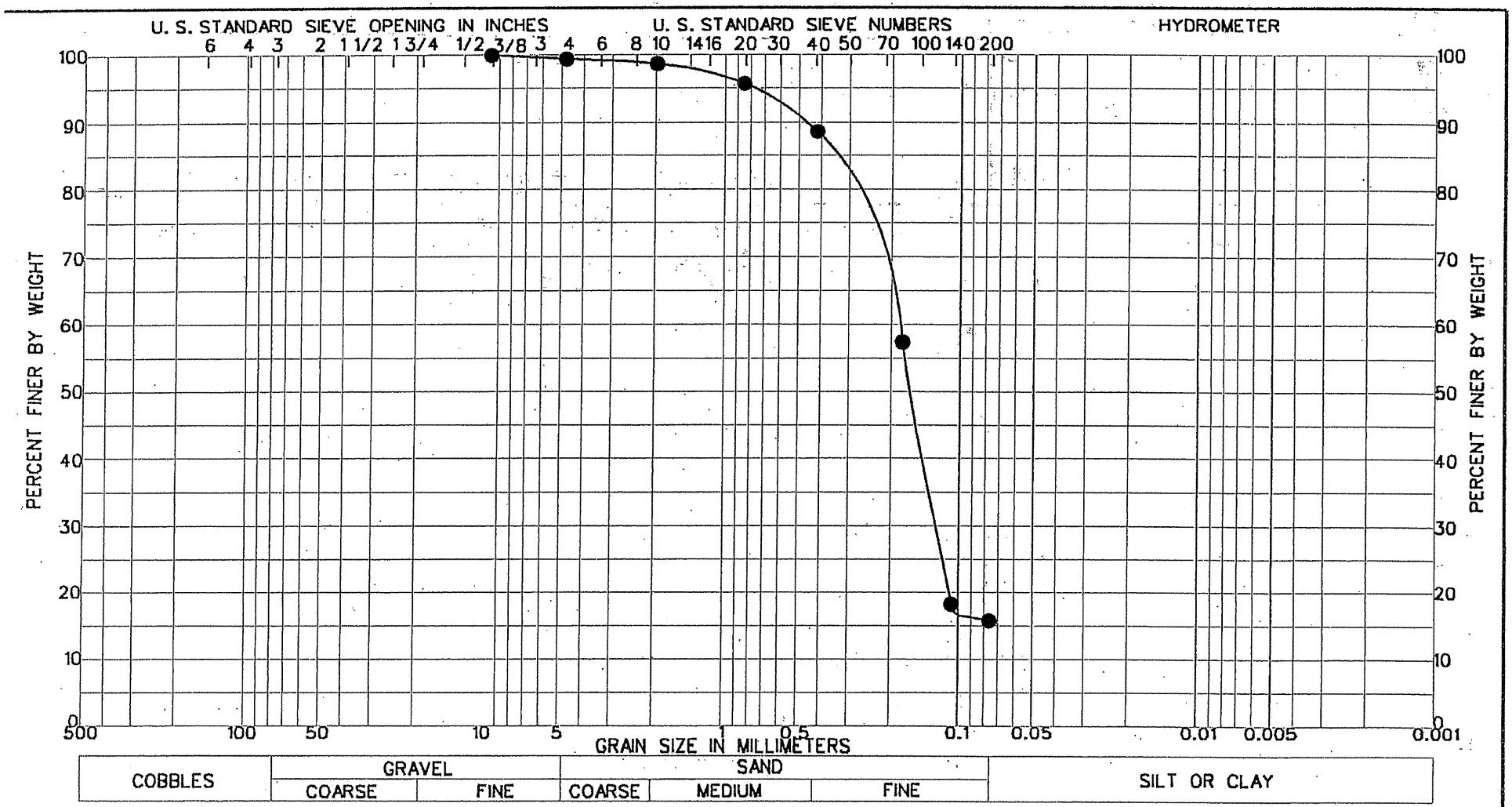
PROJECT Camino Real Landfill

Lab No. 48448

BORING NO. 7, 35-36.5'

DATE 12/27/2005

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

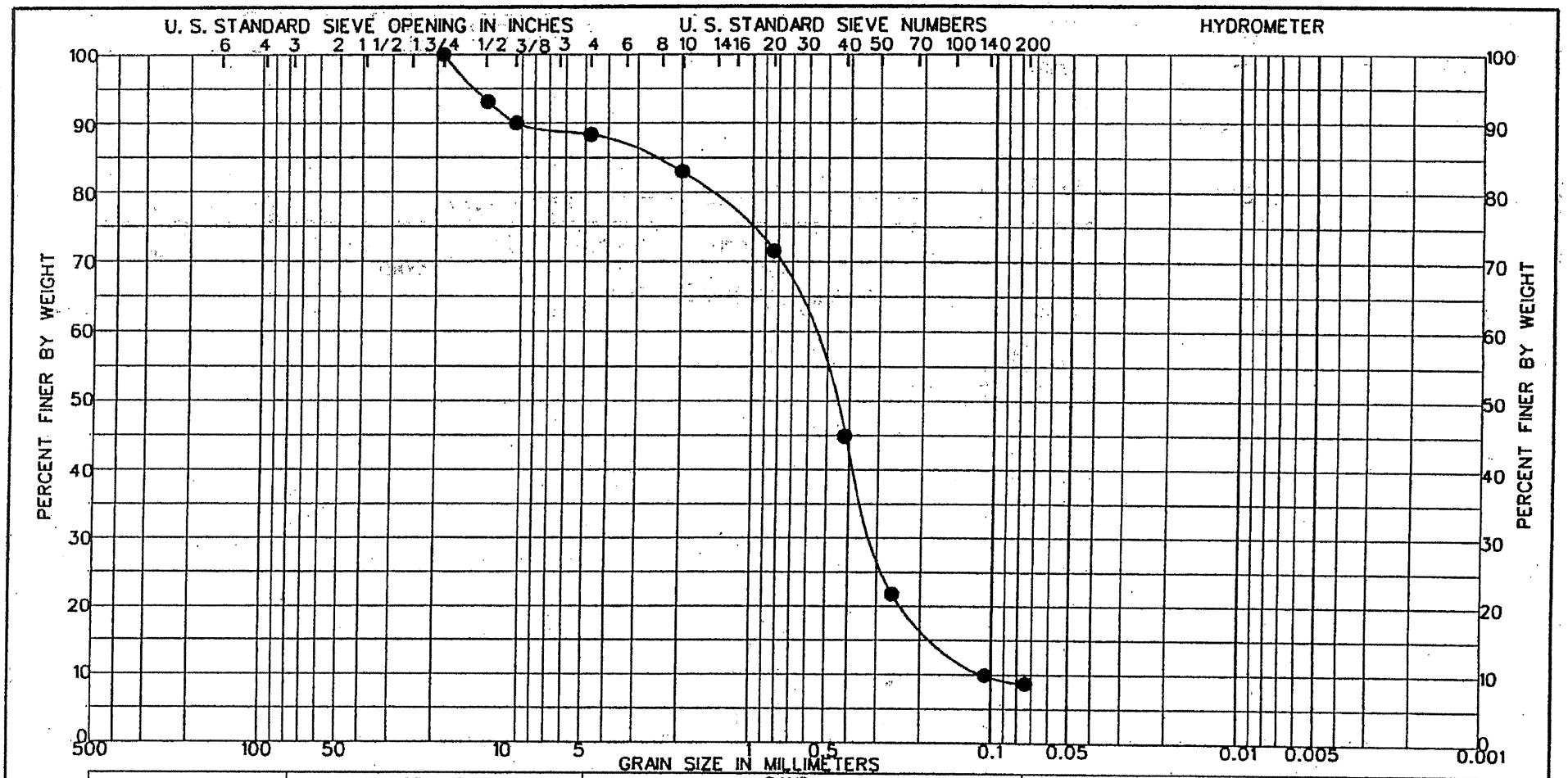
PROJECT Camino Real Landfill

Lab No. 48449

BORING NO. 7, 50.0-51.5'

DATE 12/27/2005

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

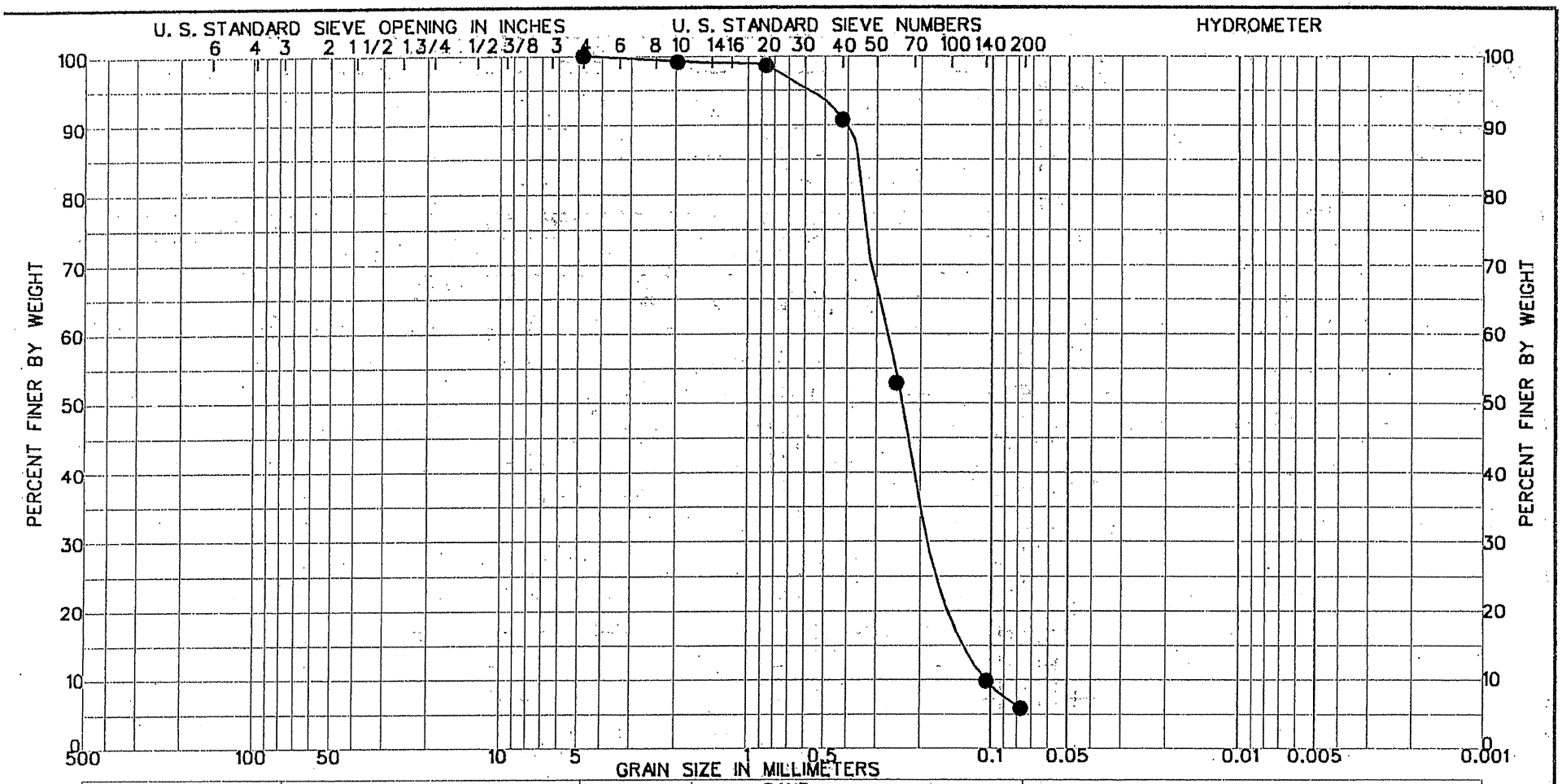
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48450

BORING NO. 7, 60.0-61.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

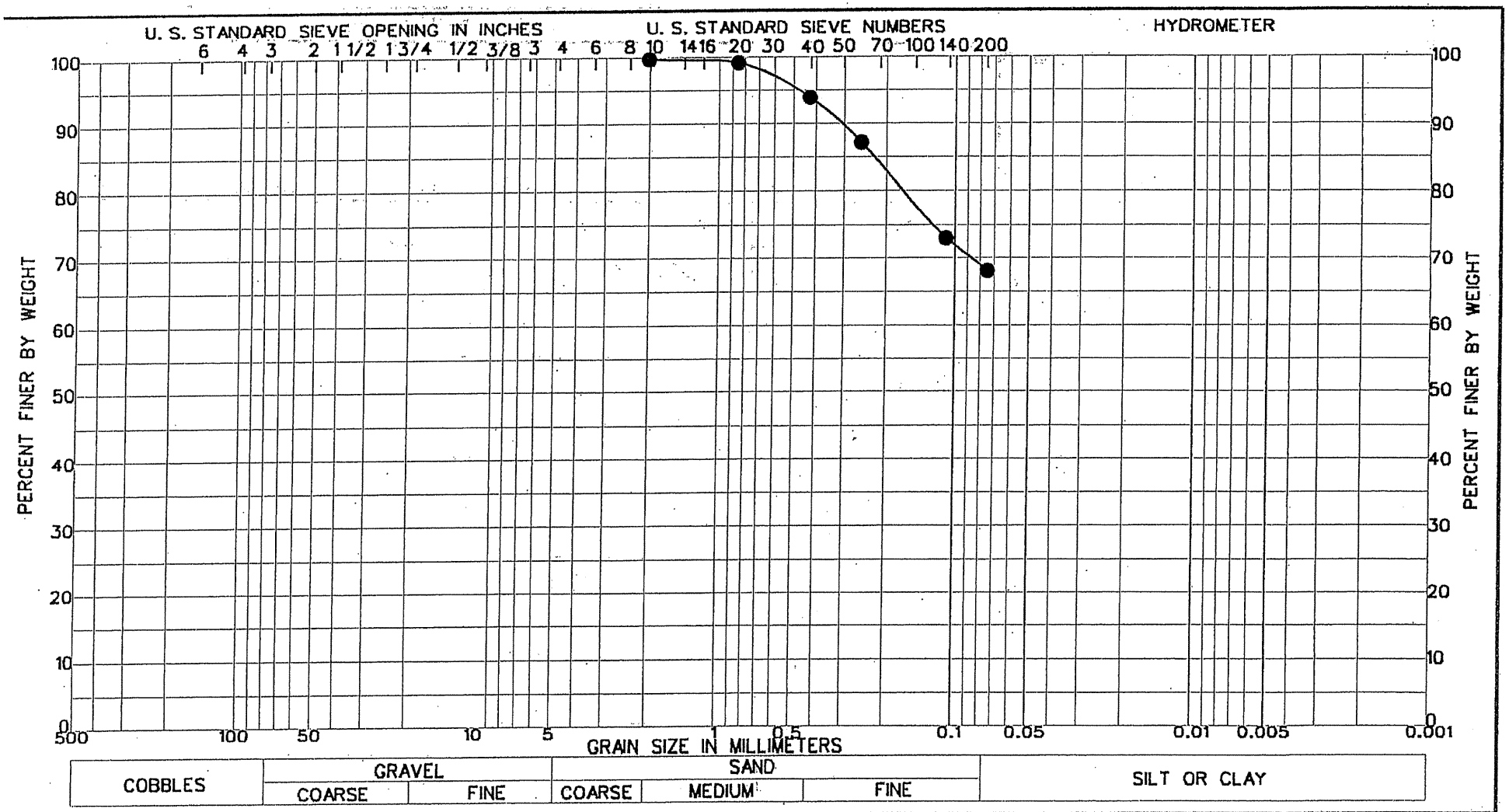
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48451

BORING NO. 8, 20-21.5'

DATE 2/28/06



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				57	24	33

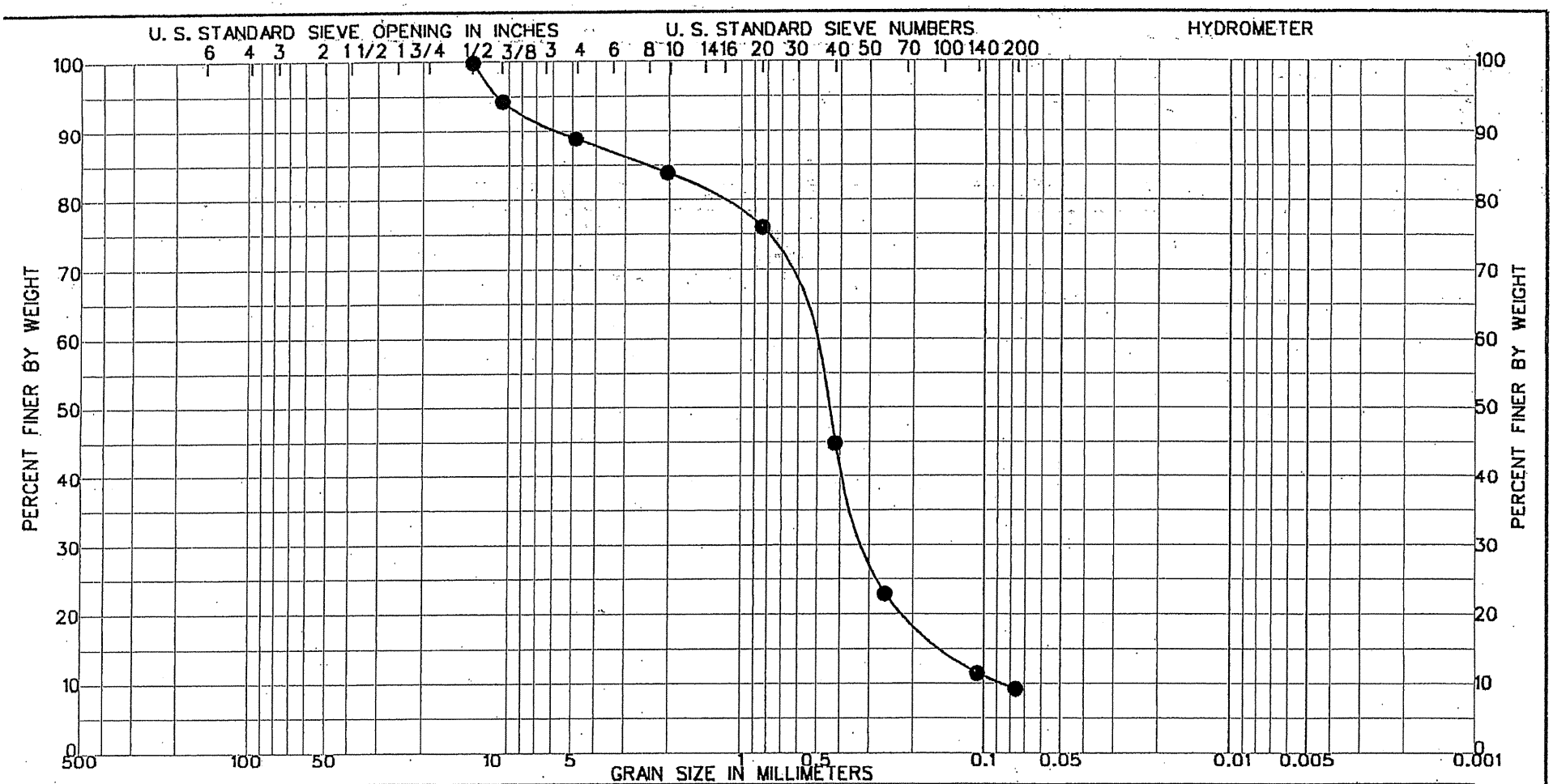
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48452

BORING NO. 8, 50.0-51.5'

DATE 12/27/2005



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

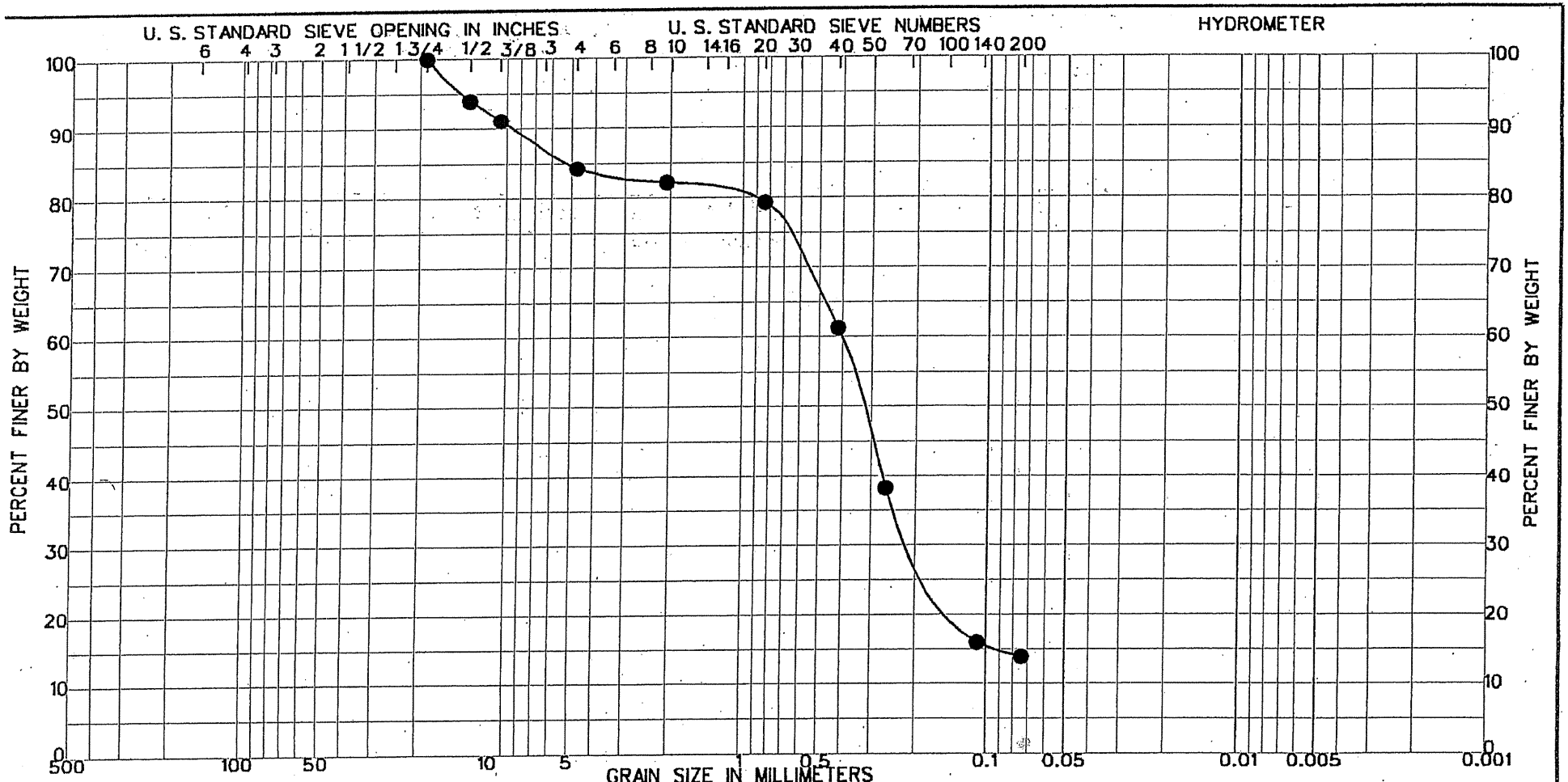
PROJECT Camino Real Landfill

Lab No. 48453

BORING NO. 8, 55.0-56.5'

DATE 12/27/2005

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

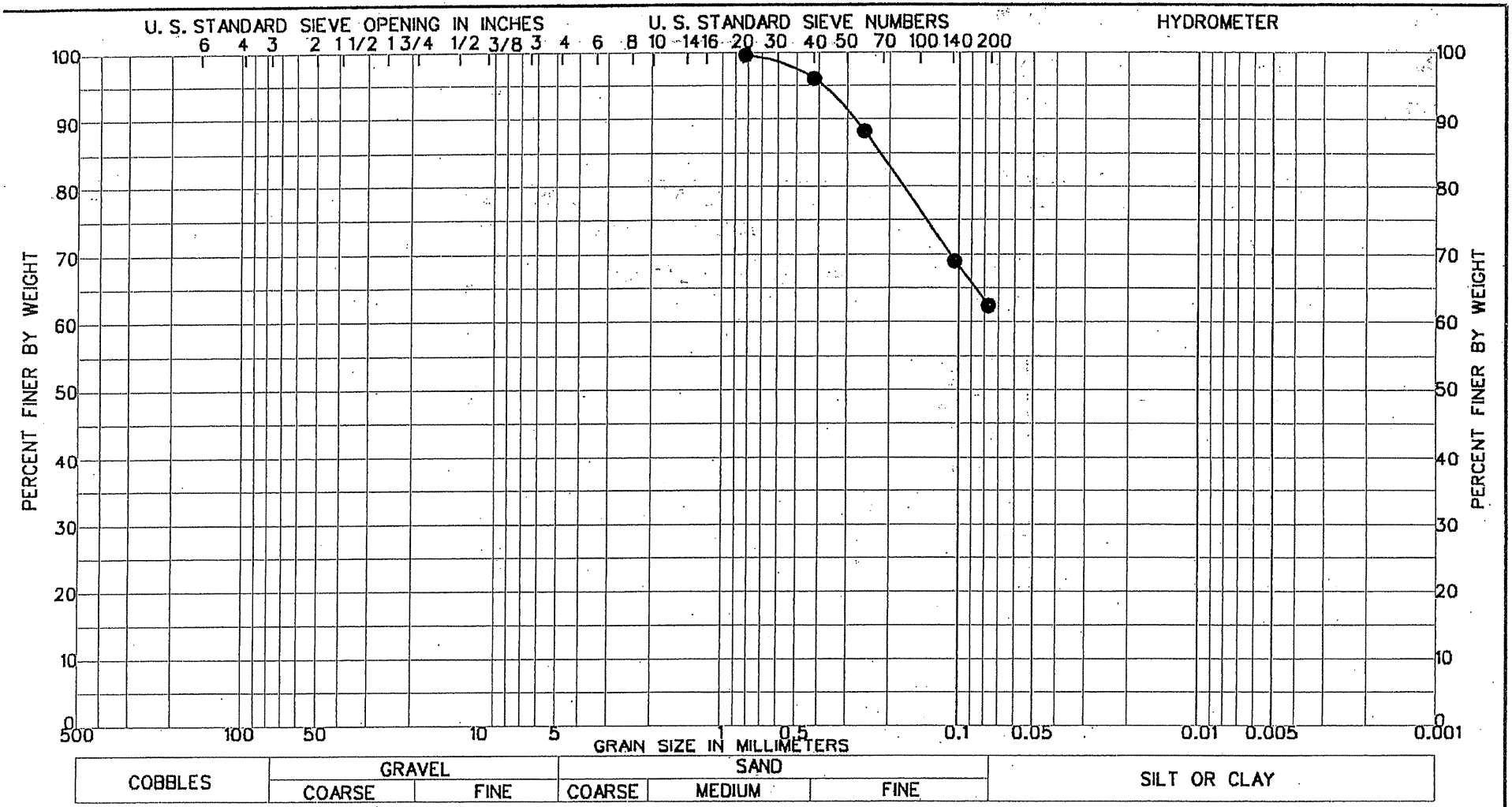
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48454

BORING NO. 8, 60.0-61.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				64	22	42

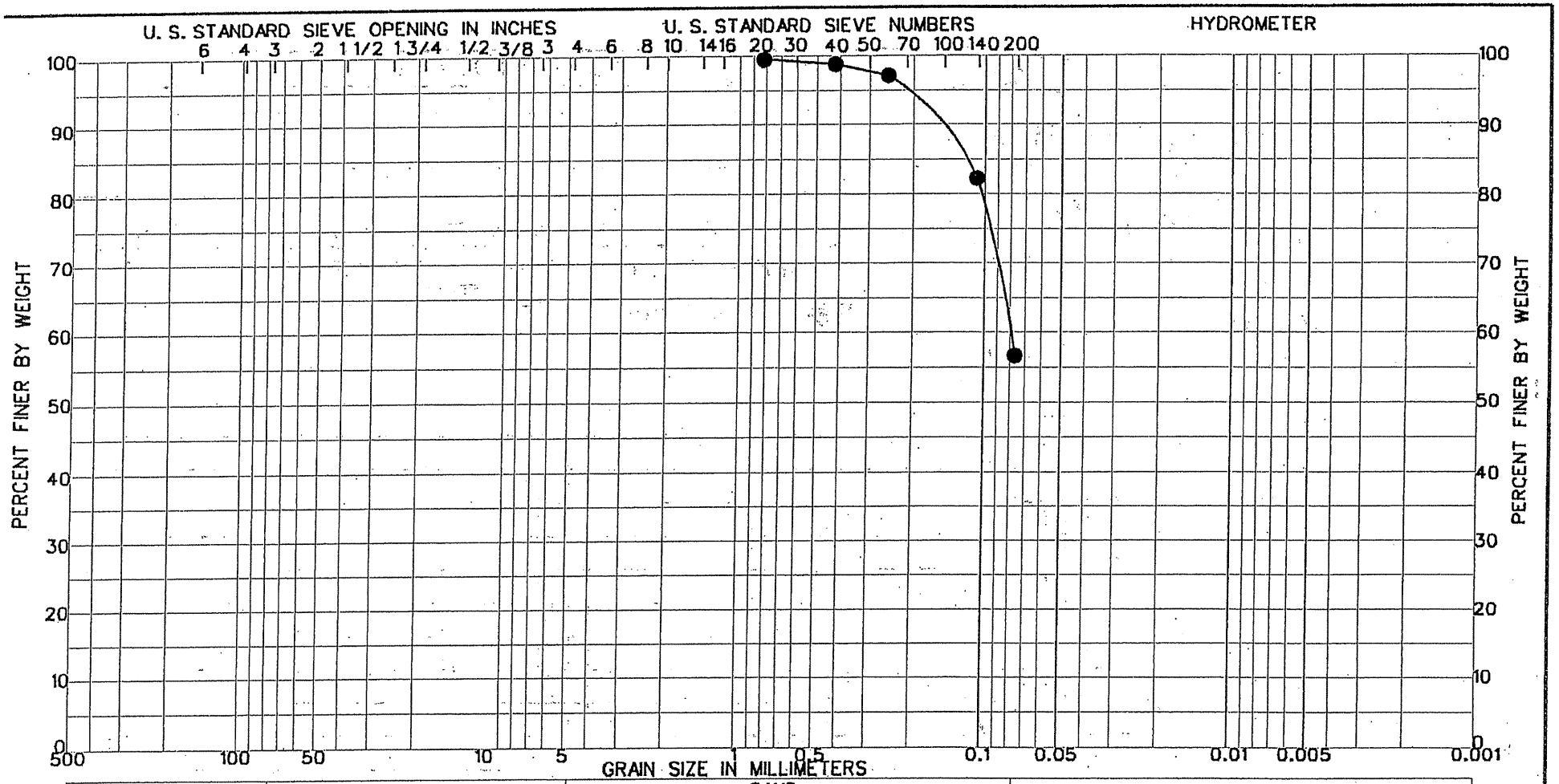
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48455

BORING NO. 8, 95.0-96.5'

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

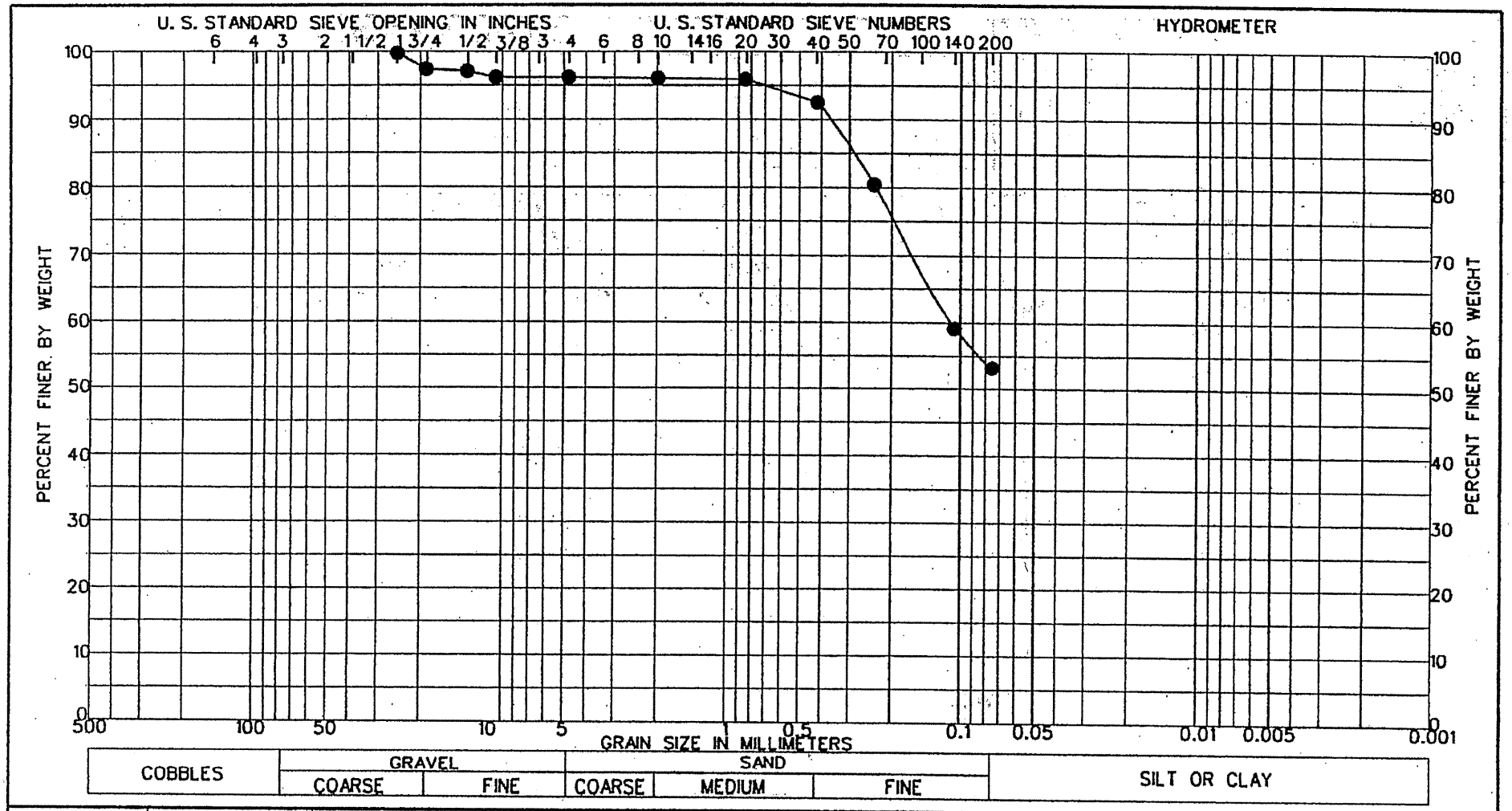
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48456

BORING NO. B-100.0-101.5

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

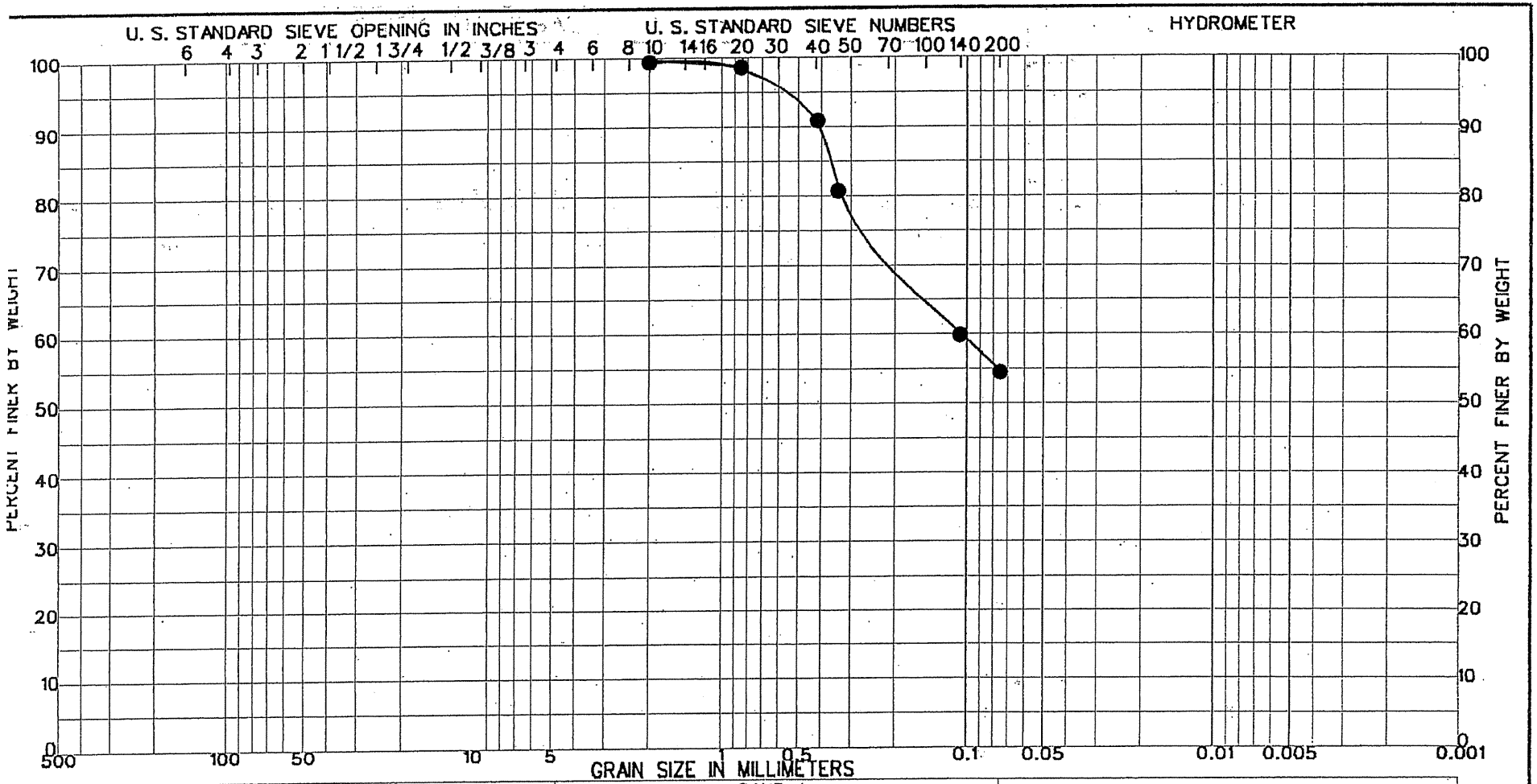
MHR

PROJECT Camino Real Landfill

Lab No. 48457

BORING NO. B-115.0-116.5

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

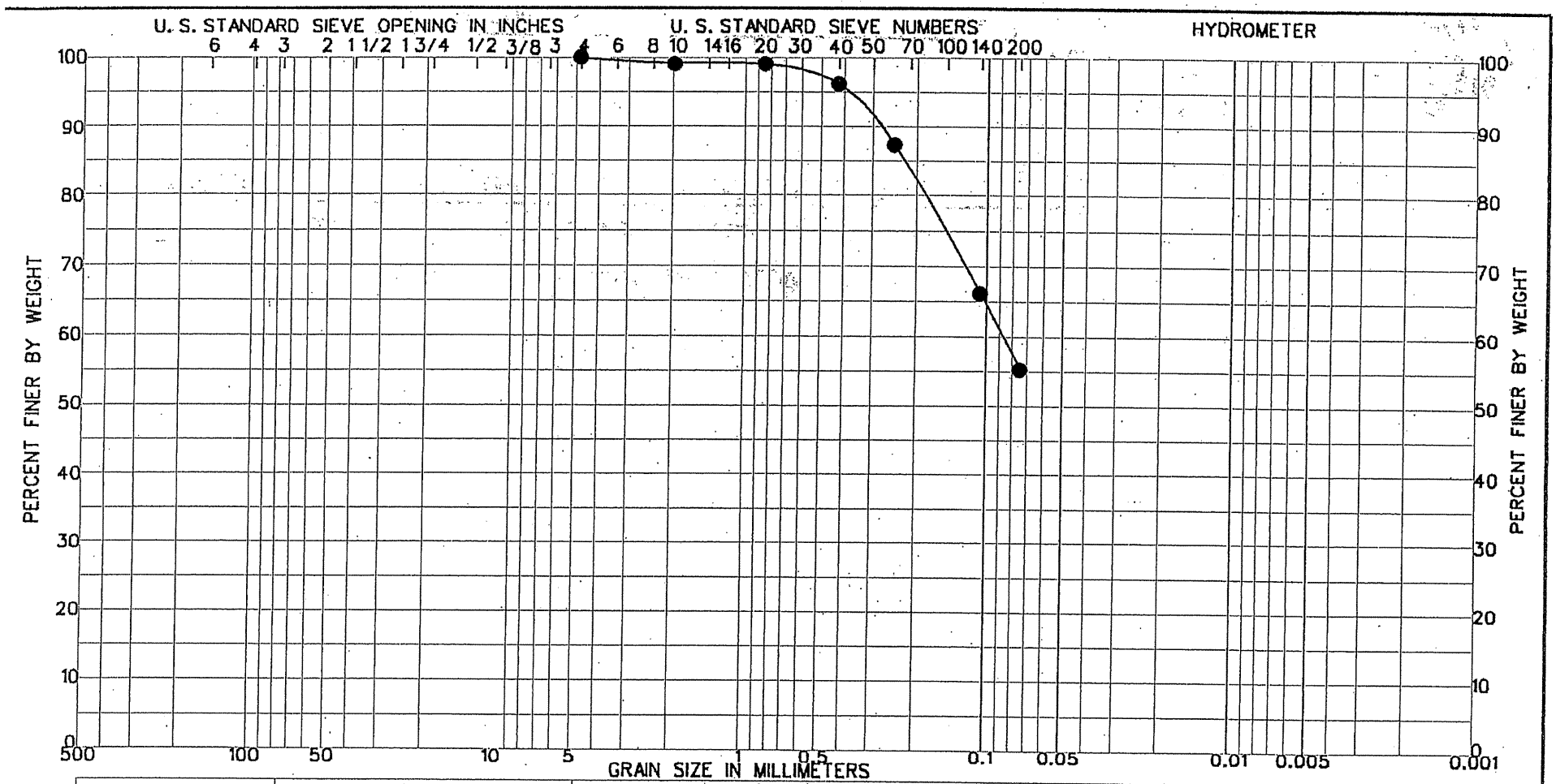
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48458

BORING NO. 8, 125.0-126.5

DATE 12/27/2005



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

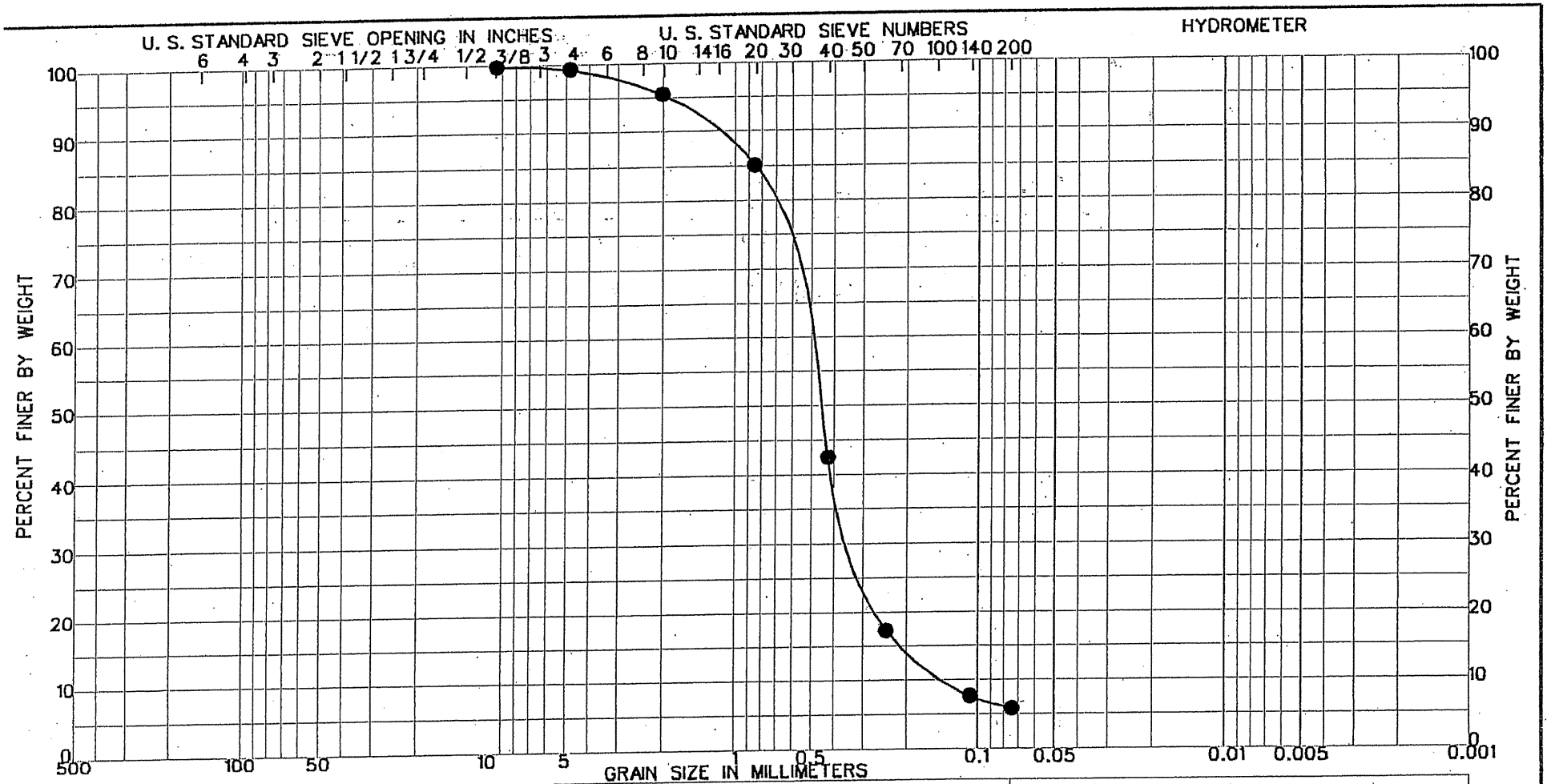
PROJECT Camino Real Landfill

Lab No. 48459

BORING NO. B-130.0-131.5

DATE 12/27/2005

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

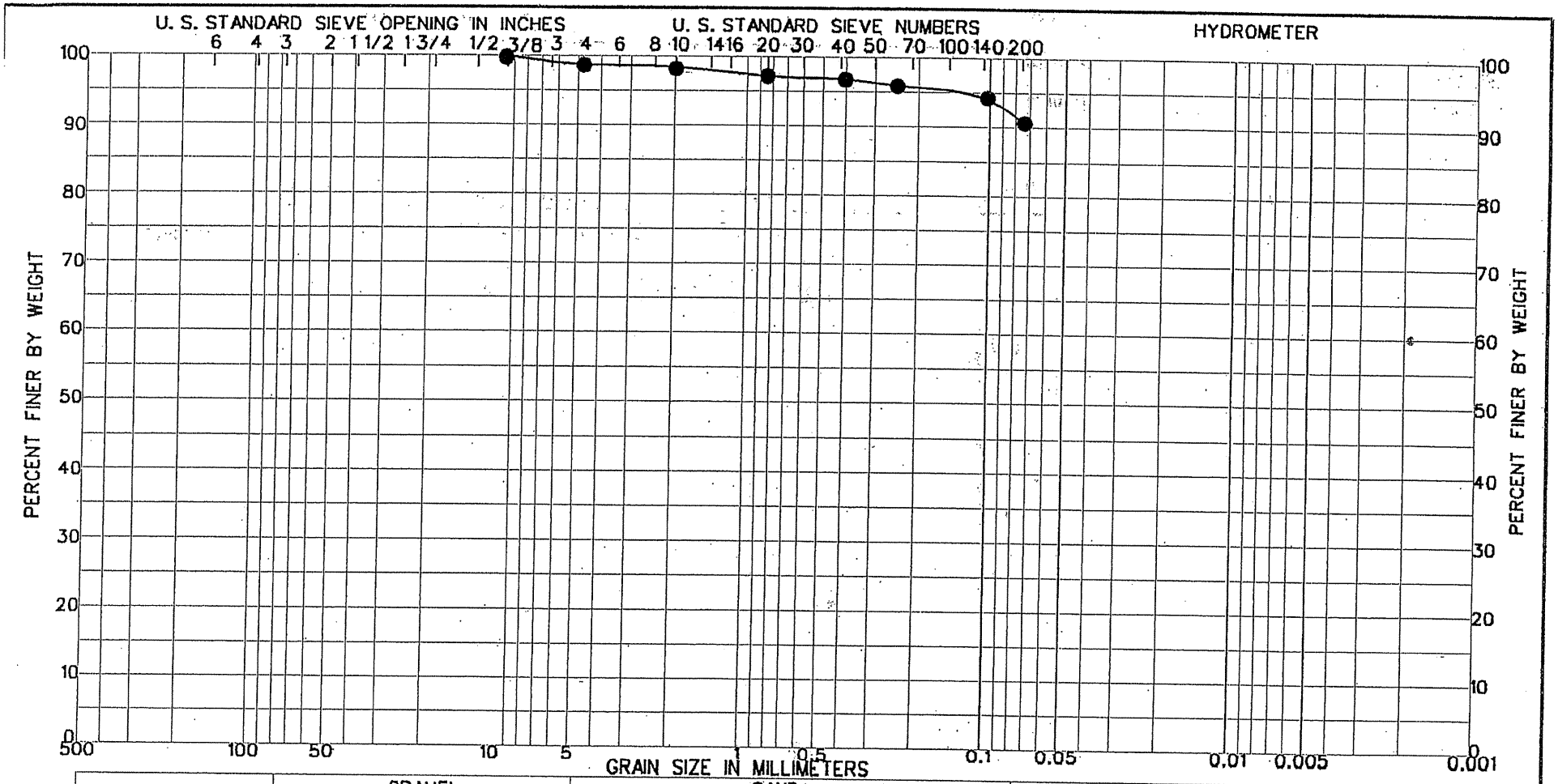
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48559

BORING NO. 9, 60.0-61.5'

DATE 1/24/2006



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

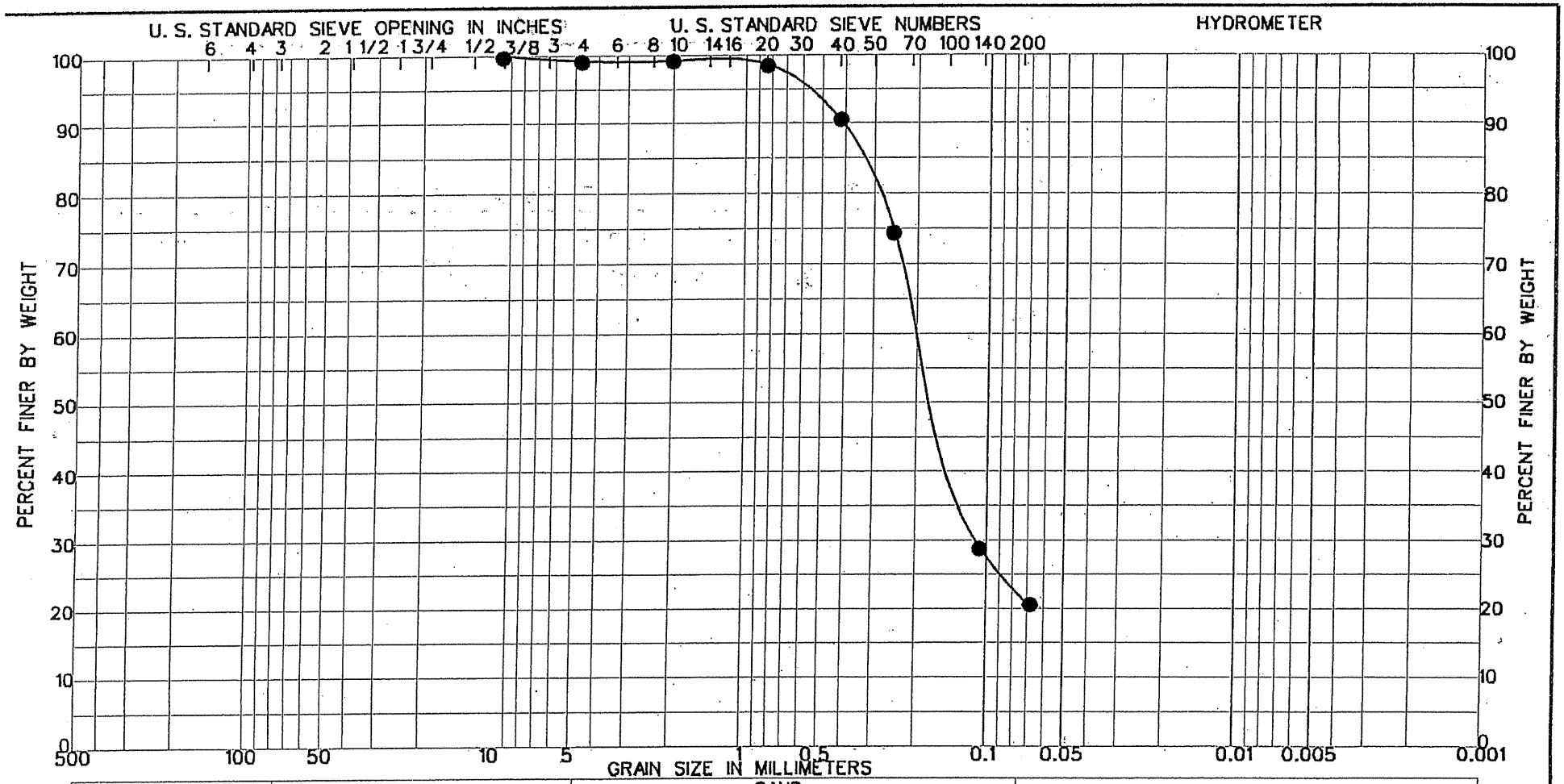
PROJECT Camino Real Landfill

Lab No. 48560B

BORING NO. 9, 80.0-81.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

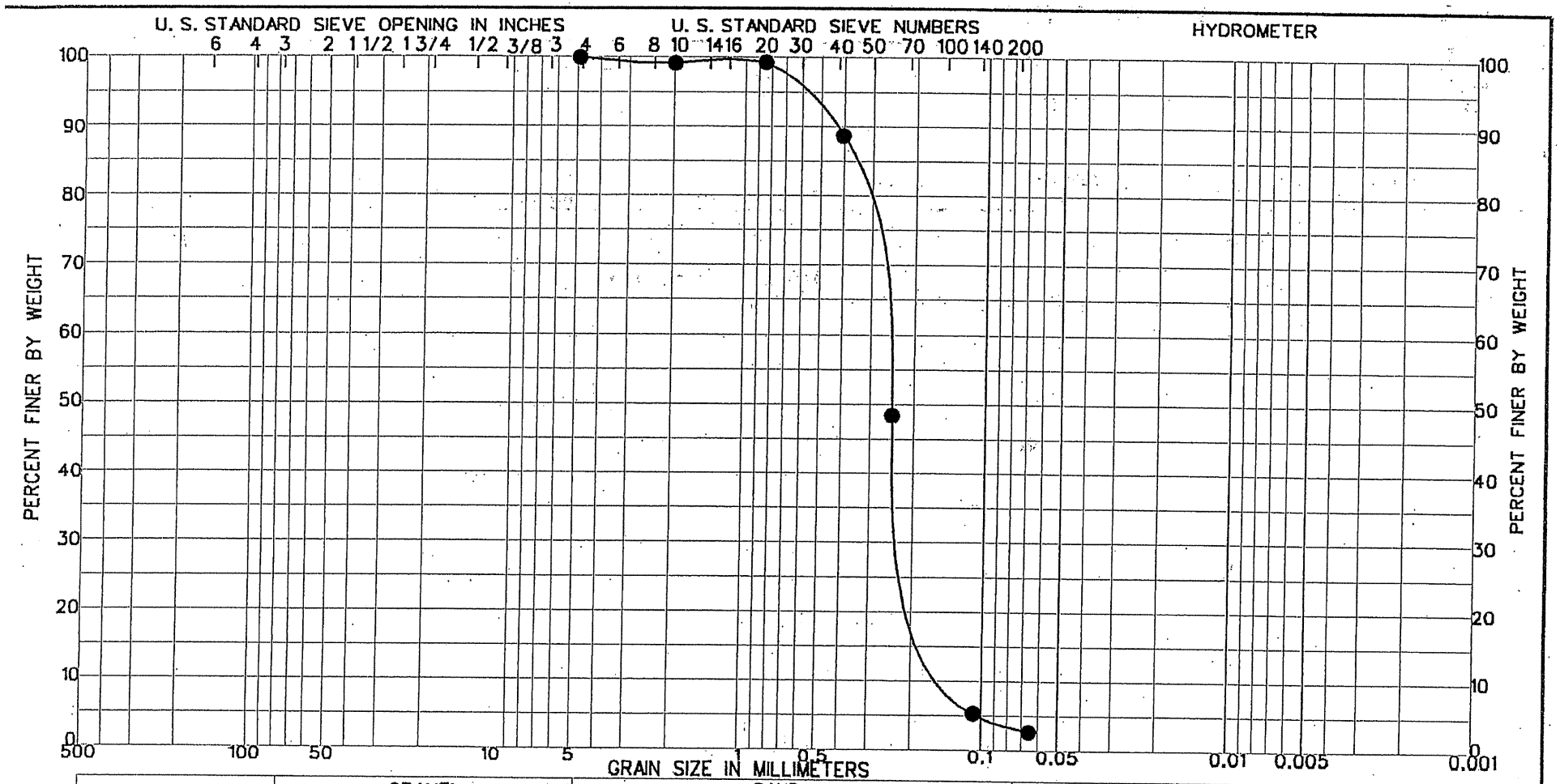
PROJECT Camino Real Landfill

Lab No. 48561

BORING NO. 9, 85.0-86.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

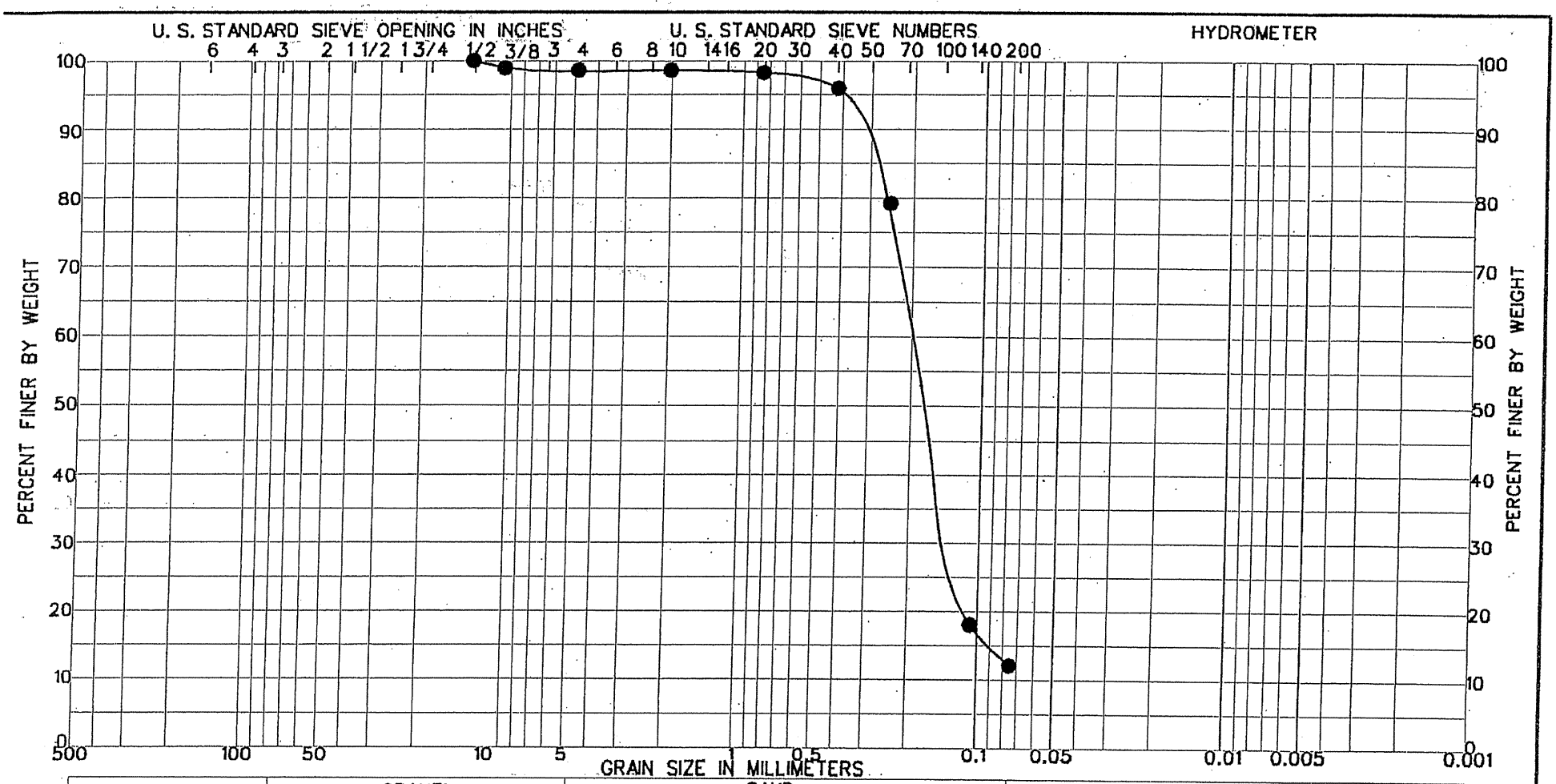
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48562

BORING NO. 9, 100.0-101.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

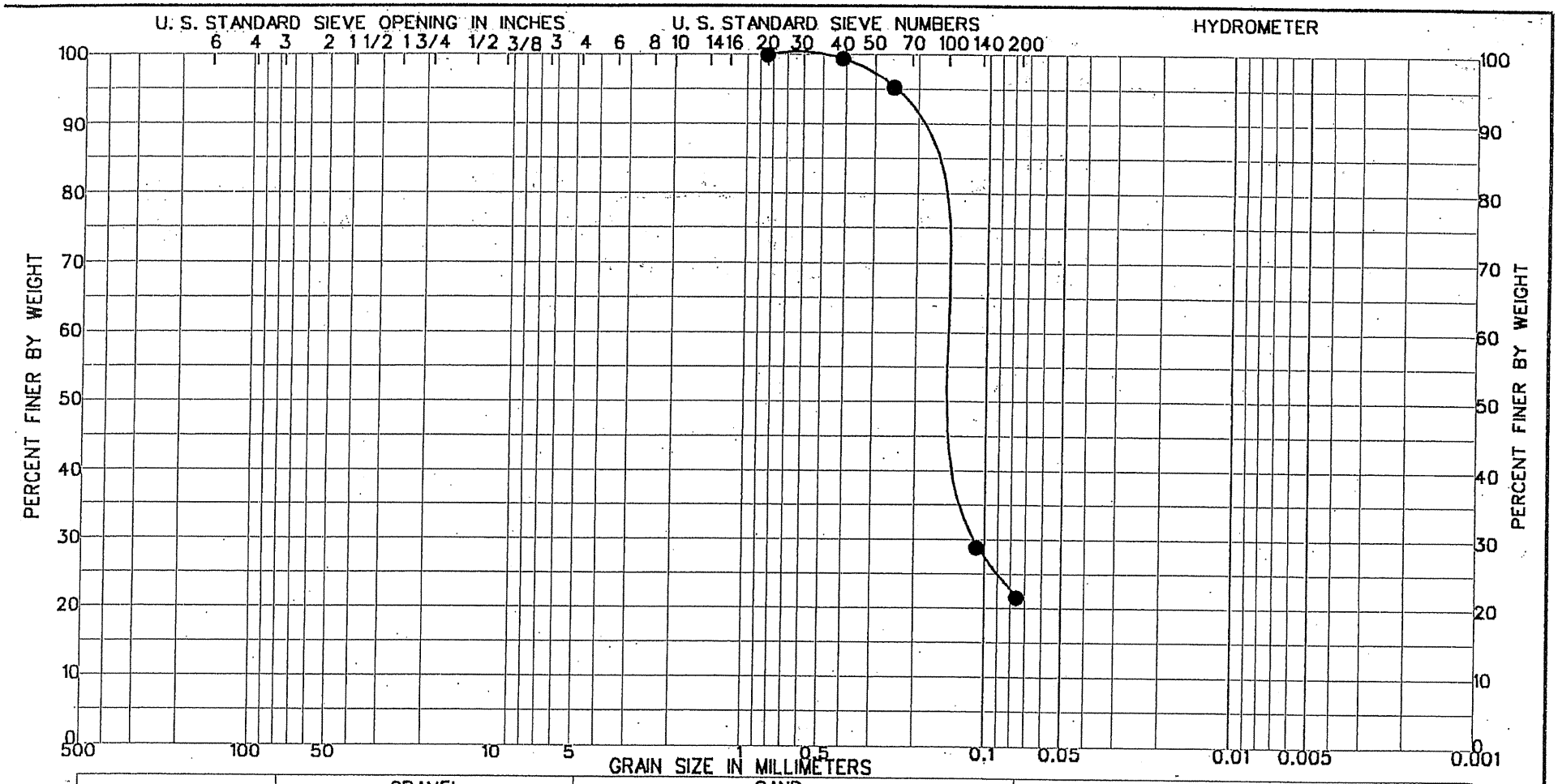
PROJECT Camino Real Landfill

Lab No. 48564B

BORING NO. 10, 45.0-46.5

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

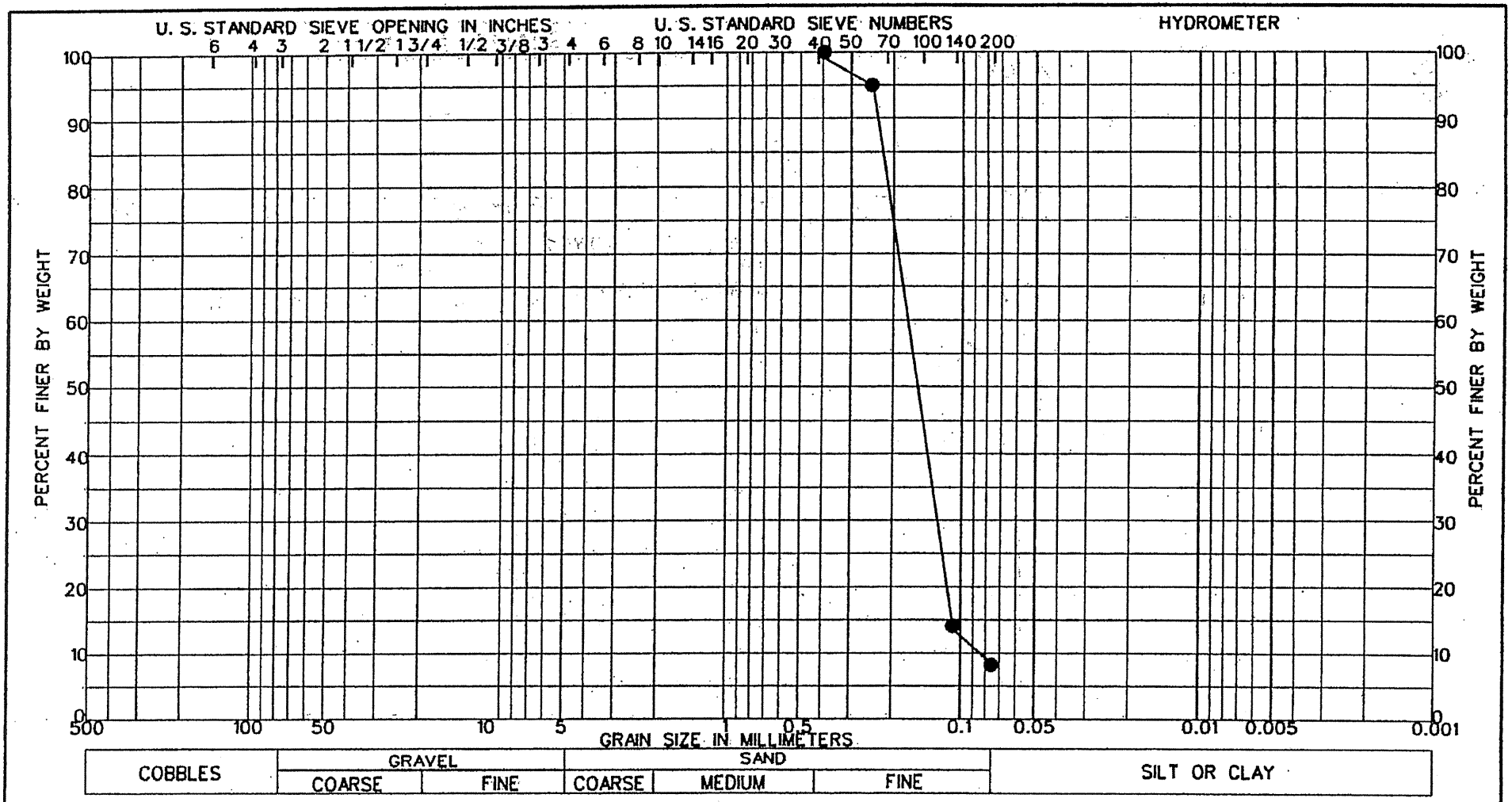
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48565B

BORING NO. 10, 50.0-51.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

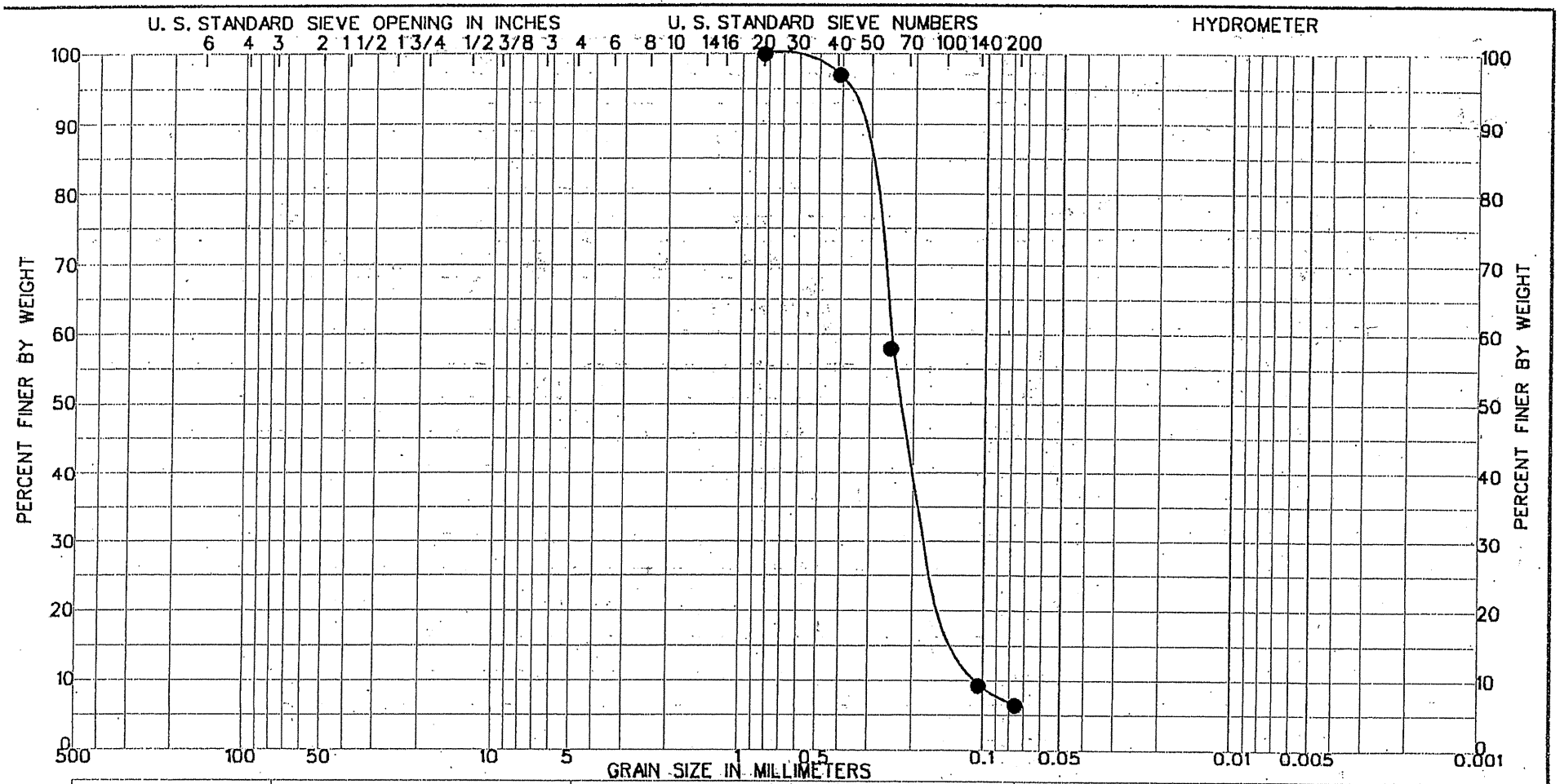
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48566

BORING NO. 10, 65.0-66.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

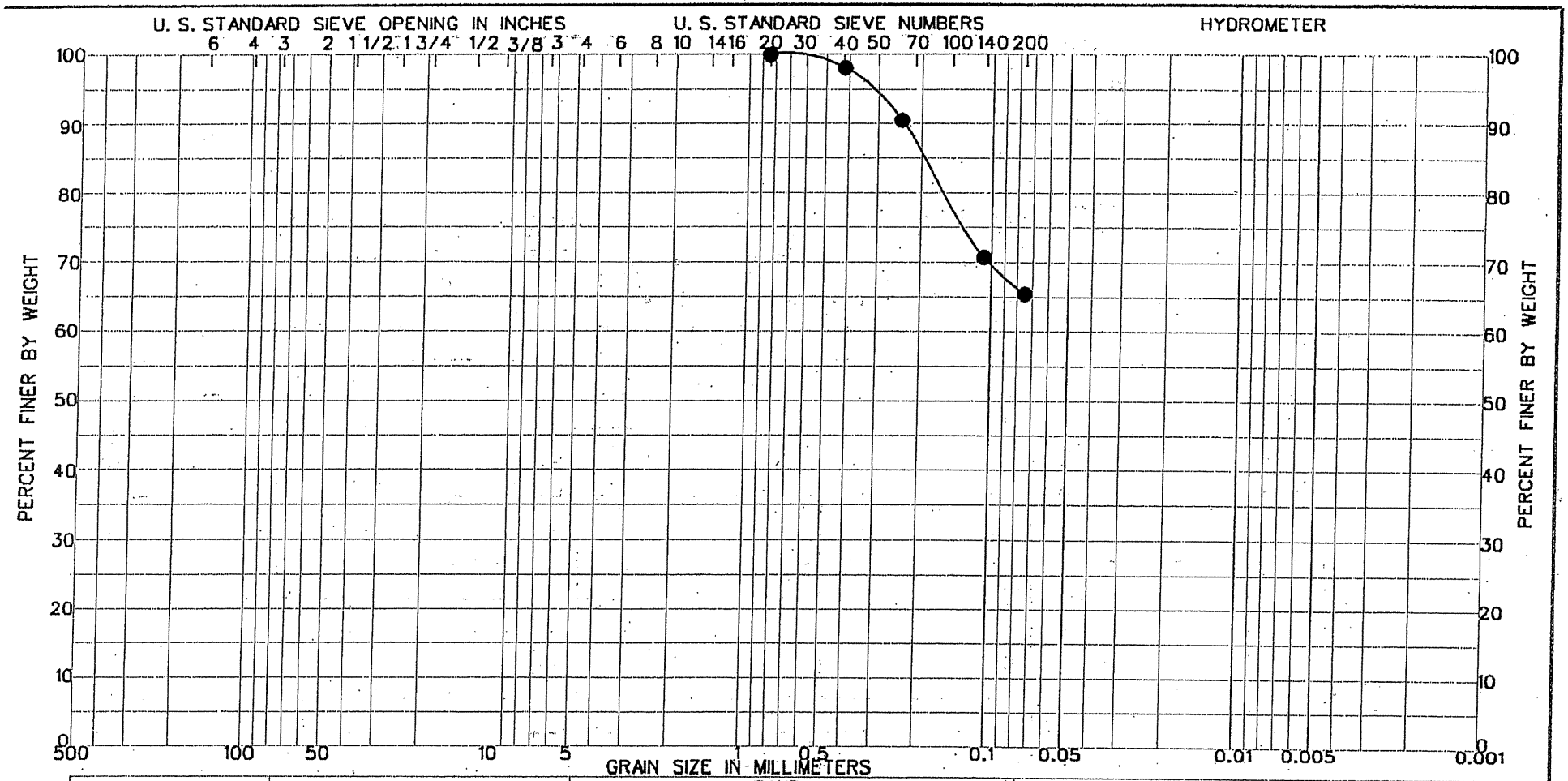
PROJECT Camino Real Landfill

Lab No. 48567

BORING NO. 10, 80-81.5'

DATE 2/28/06

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				57	21	36

GRADATION CURVES

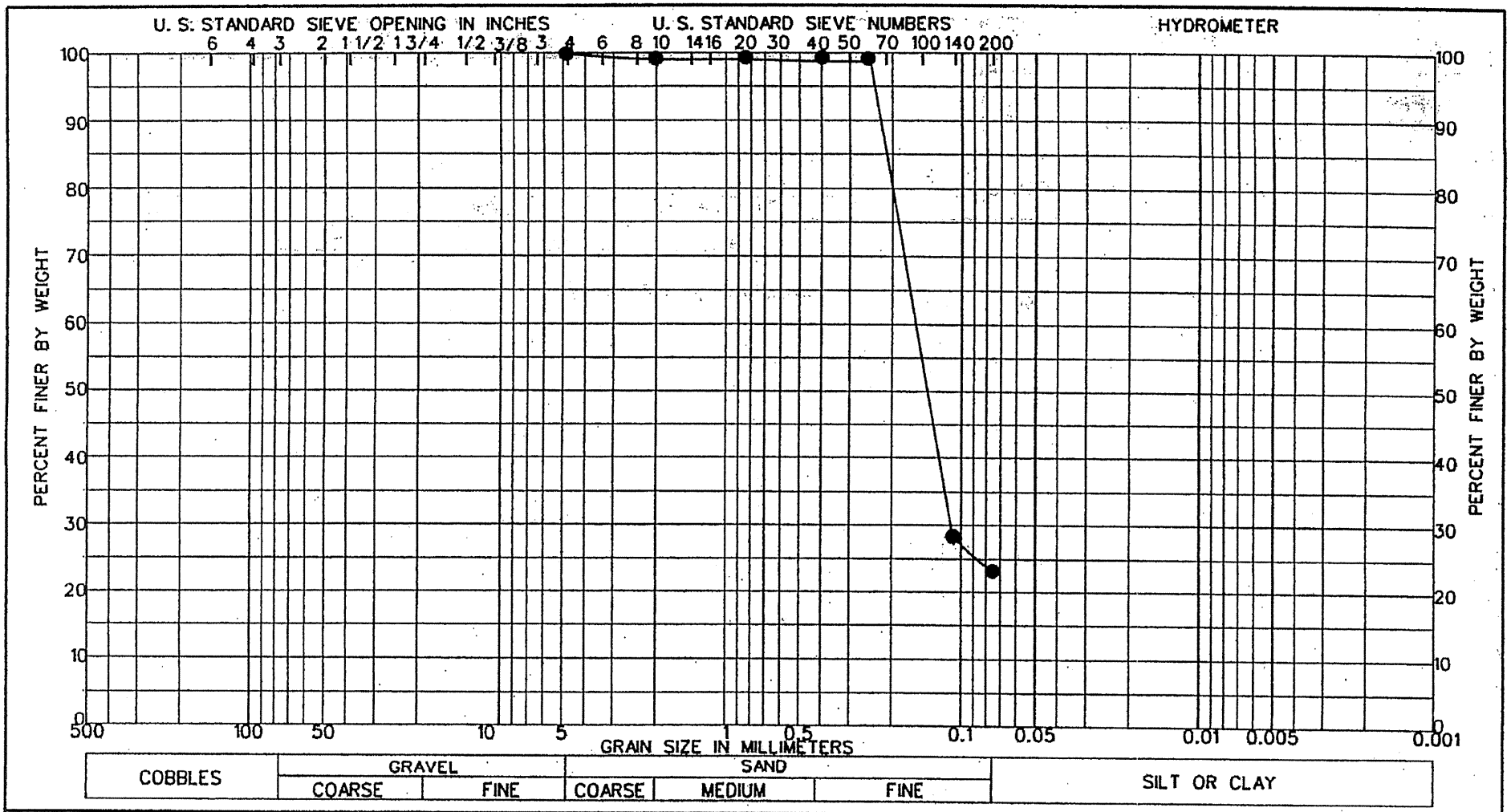
PROJECT Camino Real Landfill

Lab No. 48568

BORING NO. 10, 95.0-96.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

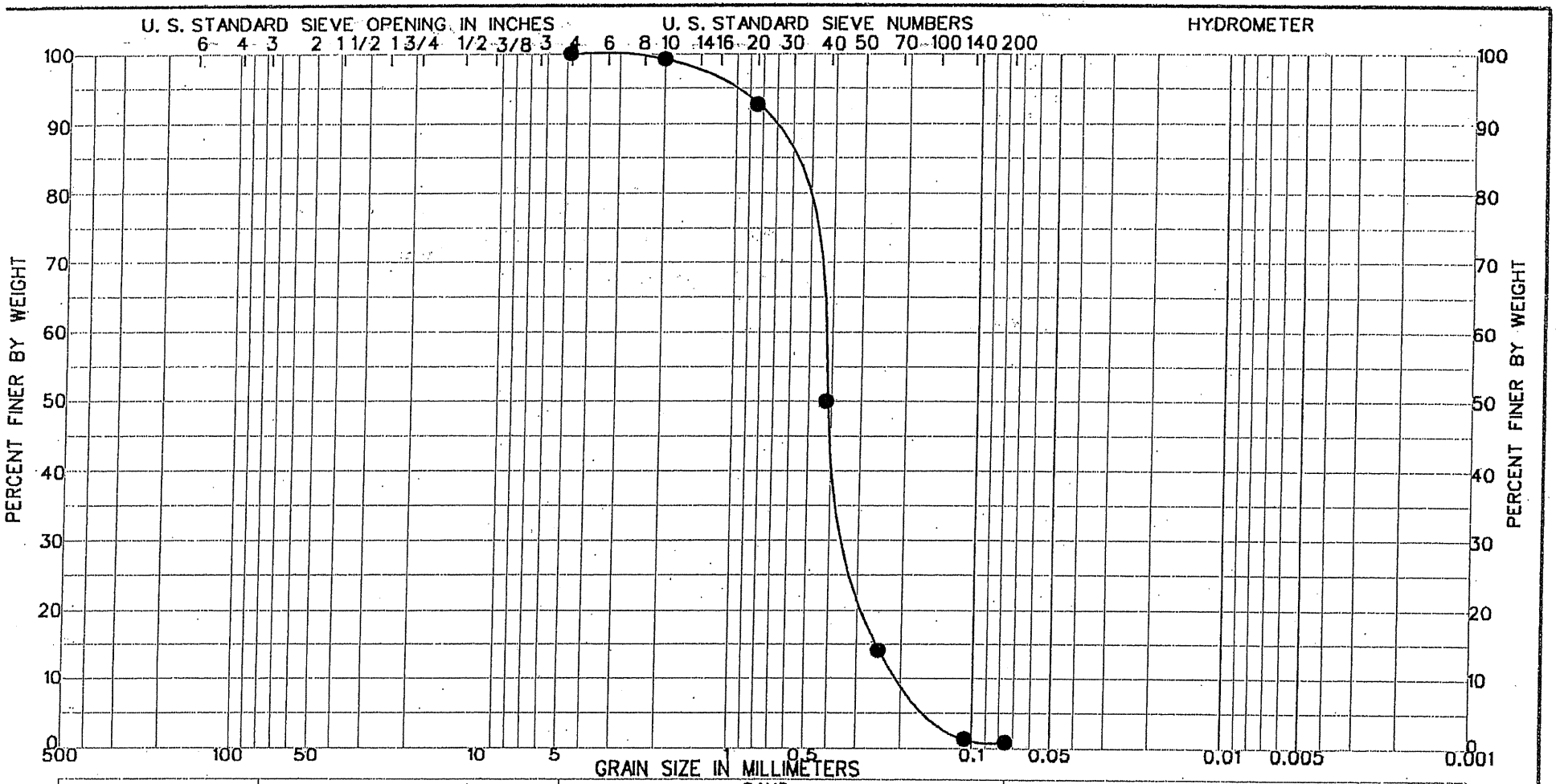
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48569

BORING NO. 10.100.0-100.5'

DATE 1/24/2006



AMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

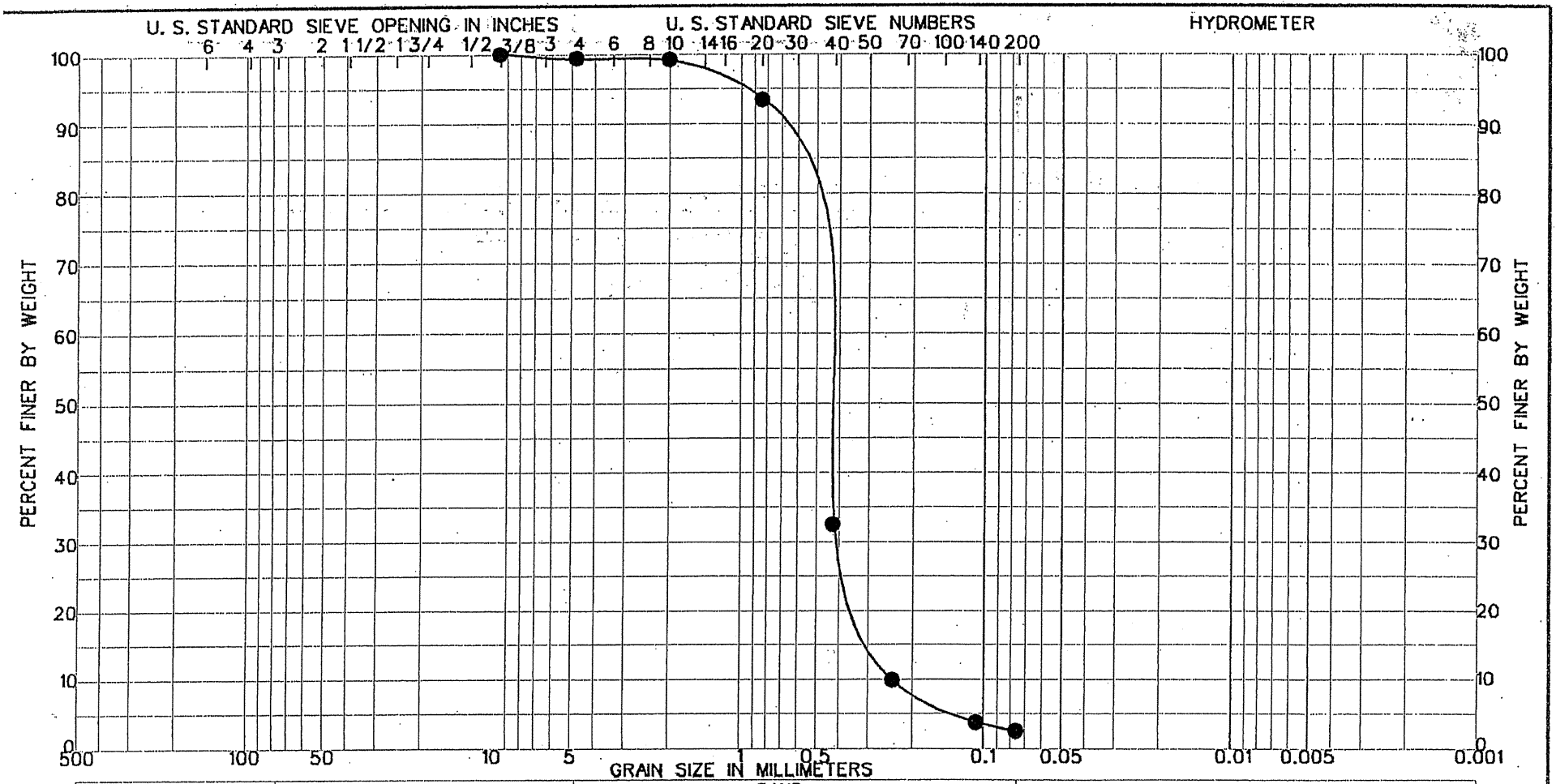
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48570

BORING NO. 11, 10.0-11.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

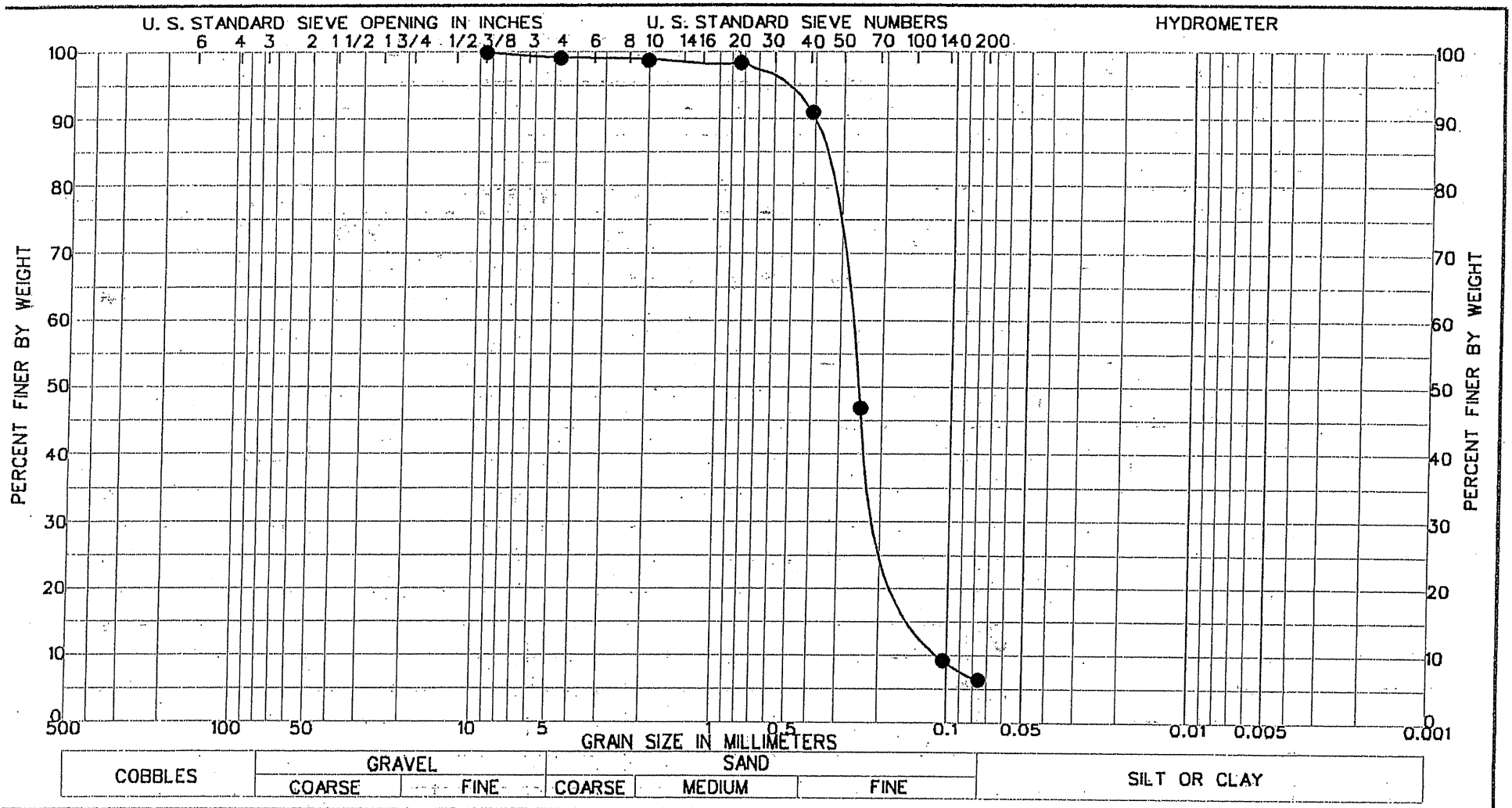
PROJECT Camino Real Landfill

Lab No. 48571

BORING NO. 11, 20.0-21.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



AMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

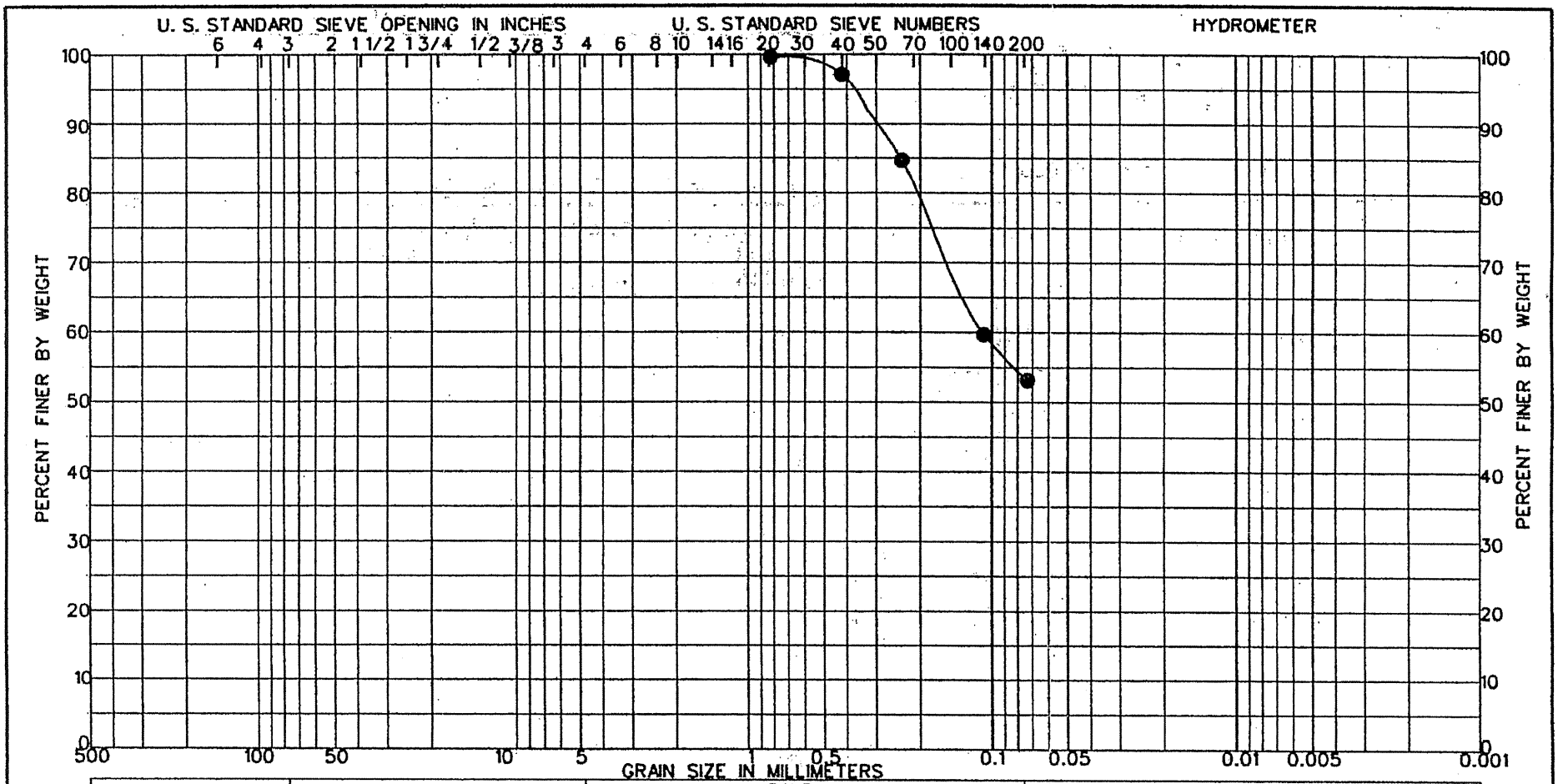
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48573

BORING NO. 11, 35-36.5'

DATE 2/28/06



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				47	15	32

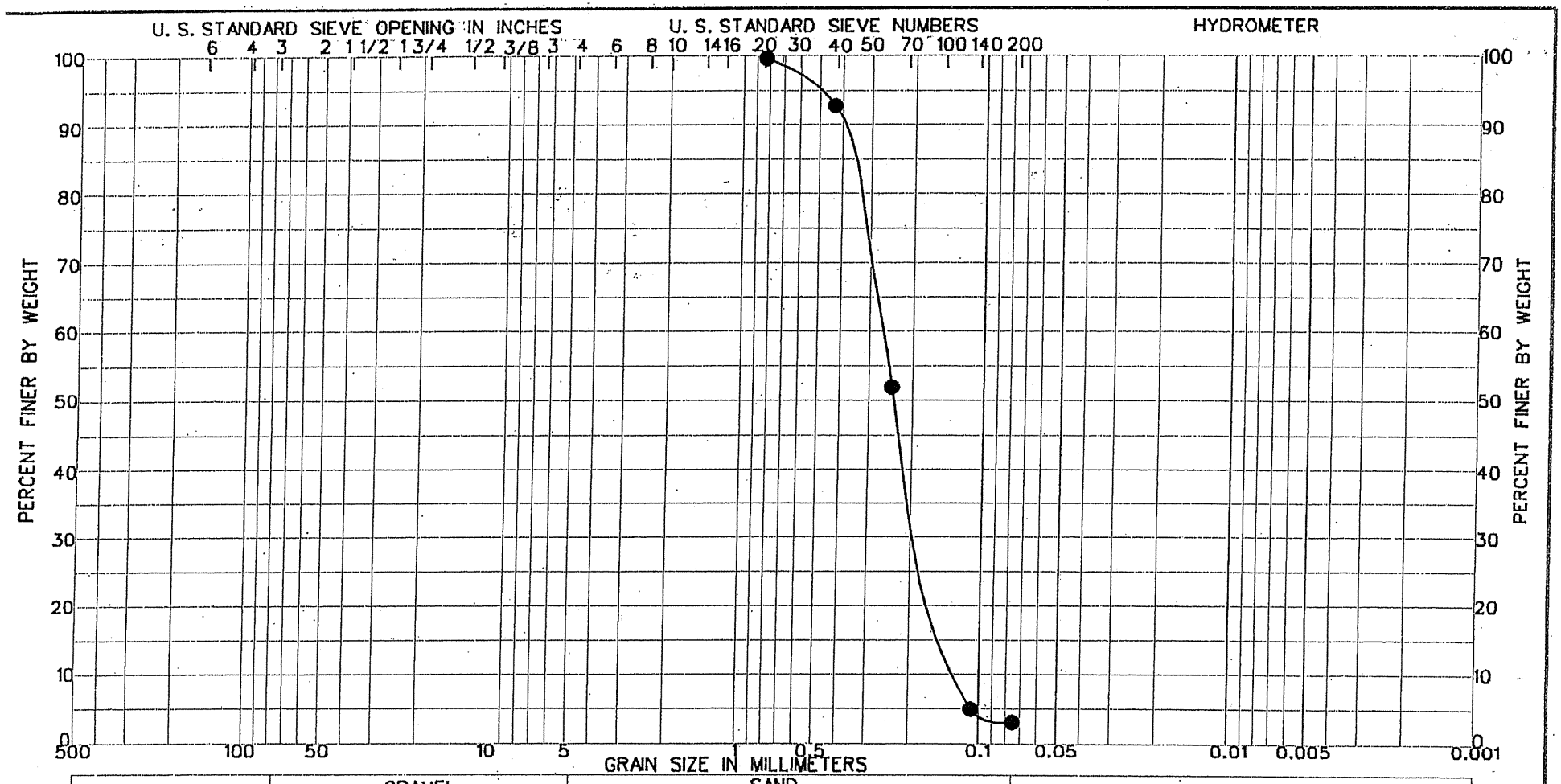
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48574

BORING NO. 11, 40.0-41.5

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

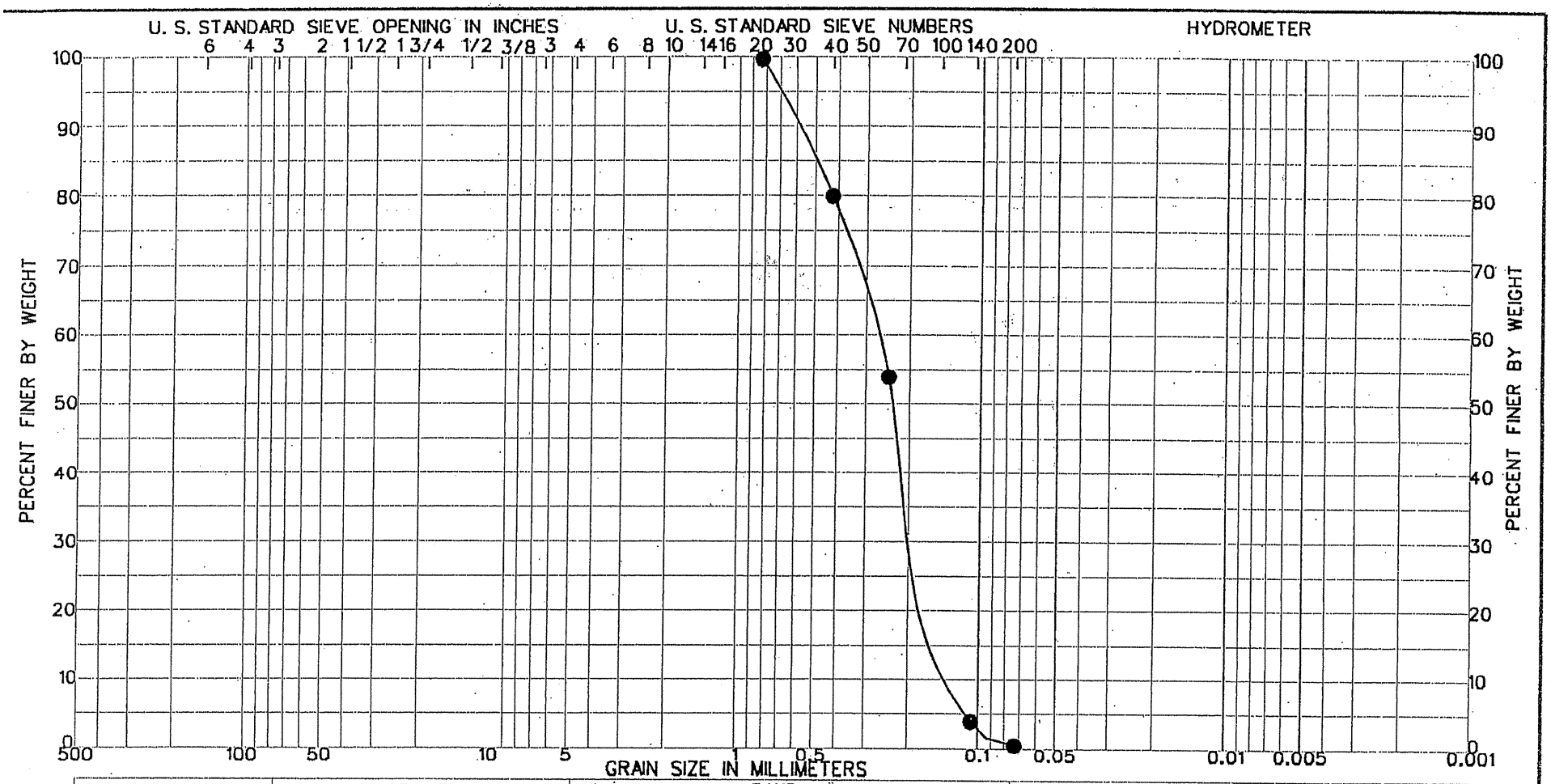
PROJECT Camino Real Landfill

Lab No. 48575

BORING NO. 11, 60.0-61.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

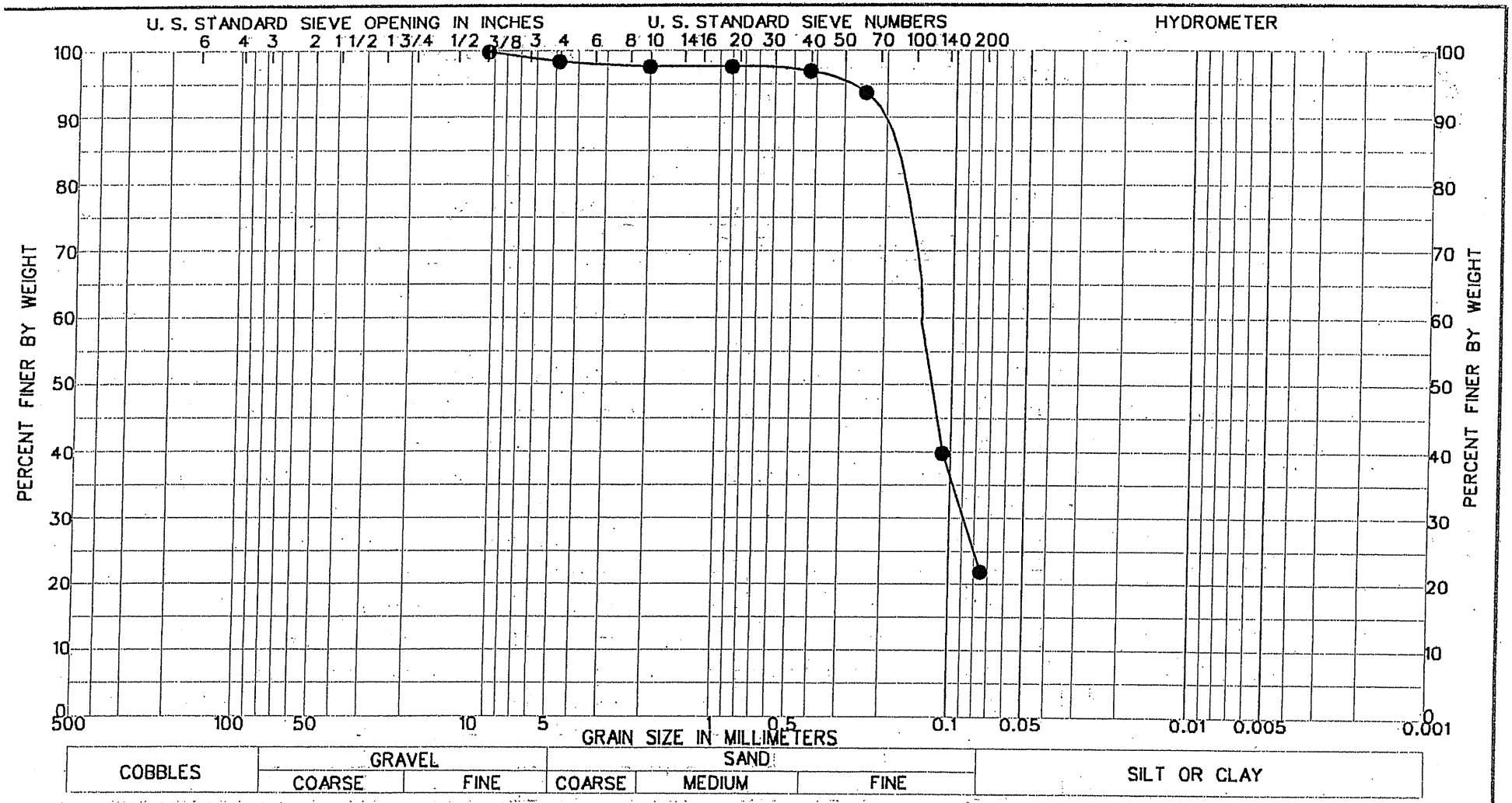
PROJECT Camino Real Landfill

Lab No. 48576

BORING NO. 11, 75.0-76.5

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

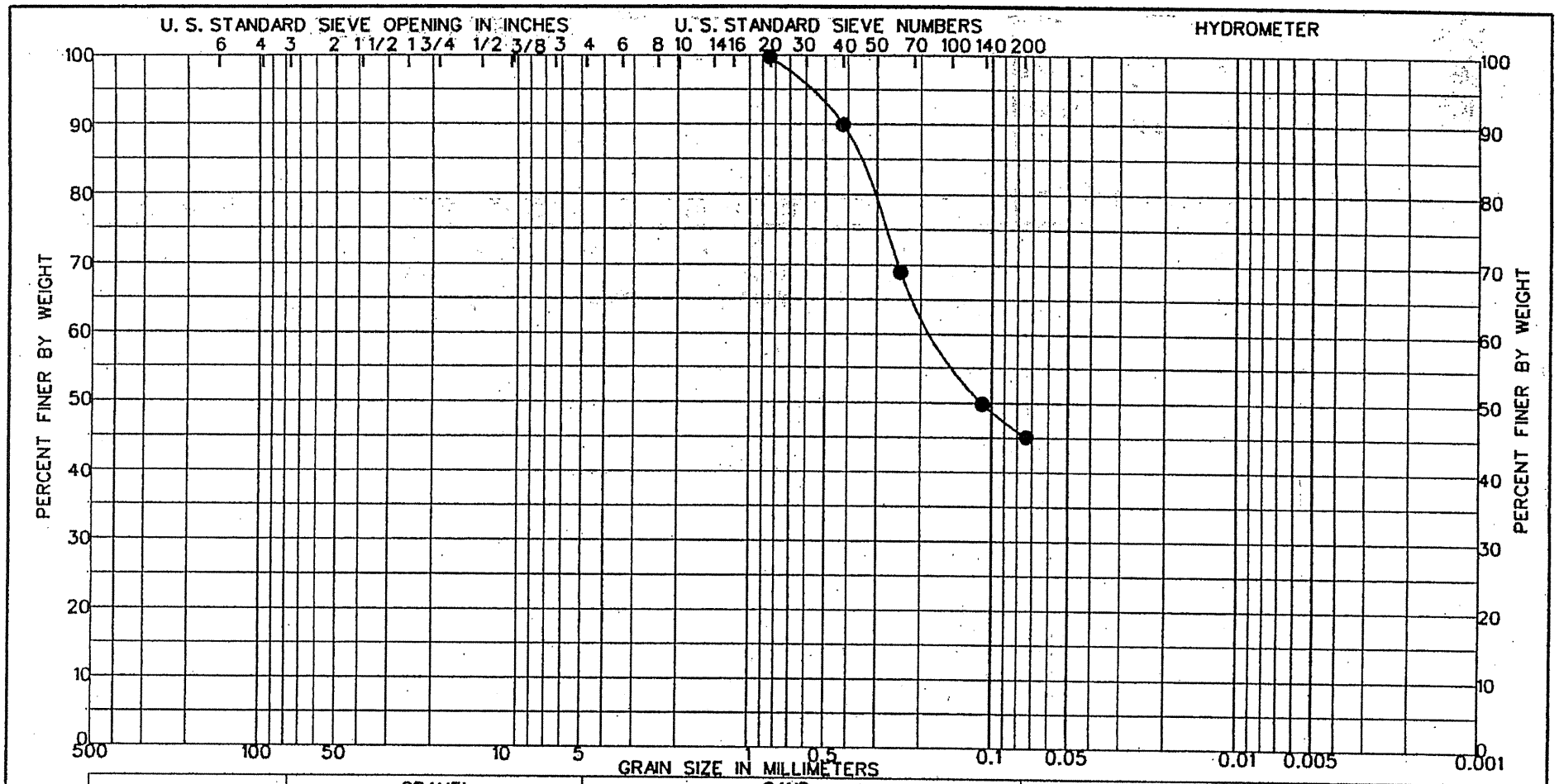
PROJECT Camino Real Landfill

Lab No. 48578

BORING NO. 11, 95.0-96.5

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				50	18	32

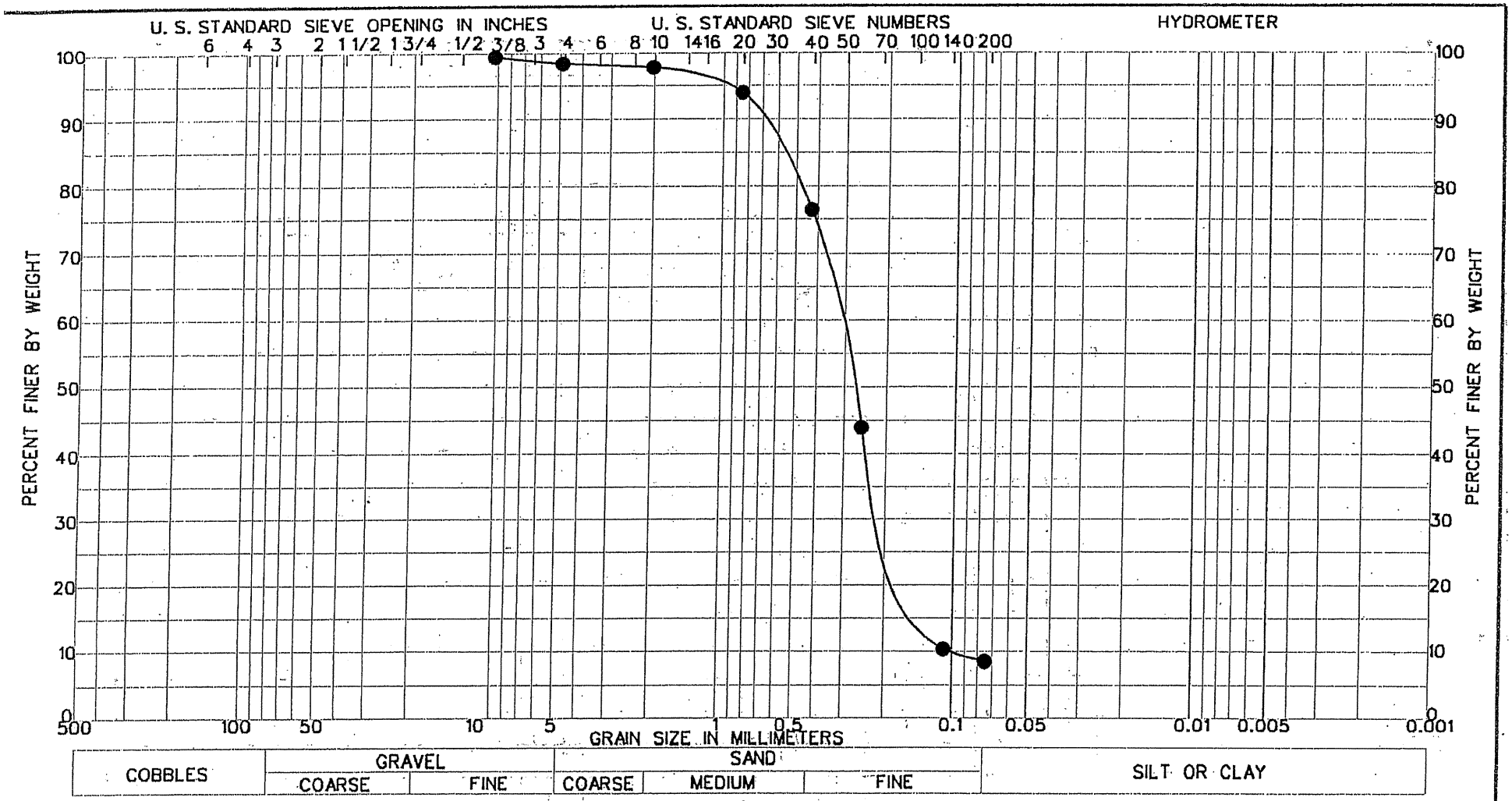
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48579

BORING NO. 11. 100.0-101.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

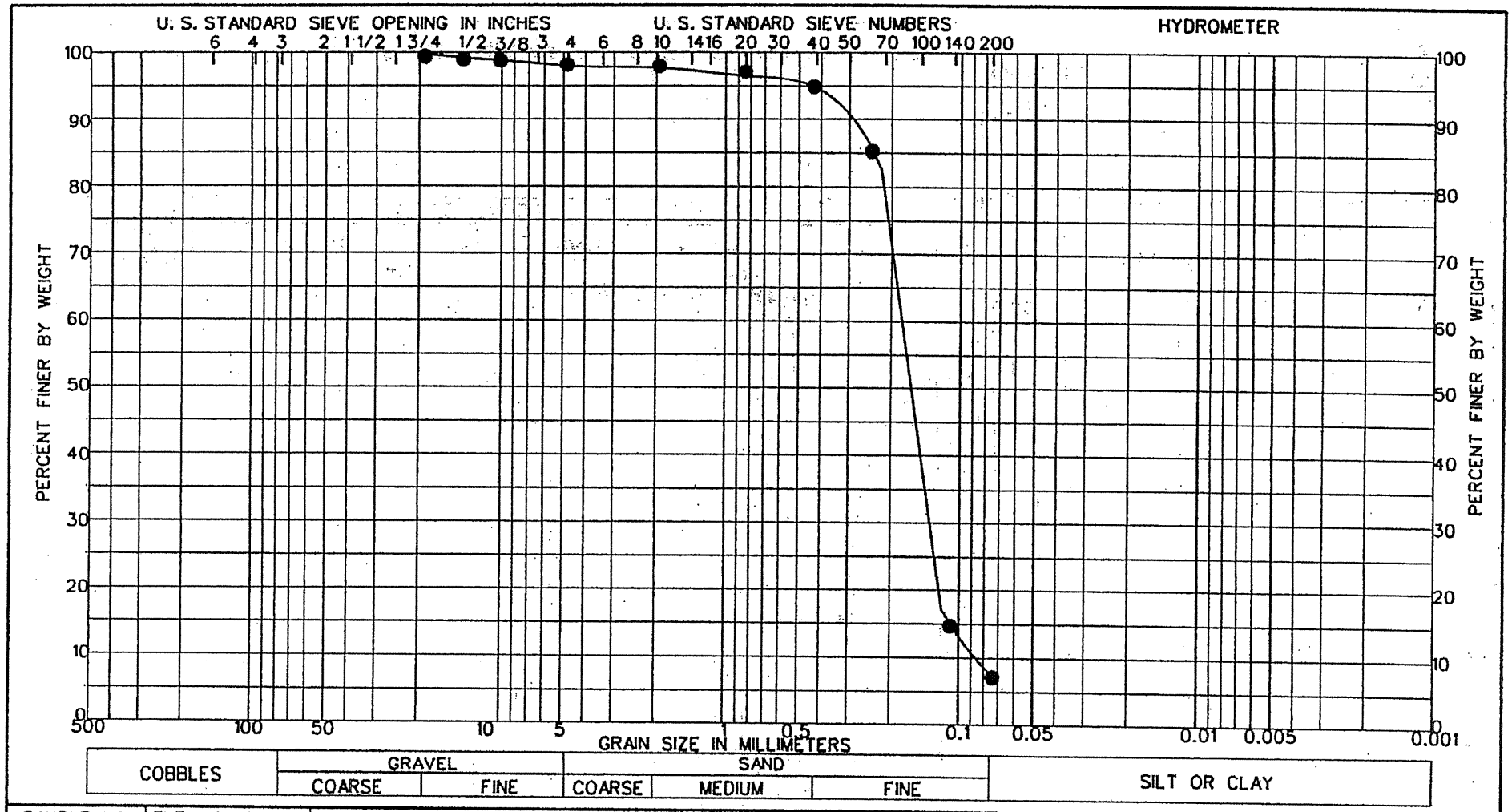
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48580

BORING NO. 12, 10.0-11.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

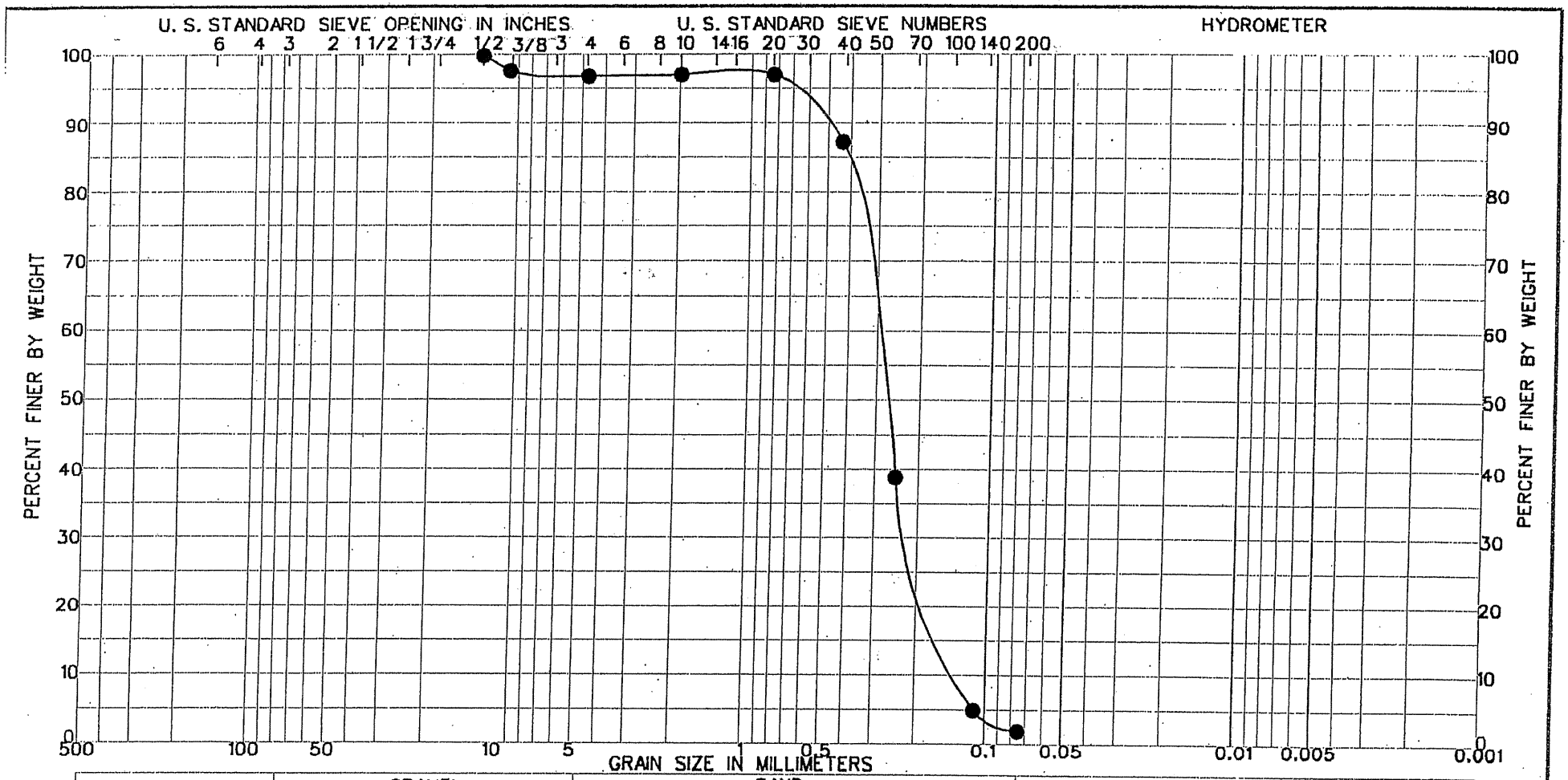
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48581

BORING NO. 12, 20.0-21.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

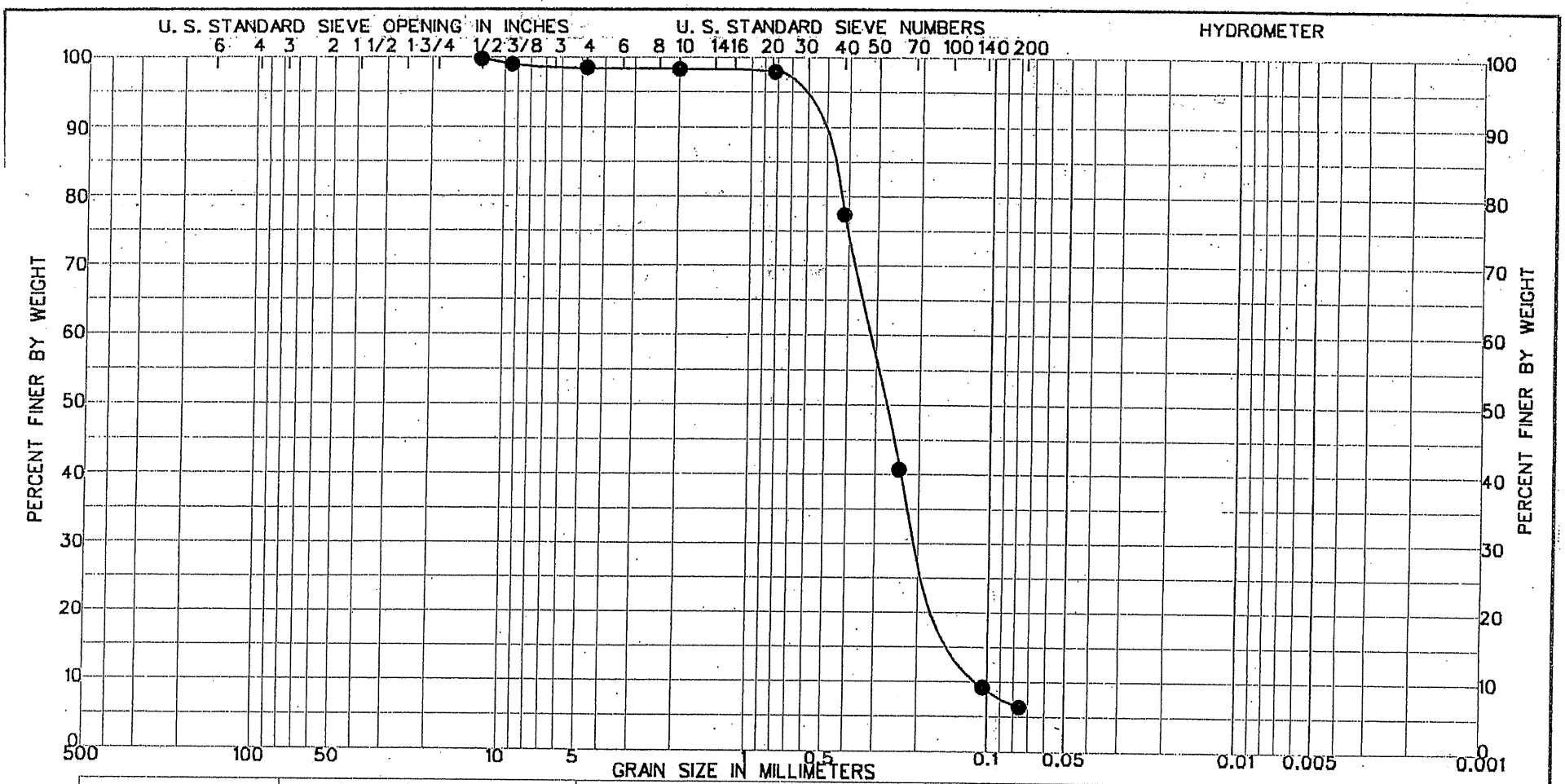
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48582

BORING NO. 12, 35.0-36.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

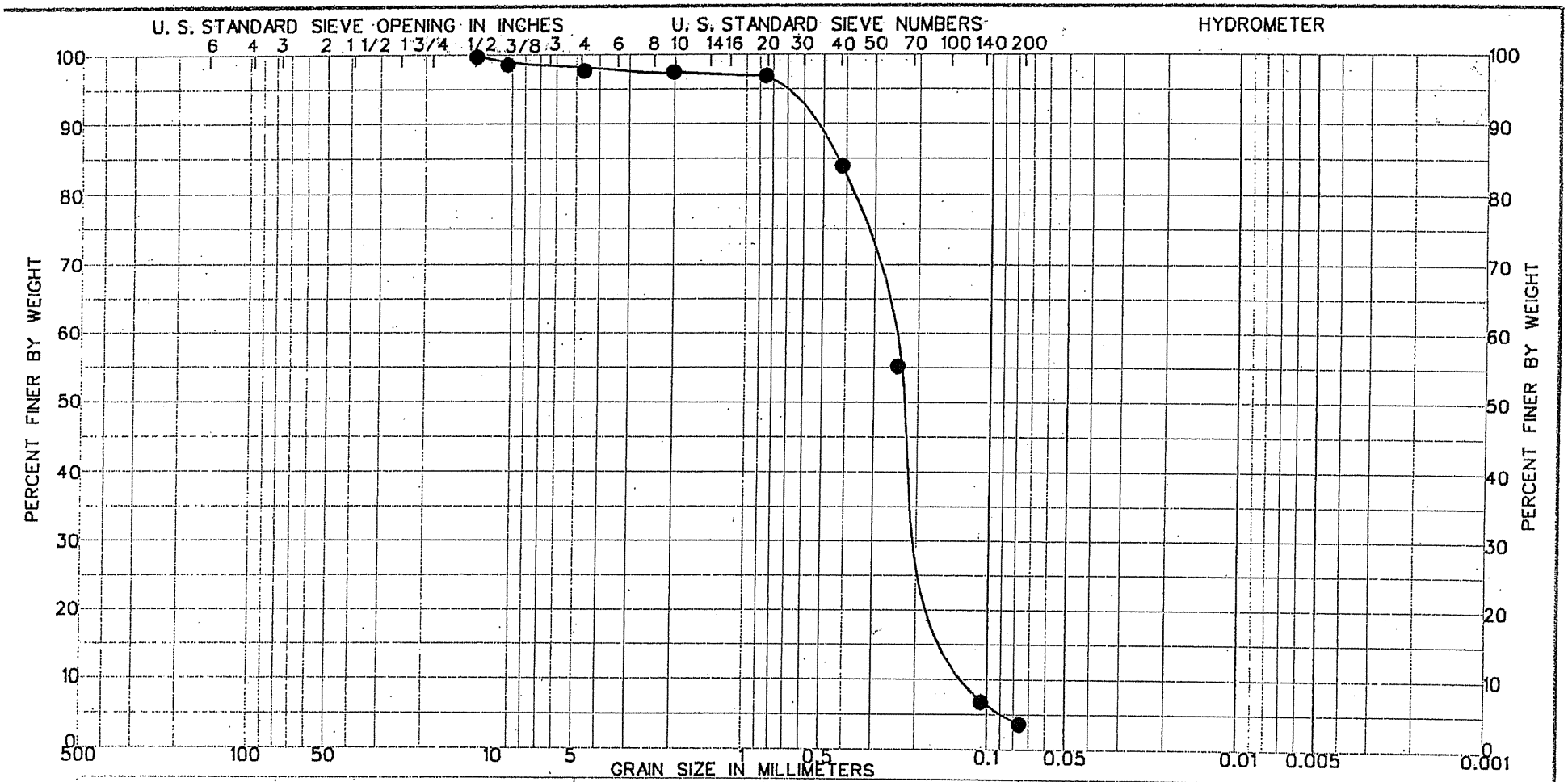
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48583

BORING NO. 12, 45-46.5'

DATE 2/28/06



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

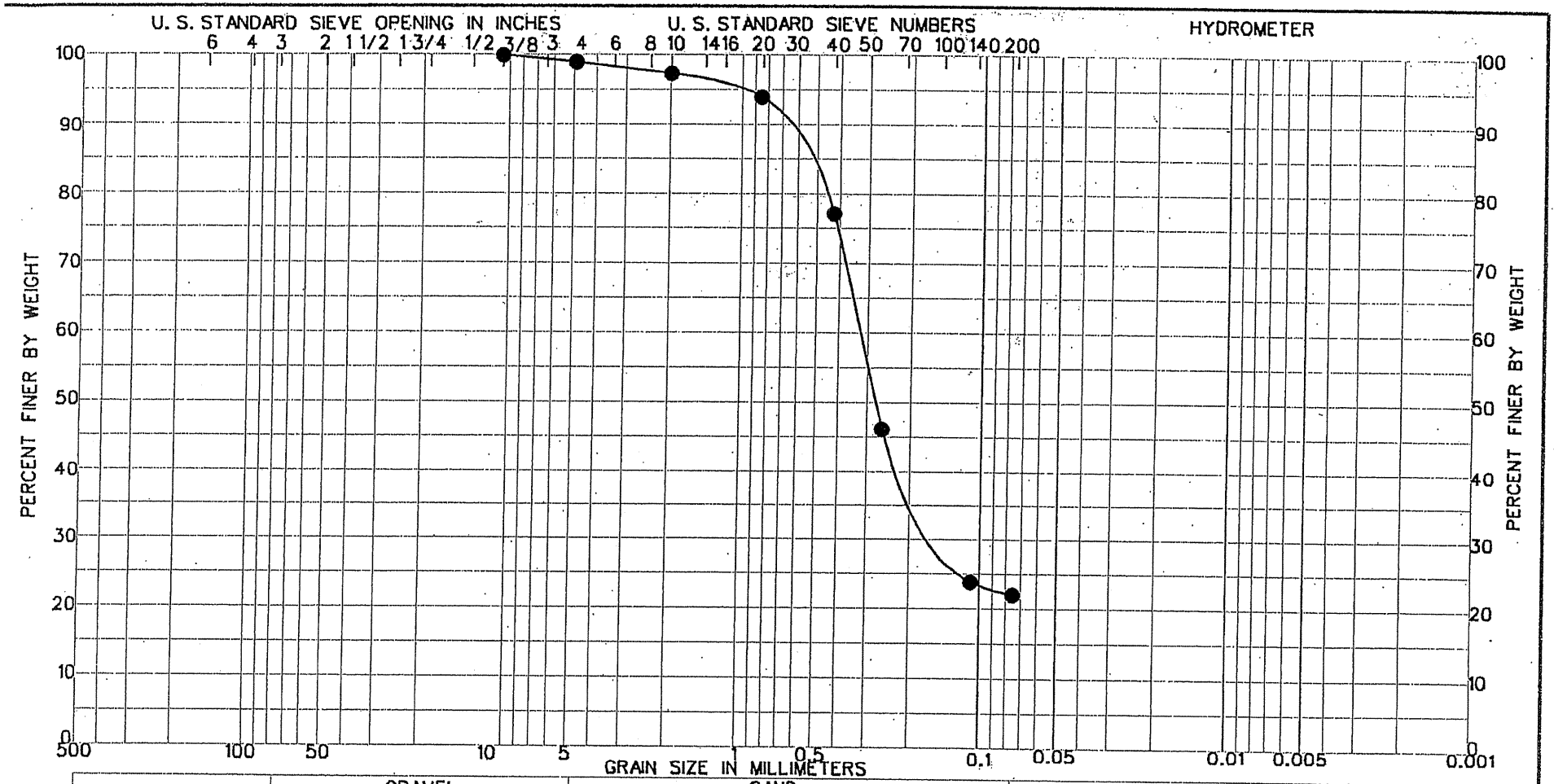
PROJECT Camino Real Landfill

Lab No. 48584

BORING NO. 13, 10.0-11.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

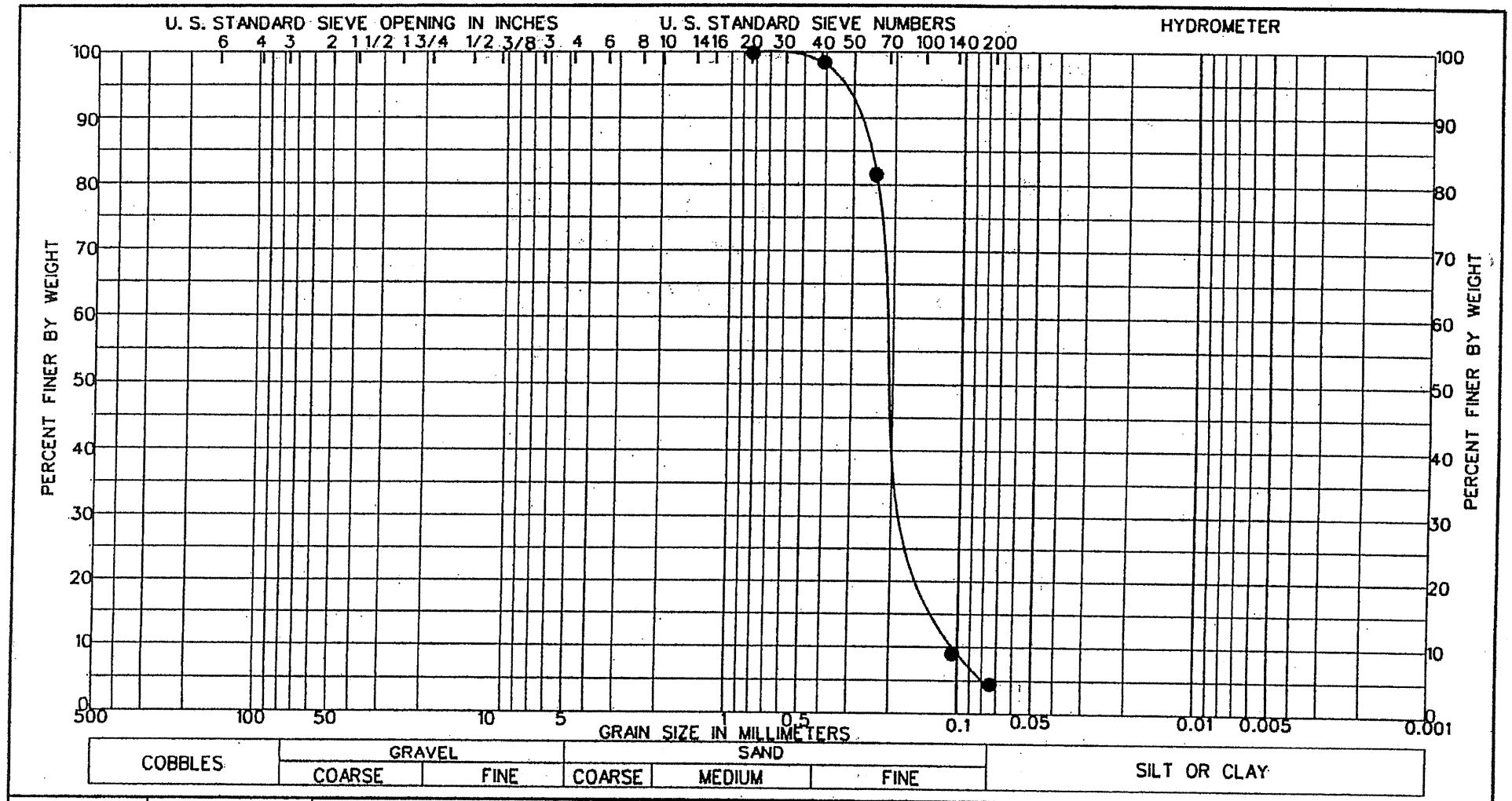
PROJECT Camino Real Landfill

Lab No. 48585B

BORING NO. 13, 20.0-21.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

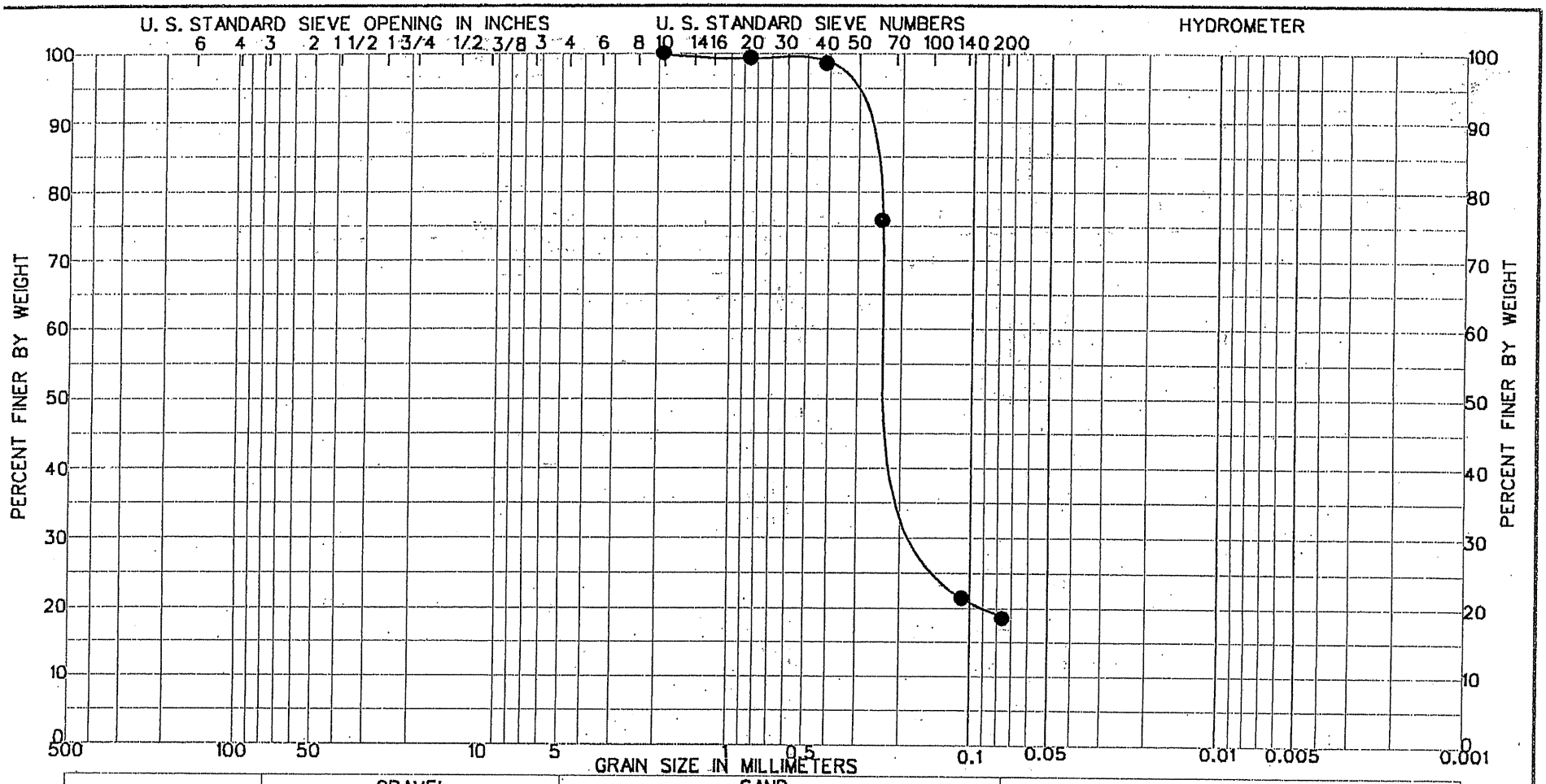
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48586

BORING NO. 13, 30.0-31.5'

DATE 1/24/2006



AMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

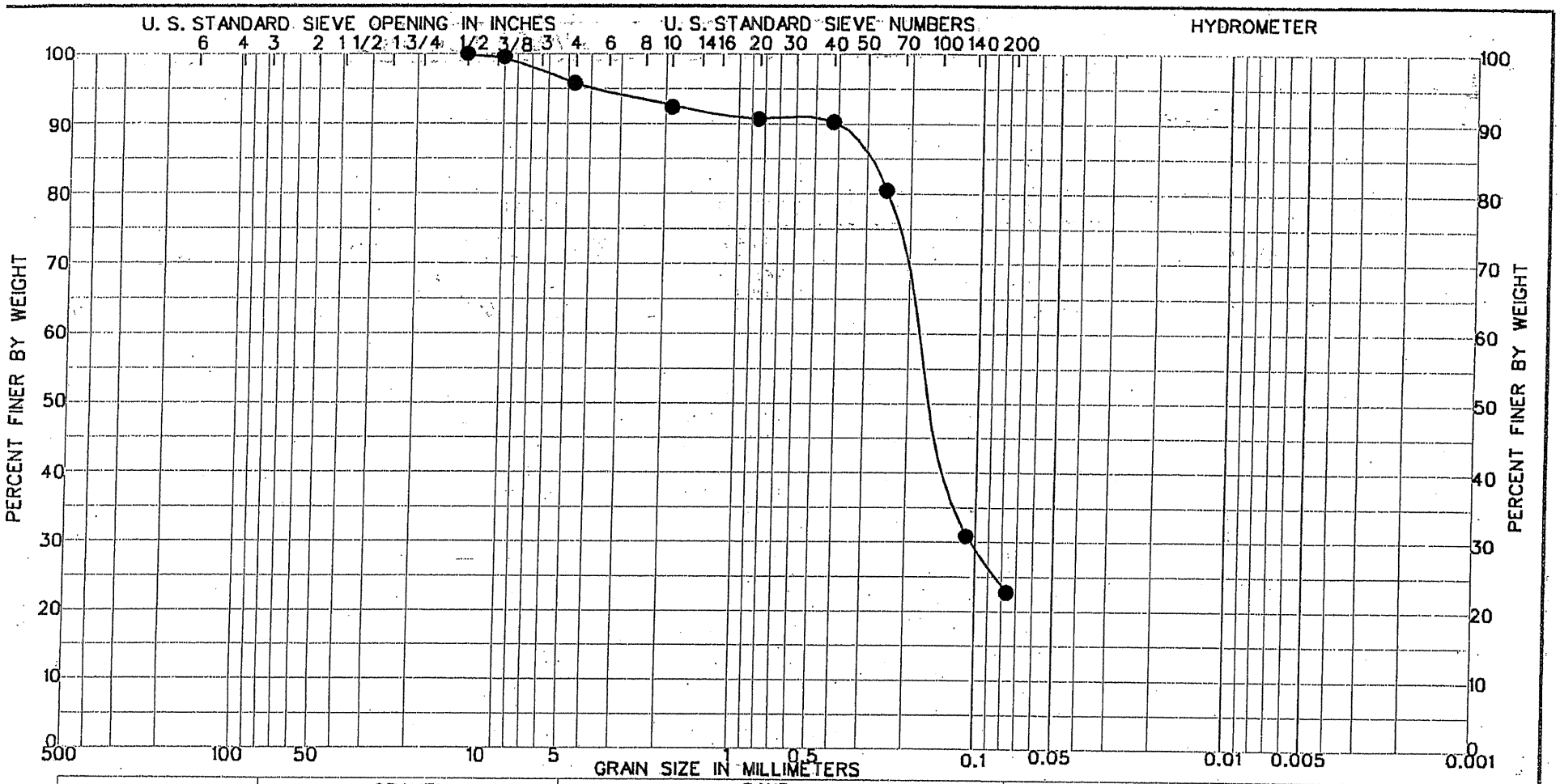
PROJECT Camino Real Landfill

Lab No. 48587B

BORING NO. 13, 40.0-41.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



AMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

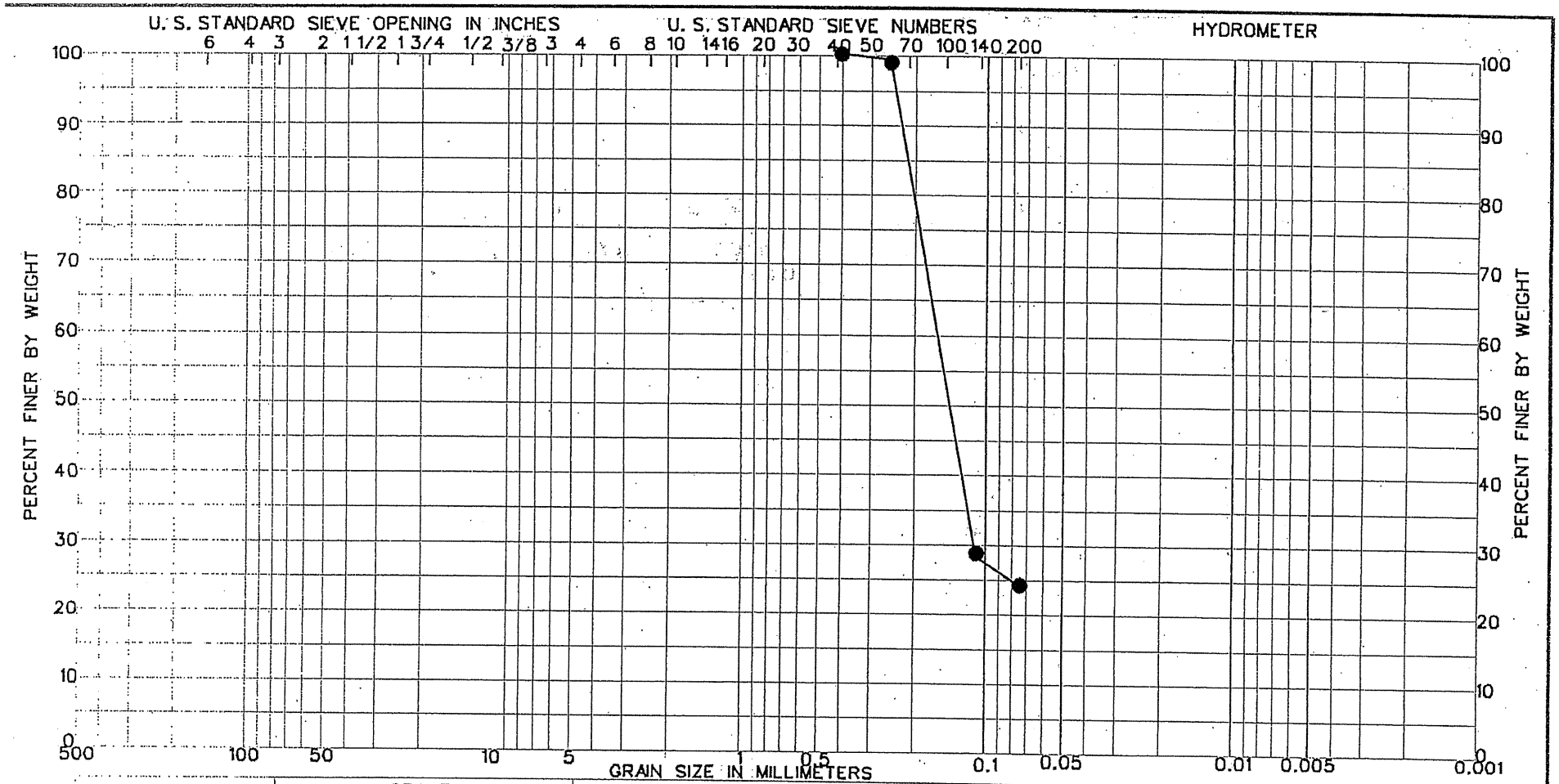
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48588B

BORING NO. 13, 45.0-46.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

AK

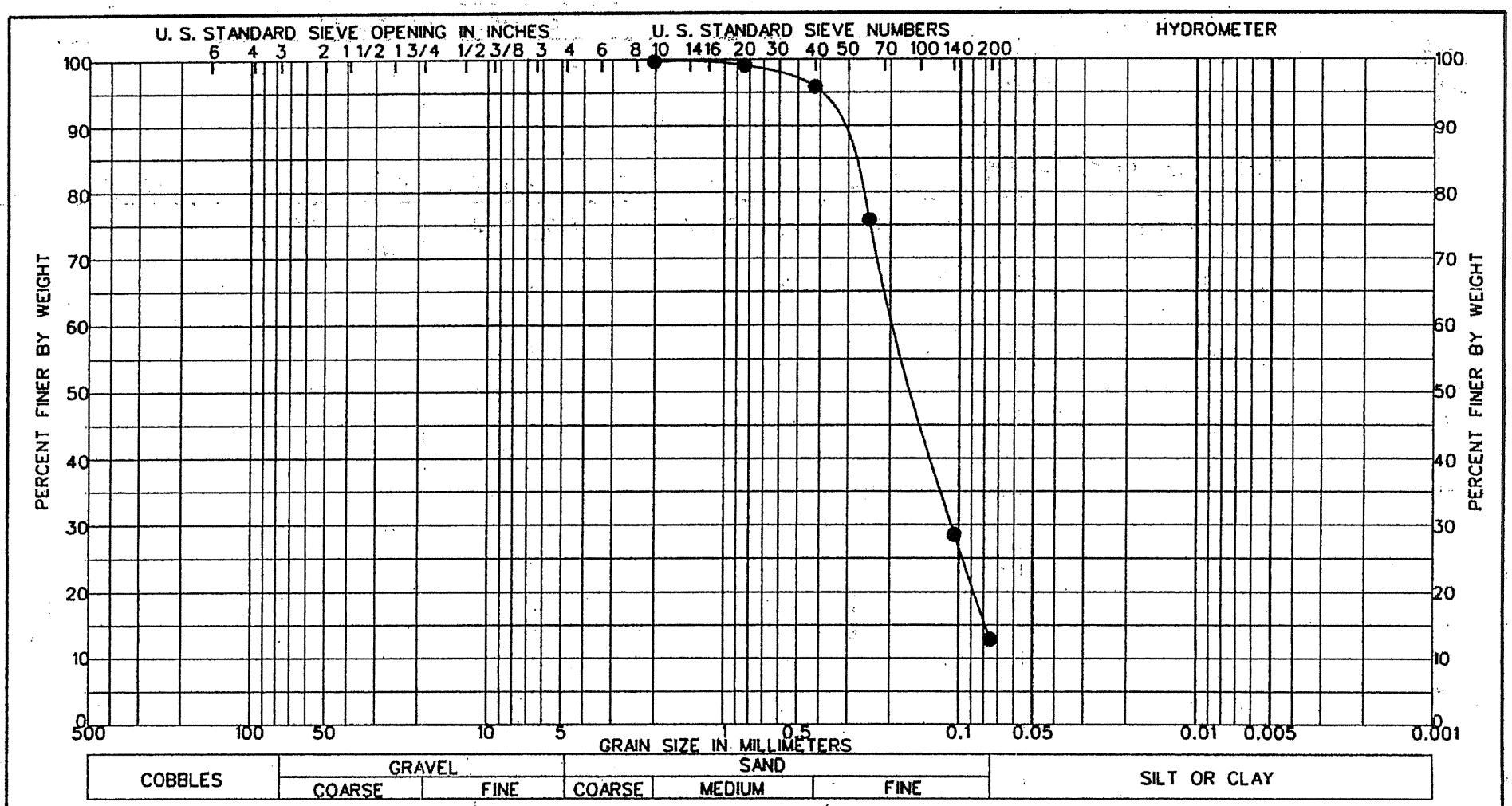
PROJECT Camino Real Landfill

Lab No. 48589

BORING NO. 13, 60.0-61.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				23	20	3

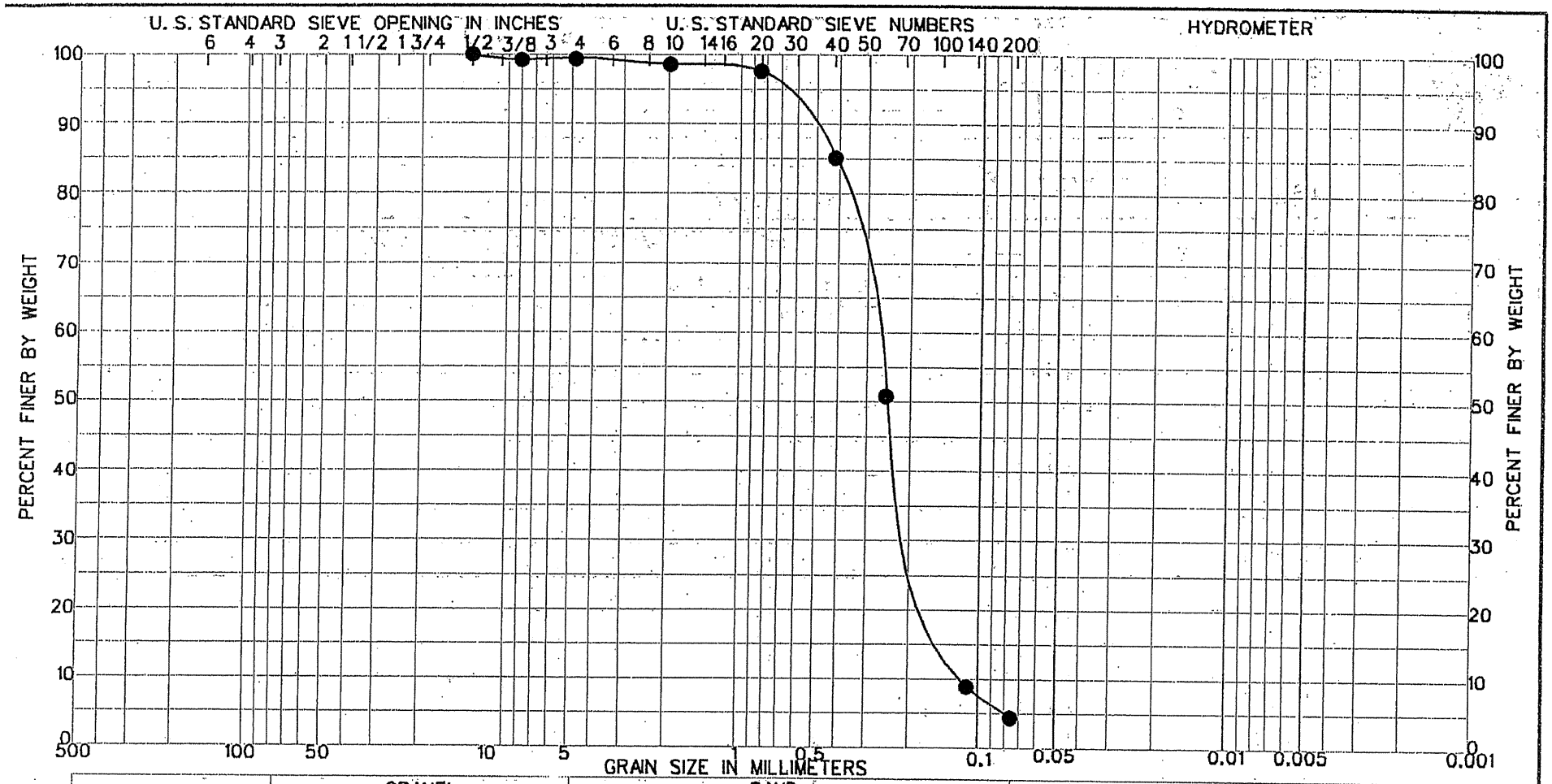
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48590

BORING NO. 13, 65-66.5'

DATE 2/28/06



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

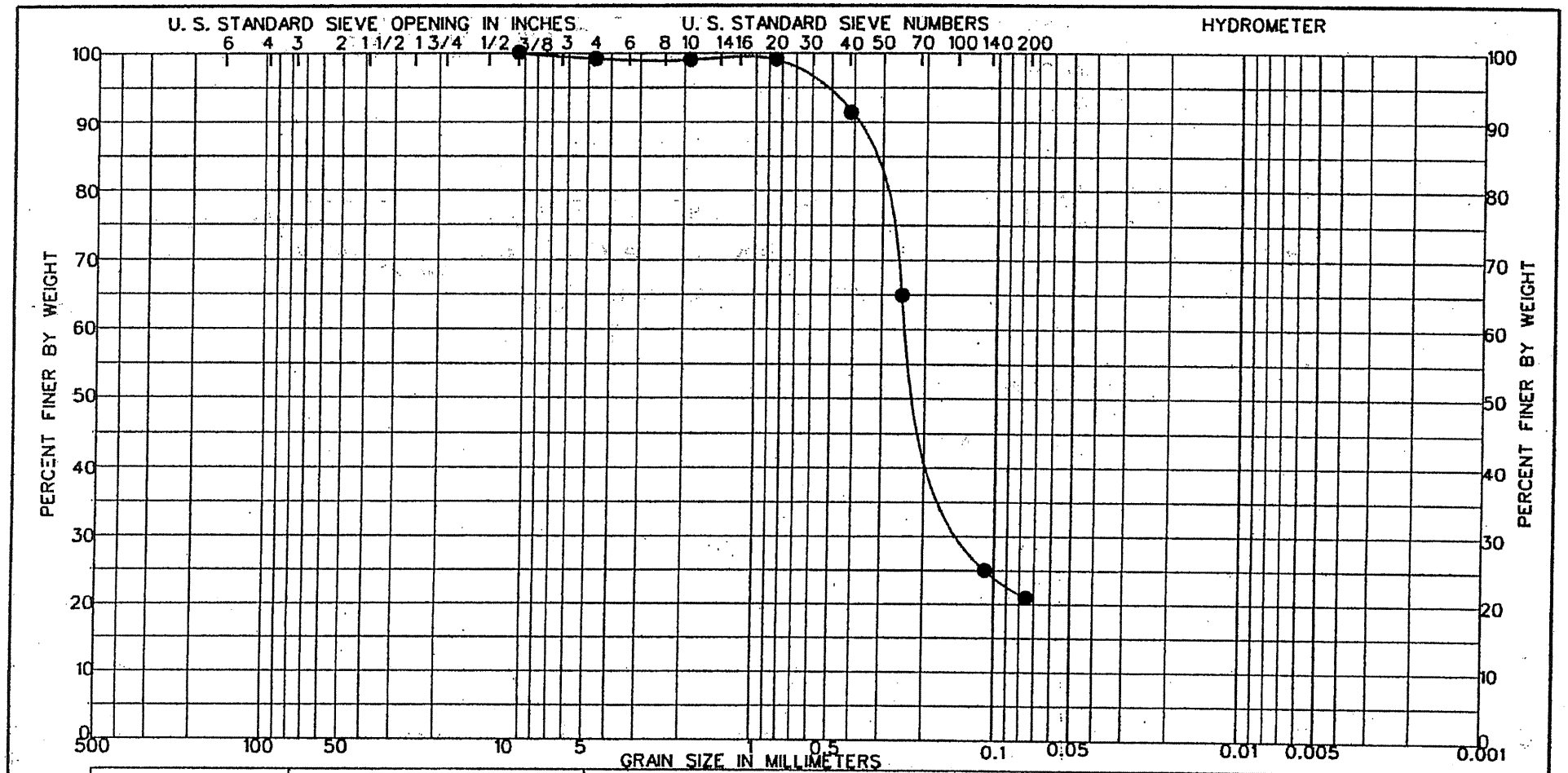
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48591

BORING NO. 12, 35.0-40.0'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

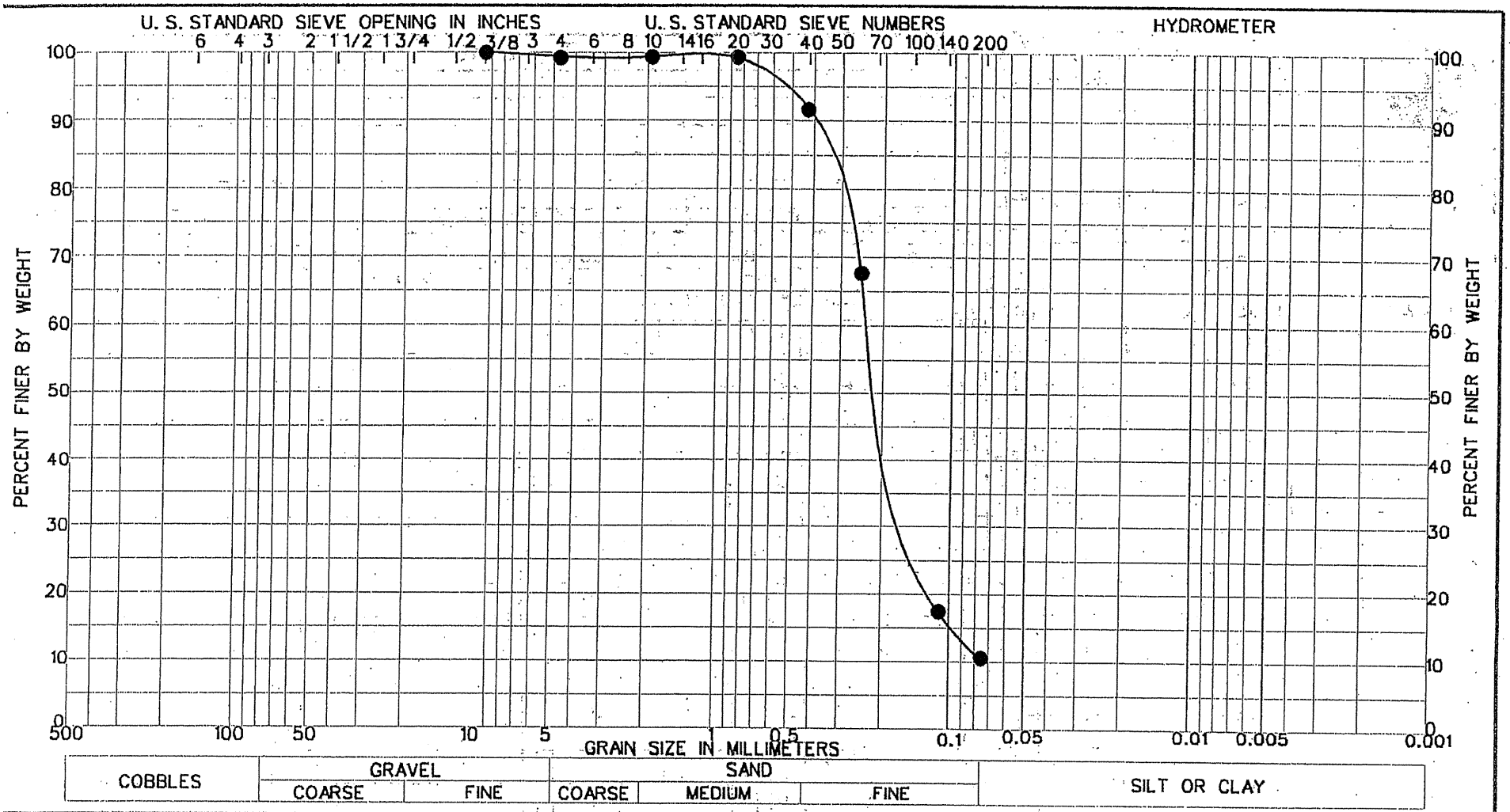
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48592

BORING NO. 14, 15.0-20.0'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

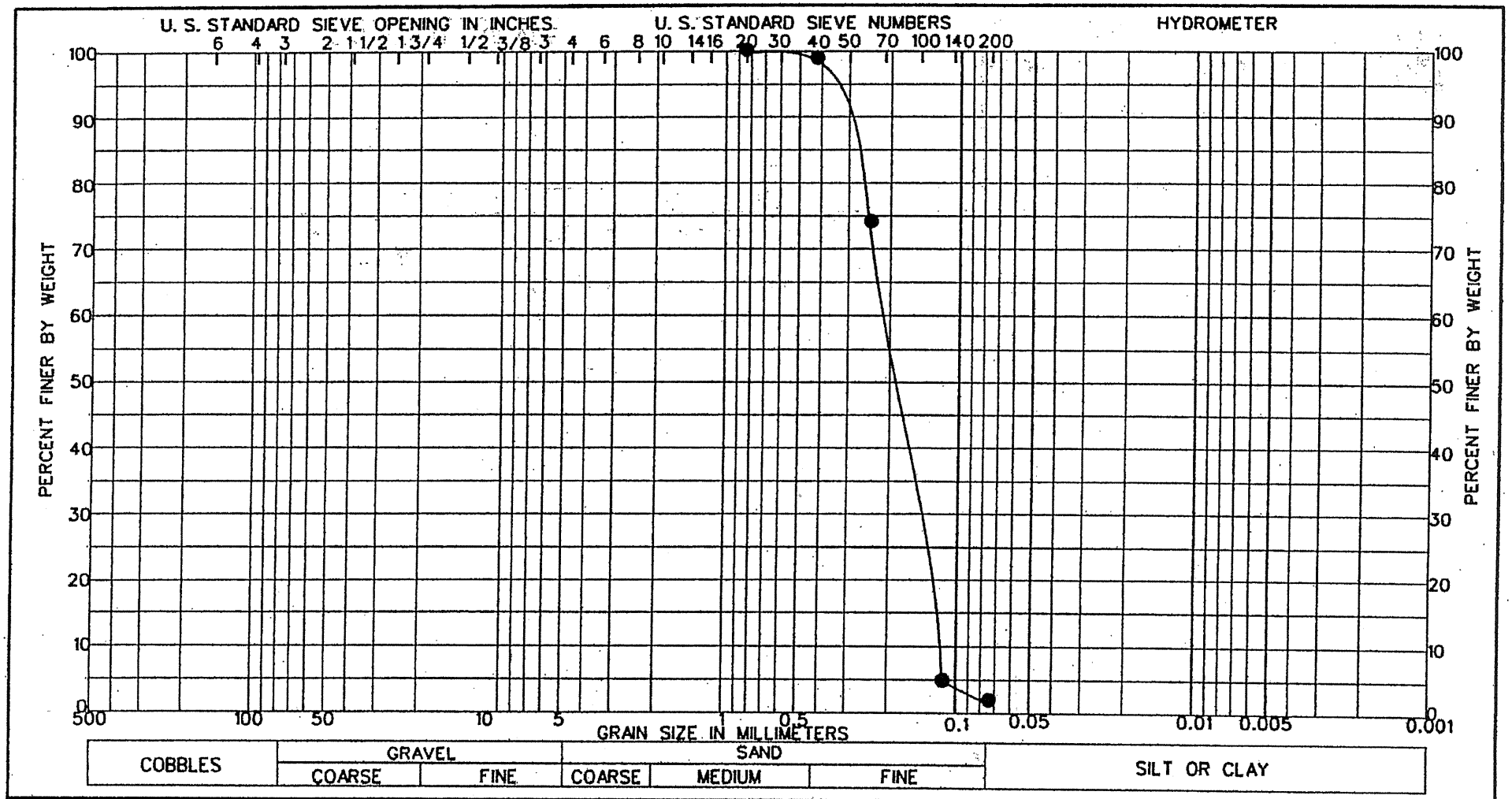
PROJECT Camino Real Landfill

Lab No. 48611

BORING NO. 14, 10.0-11.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI

GRADATION CURVES

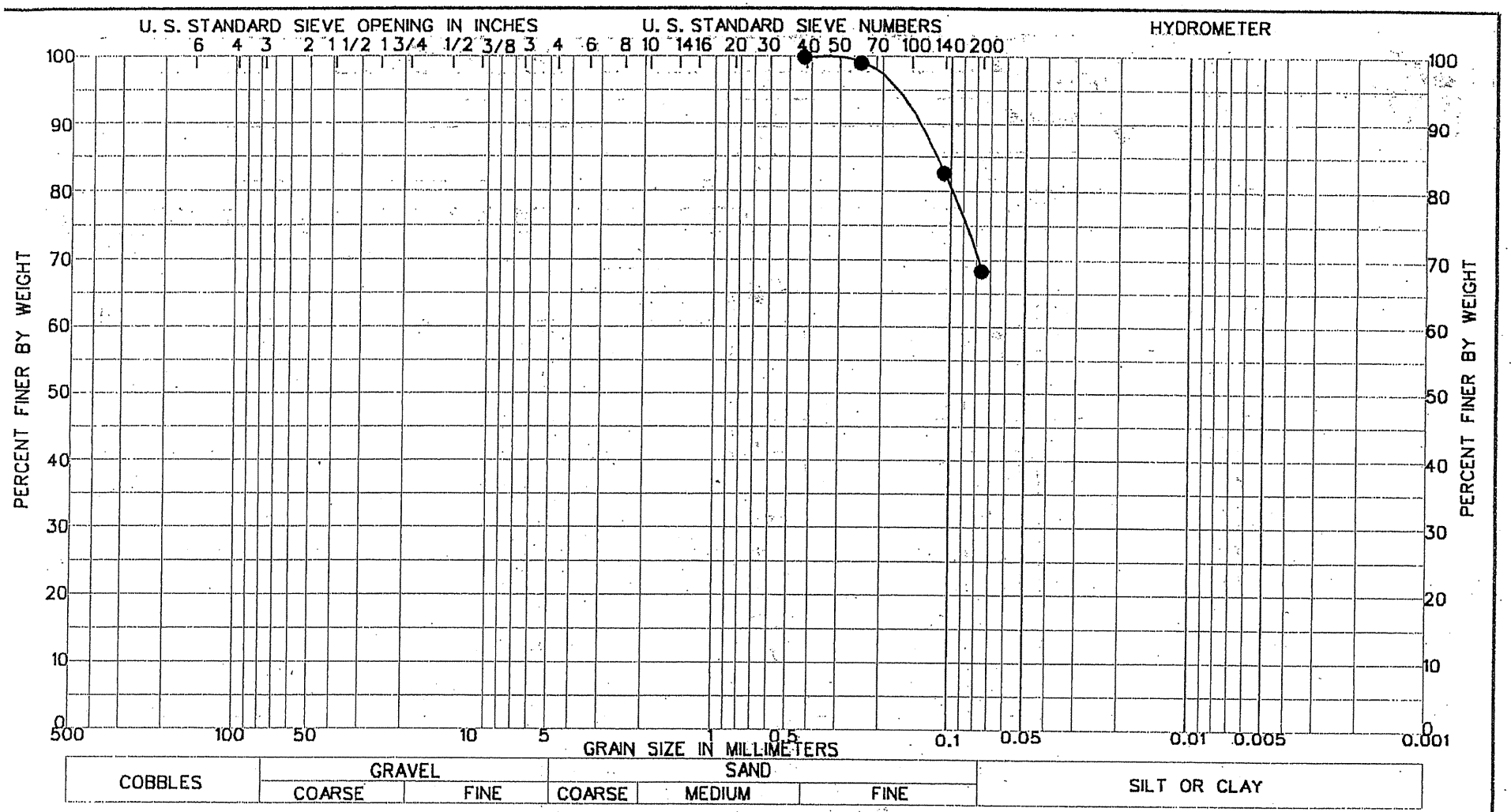
NR

PROJECT Camino Real Landfill

Lab No. 48613

BORING NO. 14. 30.0-31.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				43	17	26

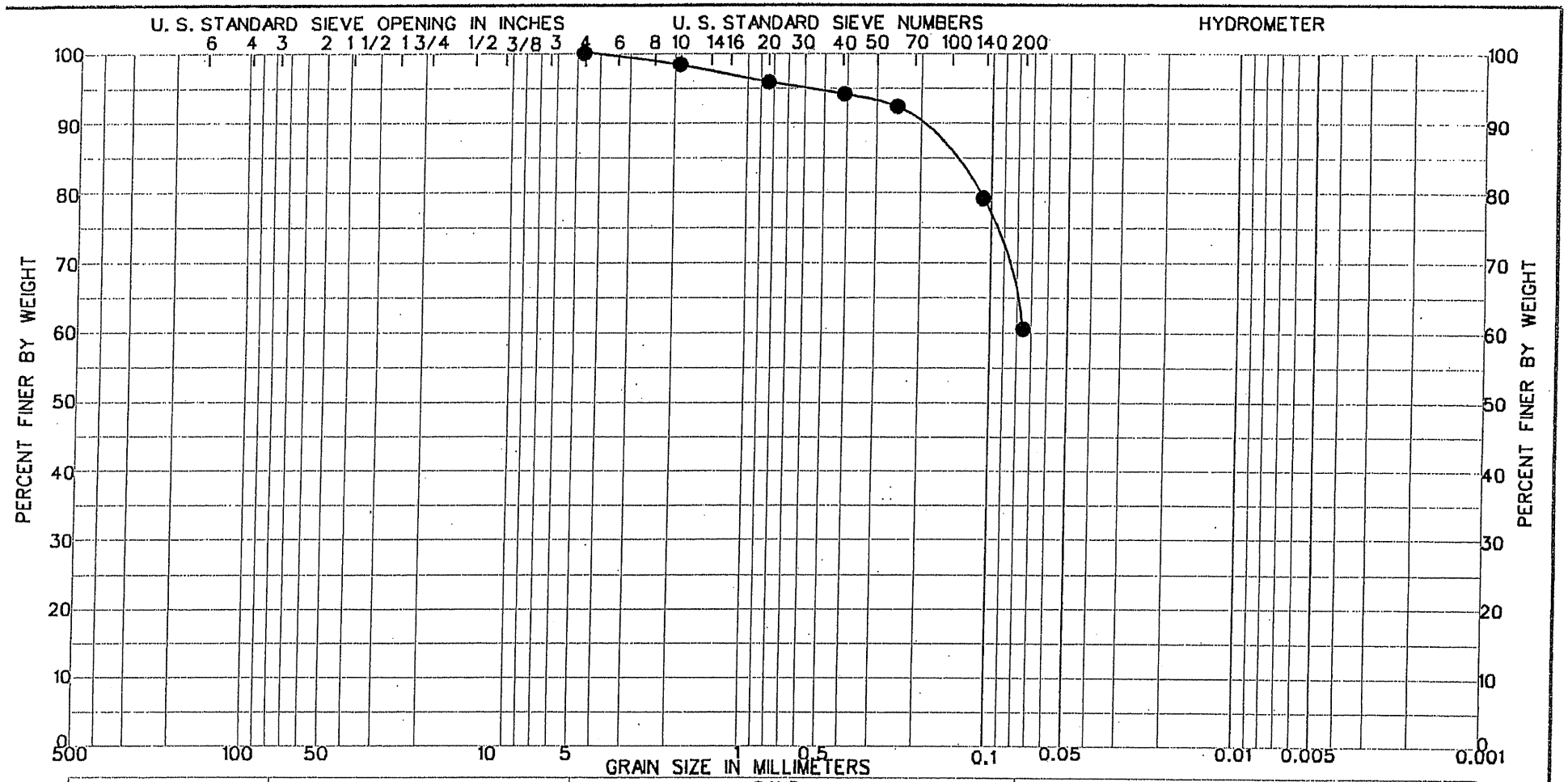
GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48614

BORING NO. 14, 40.0-41.5'

DATE 1/24/2006



SAMPLE NO.	ELEV. OR DEPTH	CLASSIFICATION	Nat w%	LL	PL	PI
				32	23	9

GRADATION CURVES

PROJECT Camino Real Landfill

Lab No. 48615

BORING NO. 14, 45.0-45.5'

DATE 1/24/2006

PRECISION ENGINEERING, INC.

ATTACHMENT V.1.G

Unit 4 Boring Geotechnical Testing

Laboratory Report

4606 Titanic Avenue
El Paso, Texas 79904
Ph. (915) 771-7766
Fax (915) 771-7786

Construction Materials Testing
Geotechnical Engineering
Environmental Site Assessments
Forensic Analysis / Testing

February 28, 2020

Gordon Environment / PSC
333 Rio Rancho Boulevard NE, Suite 400
Rio Rancho, New Mexico 87124

Attn.: Mr. Clay Kilmer, P.G.
Senior Hydrologist

Re: Contract Drilling and Laboratory Soils Testing Services
Camino Landfill Project
El Paso, El Paso County, Texas
CQC Project No. ADCQC19-008

Dear Mr. Kilmer:

In accordance with our scope of services under proposal no. PDCQC19-008 dated July 23, 2019 (Revised November 7, 2019), CQC Testing and Engineering, L.L.C. (CQC) is pleased to provide **Gordon Environment / PSC** (Client) with our test results data for the above referenced project.

Our contract drilling services scope of work consisted of completing a total of three (3) soil vertical exploration borings within the subject project area to depths ranging from 100 to 120 feet below the existing ground surface elevation. Our Client physically marked the boring locations, coordinated the necessary access and dig permits, provided access to our drill rig, coordinated utility clearance before our field activities and provided qualified personnel for logging of the collected soil samples.

On December 11, 2019 through December 14, 2020, we conducted the vertical exploration borings to approximate depths ranging from 100 to 120 feet below the existing surface elevation at the time of their drilling activities. Soil samples were collected within a split-spoon sampler at discrete depth intervals. Representative soil samples were transported to our laboratory for further engineering soil classification testing.

As requested by our Client in a formal test and chain-of-custody request dated January 9, 2020, our engineering soil classification tests were performed in accordance with accepted ASTM test procedures D 2216, D 6913, D 4318, D 2487, D 1557, D3080, D2434 and D 2435. The geotechnical engineering properties of selected samples were evaluated by the following tests:

Table – Summary of Performed Limited Laboratory Soil Classification Tests

Type of Test	Procedure	Total Number Conducted
Moisture Contents	ASTM D 2216	15
Atterberg Limit Tests	ASTM D 4318	9
Particle Size Analysis	ASTM D 6913	15
Soil Moisture Density Relationship Tests	ASTM D 1557	3
Soil Direct Shear Tests	ASTM D 3080	2
Permeability Flex-Wall Tests	ASTM D2434	3
Consolidation Tests	ASTM D 2435	1
Engineering Classification of Soil	ASTM D 2487	15

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testing and engineering
4606 Titanic Avenue
El Paso, Texas 79904
Ph. (915) 771-7766
Fax (915) 771-7786

Construction Materials Testing
Geotechnical Engineering
Environmental Site Assessments
Forensic Analysis / Testing

Our laboratory engineering soil classification test results are reported in Appendix A attached to this letter in Sheets A1 through A37. We shall note that based on the chain of custody request two (2) samples identified as Boring 4-3 at a depth of 15 feet and Boring 4-2 at a depth of 65 feet could not be conducted in our laboratory due to sample not being collected on the field and sandy (coarse grained) soils extracted from the California-Sampler tube, respectively.

Our scope of work under this contract drilling and limited laboratory testing project did not include a geotechnical report, soil classification, soil sampling, an environmental assessment of the property's air, soil, water, the identification of buried materials, site fault delineation and evaluation, delineation of subsurface flowing water or rock conditions either on or adjacent to the site, the development of a dewatering plan, development of a trench safety plan, construction materials testing services during construction, an assessment of the potential impacts or distress to existing structures on or adjacent to the project site resulting from construction activities, and directing or controlling the means and methods utilized by contractors during the construction of the project.

Please feel free to contact us if you have any questions regarding the information presented above or if we may assist you with other services.

Respectfully Submitted,
CQC Testing and Engineering, L.L.C.
TBPE Firm Registration No. F-10632

Benjamin Lopez, E.I.T.
Project Engineer
blopez@cqceng.com

Jaime Rojas, P.E.
Principal Engineer
jrojas@cqceng.com

Attachments:

Appendix A:
Summary of Laboratory Soil Classification & Test Results for Boring 4-1, Sheets A1-7
Summary of Laboratory Soil Classification & Test Results for Boring 4-2, Sheets A8-14
Summary of Laboratory Soil Classification & Test Results for Boring 4-3, Sheets A15-21
Soil Moisture-Density Relationship Test Results, Sheets A22-24
Soil Direct Shear Test Results, Sheets A25-26 & A30-31
Rigid-Wall Constant Head Permeability Test Results, Sheets A27-29
One-Dimensional Consolidation Test Results, Sheets A32-37

Copies: 1.) Above Addressee:1 copy by email (ckilmer@team-psc.com)
2.) File

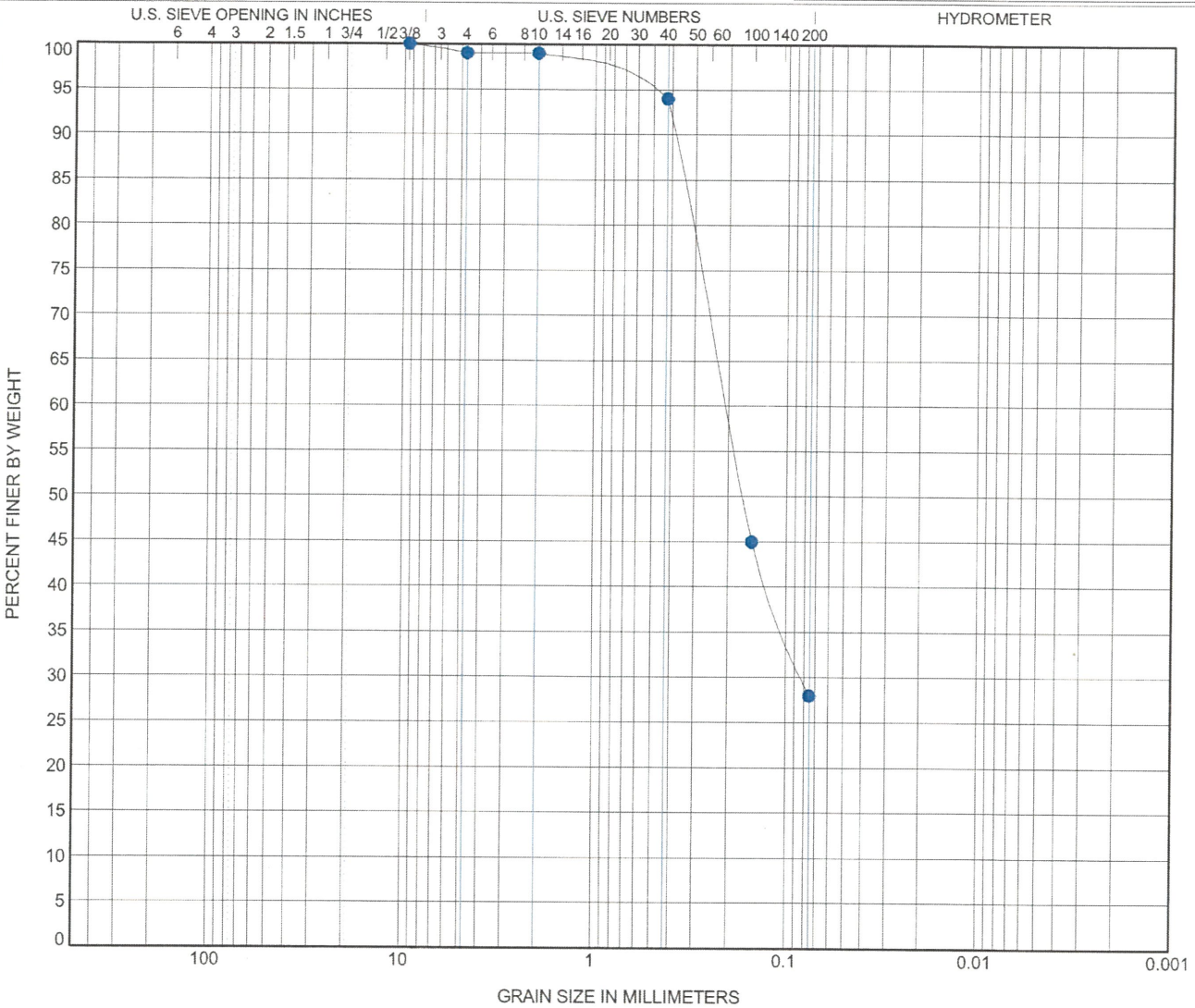
APPENDIX A

CQC Testing and Engineering LLC - TBPE Firm No. F-10632
4606 Titanic Avenue
El Paso, Texas 79904
Ph: (915) 771-7766
Fx: (915) 771-7786

SOIL PARTICLE SIZE ANALYSIS TESTS

Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC
PROJECT NAME Camino Landfill Project
PROJECT NUMBER ADCQC19-008
PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-1	10.0 - 11.5	CLAYEY SAND(SC)	26	16	10		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-1	10.0 - 11.5	9.5	0.206	0.081		1.0	71.0	28.0	

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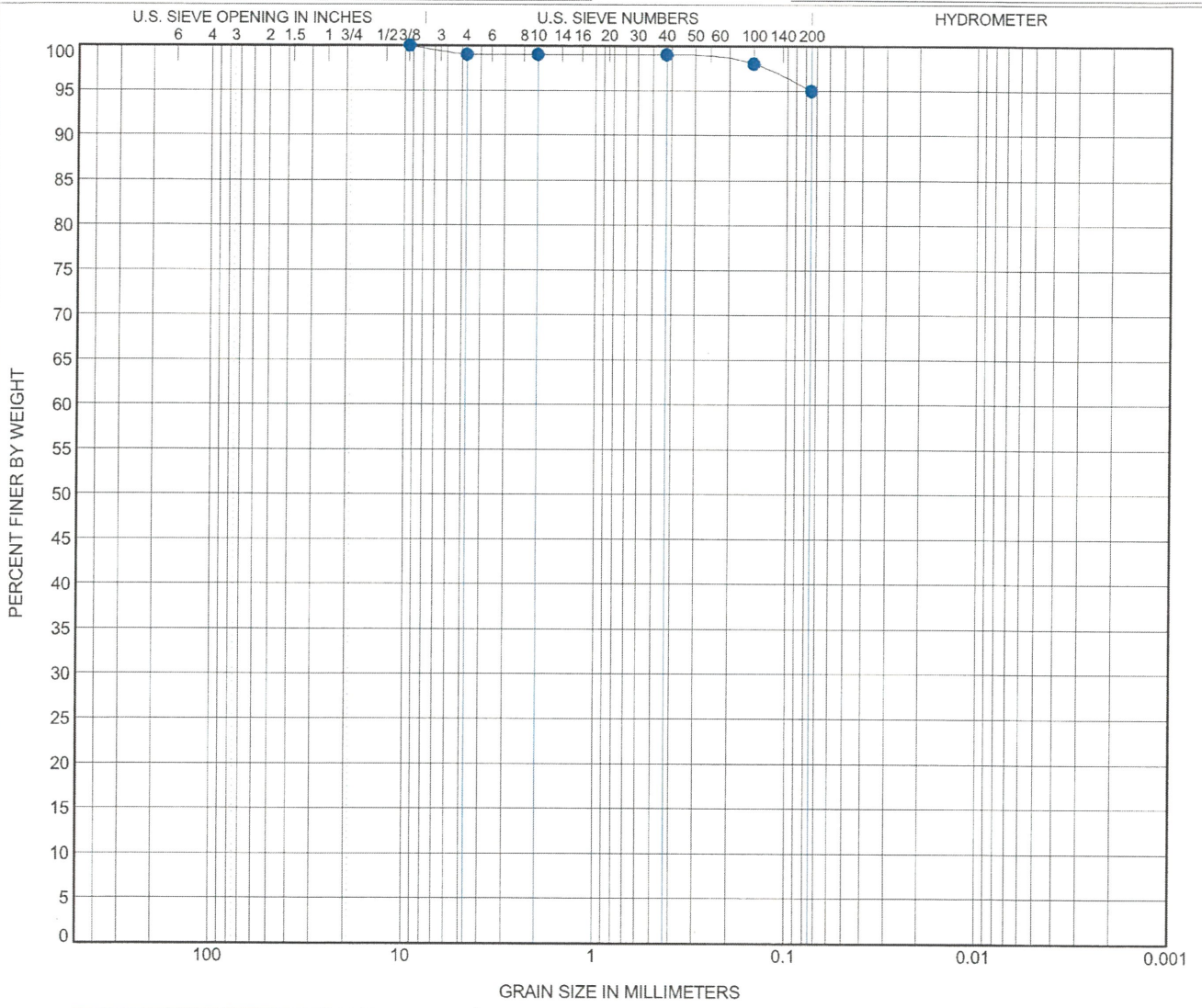
SOIL PARTICLE SIZE ANALYSIS TESTS

Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC **PROJECT NAME** Camino Landfill Project

PROJECT NUMBER ADCQC19-008 **PROJECT LOCATION** Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-1	20.0 - 21.5						

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-1	20.0 - 21.5	9.5				1.0	4.0	95.0	

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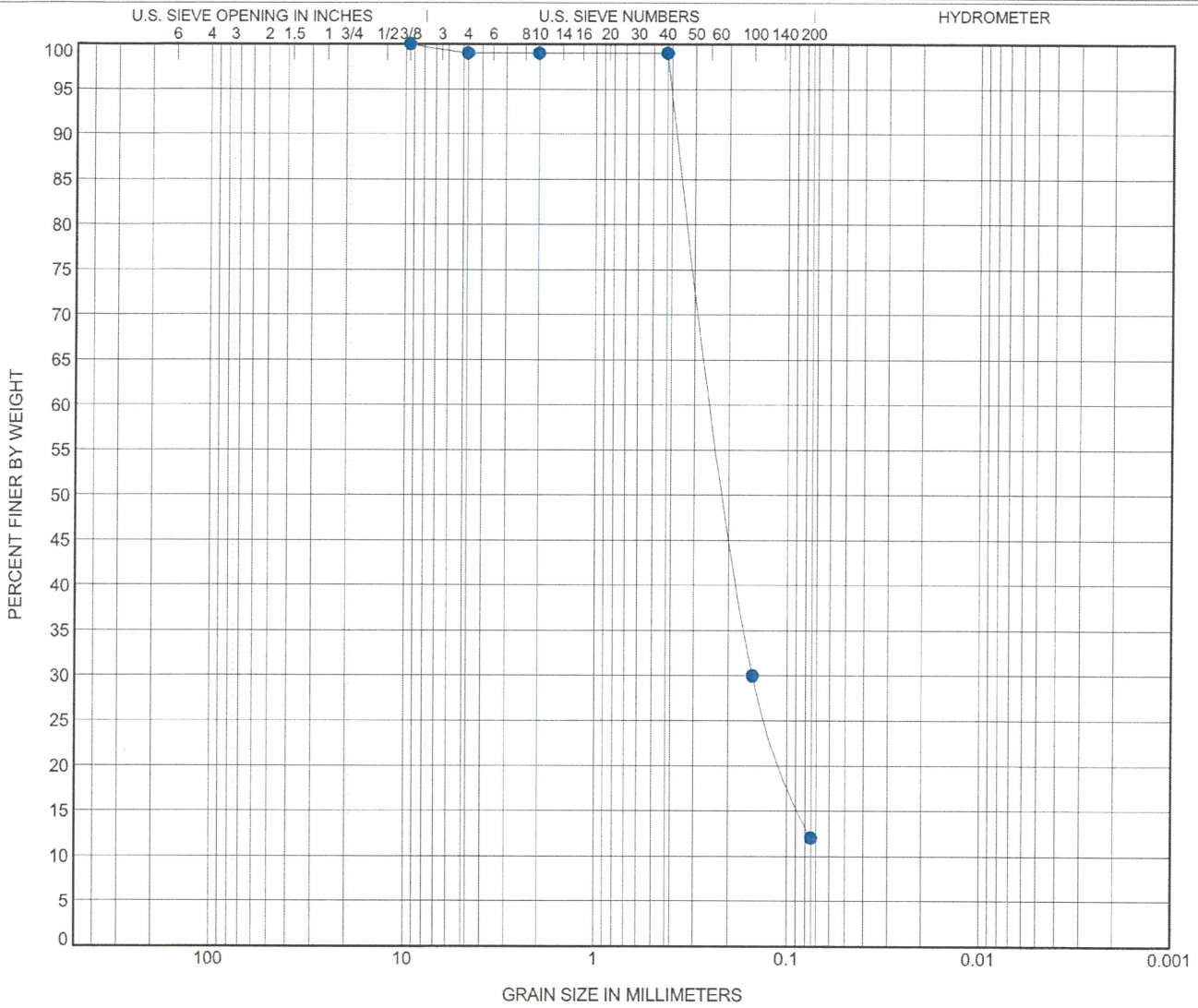
SOIL PARTICLE SIZE ANALYSIS TESTS

Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC
PROJECT NAME Camino Landfill Project
PROJECT NUMBER ADCQC19-008
PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-1	30.0 - 31.5					1.37	3.40

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-1	30.0 - 31.5	9.5	0.236	0.15		1.0	87.0	12.0	

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El Paso, Texas 79904
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Fx: (915) 771-7786

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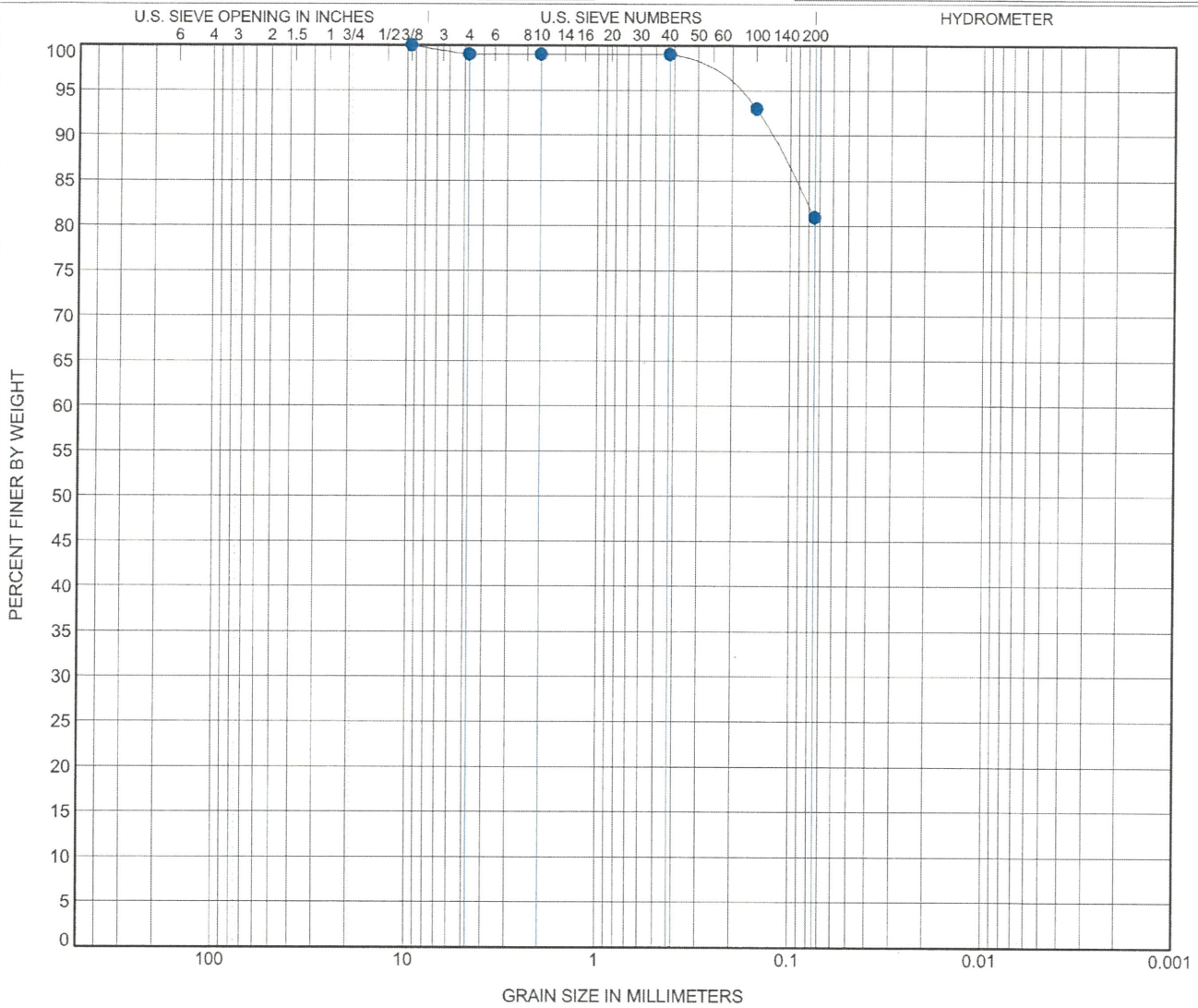
SOIL PARTICLE SIZE ANALYSIS TESTS

Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC **PROJECT NAME** Camino Landfill Project

PROJECT NUMBER ADCQC19-008 **PROJECT LOCATION** Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-1	55.0 - 56.5	LEAN CLAY with SAND(CL)	40	14	26		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-1	55.0 - 56.5	9.5				1.0	18.0	81.0	

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El Paso, Texas 79904
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SOIL PARTICLE SIZE ANALYSIS TESTS

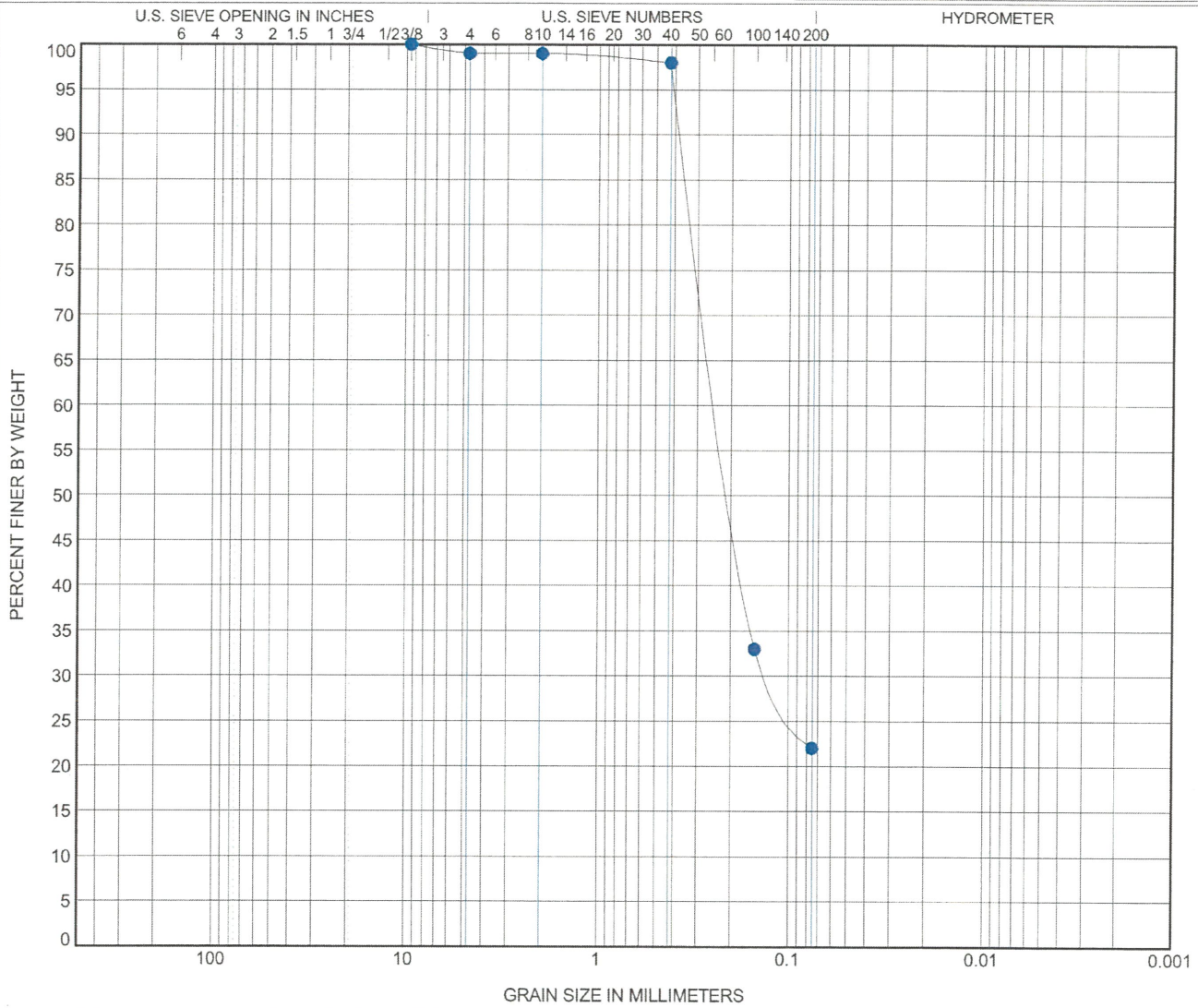
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-1	75.0 - 76.5	SILTY SAND(SM)	NP	NP	NP		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-1	75.0 - 76.5	9.5	0.231	0.124		1.0	77.0	22.0	

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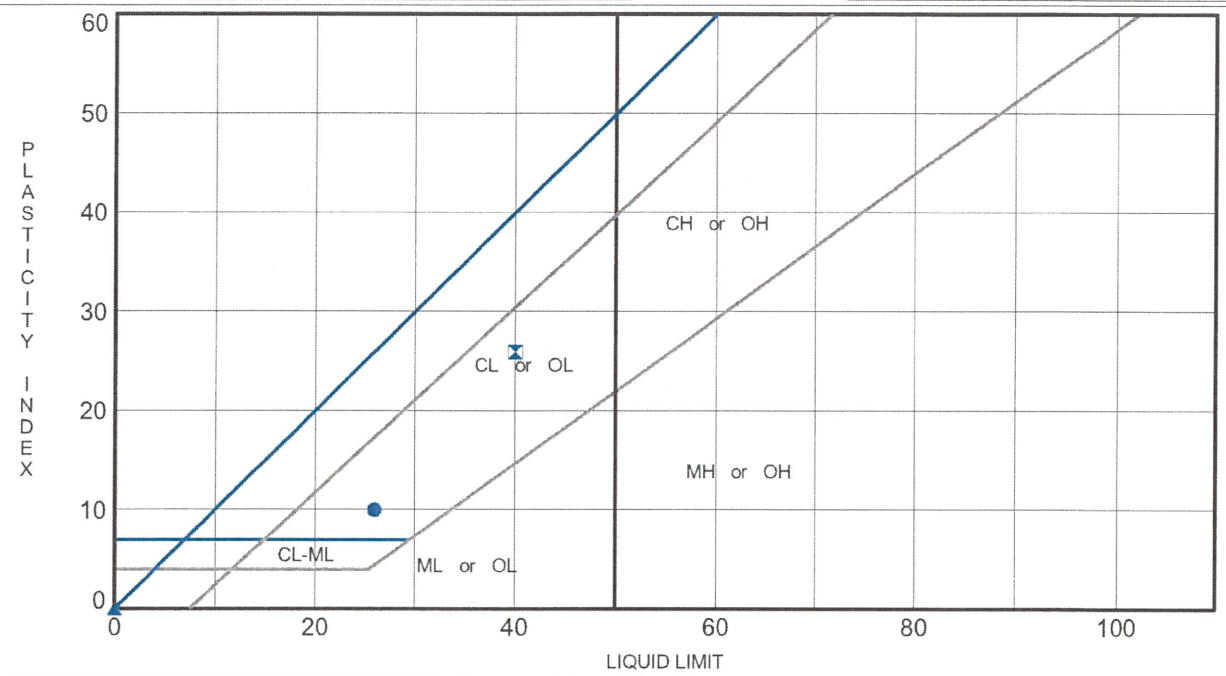
ATTERBERG LIMITS' RESULTS

ASTM D4318

CLIENT Gordon Environmental / PSC **PROJECT NAME** Camino Landfill Project

PROJECT NUMBER ADCQC19-008 **PROJECT LOCATION** Sunland Park, New Mexico



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	4-1	10.0- 11.5	26	16	10	28	CLAYEY SAND(SC)
⧗	4-1	55.0- 56.5	40	14	26	81	LEAN CLAY with SAND(CL)
▲	4-1	75.0- 76.5	NP	NP	NP	22	SILTY SAND(SM)

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SUMMARY OF LABORATORY ENGINEERING SOIL CLASSIFICATION TEST RESULTS

CLIENT Gordon Environmental / PSC **PROJECT NAME** Camino Landfill Project

PROJECT NUMBER ADCQC19-008 **PROJECT LOCATION** Sunland Park, New Mexico

Borehole	Depth	N - Value	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 4	% Passing No. 200	Pocket Pen. (tsf)	Total Unit Weight (pcf)	Classification
4-1	10.0- 11.5		10.7	26	16	10	99	28			SC
4-1	20.0- 21.5		27.7				99	95			
4-1	30.0- 31.5		3.3				99	12			
4-1	55.0- 56.5		22.0	40	14	26	99	81			CL
4-1	75.0- 76.5		7.6	NP	NP	NP	99	22			SM

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SOIL PARTICLE SIZE ANALYSIS TESTS

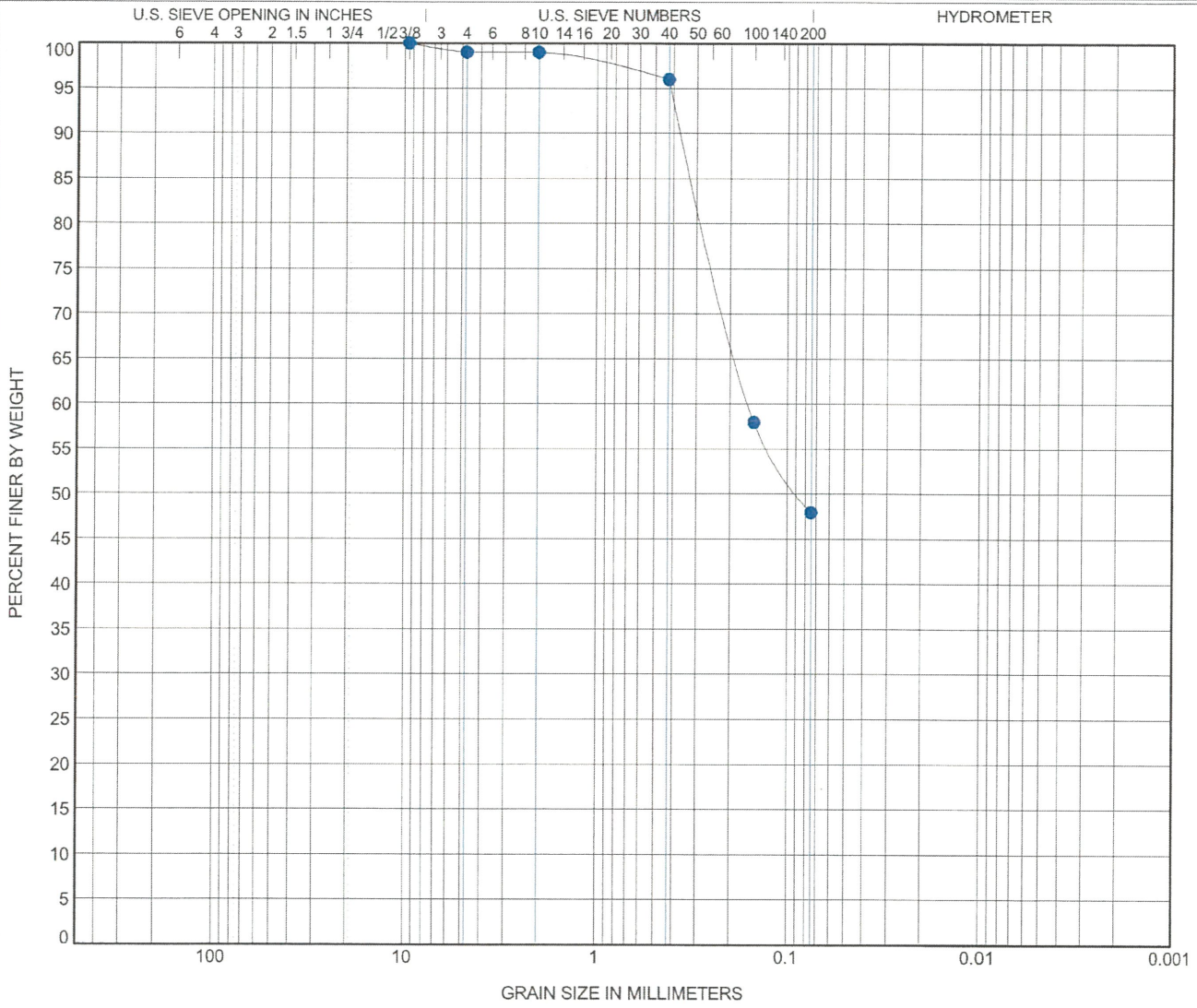
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-2	15.0 - 16.5						

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-2	15.0 - 16.5	9.5	0.158			1.0	51.0	48.0	

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SOIL PARTICLE SIZE ANALYSIS TESTS

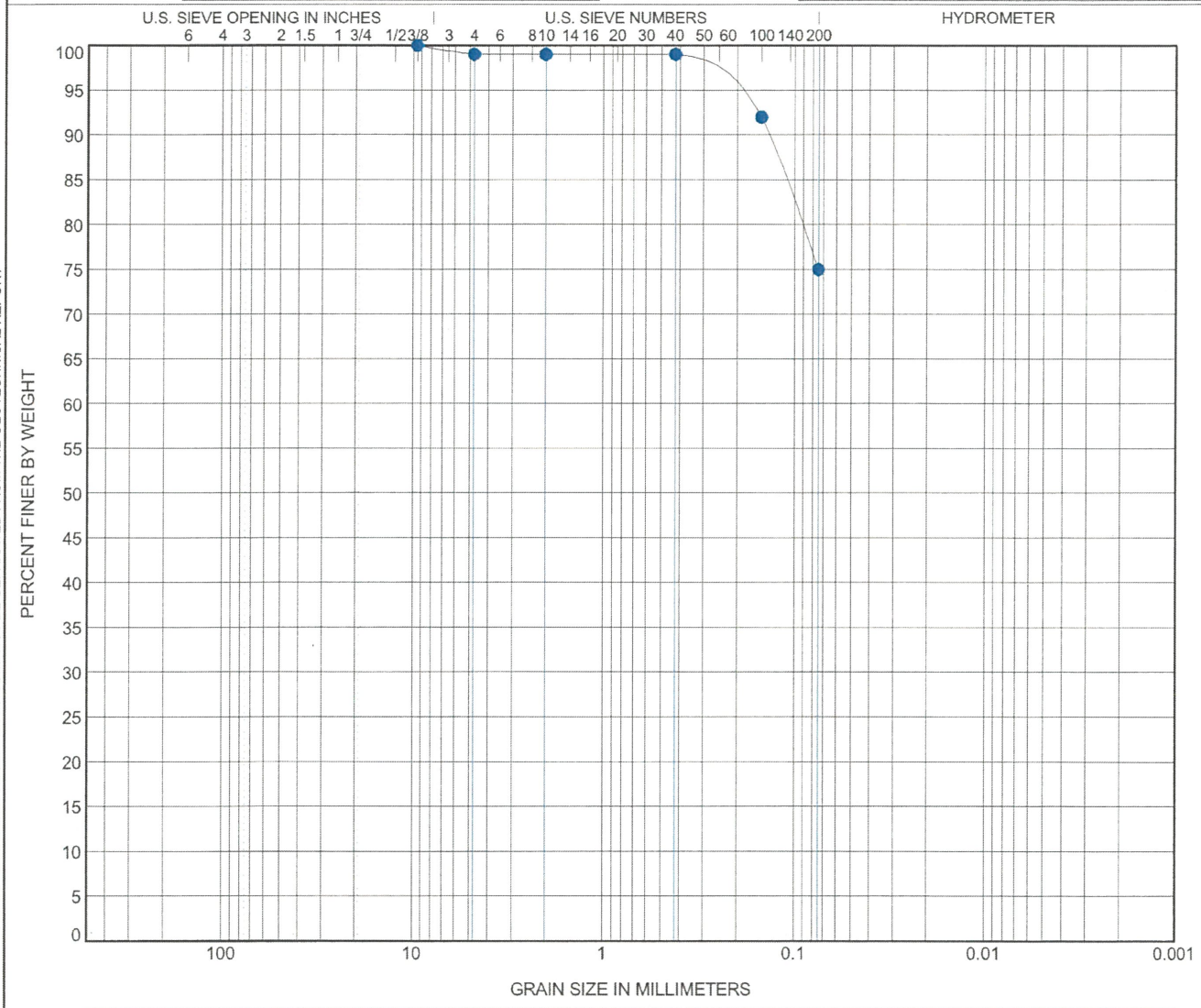
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-2	35.0 - 36.5	LEAN CLAY with SAND(CL)	28	18	10		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-2	35.0 - 36.5	9.5				1.0	24.0	75.0	

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construction quality control
testing and engineering

SOIL PARTICLE SIZE ANALYSIS TESTS

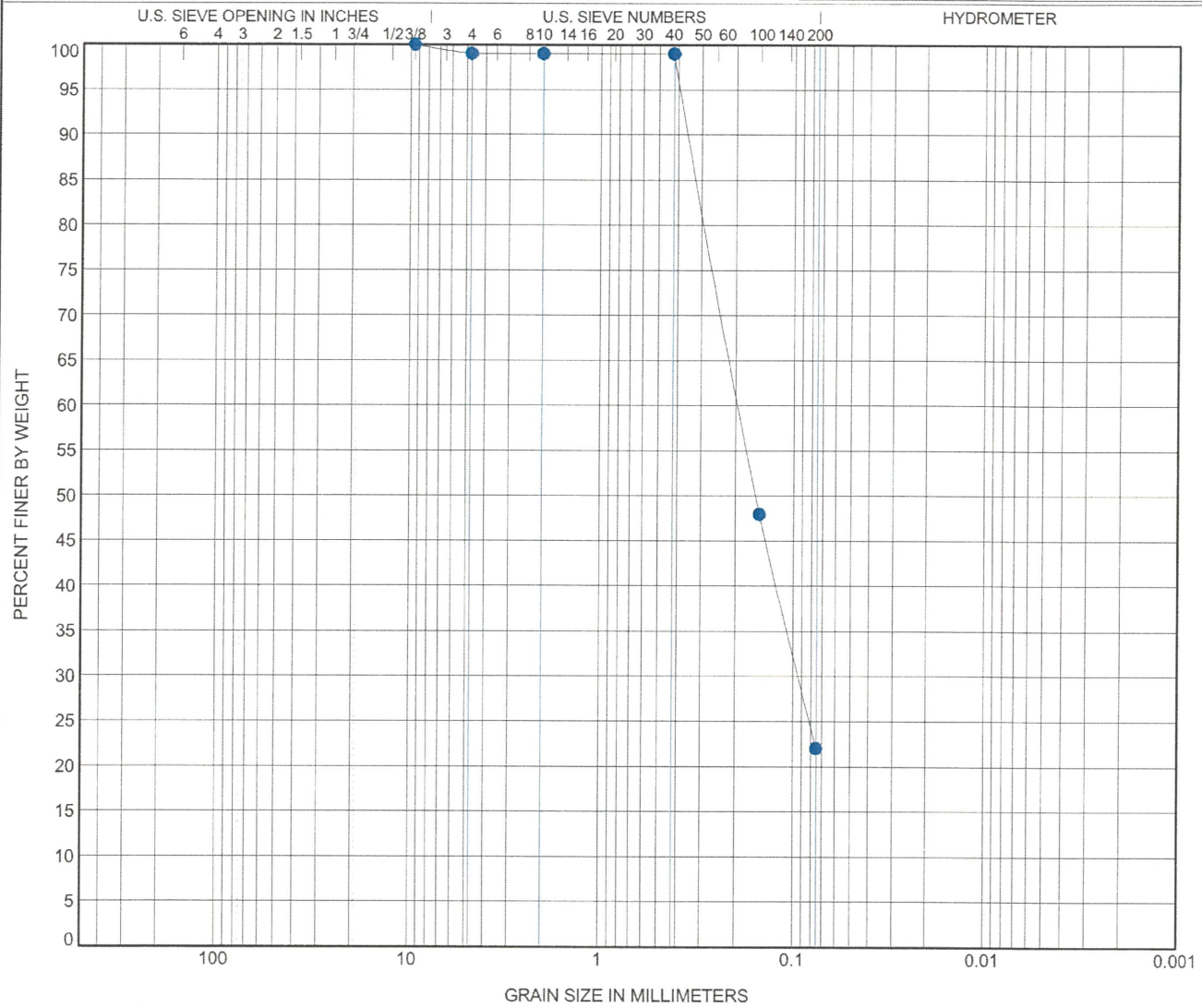
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-2	50.0 - 51.5						

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-2	50.0 - 51.5	9.5	0.192	0.093		1.0	77.0	22.0	

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SOIL PARTICLE SIZE ANALYSIS TESTS

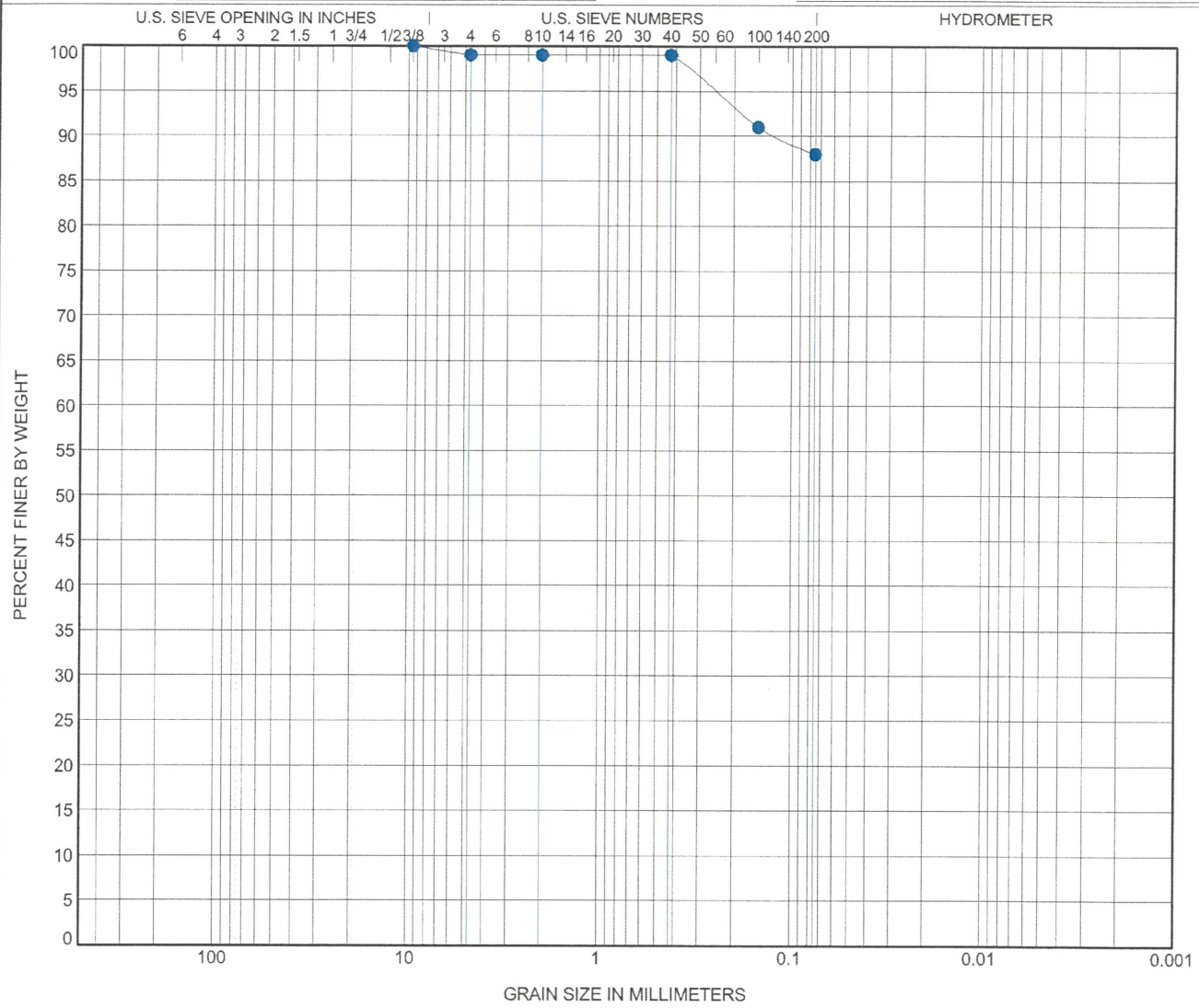
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-2	65.0 - 66.5	FAT CLAY(CH)	65	19	46		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-2	65.0 - 66.5	9.5				1.0	11.0	88.0	

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SOIL PARTICLE SIZE ANALYSIS TESTS

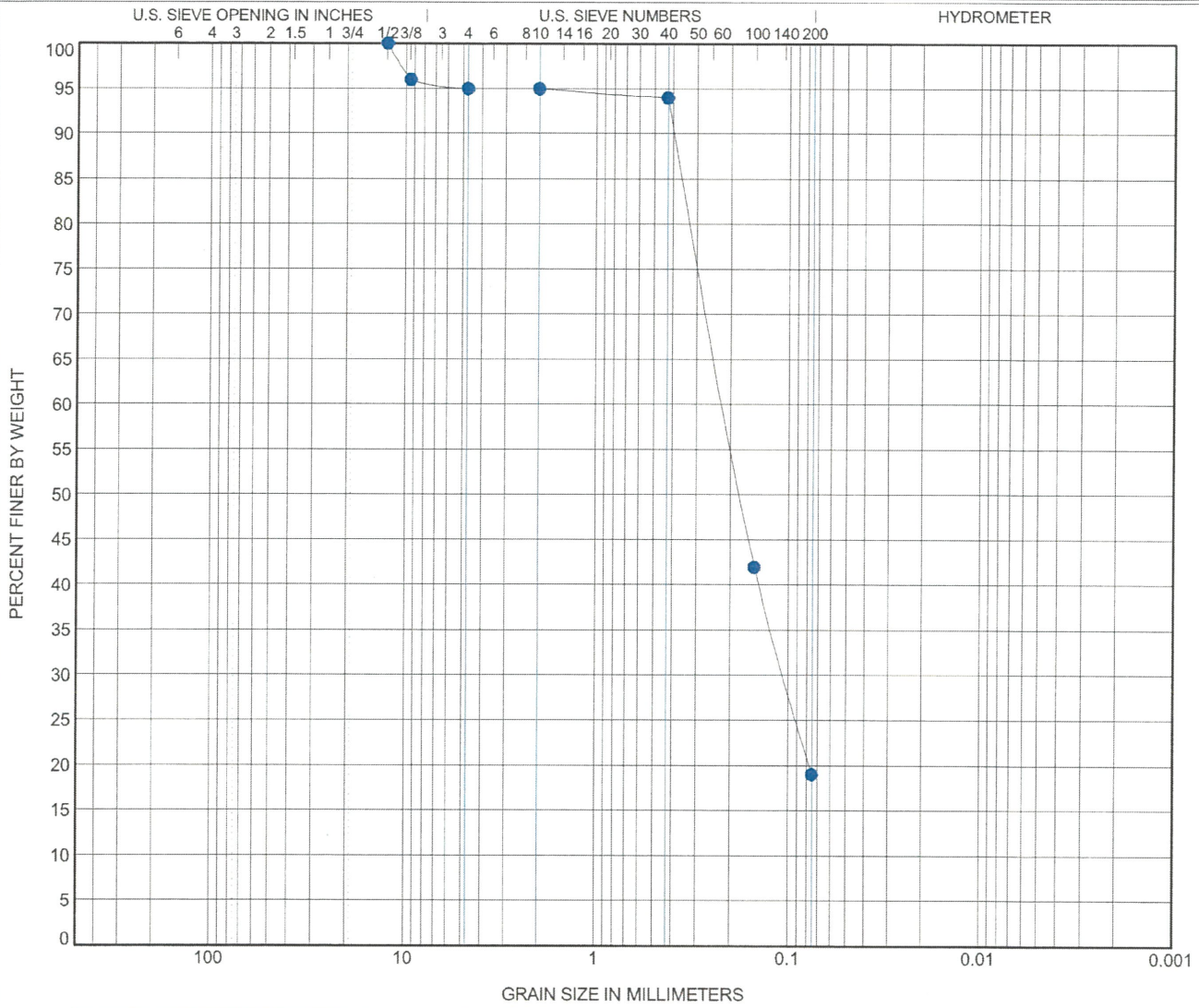
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-2	85.0 - 86.5	CLAYEY SAND(SC)	28	16	12		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-2	85.0 - 86.5	12.5	0.215	0.104		5.0	76.0	19.0	

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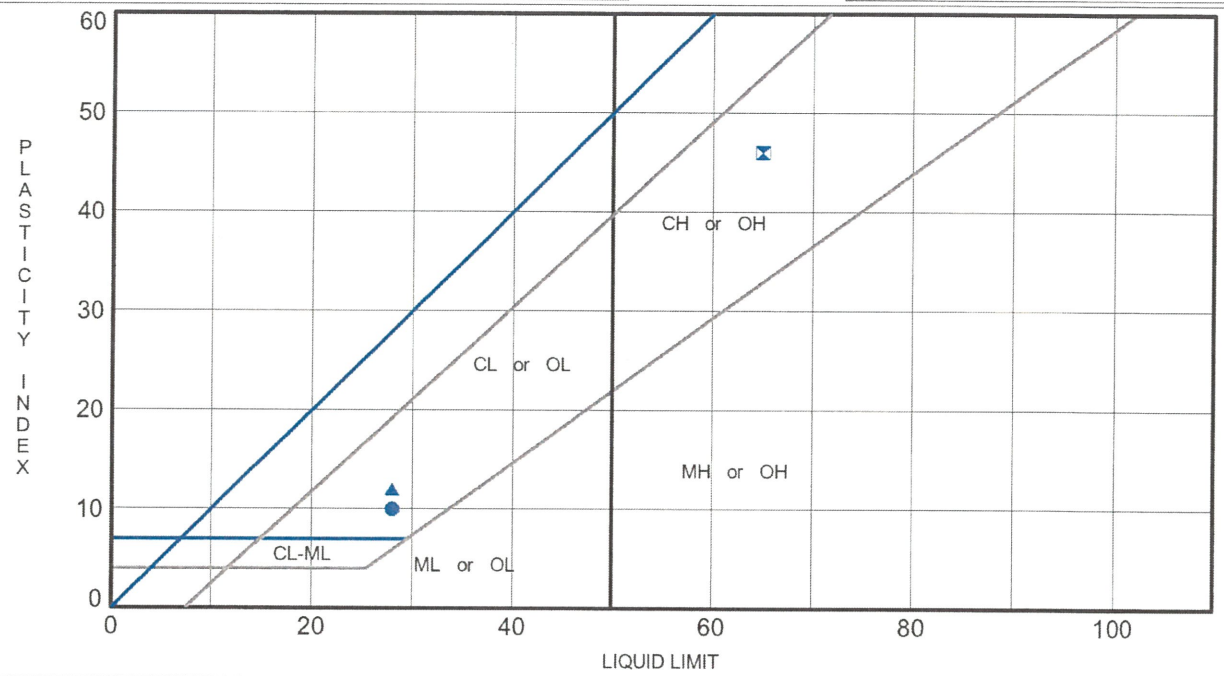
construction quality control
testing and engineering

ATTERBERG LIMITS' RESULTS

ASTM D4318

CLIENT Gordon Environmental / PSC **PROJECT NAME** Camino Landfill Project

PROJECT NUMBER ADCQC19-008 **PROJECT LOCATION** Sunland Park, New Mexico



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	4-2	35.0- 36.5	28	18	10	75	LEAN CLAY with SAND(CL)
⧗	4-2	65.0- 66.5	65	19	46	88	FAT CLAY(CH)
▲	4-2	85.0- 86.5	28	16	12	19	CLAYEY SAND(SC)

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SUMMARY OF LABORATORY ENGINEERING SOIL CLASSIFICATION TEST RESULTS

CLIENT Gordon Environmental / PSC **PROJECT NAME** Camino Landfill Project

PROJECT NUMBER ADCQC19-008 **PROJECT LOCATION** Sunland Park, New Mexico

Borehole	Depth	N - Value	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 4	% Passing No. 200	Pocket Pen. (tsf)	Total Unit Weight (pcf)	Classification
4-2	15.0- 16.5		16.9				99	48			
4-2	35.0- 36.5		14.3	28	18	10	99	75			CL
4-2	50.0- 51.5		6.1				99	22			
4-2	65.0- 66.5		25.7	65	19	46	99	88			CH
4-2	85.0- 86.5		3.6	28	16	12	95	19			SC

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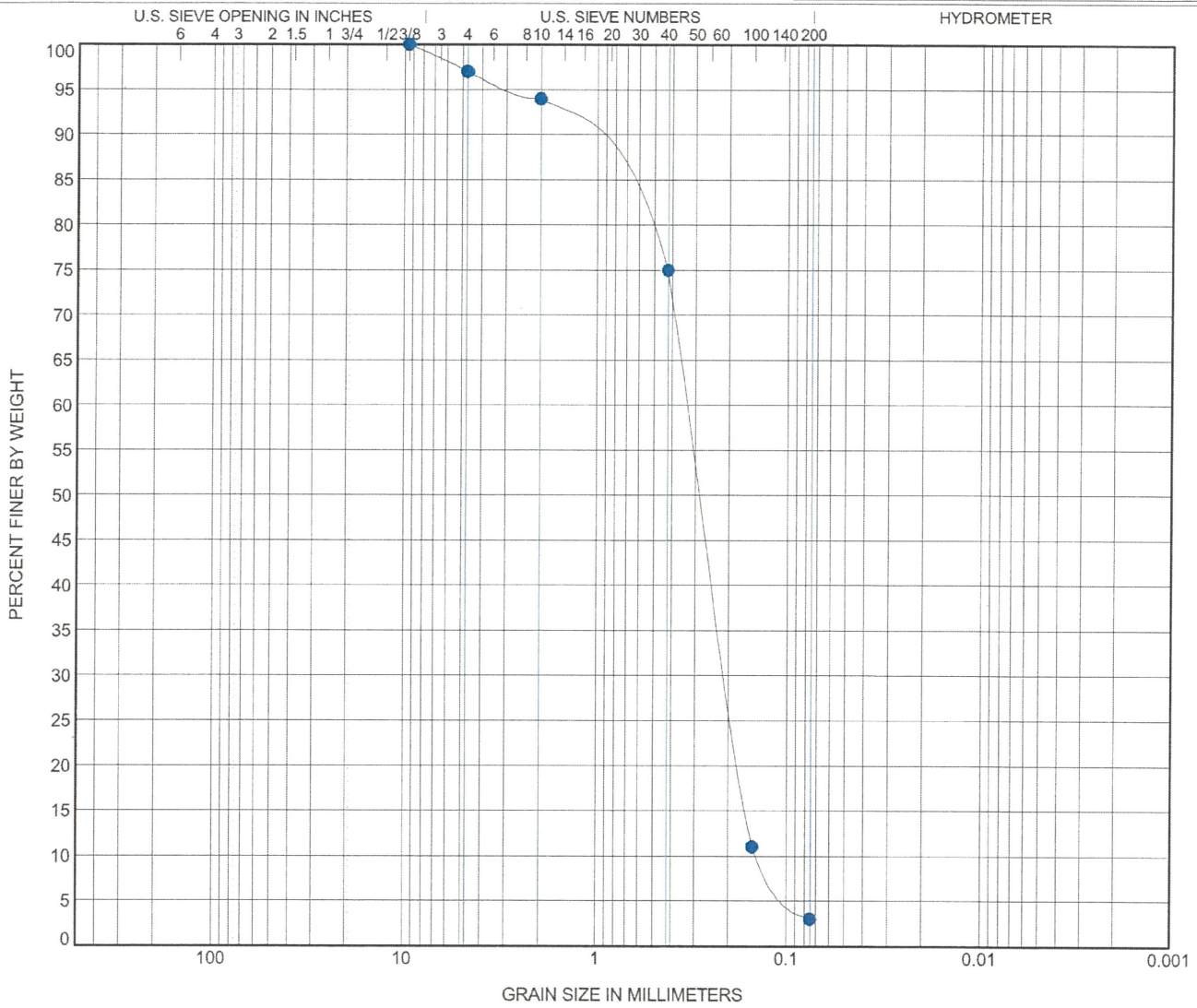
SOIL PARTICLE SIZE ANALYSIS TESTS

Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC **PROJECT NAME** Camino Landfill Project

PROJECT NUMBER ADCQC19-008 **PROJECT LOCATION** Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-3	15.0 - 16.5	POORLY GRADED SAND(SP)	NP	NP	NP	0.91	2.42

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-3	15.0 - 16.5	9.5	0.333	0.204	0.138	3.0	94.0	3.0	

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SOIL PARTICLE SIZE ANALYSIS TESTS

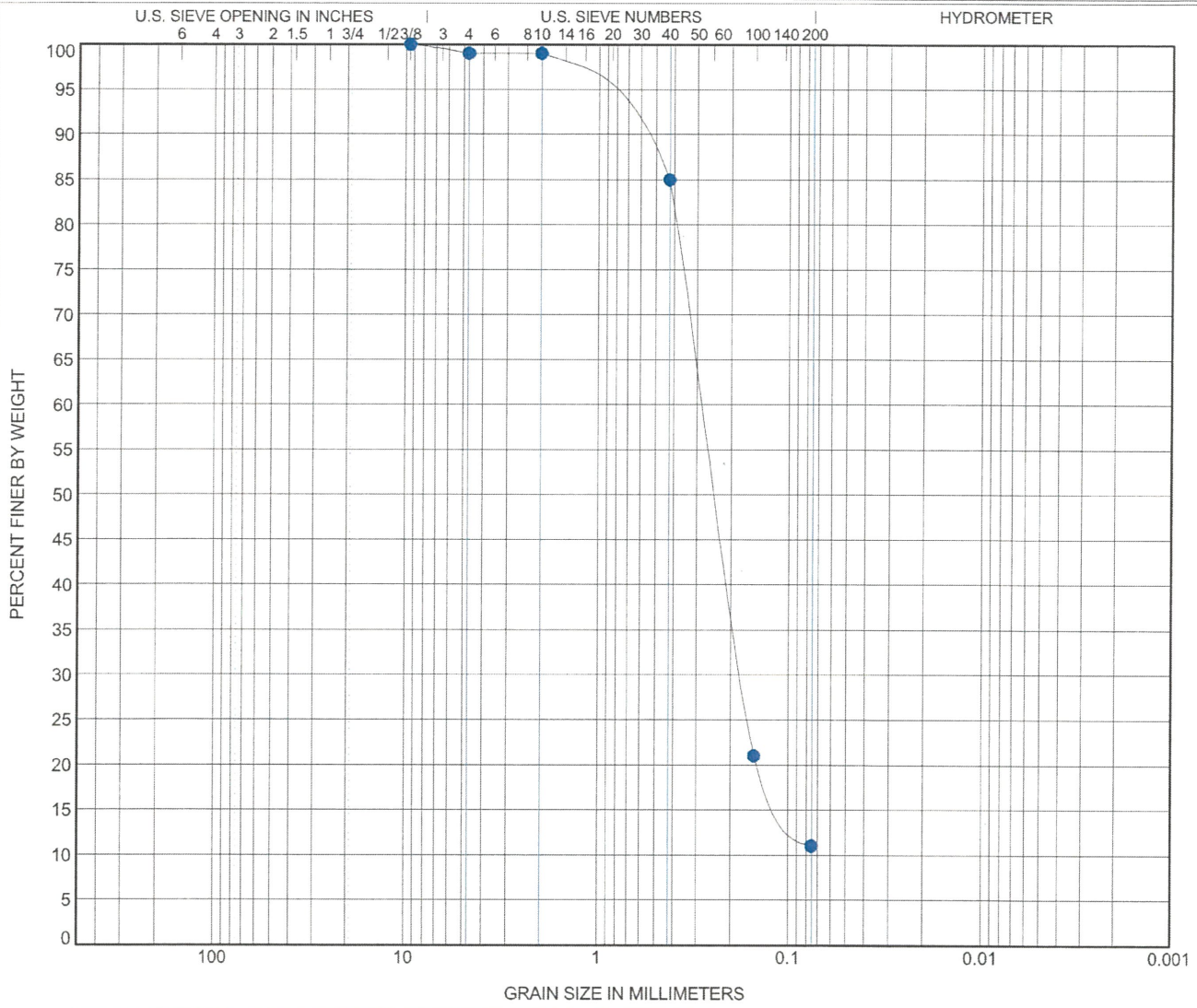
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-3	30.0 - 31.5					1.52	4.04

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-3	30.0 - 31.5	9.5	0.283	0.174		1.0	88.0	11.0	

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SOIL PARTICLE SIZE ANALYSIS TESTS

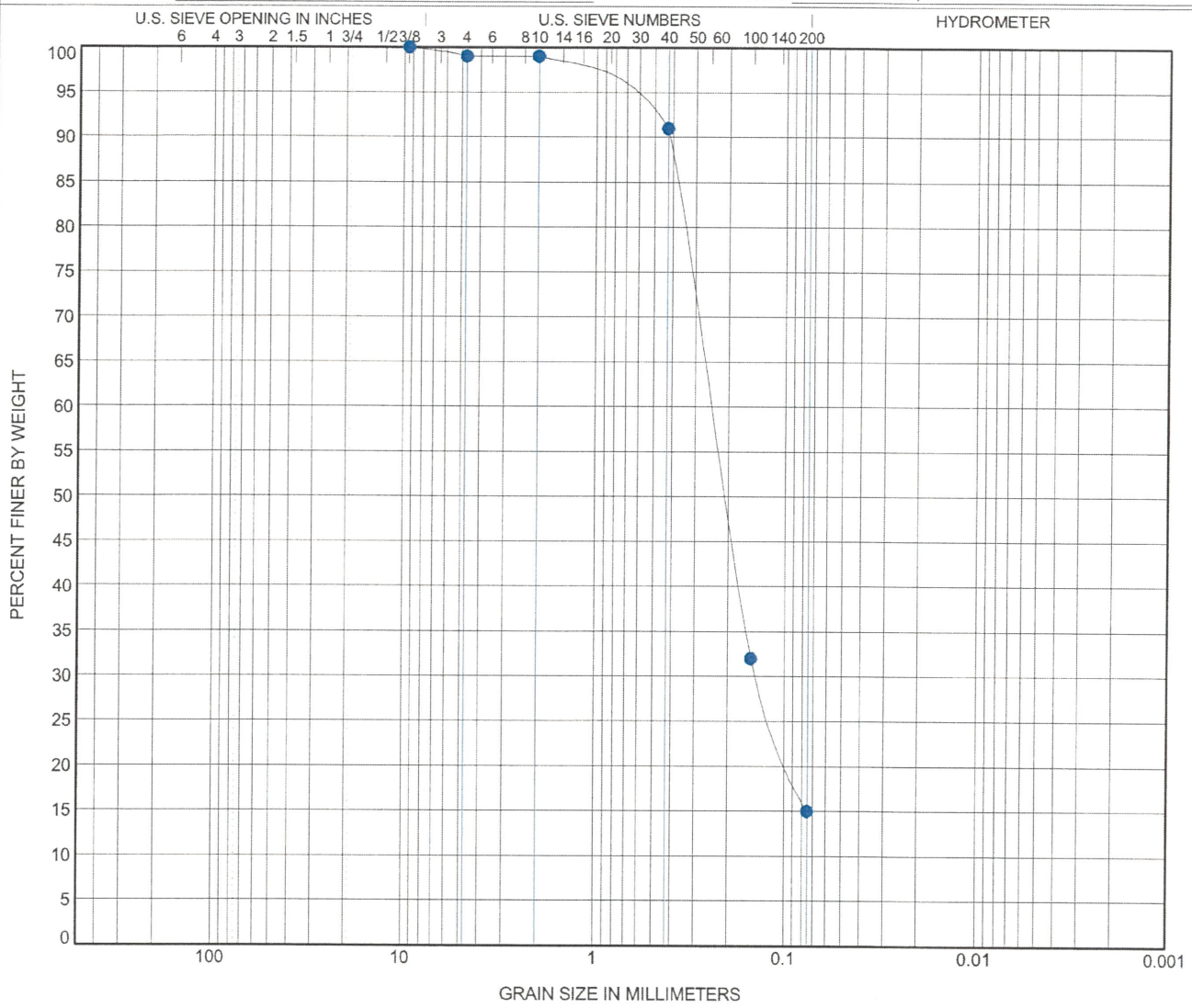
Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-3	45.0 - 46.5	SILTY SAND(SM)	NP	NP	NP		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-3	45.0 - 46.5	9.5	0.246	0.138		1.0	84.0	15.0	

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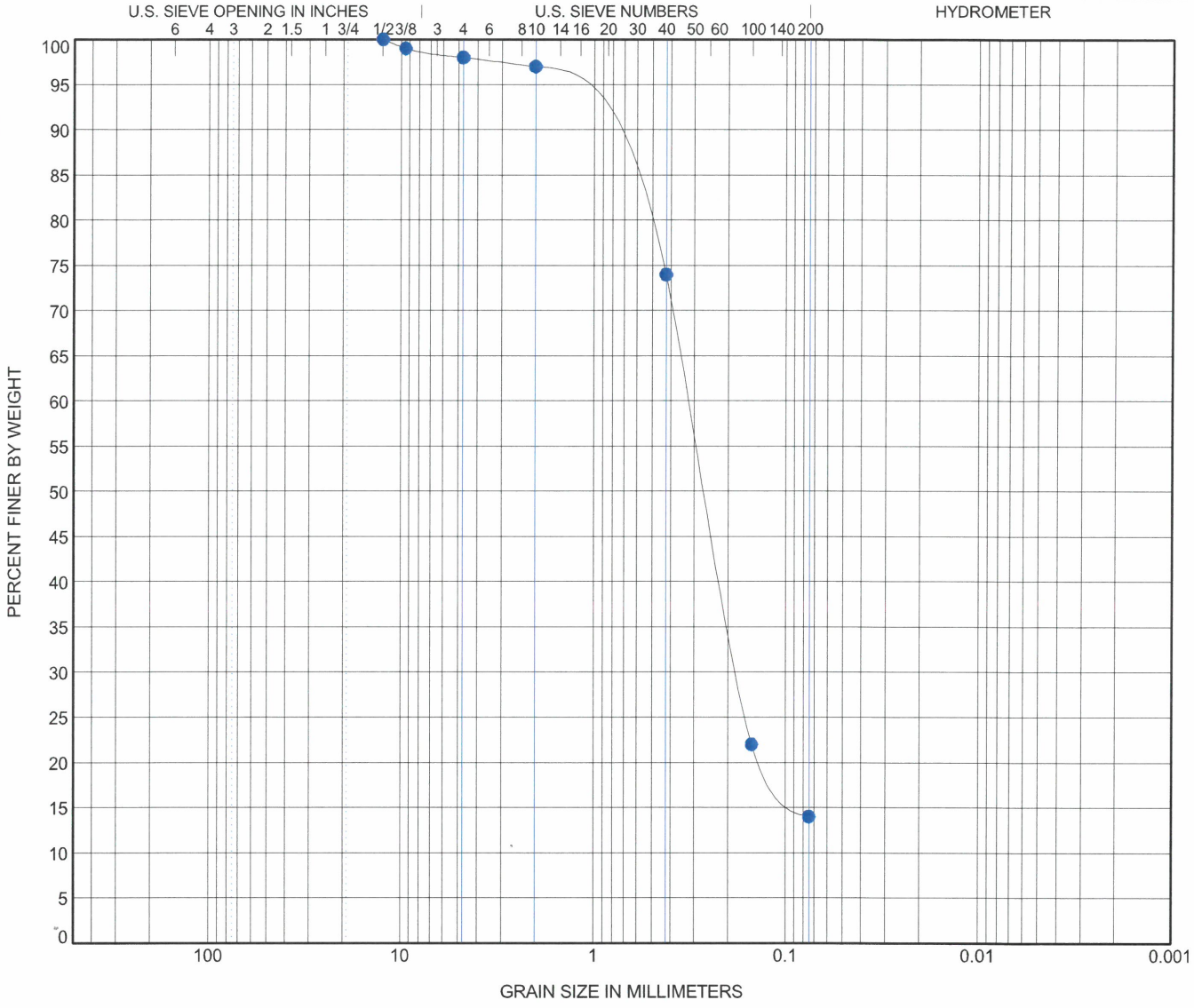
SOIL PARTICLE SIZE ANALYSIS TESTS

Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC
PROJECT NAME Camino Landfill Project
PROJECT NUMBER ADCQC19-008
PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-3	60.0 - 61.5						

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-3	60.0 - 61.5	12.5	0.321	0.176		2.0	84.0	14.0	

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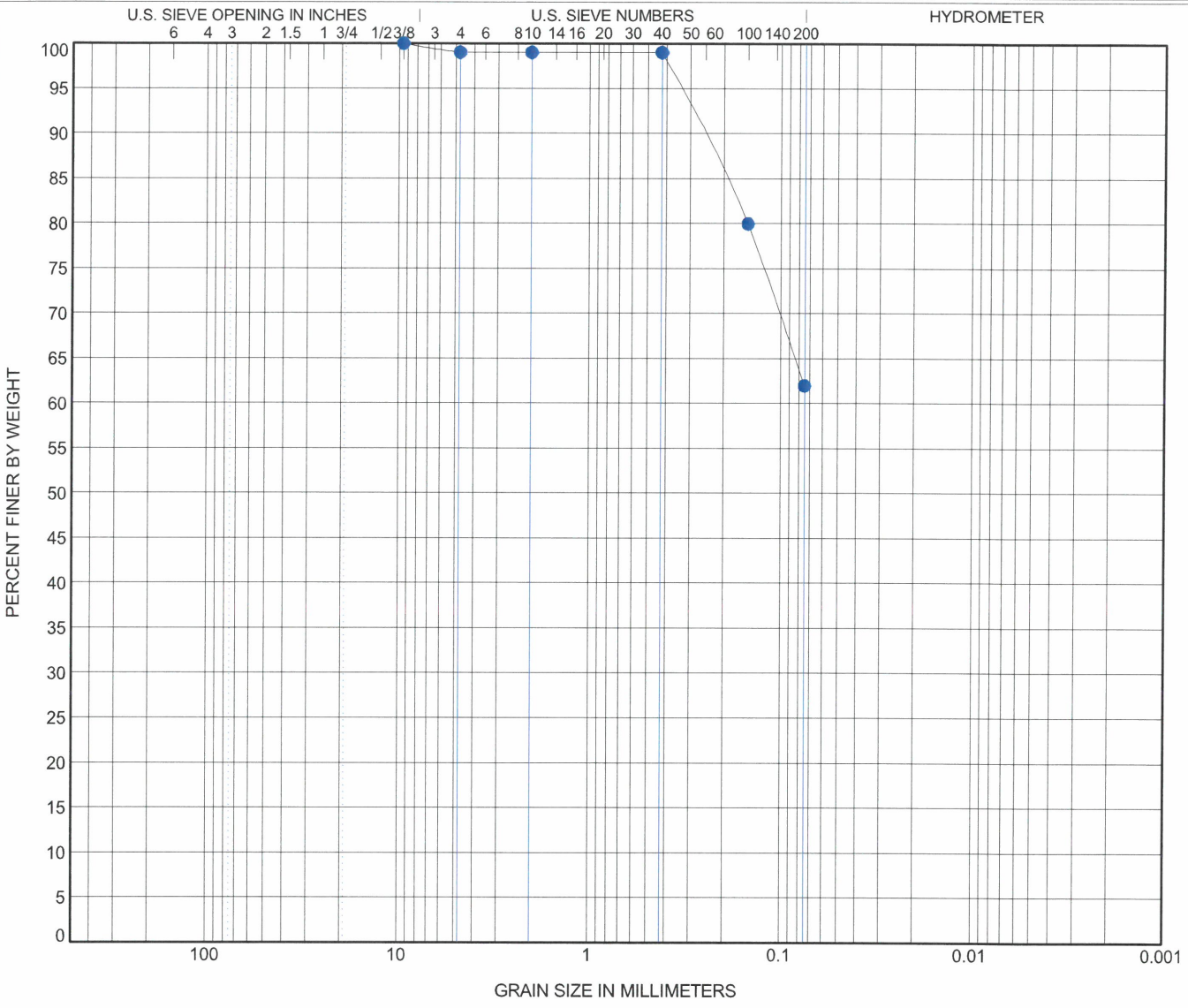
SOIL PARTICLE SIZE ANALYSIS TESTS

Test Method: ASTM D6913

CLIENT Gordon Environmental / PSC
PROJECT NAME Camino Landfill Project
PROJECT NUMBER ADCQC19-008
PROJECT LOCATION Sunland Park, New Mexico



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
4-3	75.0 - 76.5	SANDY FAT CLAY(CH)	58	18	40		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
4-3	75.0 - 76.5	9.5				1.0	37.0	62.0	

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ATTERBERG LIMITS' RESULTS

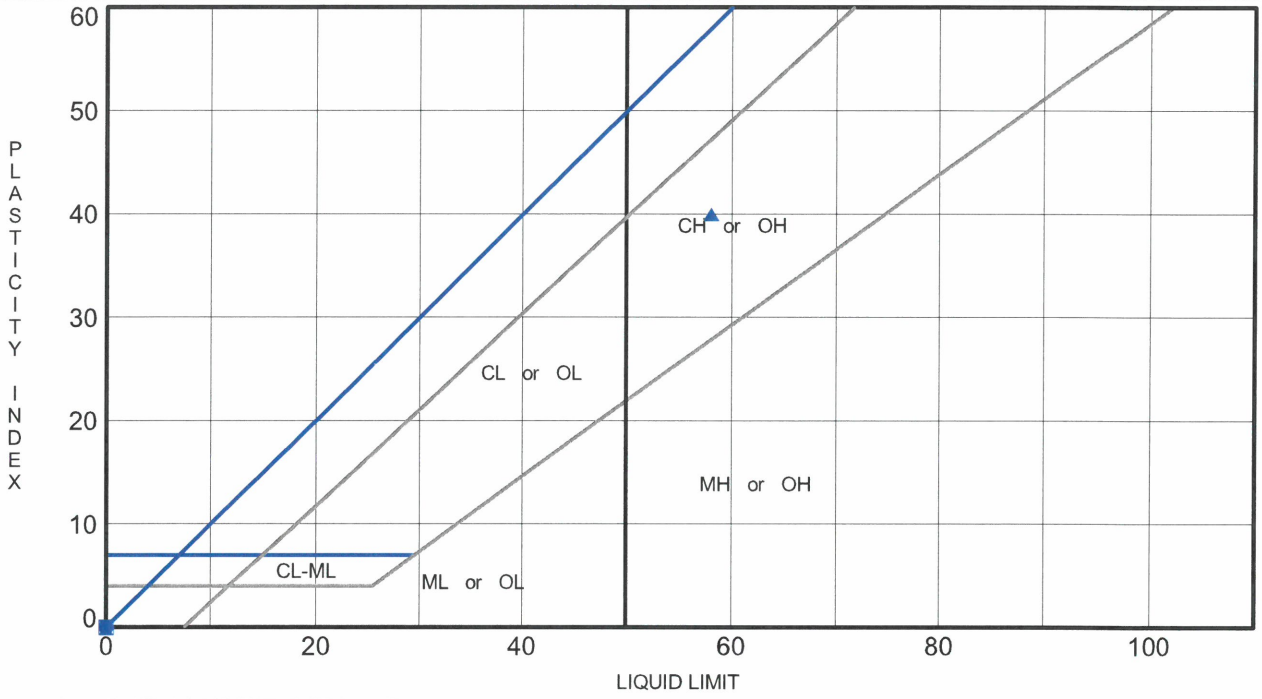
ASTM D4318

CLIENT Gordon Environmental / PSC

PROJECT NAME Camino Landfill Project

PROJECT NUMBER ADCQC19-008

PROJECT LOCATION Sunland Park, New Mexico



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	4-3	15.0- 16.5	NP	NP	NP	3	POORLY GRADED SAND(SP)
⧓	4-3	45.0- 46.5	NP	NP	NP	15	SILTY SAND(SM)
▲	4-3	75.0- 76.5	58	18	40	62	SANDY FAT CLAY(CH)

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SUMMARY OF LABORATORY ENGINEERING SOIL CLASSIFICATION TEST RESULTS

CLIENT Gordon Environmental / PSC
PROJECT NAME Camino Landfill Project
PROJECT NUMBER ADCQC19-008
PROJECT LOCATION Sunland Park, New Mexico

Borehole	Depth	N - Value	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Passing No. 4	% Passing No. 200	Pocket Pen. (tsf)	Total Unit Weight (pcf)	Classification
4-3	15.0- 16.5		1.1	NP	NP	NP	97	3			SP
4-3	30.0- 31.5		2.6				99	11			
4-3	45.0- 46.5		1.1	NP	NP	NP	99	15			SM
4-3	60.0- 61.5		2.0				98	14			
4-3	75.0- 76.5		14.4	58	18	40	99	62			CH

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Construction Materials Testing
Geotechnical Engineering
Environmental Site Assessments
Forensic Analysis/Testing

SOIL MOISTURE - DENSITY RELATIONSHIP TEST RESULTS

PROJECT NO.: ADCQC19-008

PROJECT NAME: Contract Drilling Services
Camino Landfill Project
Sunland Park, New Mexico

SAMPLE INFORMATION

PROCTOR NO.: 1 **SAMPLED BY:** PG

SOIL SAMPLE LOCATION: B4-1 **SAMPLE DATE:** 12/12/2019

SOIL SAMPLE APPROX. DEPTH: 10 - 11.5'

SOIL TYPE/DESCRIPTION: On Site Subsurface Soils / SAND, Fine to Medium Grained, Silty, Clayey

SAMPLE TEST RESULTS

Sieve Analysis Test
Test Method: ASTM D 6913

Sieve Size/No.	Percent Retained	Percent Passing
3"	0	100
2-1/2"	0	100
1-1/2"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	0	100
No. 4	0	100
No. 10	1	99
No. 40	10	90
No. 100	62	38
No. 200	75.6	24.4

NS- Not Specified

Atterberg Limits Test
Test Method: ASTM D 4318

Limit Test	Index Test Result
LL	22
PL	16
PI	6

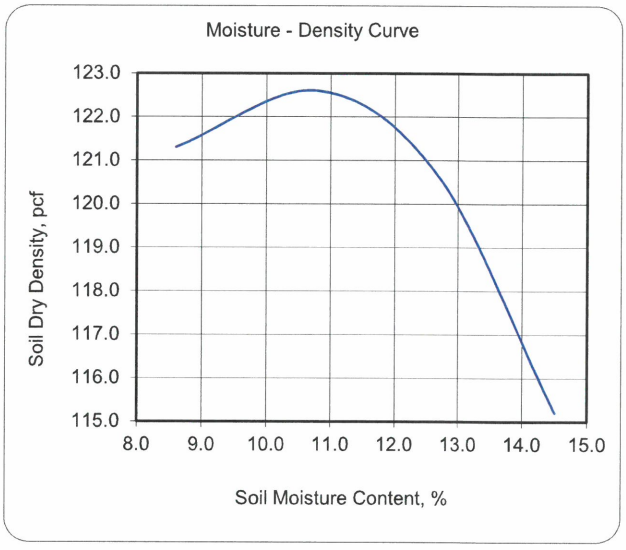
NP-Non Plastic
NS - Not Specified

Soil Classification: **SC-SM**
Test Method: ASTM D 2487

Moisture-Density Relationship Test
Test Method: ASTM D 1557, Method "A"

Test Sample No.	Moisture Content (%)	Sample Dry Density (pcf)
1	8.6	121.3
2	10.8	122.6
3	12.7	120.6
4	14.5	115.2

Maximum Dry Density, pcf: **122.6**
Optimum Moisture Content, %: **10.7**



construction quality control
testing and engineering

Construction Materials Testing
Geotechnical Engineering
Environmental Site Assessments
Forensic Analysis/Testing

SOIL MOISTURE - DENSITY RELATIONSHIP TEST RESULTS

PROJECT NO.: ADCQC19-008

PROJECT NAME: Contract Drilling Services
Camino Landfill Project
Sunland Park, New Mexico

SAMPLE INFORMATION

PROCTOR NO.: 2 **SAMPLED BY:** PG

SOIL SAMPLE LOCATION: B4-1 **SAMPLE DATE:** 12/12/2019

SOIL SAMPLE APPROX. DEPTH: 55 - 56.5'

SOIL TYPE/DESCRIPTION: On Site Subsurface Soils / SAND, Fine to Medium Grained, Silty

SAMPLE TEST RESULTS

Sieve Analysis Test
Test Method: ASTM D 6913

Sieve Size/No.	Percent Retained	Percent Passing
3"	0	100
2-1/2"	0	100
1-1/2"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	0	100
No. 4	0	100
No. 10	1	99
No. 40	4	96
No. 100	56	44
No. 200	76.9	23.1

NS- Not Specified

Atterberg Limits Test
Test Method: ASTM D 4318

Limit Test	Index Test Result
LL	-
PL	-
PI	NP

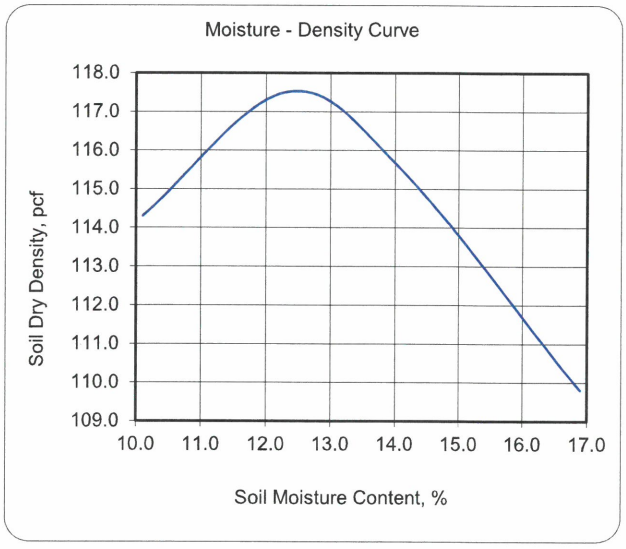
NP-Non Plastic
NS - Not Specified

Soil Classification: **SM**
Test Method: ASTM D 2487

Moisture-Density Relationship Test
Test Method: ASTM D 1557, Method "A"

Test Sample No.	Moisture Content (%)	Sample Dry Density (pcf)
1	10.1	114.3
2	12.3	117.5
3	14.1	115.5
4	16.9	109.8

Maximum Dry Density, pcf: **117.5**
Optimum Moisture Content, %: **12.4**



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Forensic Analysis/Testing

SOIL MOISTURE - DENSITY RELATIONSHIP TEST RESULTS

PROJECT NO.: ADCQC19-008

PROJECT NAME: Contract Drilling Services
Camino Landfill Project
Sunland Park, New Mexico

SAMPLE INFORMATION

PROCTOR NO.: 3 **SAMPLED BY:** PG

SOIL SAMPLE LOCATION: B4-2 **SAMPLE DATE:** 12/13/2019

SOIL SAMPLE APPROX. DEPTH: 60 - 61.5'

SOIL TYPE/DESCRIPTION: On Site Subsurface Soils / SAND, Fine to Medium Grained, Silty, Clayey

SAMPLE TEST RESULTS

Sieve Analysis Test
Test Method: ASTM D 6913

Sieve Size/No.	Percent Retained	Percent Passing
3"	0	100
2-1/2"	0	100
1-1/2"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	0	100
No. 4	0	100
No. 10	0	100
No. 40	3	97
No. 100	51	49
No. 200	67.2	32.8

NS- Not Specified

Atterberg Limits Test
Test Method: ASTM D 4318

Limit Test	Index Test Result
LL	23
PL	17
PI	6

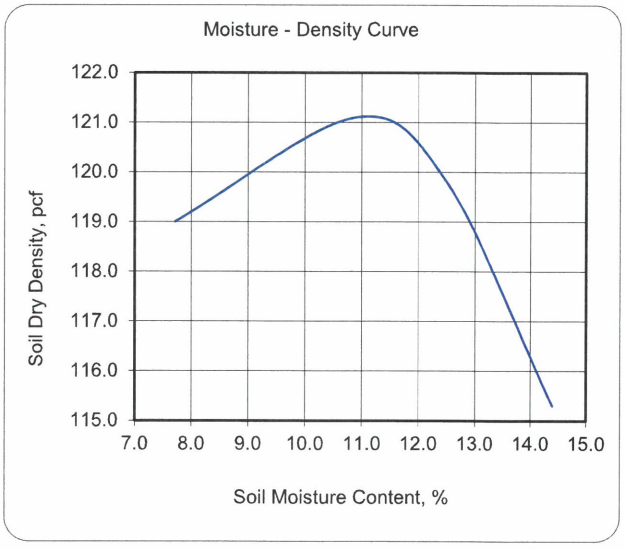
NP-Non Plastic
NS - Not Specified

Soil Classification: **SC-SM**
Test Method: ASTM D 2487

Moisture-Density Relationship Test
Test Method: ASTM D 1557, Method "A"

Test Sample No.	Moisture Content (%)	Sample Dry Density (pcf)
1	7.7	119.0
2	10.9	121.1
3	12.5	119.8
4	14.4	115.3

Maximum Dry Density, pcf: **121.2**
Optimum Moisture Content, %: **11.1**

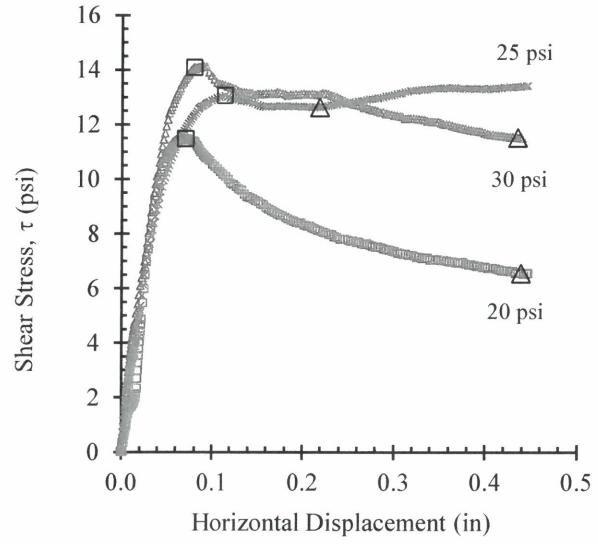


Beyond Engineering & Testing, LLC
3801 Doris Lane, Suite B
Round Rock, TX 78664
(512) 358-6048

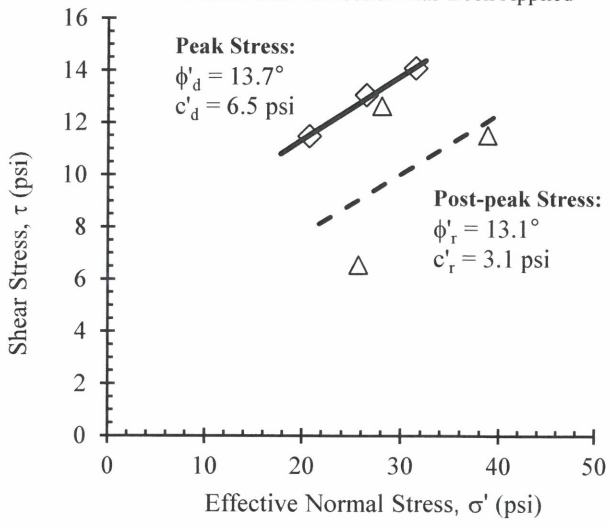
Direct Shear of Soil Under Consolidated-Drained Conditions

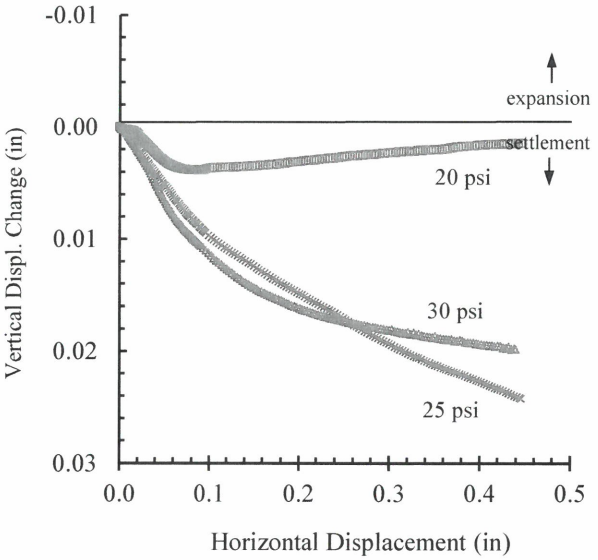
Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

Beyond Project No.: LT2001009
Test Method: ASTM D3080
Test Date: 01/27/20



Note: Area Correction Has Been Applied





Sample Number		1	2	3
Initial Condition	Diameter, in	2.50	2.51	2.50
	Height, in (before consol)	1.00	1.00	1.00
	Water Content, %	39.3	38.2	38.5
	Saturation, %	91.8	86.3	83.7
	Dry Unit Weight, pcf	77.6	76.3	74.6
	Void Ratio	1.14	1.18	1.22
Post Consol	Height, in (prior to shear)	0.98	0.97	0.97
	Final Water Content, %	46.1	44.3	46.7
	Dry Unit Weight, pcf	78.6	78.6	77.5
	Void Ratio	1.11	1.11	1.14
Peak Normal Stress, σ' (psi)		20.7	26.5	31.4
Peak Shear Stress, τ (psi)		11.5	13.1	14.1
Displacement at Failure (in)		0.07	0.11	0.08
Displacement rate (in/min)		0.0003	0.0003	0.0003
Peak Strength Parameters		ϕ'_d, degrees		**13.7**
		c'_d, psi		**6.5**
Post-peak Strength Parameters		ϕ'_r, degrees		**13.1**
		c'_r, psi		**3.1**

Note: The intact Shelby tube sample was extruded and provided by the client. Specimens were trimmed using a trimming turntable.

Cheng-Wei Chen, Ph.D. 01/30/20
Analysis & Quality Review/Date

Specimens prepared by: T.D.

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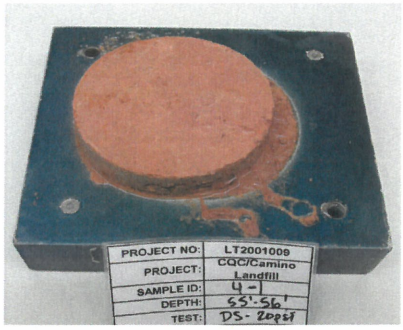
Direct Shear of Soil Appendix

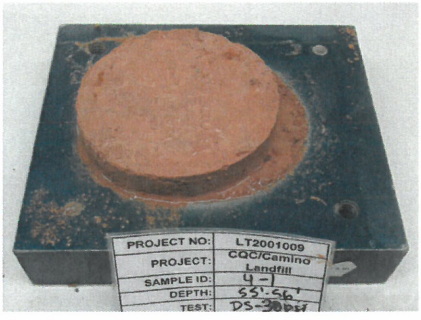
Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

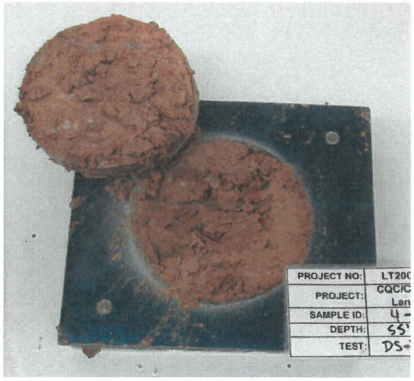
Beyond Project No.: LT2001009
Test Method: ASTM D3080
Test Date: 01/27/20



(a) Normal Load = 20 psi

(b) Normal Load = 25 psi





(c) Normal Load = 30 psi

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Rigid Wall Constant Head Permeability

Client: CQC Testing & Engineering, LLC

Beyond Project No: LT2001009

Project: Camino Landfill (PN: ADCQC19-008)

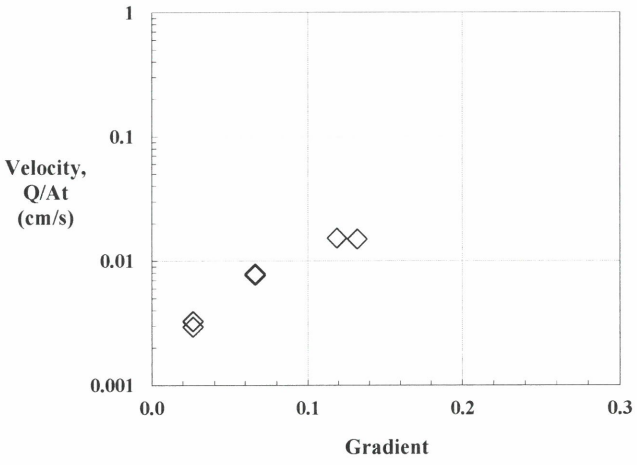
Test Method: ASTM D2434

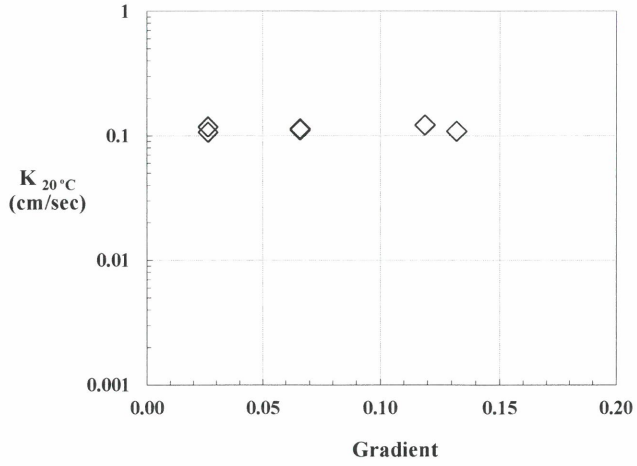
Sample: 4-1 at 75 ft

Test Date: 01/31/20

Manometer Reading (cm)		Gradient	Flow Volume, Q (ml)	Flow Time, t (s)	Temperature (°C)	Flow Rate (cm^3/s)	Velocity, Q/At (cm/s)	System Permeability (cm/s)	System Permeability @ 20 °C, $K_{20°C}$ (cm/s)	Average System Permeability @ 20 °C (cm/s)
1	2									
Gradient No. 1										
49.3	49.1	0.03	8.0	60	22.0	0.13	0.003	0.11	0.11	**1.1E-01**
49.2	49.0	0.03	13.3	90	22.2	0.15	0.003	0.12	0.12	
Gradient No. 2										
44.9	44.4	0.07	10.7	30	22.1	0.36	0.008	0.12	0.11	**1.1E-01**
44.9	44.4	0.07	15.7	45	22.0	0.35	0.008	0.12	0.11	
Gradient No. 3										
39.5	38.5	0.13	20.4	30	22.1	0.68	0.015	0.11	0.11	**1.2E-01**
39.7	38.8	0.12	20.7	30	22.2	0.69	0.015	0.13	0.12	

Average Permeability @ 20 °C (cm/s): 0.11





Remolded Dry Density (pcf):	91.1
Remolded Moisture Content (%):	5.8

Note 1: Soil specimen was tamped in place, which based on the test request.
Note 2: Tap water was used.

Cheng-Wei Chen, Ph.D. 02/03/20
Quality Review/Date
Tested by: C.M.

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Rigid Wall Constant Head Permeability

Client: CQC Testing & Engineering, LLC

Beyond Project No: LT2001009

Project: Camino Landfill (PN: ADCQC19-008)

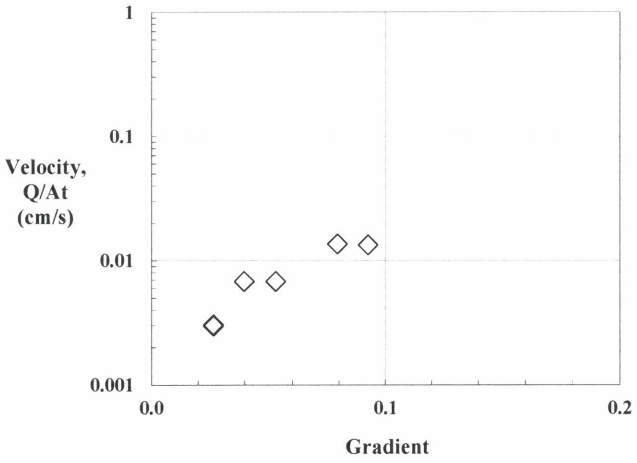
Test Method: ASTM D2434

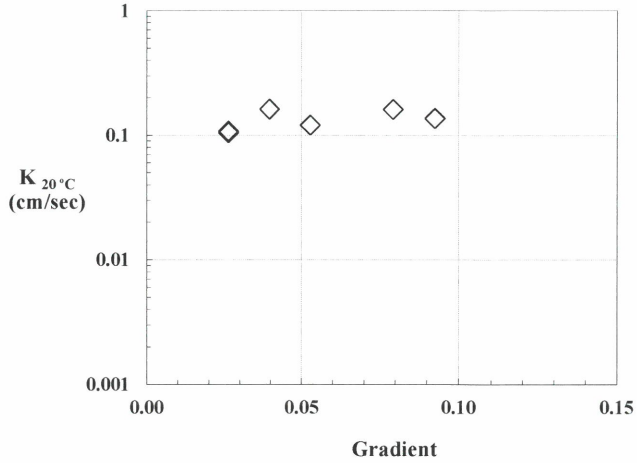
Sample: 4-2 at 85 ft

Test Date: 01/30/20

Manometer Reading (cm) 1	Manometer Reading (cm) 2	Gradient	Flow Volume, Q (ml)	Flow Time, t (s)	Temperature (°C)	Flow Rate (cm^3/s)	Velocity, Q/At (cm/s)	System Permeability (cm/s)	System Permeability @ 20 °C, $K_{20°C}$ (cm/s)	Average System Permeability @ 20 °C (cm/s)
Gradient No. 1										
48.4	48.2	0.03	12.1	90	23.0	0.13	0.003	0.11	0.11	**1.1E-01**
48.4	48.2	0.03	12.4	90	22.8	0.14	0.003	0.12	0.11	
Gradient No. 2										
44.9	44.5	0.05	9.3	30	22.9	0.31	0.007	0.13	0.12	**1.4E-01**
44.9	44.6	0.04	9.3	30	22.7	0.31	0.007	0.17	0.16	
Gradient No. 3										
39.9	39.2	0.09	18.2	30	22.6	0.61	0.013	0.15	0.14	**1.5E-01**
39.9	39.3	0.08	18.5	30	22.7	0.62	0.014	0.17	0.16	

Average Permeability @ 20 °C (cm/s): 0.12





Remolded Dry Density (pcf):	88.7
Remolded Moisture Content (%):	5.7

Note 1: Soil specimen was tamped in place, which based on the test request.
Note 2: Tap water was used.

Cheng-Wei Chen, Ph.D. 02/03/20
Quality Review, Date
Tested by: C.M.

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Rigid Wall Constant Head Permeability

Client: CQC Testing & Engineering, LLC

Beyond Project No: LT2001009

Project: Camino Landfill (PN: ADCQC19-008)

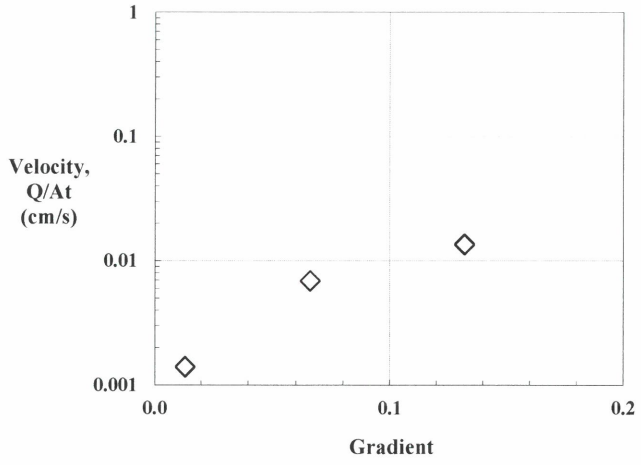
Test Method: ASTM D2434

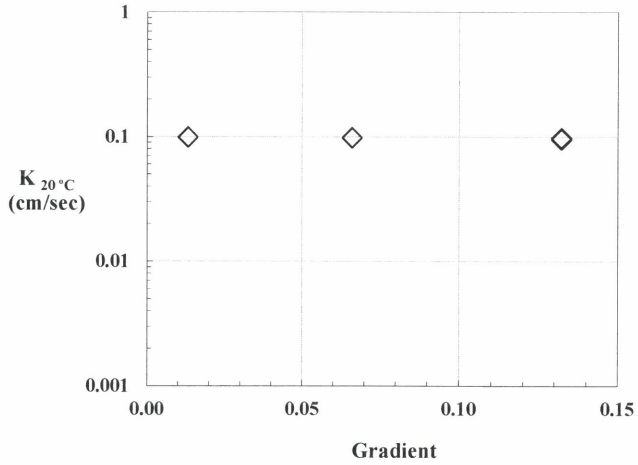
Sample: 4-3 at 75 ft

Test Date: 01/30/20

Manometer Reading (cm)		Gradient	Flow Volume, Q (ml)	Flow Time, t (s)	Temperature (°C)	Flow Rate (cm^3/s)	Velocity, Q/At (cm/s)	System Permeability (cm/s)	System Permeability @ 20 °C, $K_{20°C}$ (cm/s)	Average System Permeability @ 20 °C (cm/s)
1	2									
Gradient No. 1										
49.2	49.1	0.01	11.3	180	22.7	0.06	0.001	0.10	0.10	**9.9E-02**
49.2	49.1	0.01	19.1	300	22.8	0.06	0.001	0.11	0.10	
Gradient No. 2										
44.6	44.1	0.07	14.0	45	22.6	0.31	0.007	0.10	0.10	**9.8E-02**
44.6	44.1	0.07	14.1	45	22.7	0.31	0.007	0.11	0.10	
Gradient No. 3										
40.3	39.3	0.13	18.1	30	22.6	0.60	0.013	0.10	0.10	**9.7E-02**
40.3	39.3	0.13	18.6	30	22.5	0.62	0.014	0.10	0.10	

Average Permeability @ 20 °C (cm/s): 0.10





Remolded Dry Density (pcf):	102.8
Remolded Moisture Content (%):	0.9

Note 1: Soil specimen was tamped in place, which based on the test request.
Note 2: Tap water was used.

Cheng-Wei Chen, Ph.D. 02/03/20
Quality Review/Date
Tested by: C.M.

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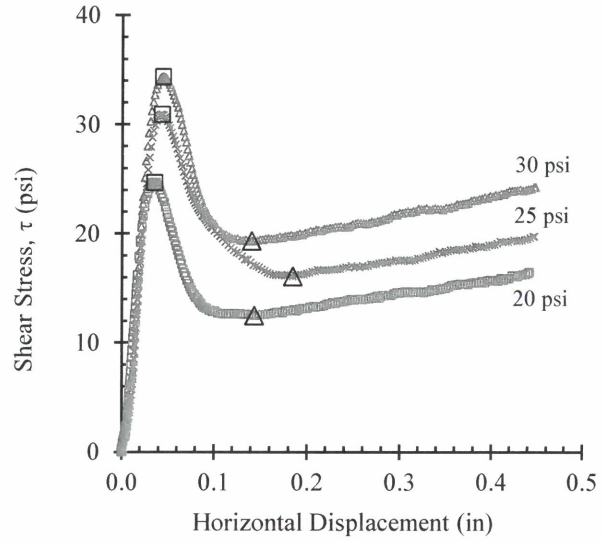
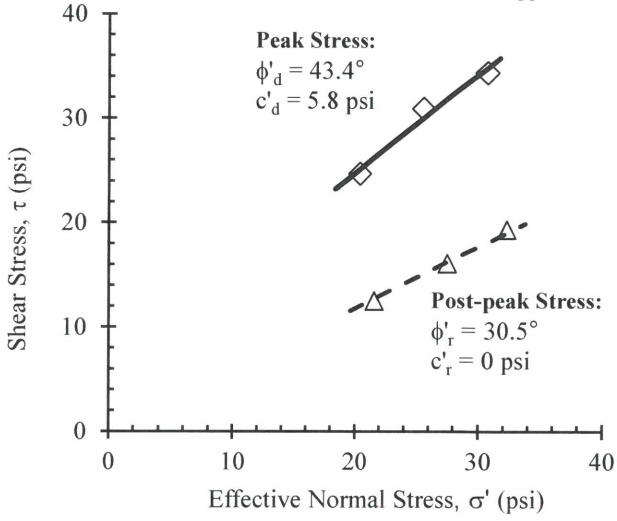
Direct Shear of Soil Under Consolidated-Drained Conditions

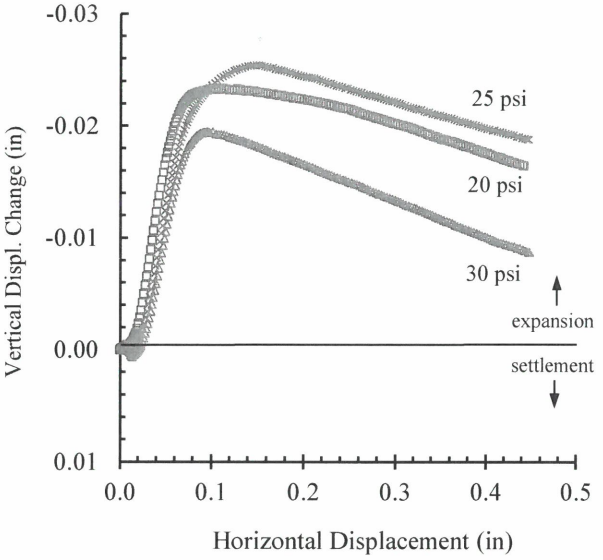
Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-3 at 75-76 ft

Beyond Project No.: LT2001009
Test Method: ASTM D3080
Test Date: 01/31/20



Note: Area Correction Has Been Applied





Sample Number		1	2	3
Initial Condition	Diameter, in	2.50	2.50	2.50
	Height, in (before consol)	1.03	1.03	1.03
	Water Content, %	10.1	9.4	9.8
	Saturation, %	68.3	65.3	66.9
	Dry Unit Weight, pcf	119.3	120.3	119.7
	Void Ratio	0.40	0.39	0.39
Post Consol	Height, in (prior to shear)	1.03	1.02	1.02
	Final Water Content, %	14.9	15.6	17.1
	Dry Unit Weight, pcf	119.4	121.2	120.5
	Void Ratio	0.40	0.38	0.38
Peak Normal Stress, σ' (psi)		20.4	25.6	30.7
Peak Shear Stress, τ (psi)		24.7	30.9	34.4
Displacement at Failure (in)		0.04	0.04	0.04
Displacement rate (in/min)		0.0005	0.0005	0.0005
Peak Strength Parameters	ϕ'_d, degrees			**43.4**
	c'_d, psi			**5.8**
Post-peak Strength Parameters	ϕ'_r, degrees			**30.5**
	c'_r, psi			**0**

Note: Specimens remolded to 123.0 pcf dry unit weight at 10 % water content. The specific gravity of 2.67 was assumed.

Cheng-Wei Chen, Ph.D. 02/08/20
Analysis & Quality Review/Date

Specimens prepared by: T.D.

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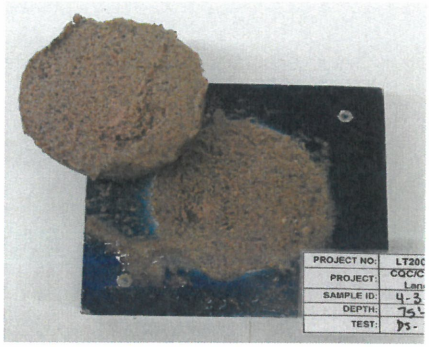
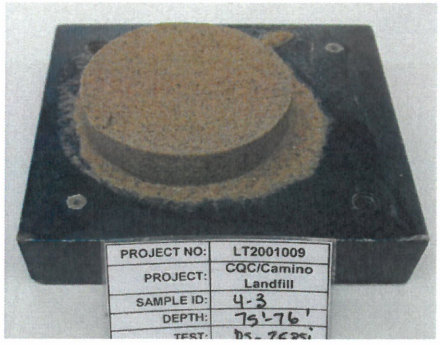
Direct Shear of Soil Appendix

Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-3 at 75-76 ft

Beyond Project No.: LT2001009
Test Method: ASTM D3080
Test Date: 01/31/20



(a) Normal Load = 20 psi



(b) Normal Load = 25 psi

(c) Normal Load = 30 psi

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One-Dimensional Consolidation Properties of Soil

Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

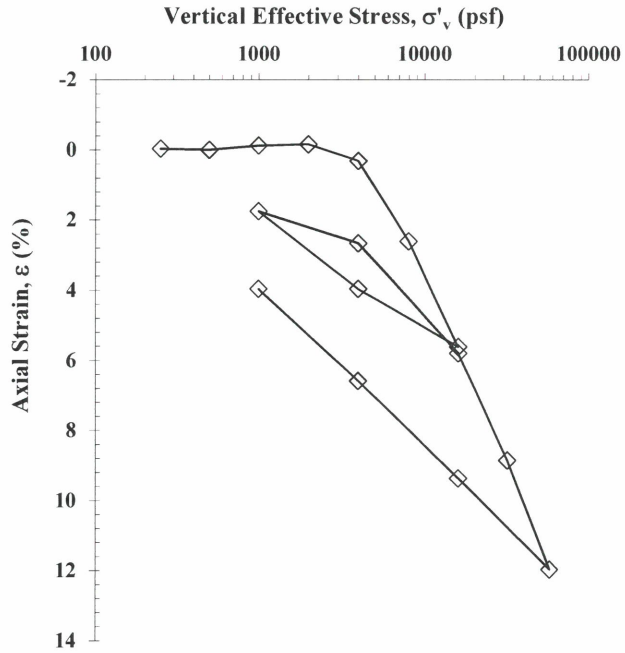
Beyond Project No.: LT2001009
Test Method: ASTM D2435, Method A
Test Date: 01/29/20

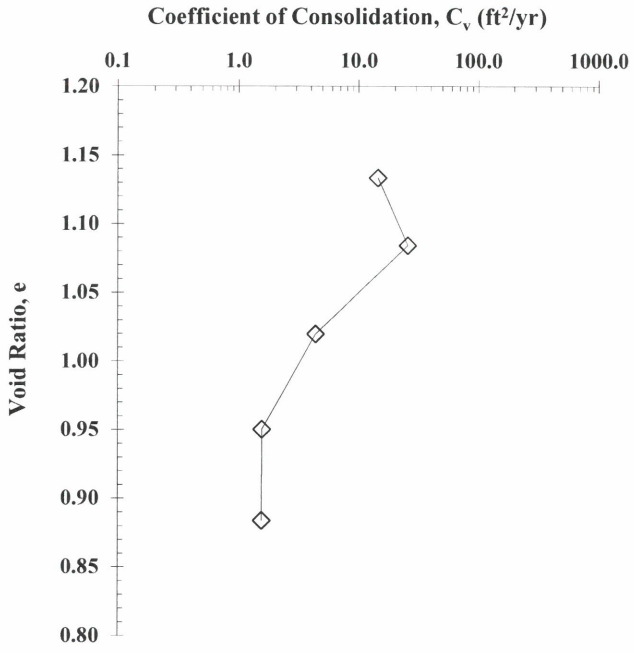
Soil Specimen Properties	
Initial Specimen Water Content (%)	37.5
Final Specimen Water Content (%)	40.0
Initial Specimen Height (in)	0.901
Final Specimen Height (in)	0.866
Initial Dry Unit Weight, γ_o (pcf)	78.2
Final Dry Unit Weight, γ_f (pcf)	81.3
Initial Void Ratio, e_o	1.140
Final Void Ratio, e_f	1.056
Initial Degree of Saturation (%)	88.2
Preconsolidation Pressure, p'_c (psf)	5550
Seating Load (psf)	250

Specimen was trimmed using a trimming turntable.
Specimen was inundated with tap water during testing.
Coefficient of Consolidation was determined using the Log Time Method. Loading increment duration was 24 hours. The calculation was included the machine deflections that measured in each loading steps. G_s was assumed to be 2.68.

Preconsolidation pressure was determined by using the Casagrande construction technique.
Compression Index, C_c & Recompression Index, C_r calculated in accordance with void ratio (Δe).

Specimen Diameter: 2.496 inches





σ'_v (psf)	250	500	1000	2000	4000	8000	16000	4000	1000	4000	16000
C_v (ft²/yr)	- -	- -	- -	- -	14.50	25.77	4.40	- -	- -	3.58	3.88
Axial Strain (%)	-0.04	-0.01	-0.12	-0.16	0.31	2.61	5.61	3.96	1.75	2.66	5.79
e	1.141	1.140	1.143	1.143	1.133	1.084	1.020	1.055	1.103	1.083	1.016

σ'_v (psf)	32000	58000	16000	4000	1000
C_v (ft²/yr)	1.57	1.56	- -	- -	- -
Axial Strain (%)	8.86	11.96	9.36	6.58	3.96
e	0.950	0.884	0.940	0.999	1.055

Compression Index, C_c 0.244
Recompression Index, C_r (1st Rebound) 0.069
Recompression Index, C_r (2nd Rebound) 0.097

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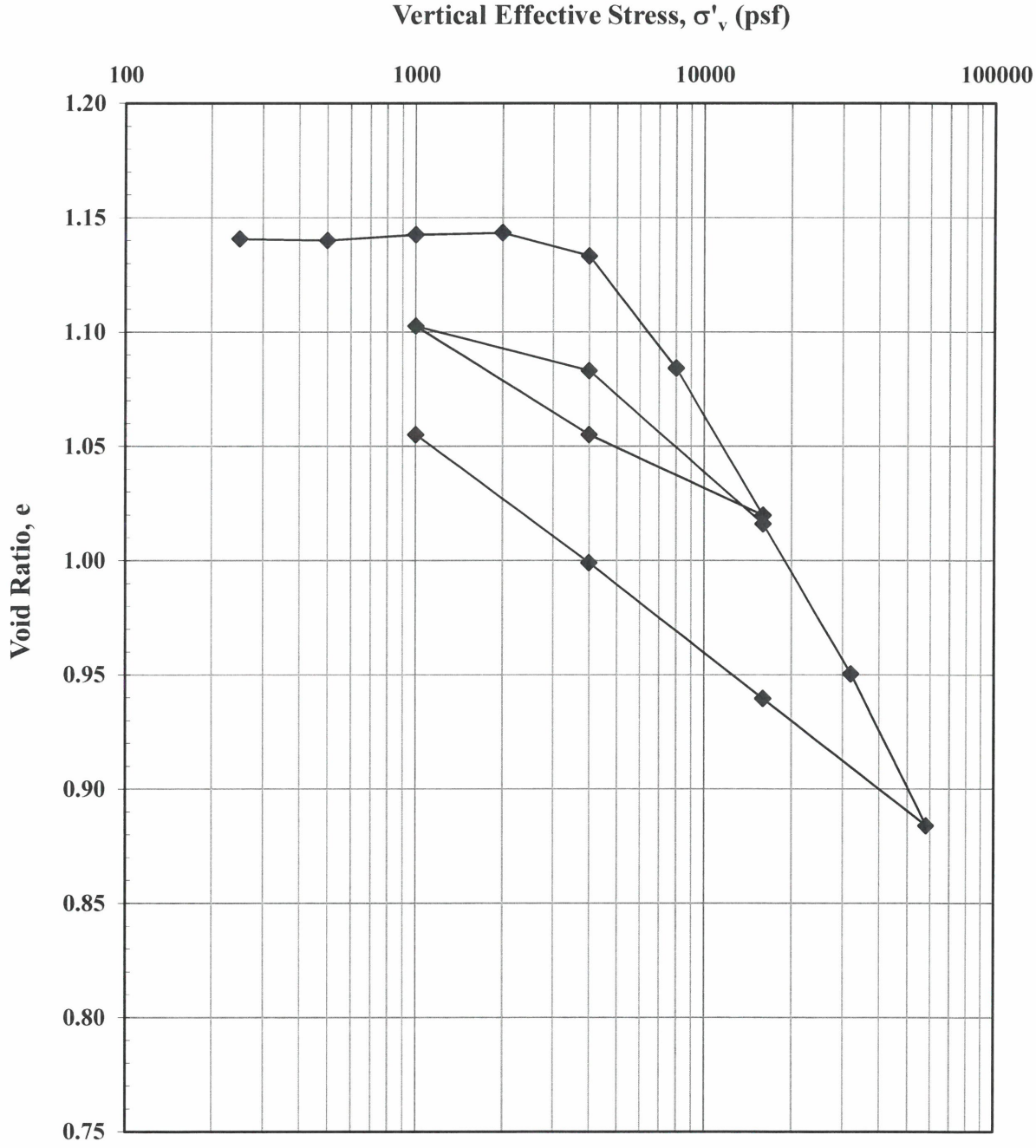
One-Dimensional Consolidation Properties of Soil

Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

Beyond Project No.: LT2001009
Test Method: ASTM D2435, Method A
Test Date: 01/29/20



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One-Dimensional Consolidation Properties of Soil Appendix

Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

Beyond Project No.: LT2001009
Test Method: ASTM D2435, Method A
Test Date: 01/29/20

Cheng-Wei Chen, Ph.D. 02/12/20
Quality Review/Date

Sample Prepared by: T.D.

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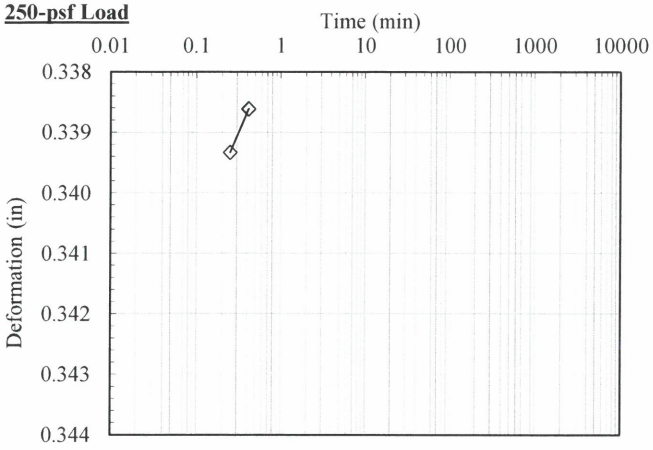
One-Dimensional Consolidation Properties of Soil Appendix

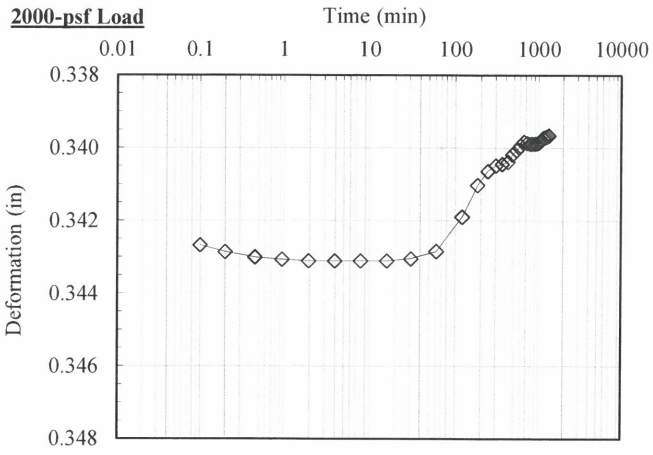
Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

Beyond Project No.: LT2001009
Test Method: ASTM D2435, Method A
Test Date: 01/29/20

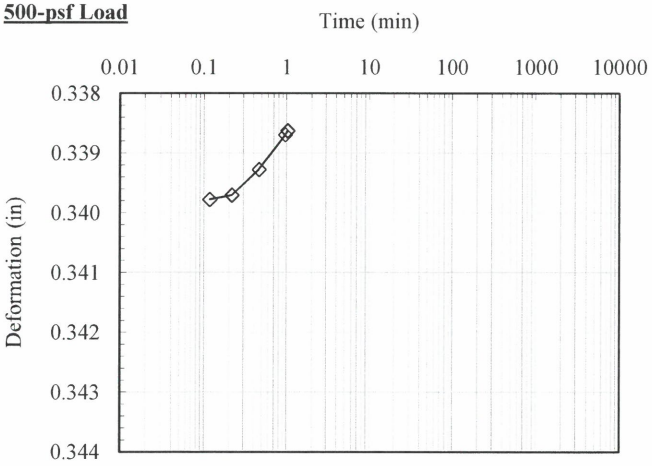
250-psf Load



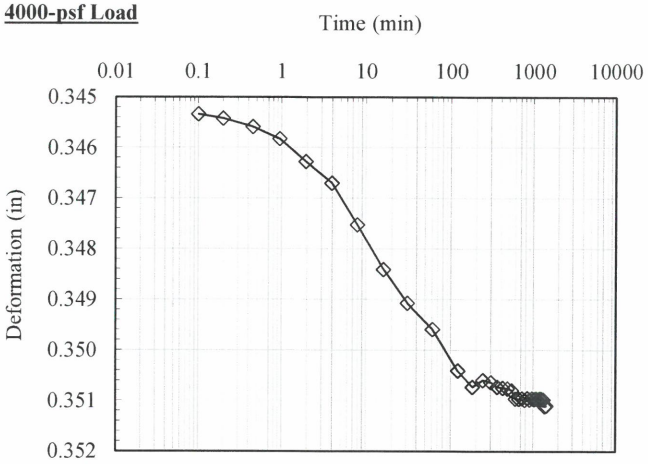
2000-psf Load



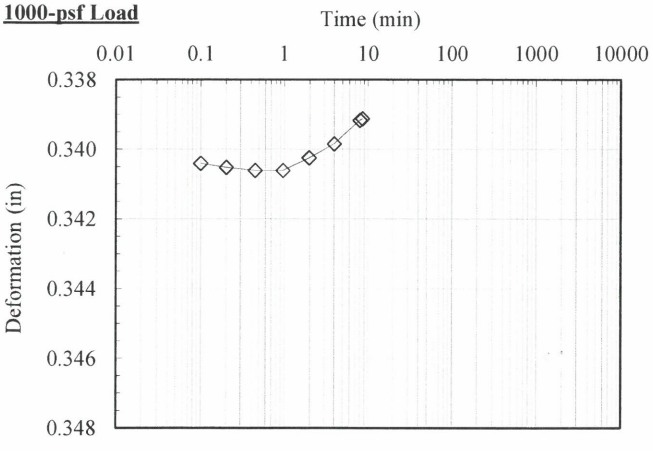
500-psf Load



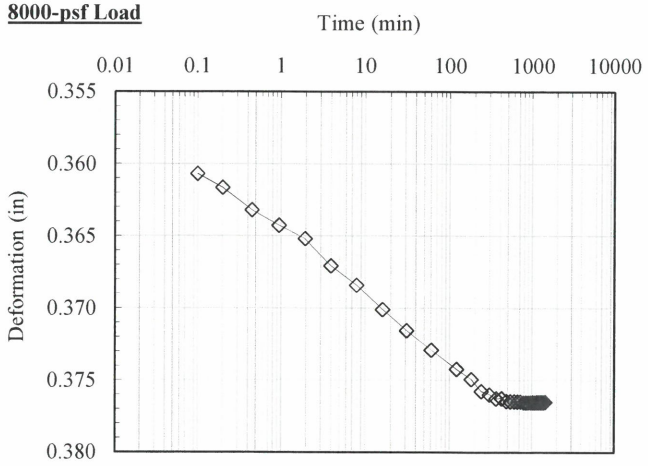
4000-psf Load



1000-psf Load



8000-psf Load



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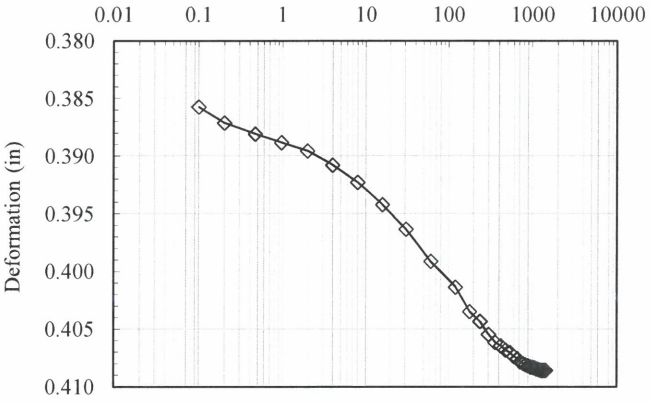
One-Dimensional Consolidation Properties of Soil Appendix

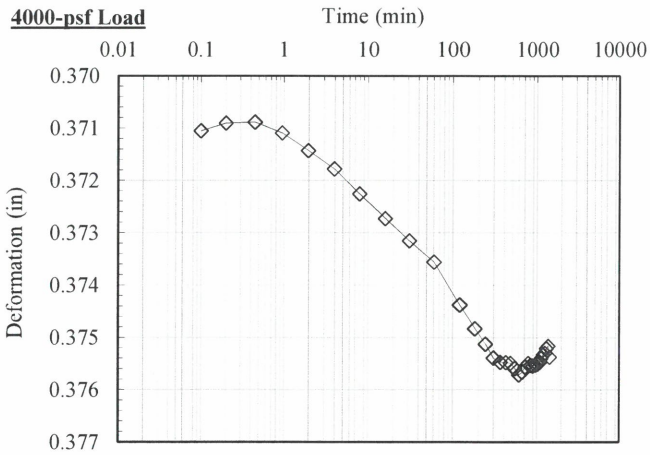
Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

Beyond Project No.: LT2001009
Test Method: ASTM D2435, Method A
Test Date: 01/29/20

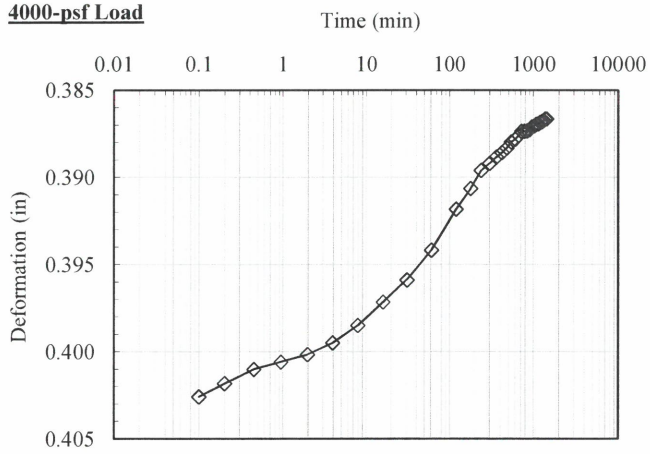
16000-psf Load



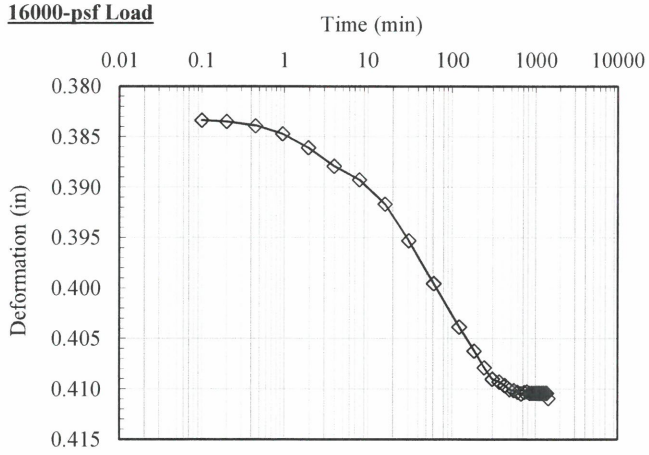
4000-psf Load



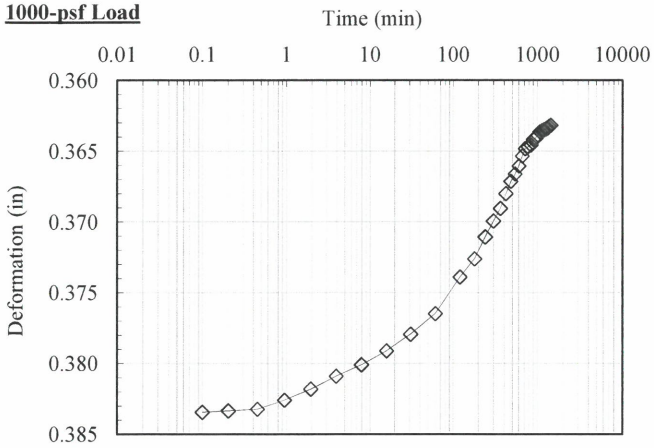
4000-psf Load



16000-psf Load



1000-psf Load



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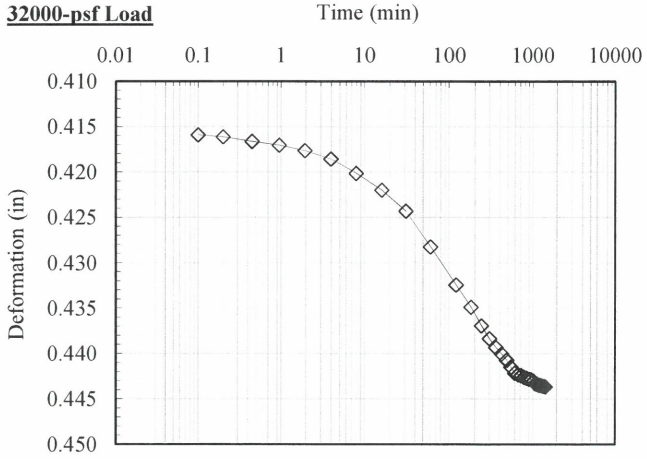

Beyond Engineering & Testing, LLC
3801 Doris Lane, Suite B
Round Rock, TX 78664
(512) 358-6048

One-Dimensional Consolidation Properties of Soil Appendix

Client: CQC Testing & Engineering, LLC
Project: Camino Landfill (PN: ADCQC19-008)
Specimen: 4-1 at 55 to 56 ft

Beyond Project No.: LT2001009
Test Method: ASTM D2435, Method A
Test Date: 01/29/20

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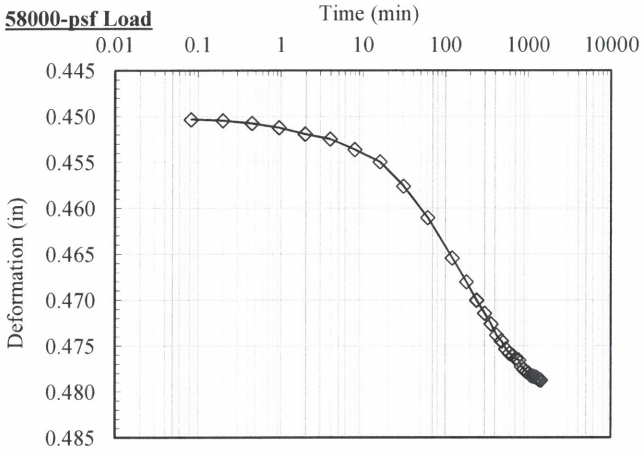

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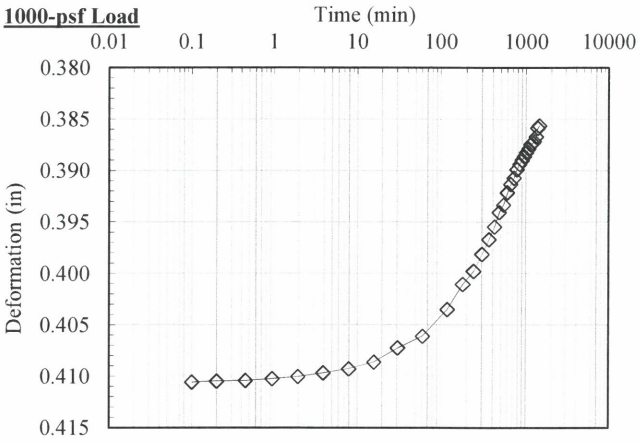

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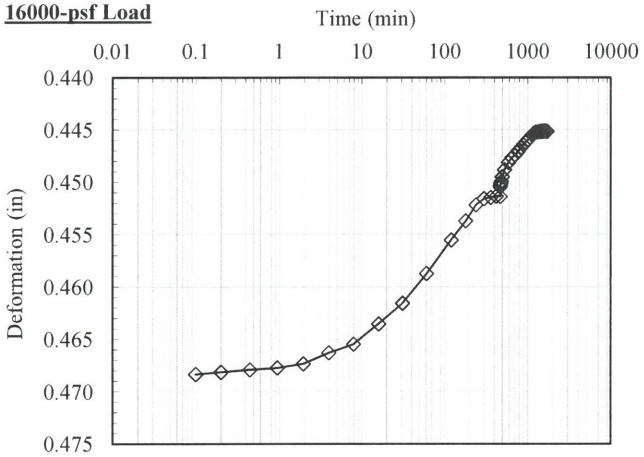

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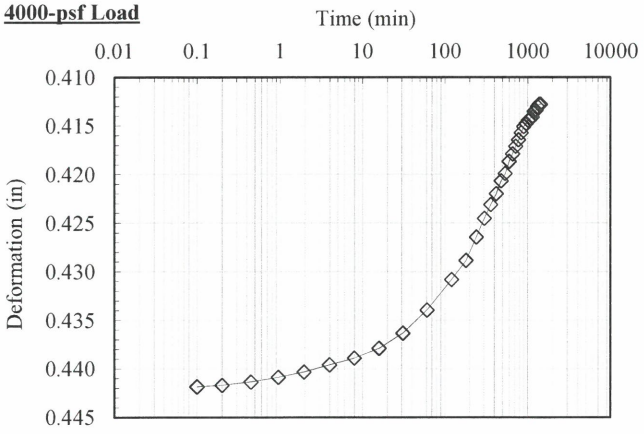


ATTACHMENT V.1.H

Monitoring Well D

Decommissioning Report (May 25, 2019)

333 Rio Rancho Blvd. NE, Suite 400
Rio Rancho, New Mexico 87124
505.867.6990

June 20, 2019

Mr. George Schuman
Permit Section Manager
NMED Solid Waste Bureau
Harold Runnels Bldg. – Room N2150
P.O. Box 5469 - 1190 St. Francis Drive
Santa Fe, NM 87502-5469

Re: Camino Real Landfill:
Notice of Completion - Groundwater Monitoring Well Decommissioning

Dear Mr. Schuman:

On behalf of our client, Waste Connections, Inc., Gordon Environmental/PSC (Gordon/PSC) is submitting this notice of completion of decommissioning upgradient groundwater monitoring Well D at the Camino Real Landfill in advance of Cell 3.1A construction. Decommissioning was completed on 5/25/19, and included the following actions:

1. Filing a Monitoring Well Decommissioning Workplan with NMED-SWB on April 9, 2019,
2. Filing a Plugging Plan of Operations with the NM Office of the State Engineer (4/12/19, Form WD-08), and receiving an approval from NMOSE (5/10/19),
3. Removing the sampling pump from Well D, reinstalling in adjacent Well D2, and testing for proper operation.
4. Removing the concrete surface slab and steel protective shroud from Well D and disposing in the Landfill.
5. Decommissioning Well D in accordance with the well abandonment requirements of the New Mexico Solid Waste Rules and the New Mexico Office of the State Engineer (NMOSE):
   - A tremie line and grout pump were used to place a sealant consisting of neat cement grout from the bottom of the well casing to ground surface (approximately 430 feet).
   - The tremie line remained submerged in the sealant throughout the sealing process.
   - The well casing was excavated to a depth of 4 feet below ground surface and the open hole was filled with 2 feet of concrete.
6. The Well D site was regraded to pre-decommissioning conditions.
7. The drilling contractor submitted a completed Plugging Record (Form WD-11) to the NMOSE field office in Las Cruces, NM, showing that the decommissioning was performed in conformance with the requirements set forth in 19.27.4.30.C NMAC, and the Plugging Plan.

The NMED-SWB is hereby advised that the Groundwater Monitoring Plan for the Camino Real landfill will be revised to indicate that upgradient monitoring will henceforth be performed in Well D2.

We appreciate the Department's review of this documentation of decommissioning of groundwater monitoring Well D at the Camino Real Landfill. Please contact us with any questions or comments.

Very truly yours,
Gordon Environmental/PSC

Clay Kilmer, P.G.
Senior Hydrogeologist

Attachments: NMED-SWB Well Decommissioning Workplan
NMOSE Plugging Plan of Operations
NMOSE Approval for Plugging Plan of Operations
NMOSE Plugging Record for Well LRG-17674-POD1

cc: Ms. Auralie Ashley-Marx, Chief, NMED Solid Waste Bureau
Mr. James Dyer, Hydrologist, NMED Solid Waste Bureau
Mr. Brady Stewart, Region Engineer, Waste Connections, Inc.
Dr. Juan Carlos Tomás, Manager, Camino Real Landfill (Facility Operating Record)

333 Rio Rancho Blvd. NE, Suite 400
Rio Rancho, New Mexico 87124
505.867.6990

April 9, 2019

Mr. George Schuman
Permit Section Manager
NMED Solid Waste Bureau
Harold Runnels Bldg. – Room N2150
P.O. Box 5469 - 1190 St. Francis Drive
Santa Fe, NM 87502-5469

Re: Camino Real Landfill:
Groundwater Monitoring Well D Decommissioning Workplan

Dear Mr. Schuman:

On behalf of our client, Waste Connections, Inc., Gordon Environmental/PSC (Gordon/PSC) is submitting this Workplan for the decommissioning of upgradient groundwater monitoring Well D at the Camino Real Landfill in advance of Cell 3.1A construction. Decommissioning is expected to occur on 04/18/19, and will consist of the following activities:

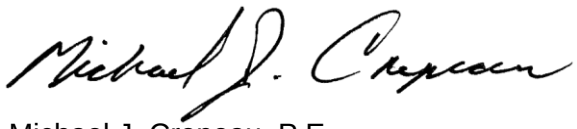
1. The sampling pump will be removed from Well D, reinstalled in adjacent Well D2, and tested for proper operation.
2. The concrete surface slab and steel protective shroud from Well D will be removed and disposed of in the Landfill.
3. Well D will be decommissioned in accordance with the well abandonment requirements of the New Mexico Solid Waste Rules and the New Mexico Office of the State Engineer (NMOSE):
   - A tremie line will be used to place a sealant consisting of neat cement grout slurry from the bottom of the well casing to ground surface (approximately 430 feet).
   - The tremie line will remain submerged in the sealant throughout the sealing process.
   - The well casing will be over-drilled to a minimum depth of 4 feet below ground surface and the open hole will be filled with at least 2 feet of concrete.
4. To the extent practical, the Well D site will be regraded to pre-decommissioning conditions.

Based on recent discussions with the NMOSE field office in Las Cruces, NM, if well decommissioning is performed consistent with the requirements set forth in 19.27.4.30.C NMAC, then a "Well Plugging Plan of Operations" (Form WD-08) is not required to be submitted to NMOSE prior to plugging. At the completion of well decommissioning, the following activities will be performed:

1. The well driller will submit the "Plugging Record" (Form WD-11) to NMOSE.
2. Gordon/PSC will submit to NMED a Completion Report that summarizes the decommissioning activities. The Report will include a copy of the NMOSE Plugging Record and NMED's Notice of Intent to Install and/or Decommission a Groundwater Well.
3. Annual groundwater monitoring at the upgradient position of the Landfill will transition to Well D2.

We appreciate the Department's review of this Workplan for the decommissioning of groundwater monitoring Well D at the Camino Real Landfill. Please contact us with any questions or comments.

Very truly yours,
Gordon Environmental/PSC



Michael J. Crepeau, P.E.
Senior Project Manager

cc: Ms. Auralie Ashley-Marx, Chief, NMED Solid Waste Bureau
Mr. James Dyer, Hydrologist, NMED Solid Waste Bureau
Mr. Brady Stewart, Region Engineer, Waste Connections, Inc.
Dr. Juan Carlos Tomás, Manager, Camino Real Landfill (Facility Operating Record)

John D'Antonio, Jr., P.E.
State Engineer

1680 Hickory Loop, Suite J
Las Cruces, New Mexico 88005-6598
Phone: (575) 524-6161
FAX: (575) 524-6160

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
District 4 Office

May 10, 2019

Waste Connections
PO Box 580
Sunland Park, NM 88063

Greetings:

Enclosed please find the Conditions of Approval for Plugging Plan of Operations for existing well LRG-17674-POD1.

As a reminder the plugging record for LRG-17674-POD1 is due within **thirty (30) days** of the completion of plugging.

Please do not hesitate to call me if you should have any questions.

Sincerely,

Yvette C. López
Water Resource Professional II
WRAP District IV

WELL PLUGGING PLAN OF OPERATIONS

NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: Not a permitted well

Name of well owner: Waste Connections

Mailing address: PO Box 580

City: Sunland Park State: New Mexico Zip code: 88063

Phone number: 575-589-9440 E-mail: JuanT@WasteConnections.com

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: JR Drilling Inc.

New Mexico Well Driller License No.: WD-1644 Expiration Date: 10/31/2020

RECEIVED 2019 APR 16 PM 1:01

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location: Latitude: 31 deg, 47 min, 6.49 sec
Longitude: -106 deg, 35 min, 51.2 sec, WGS84
☑ Check if seconds are decimal format.

2) Reason(s) for plugging well:

Upgradient monitoring well will be decommissioned for new cell construction at the landfill. Upgradient monitoring will be performed on an alternate well.

3) Was well used for any type of monitoring program? Yes If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: 387 below feet below land surface / feet above land surface (circle one)

6) Depth of the well: 450 feet

LRG-17674
TRN-648617

7) Inside diameter of innermost casing: 4 inches.

8) Casing material: Schedule 80 PVC

9) The well was constructed with:

☐ an open-hole production interval, state the open interval: _____

☒ a well screen or perforated pipe, state the screened interval(s): 390 ft to 430 ft below gl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? 0-413 ft below gl

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? _____ If yes, please describe:

Single blank casing string sealed with 15 ft hydrated bentonite pellet seal and 413 ft annular flood with neat cement-bentonite grout mixture.

12) Has all pumping equipment and associated piping been removed from the well? No If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well:

HDPE tremie line will be advanced to total depth of well and neat cement grout will be pumped through the tremie line until grout floods the well from TD to surface. Cement surface pad will be removed, and a hole will be excavated to depth of 2 feet and casing cut off at 2 ft below grade. Remaining hole will be flooded with grout and surface leveled.

2) Will well head be cut-off below land surface after plugging? Yes. Casing will be cut 2 ft below grade, hole grouted

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant.

1) For plugging intervals that employ cement grout, complete and attach Table A.

2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3) Theoretical volume of grout required to plug the well to land surface: 41.34 cubic feet; 309.28 gallons

4) Type of Cement proposed: Neat portland cement

5) Proposed cement grout mix: 5.5 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the site

X mixed on site

7) Grout additives requested, and percent by dry weight relative to cement:

8) Additional notes and calculations:

VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

Existing groundwater sampling pump, drop pipe and submerisble pump wiring will be removed from the well prior to well abandonment.

2019 APR 15 P 2:02

VIII. SIGNATURE:

I, Clay Kilmer, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

Clay Kilmer — 4/12/19

Signature of Applicant — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.
_____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 20th day of May, 2019

STATE OF NEW MEXICO STATE ENGINEER

John R. D Antonio, Jr., STATE ENGINEER

BY Yvette C. Lopez
Water Resources Professional II

TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			Surface
Bottom of proposed interval of grout placement (ft bgl)			450
Theoretical volume of grout required per interval (gallons)			41.34 cubic feet; 309.28 gal (inner casing volume for blank casing, 1.5X casing volume for 48 ft gravel pack)
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			5.5 gallons per 94 Lb bag to achieve thin mix for enhanced screen penetration and gravel pack flood
Mixed on-site or batch-mixed and delivered?			Grout mixing plant on site
Grout additive 1 requested			Neat Portland Cement only
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

Attachment
Conditions of Approval

Well Plugging Plan of Operations
Well Number LRG-17674-POD1

File No.: LRG-17674

1) Well LRG-17674-POD1 shall be plugged using the methods and materials identified in the State Engineer approved Well Plugging Plan of Operations filed on **April 16, 2019**.

2) A licensed well driller shall keep a record of the plugging work as it progresses and file a complete Plugging Record (Office of the State Engineer Form No.: WR-20) with the State Engineer no later than **thirty (30) days** after completion of plugging.

3) New Mexico Office of the State Engineer (NMOSE) witnessing of the plugging will not be required unless artesian conditions are encountered, but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal work hours by calling the District IV NMOSE office at 575-524-6161 at least 48 hours in advance. NMOSE inspection will occur dependant of personnel availability.

4) Should another regulatory agency sharing jurisdiction of the project authorize or by regulation require more stringent requirements than stated herein, the more stringent procedure shall be followed. This in part includes provisions regarding preauthorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the plugging process.

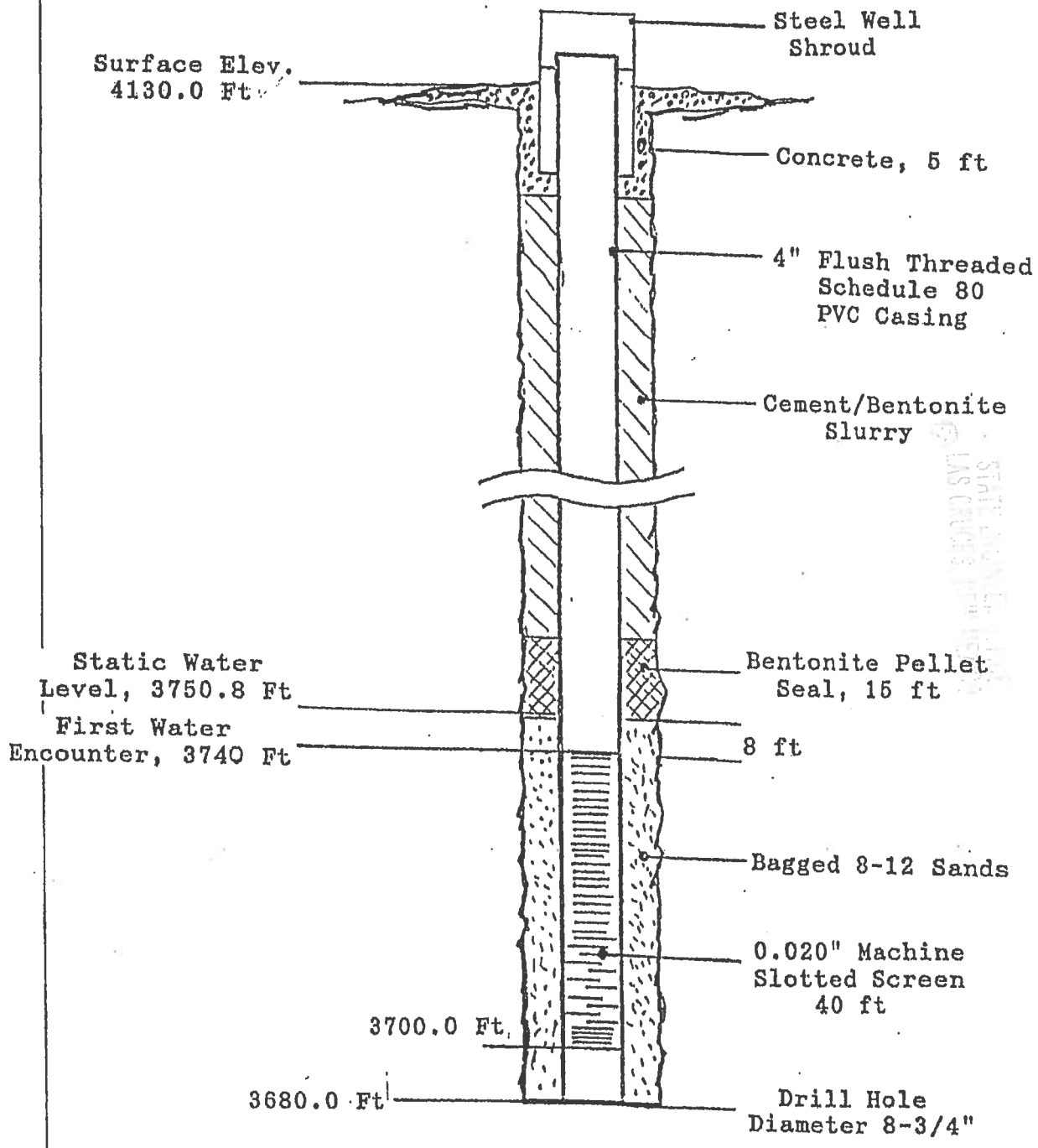
Date: 5-20-2019

Yvette C. López
Water Resource Professional II
WRAP, District IV


LRG-17674-POD1
V.1.H-13

Nu-Mex Landfill Ground Water Monitoring Well Details

Well-D



LOG OF WELL D

Location: Grid 15S, 5E
Surface Elevation: 4128 ft

Name: New Well D
Date: 01-28-91

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	3	3	Top soil
3	8	5	Caliche - duracrust
8	25	17	Sand
25	31	6	Clay
31	44	13	Sandy Clay
44	65	21	Sand
65	90	25	Sand and Clay
90	140	50	Sandy Clay
140	155	15	Sand
155	176	21	Clay with some sand
176	206	30	Sand
206	226	20	Clay
226	235	9	Sand
235	242	7	Clay
242	255	13	Sand and Clay
255	265	10	Clay
265	280	15	Sand and Clay
280	293	13	Clay
293	305	12	Sand
305	311	6	Clay
311	320	9	Sand

LOG OF WELL D

Location: Grid 15S, 5E
Surface Elevation: 4128 ft.

Name: New Well D
Date: 01-28-91

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
320	330	10	Clay
330	340	10	Sand
340	350	10	Hard Clay
350	370	20	Sand
370	396	26	Hard Clay
396	412	16	Sand
412	420	8	Sand and Clay
420	423	3	Clay
423	441	18	Sand and some clay
441	443	3	Clay
443	450	7	Sand
			450 feet total depth

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: Not a permitted Well LRG-17674 POD1

Well owner: Waste Connections Mr. Juan Carlos Thomas Phone No.: 575-589-9440

Mailing address: PO Box 580

City: Sunland Park State: NM Zip code: 88063

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: JR Drilling, LLC

2) New Mexico Well Driller License No.: 1644 Expiration Date: 10/31/2020

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): Rob Helton

4) Date well plugging began: 5/7/2019 Date well plugging concluded: 5/7/2019

5) GPS Well Location: Latitude: 31 deg, 47 min, 6.49 sec
Longitude: 106 deg 35 min, 51.2 sec, WGS 84

6) Depth of well confirmed at initiation of plugging as: 450.00 ft below ground level (bgl), by the following manner: Water Level Indicator

7) Static water level measured at initiation of plugging: 386.05 ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 5/10/2019 Ms. Yvette C. Lopez

9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

Depth (ft bl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
LRG-17674 POD1 TD @	Portland Cement	340.50	297.00	1" Tremie	Upon Completion of the Plugging, the well sat for 72 hrs. Then the well was demolished to allow for a new Cell to be built for the Landfill

MULTIPLY		BY		AN
cubic feet	x	7.4805	=	gal

For each interval plugged, describe within the following columns: III.

I, Rob Helton, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

5/25/2019
Date

Version: September 8, 2009
Page 2 of 2

SECTION 2

GROUNDWATER MONITORING SYSTEM PLAN

GROUNDWATER MONITORING SYSTEM PLAN
CAMINO REAL LANDFILL
February 2020 Application for Permit: Section 2, Volume V

TABLE OF CONTENTS

GROUNDWATER MONITORING SYSTEM PLAN
CAMINO REAL LANDFILL
February 2020 Application for Permit: Section 2, Volume V

1.0 PURPOSE

This Groundwater Monitoring System Plan (the "Plan") for the Camino Real Landfill (CRLF) addresses the applicable requirements of 20.9.9.9 – 20.9.9.20 NMAC of the 8/2/07 New Mexico Solid Waste Rules (the "Rules") pertaining to the groundwater monitoring program for the site. This Plan provides the guidance necessary for sampling, analysis, and quality assurance/quality control that will be followed during groundwater monitoring and reporting activities. This Plan also encapsulates salient hydrogeology elements of the 1990 and 1995 Permit Applications, as well as Section 1, Volume V of the 2008 Application for Permit Renewal/Modification. In addition to new data, Figures and Tables from the 2008 Permit Application are provided with their original nomenclature (i.e., Figure V.2.1, Table V.2.1, etc.); and the pagination starts at 2-1.

2.0 SITE HYDROGEOLOGY

2.1 Regional and Site Geology

The CRLF site is situated on the western edge of the valley of the Rio Grande in a cusp incised into the La Mesa Escarpment. The topography of the landfill area generally slopes to the northeast at an average of approximately 300 feet per mile. The site is underlain by unconsolidated alluvial sediments, including the Camp Rice and other Quaternary units of the Santa Fe Group. The subsurface deposits are comprised of inter-bedded medium to very fine-grained sands with silt, silty sands, and sands. Subordinate reddish-brown silt and minor clay layers are inter-bedded locally, as are caliche, carbonate nodules, and carbonate-cemented silty sands and sands. The sediment silt-clay content generally increases with depth based on boring logs and soils laboratory testing.

2.2 Landfill Hydrogeology

Based upon borings and soil samples analyzed in 1995 and 2006, the regional aquifer occurs in the Fort Hancock formation. The depth to groundwater varies primarily as a function of surface topography; and measured groundwater depths range from approximately 156 feet to 385 feet below ground surface at the facility. The approximate 230-foot difference is due more to surface topography differences rather than the presence of locally confining conditions or groundwater gradient. The minimum separation distance between the base of the landfill and the established water table is approximately 160 feet. The average groundwater gradient is estimated to be 0.0016 ft/ft to the north-northeast towards the Rio Grande.

3.0 GROUNDWATER MONITORING SYSTEM

3.1 Monitoring Network

Locations of existing, proposed and decommissioned groundwater monitoring wells at Camino Real Landfill (CRLF) are shown in **Figure V.2.1.** The current groundwater monitoring well network consists of two upgradient wells (Well D2, H), four downgradient wells (Wells A, B, F, and G), and one sidegradient well (Well E). Groundwater monitoring at the site commenced in July 1989 with the semi-annual sampling and analysis of monitoring Well A (the site's water supply well) for select groundwater parameters. Wells B, C, and D were added to the network from 1990 to 1991. Well C was deleted from the monitoring program in 1997 and, consistent with prior NMED Solid Waste Bureau (SWB) approval, decommissioned on April 29, 2008. In October and November 1995, three additional Wells (E, F, and G) were installed to enhance downgradient monitoring capabilities. Well D was decommissioned in accordance with SWB approval on May 29, 2019. A summary of the details for each active groundwater monitoring well is provided as **Table V.2.1**; and monitoring well borehole logs are provided as **Attachment V.2.A**.

In February 2006, Wells D2 and H were installed as a part of the focused landfill investigation program conducted for the 2008 Permit Renewal/Modification. The objective of the two additional wells is to augment the site-specific hydrogeologic database for the Landfill, and to extend the monitoring well network to the perimeter of planned future cells (i.e., Unit 3), in compliance with 20.9.9.9.A NMAC. These new wells are positioned generally upgradient of existing and future waste deposits (**Figure V.2.1**). Depth-to-water measurements have been recorded for Wells D2 and H since February 2006 to augment groundwater flow data points. Background sampling and analysis for Well D2 has been completed; background sampling and analysis for Well H in accordance with 20.9.9.10.E NMAC will commence when the future waste filling sequence advances toward that well's location.

Due to waste filling progression to Unit 3, Well D has been decommissioned and upgradient monitoring data is being collected from replacement Well D2. Groundwater quality data from Well D2 was compared established background water quality for Well D before it was decommissioned. Upgradient monitoring has transitioned to Well D2, which has been subject to background groundwater quality testing in accordance with NMED requirements. Well I is planned as a third new well to monitor groundwater when the development sequence reaches Cell 3.2. A fourth future well (Well A2), intended as an eventual replacement for Well A, is planned for installation as waste filling sequences progress to the west and northwest into Cells 3.2 and 3.3. The location and specifications for Well A2 will be determined in consultation with NMED prior to development of those Cells. Construction of waste cells in Unit 4 will require

that Well E and Well G be decommissioned and replaced. The general proposed locations for replacement well E2 and G2 are shown in **Figure V.2.1**. Final locations for replacement wells E2 and G2 will be determined in consultation with NMED-SWB and based upon site constraints.

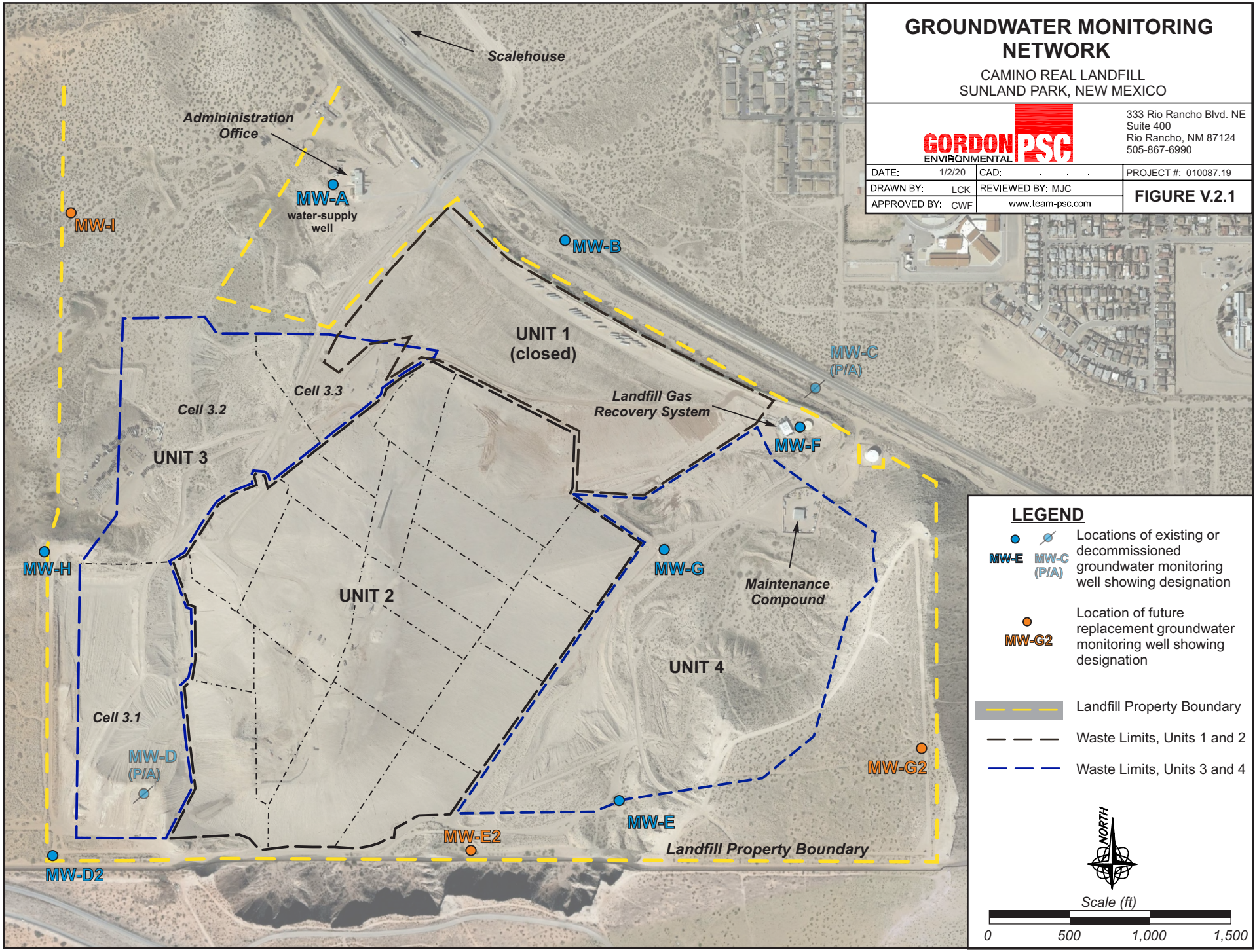

GROUNDWATER MONITORING NETWORK
CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO
GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd. NE
Suite 400
Rio Rancho, NM 87124
505-867-6990
DATE: 1/2/20
CAD:
PROJECT #: 010087.19
DRAWN BY: LCK
REVIEWED BY: MJC
APPROVED BY: CWF
www.team-psc.com
FIGURE V.2.1
Scalehouse
Admininistration Office
MW-A
water-supply well
MW-I
MW-B
UNIT 1 (closed)
MW-C (P/A)
Cell 3.3
Cell 3.2
Landfill Gas Recovery System
MW-F
UNIT 3
MW-H
MW-G
Maintenance Compound
UNIT 2
UNIT 4
Cell 3.1
MW-D (P/A)
MW-G2
MW-E
MW-E2
Landfill Property Boundary
MW-D2
LEGEND
MW-E
MW-C (P/A)
Locations of existing or decommissioned groundwater monitoring well showing designation
MW-G2
Location of future replacement groundwater monitoring well showing designation
Landfill Property Boundary
Waste Limits, Units 1 and 2
Waste Limits, Units 3 and 4
NORTH
Scale (ft)
0
500
1,000
1,500

TABLE V.2.1

GROUNDWATER MONITORING WELL DETAIL SUMMARY

CAMINO REAL LANDFILL

Well I.D.	Well Diameter (inches)	Well Construction Material	Well Rim Elevation (fmsl)	Ground Elevation (fmsl)	Top of Steel Casing Elevation (fmsl)	Well Depth (fbgs)	Boring Depth (fbgs)	Screen Interval (fbgs)	Screen Length (feet)	Location[4]		Well Completion Date
										North	East	
MW-A [1]	6	PVC	3927.55	NM	NA	400	400	320-400	80	4121.57	1629.92	1/28/88
MW-B [2]	4	Sch 80 PVC	3896.97	3894.60	3897.57	190	206	155-190	35	3665.662	3112.099	8/22/90
MW-D2 [3]	4	Sch 40 PVC	4132.29	4130.30	4133.28	405	420	375-405	30	105.02	19.31	2/17/06
MW-E [2]	4	Sch 40 PVC	4021.64	4019.36	4022.11	298	305	265-295	30	416.889	3377.561	11/3/95
MW-F [2]	4	Sch 40 PVC	3896.68	3894.38	3897.06	182	185	149-179	30	2644.209	4454.448	10/28/95
MW-G [2]	4	Sch 40 PVC	3935.36	3933.29	3935.74	218	223	185.5-215.5	30	1901.670	3642.710	10/28/95
MW-H [3]	4	Sch 40 PVC	4129.92	4127.79	4130.85	408	420	378-408	30	1783.99	8.47	2/26/06

Notes:

[1] Well rim elevation for Well A is top of sealed well casing pipe and is based on 2/27/06 survey by SkyLine Engineering.
Location information (i.e., North and East) based on 2/27/06 survey by SkyLine Engineering.

[2] Well rim, ground, and top of steel casing elevations based on 11/10/05 survey by SkyLine Engineering.
Location information (i.e., North and East) based on 11/10/05 survey by SkyLine Engineering.
Location information (i.e., North and East) based on 11/10/05 survey by SkyLine Engineering.

[3] Data for Wells D2 and H based on 2/27/06 survey by SkyLine Engineering.

[4] Location information based on local (site-specific) coordinate system (measured in feet). The "zero-zero" of the coordinate system is located adjacent to the southwest corner of the site.

- fmsl: feet above mean sea level
- fbgs: feet below ground surface
- NM: not measured
- NA: not applicable

3.2 Monitoring Schedule and Parameters

On January 13, 2006, GEI submitted to NMED the *Groundwater Monitoring Program Update* (*January 2006 Update*) for CRLF. The *January 2006 Update*, approved by SWB on 05/17/07 (**Attachment V.2.B**) and updated on 06/15/07, summarizes the historical monitoring program for the site; provides statistical analyses of the background groundwater monitoring datasets from 1989 through 2005; and includes established assessment monitoring levels (AMLs) for each active well/inorganic parameter combination. The established AMLs were updated in the 08/06/10 *Groundwater Monitoring Report* to encompass changes implemented by SWB regarding policies and guidance documents; as well as SWB revisions (e.g., 12/09 and 05/10) to the groundwater protection standards (GWPSs) and regulatory presumptive AMLs for select monitoring parameters listed in Subsection A of 20.9.9.20 NMAC.

On 05/16/11, GEI submitted the *Request for Groundwater Monitoring Reduction*, applying for SWB's "specific approval" for revisions to the site's existing Groundwater Monitoring Plan. As provided for by 20.9.9.11.A NMAC, the requested revisions included an alternative list of organic and inorganic parameters; and a reduction in sampling frequency from semi-annual to annual. The demonstrations provided in the request conformed to the regulatory requirements listed in 20.9.9.11.A(1) through (3) NMAC, as well as the *Guidance on Alternative Ground Water Monitoring Constituents for Detection Monitoring* issued by SWB on 12/28/09. On 06/07/11, SWB granted approval of the request (**Attachment V.2.B**) and, consistent with 20.9.9.11.A(3) NMAC, samples collected in 06/11 and 11/11 were analyzed for the constituents on the approved alternative parameter list (**Table V.2.2**) before transitioning to annual sampling in 2012.

Although annual groundwater monitoring is anticipated to continue for the approved alternate parameter list throughout the active life of the site, CRLF may consider making specific demonstrations to refine and reduce the groundwater monitoring parameter list in the future. Any future requests to refine the list would be based on an evaluation of the groundwater quality monitoring results and site-specific hydrogeology. Should additional reductions in groundwater monitoring requirements be pursued, proposed amendments to the this Plan will be submitted for SWB review and approval prior to implementation.

Consistent with 20.9.9.11.B NMAC, during the active life and closure/post-closure period, active monitoring wells will be sampled and analyzed for the full suite of indicator parameters listed in Subsections A&C of 20.9.9.20 NMAC at least once every 5 years. If an excluded constituent is reported as detected above the identified threshold (i.e., established AML) during the mandatory 5-year monitoring, the constituent will be reinstated to the approved alternate parameter list for routine sampling/analysis.

TABLE V.2.2 (page 1 of 2)
ALTERNATE PARAMETER LIST AND MONITORING SCHEDULE
Camino Real Landfill

Subsection A Organic Parameters	Units	EPA Method	Sampling Frequency	
			Annual	5 Years
Acetone	µg/L	8260	X	X
Acrylonitrile	µg/L	8260	X	X
Benzene	µg/L	8260	X	X
Bromochloromethane	µg/L	8260	X	X
Bromodichloromethane	µg/L	8260	X	X
Bromoform	µg/L	8260	X	X
Methyl bromide (Bromomethane)	µg/L	8260	X	X
2-Butanone (Methyl ethyl ketone - MEK)	µg/L	8260	X	X
Carbon Disulfide	µg/L	8260	X	X
Carbon Tetrachloride	µg/L	8260	X	X
Chlorobenzene	µg/L	8260	X	X
Chloroethane (Ethyl Chloride)	µg/L	8260	X	X
Chloroform (Trichloromethane)	µg/L	8260	X	X
Methyl chloride (Chloromethane)	µg/L	8260	X	X
Dibromochloromethane	µg/L	8260	X	X
Methylene Bromide (Dibromomethane)	µg/L	8260	X	X
o-Dichlorobenzene (1,2-)	µg/L	8260	X	X
p-Dichlorobenzene (1,4-)	µg/L	8260	X	X
trans-1,4-Dichloro-2-butene	µg/L	8260	X	X
1,1-Dichloroethane	µg/L	8260	X	X
1,2-Dichloroethane (EDC)	µg/L	8260	X	X
1,1-Dichloroethene (1,1-DCE)	µg/L	8260	X	X
cis-1,2-Dichloroethene	µg/L	8260	X	X
trans-1,2-Dichloroethene	µg/L	8260	X	X
Methylene chloride (Dichloromethane)	µg/L	8260	X	X
1,2-Dichloropropane	µg/L	8260	X	X
cis-1,3-Dichloropropene	µg/L	8260	X	X
trans-1,3-Dichloropropene	µg/L	8260	X	X
Ethylbenzene	µg/L	8260	X	X
2-Hexanone	µg/L	8260	X	X
Methyl iodide (Iodomethane)	µg/L	8260	X	X
4-Methyl-2-pentanone (MIBK)	µg/L	8260	X	X
Styrene	µg/L	8260	X	X
1,1,1,2-Tetrachloroethane	µg/L	8260	X	X
1,1,2,2-Tetrachloroethane	µg/L	8260	X	X
Tetrachloroethene (PCE)	µg/L	8260	X	X
Toluene	µg/L	8260	X	X
1,1,1-Trichloroethane (TCA)	µg/L	8260	X	X
1,1,2-Trichloroethane	µg/L	8260	X	X
Trichloroethene (1,1,2-Trichloroethylene, TCE)	µg/L	8260	X	X
Trichlorofluoromethane (CFC 11)	µg/L	8260	X	X
1,2,3-Trichloropropane	µg/L	8260	X	X
Vinyl Acetate	µg/L	8260	X	X
Vinyl Chloride	µg/L	8260	X	X
Xylenes (Total)	µg/L	8260	X	X
Phenolics	µg/L	9067	X	X
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	504.1		X
1,2-Dibromoethane (EDB)	µg/L	504.1		X
Polyaromatic Hydrocarbons (PAHs)	µg/L	8310		X
Polychlorinated Biphenyls (PCBs)	µg/L	8082		X

TABLE V.2.2 (page 2 of 2)
ALTERNATE PARAMETER LIST AND MONITORING SCHEDULE
Camino Real Landfill

Subsection A **Inorganic Parameters**	**Units**	**EPA Method**	**Sampling Frequency**	
			Annual	**5 Years**
Heavy Metals				
Antimony, Sb	mg/L	200.8		X
Arsenic, As	mg/L	200.8	X	X
Barium, Ba	mg/L	200.7	X	X
Beryllium, Be	mg/L	200.7		X
Cadmium, Cd	mg/L	200.7		X
Chromium, Cr	mg/L	200.7	X	X
Cobalt, Co	mg/L	200.7		X
Copper, Cu	mg/L	200.7		X
Lead, Pb	mg/L	200.8		X
Nickel, Ni	mg/L	200.7		X
Selenium, Se	mg/L	200.8	X	X
Silver, Ag	mg/L	200.7		X
Thallium, Tl	mg/L	200.8		X
Vanadium, V	mg/L	200.7		X
Zinc, Zn	mg/L	200.7		X
Other Inorganic Chemicals				
Aluminum, Al	mg/L	200.7	X	X
Boron, B	mg/L	200.7	X	X
Chloride, Cl-	mg/L	300.0	X	X
Cyanide, CN^-	mg/L	335.3		X
Fluoride, F	mg/L	300.0	X	X
Iron, Fe	mg/L	200.7	X	X
Manganese, Mn	mg/L	200.7		X
Mercury, Hg	mg/L	245.2		X
Molybdenum, Mo	mg/L	200.7		X
Nitrate as N, NO_3-N	mg/L	300.0	X	X
Sulfate, SO_4^{2-}	mg/L	300.0	X	X
Uranium, U	mg/L	200.8		X
Radioactivity				
Combined Radium, Ra 226 & Ra 228	pCi/L	903.0/904.0	X	X
Physical Parameters				
pH	Std Units	Field/Lab	X	X
Total Dissolved Solids, TDS	mg/L	160.1	X	X

Subsection C **Inorganic Parameters**	**Units**	**EPA Method**	**Sampling Frequency**	
			Annual	**5 Years**
Inorganic Chemicals				
Ammonia as N, NH_3-N	mg/L	$4500NH_3$		X
Calcium, Ca	mg/L	200.7	X	X
Magnesium, Mg	mg/L	200.7	X	X
Phosphate, PO_4^{2-}	mg/L	300.0		X
Potassium, K	mg/L	200.7	X	X
Sodium, Na	mg/L	200.7	X	X
Total Kjeldahl Nitrogen, TKN	mg/L	351.3		X
Total Nitrogen, TN	mg/L	Calculated	X	X
Total Organic Carbon, TOC	mg/L	415.2		X
Physical Parameters				
Bicarbonate Alkalinity, HCO_3^- (as $CaCO_3$)	mg/L	2320B	X	X
Carbonate Alkalinity, CO_3^- (as $CaCO_3$)	mg/L	310.1		X
Specific Conductance	µS/cm	Field/Lab	X	X
Temperature	^oC	Field	X	X
Depth to Water	Feet	Field	X	X
Groundwater Elevation	MSL	Field	X	X

3.3 Groundwater Flow

The contour map provided as **Figure V.2.2** is based on depth-to-water measurements recorded from the latest groundwater monitoring event conducted in May 2019; and demonstrates that groundwater flow at CRLF continues to exhibit a general northeasterly trend, consistent with the historical flow direction. Based on the saturated hydraulic conductivity of representative soil samples (approximately 1 X 10^{-3} cm/s); an estimated effective porosity of 0.15; and an average groundwater gradient of approximately 0.0017 ft/ft; the estimated average linear groundwater flow velocity beneath the site is calculated to be approximately 0.032 feet per day (i.e., approximately 11.7 feet per year).

3.4 Monitoring Well Sampling and Purging

Samples from Well A (the site's water supply well) are collected from the access valve on the Well A storage tank after opening the valve and allowing water to run continually for approximately 10 minutes prior to sample collection. Wells B, D2, E, and F are equipped with dedicated electrical submersible pumps, powered at the ground surface by a portable generator, which are used for purging and sampling. On 09/30/09, the dedicated, high-yield submersible pump in Well G was removed due to historically poor well performance (i.e., limited water delivery) and aquifer yield. Well G has since been equipped with a dedicated QED Well Wizard® bladder sampling pump with dedicated Teflon® tubing and has been sampled using low-flow purging methods.

3.4 Monitoring Well Construction

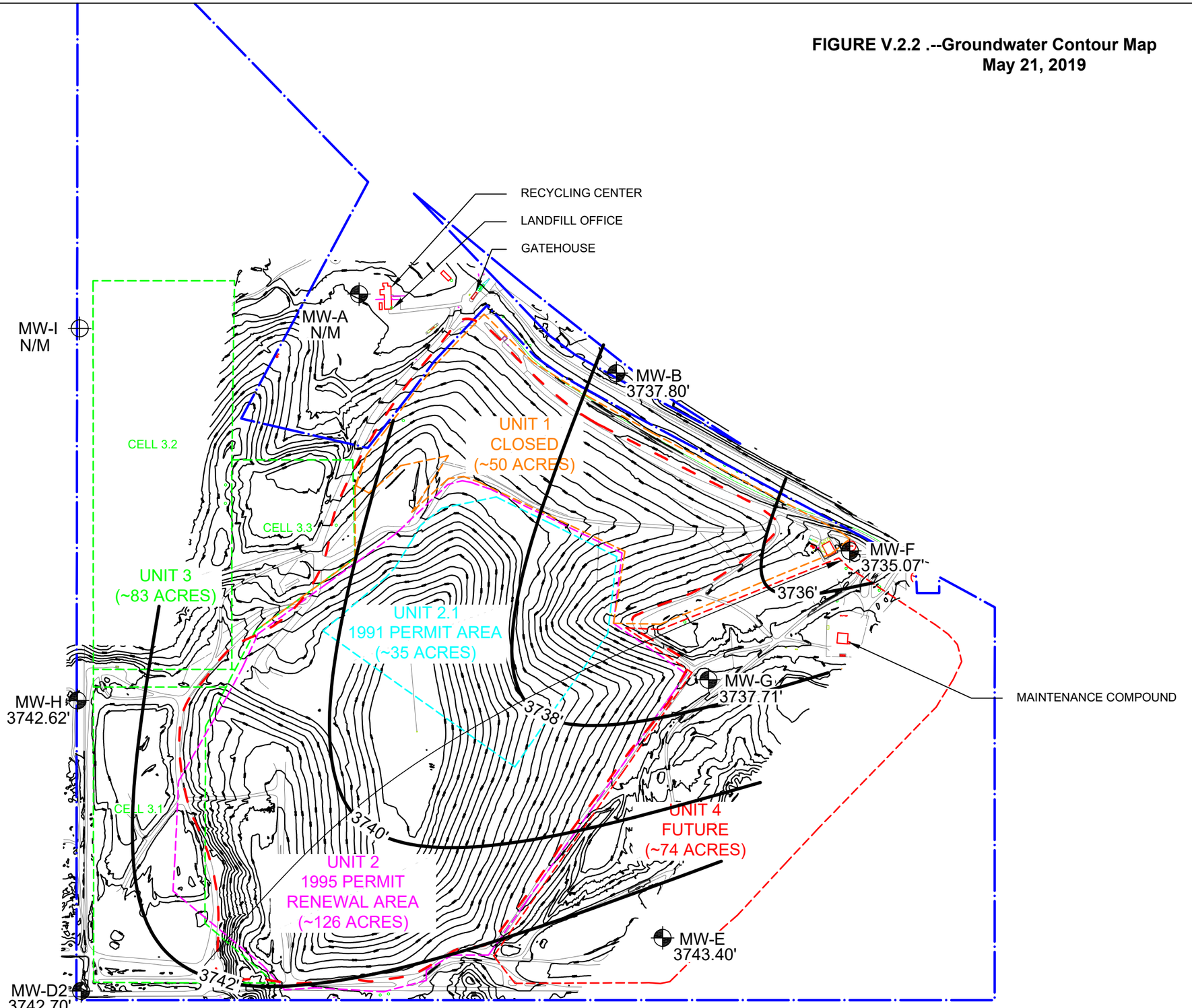
Consistent with the requirements of 20.9.9.9.E NMAC, SWB will be notified at least 14 days prior to the initiation of future well drilling activities to install new monitoring wells (e.g., Wells I, and A2). The notice will include a statement, on the form provided by NMED, that well installation complies with 20.9.9.9.E NMAC and this Plan. SWB will also be provided with a Workplan identifying the location and installation specifications for future monitoring wells at least 30 days prior to commencing these activities. SWB will be notified that such documentation has been entered into the Facility Operating Record. Prior to drilling, the appropriate permits will be obtained from the New Mexico Office of the State Engineer (NMOSE) and NMED SWB:

- Application to Explore – NMOSE
- Well Record & Log – NMOSE
- Install and/or Decommission Groundwater Well Notice of Intent – SWB

In addition, prior to drilling, equipment used to install each well borehole and related sampling tools will be decontaminated by on-site steam cleaning. Drilling and monitoring well installation

activities will be conducted in accordance with 20.9.9.9.J NMAC. Each well will be constructed consistent with the specifications listed in **Table V.2.3** and illustrated in **Figure V.2.3**.

FIGURE V.2.2 .--Groundwater Contour Map
May 21, 2019



NOTES:
1. WATER LEVELS MEASURED MAY 21-22, 2019.
2. N/M - GROUNDWATER ELEVATION NOT MEASURED.

The CAREL CORPORATION
136 Pecan Street, Keller, TX 76248

LEGEND

- FACILITY BOUNDARY
- 3990 — TOPOGRAPHICAL CONTOURS
- MONITORING WELL
- GROUNDWATER CONTOURS
- PROPOSED MONITORING WELL
- APPROXIMATE LIMITS OF WASTE

N

SCALE: 0 300 600 FEET

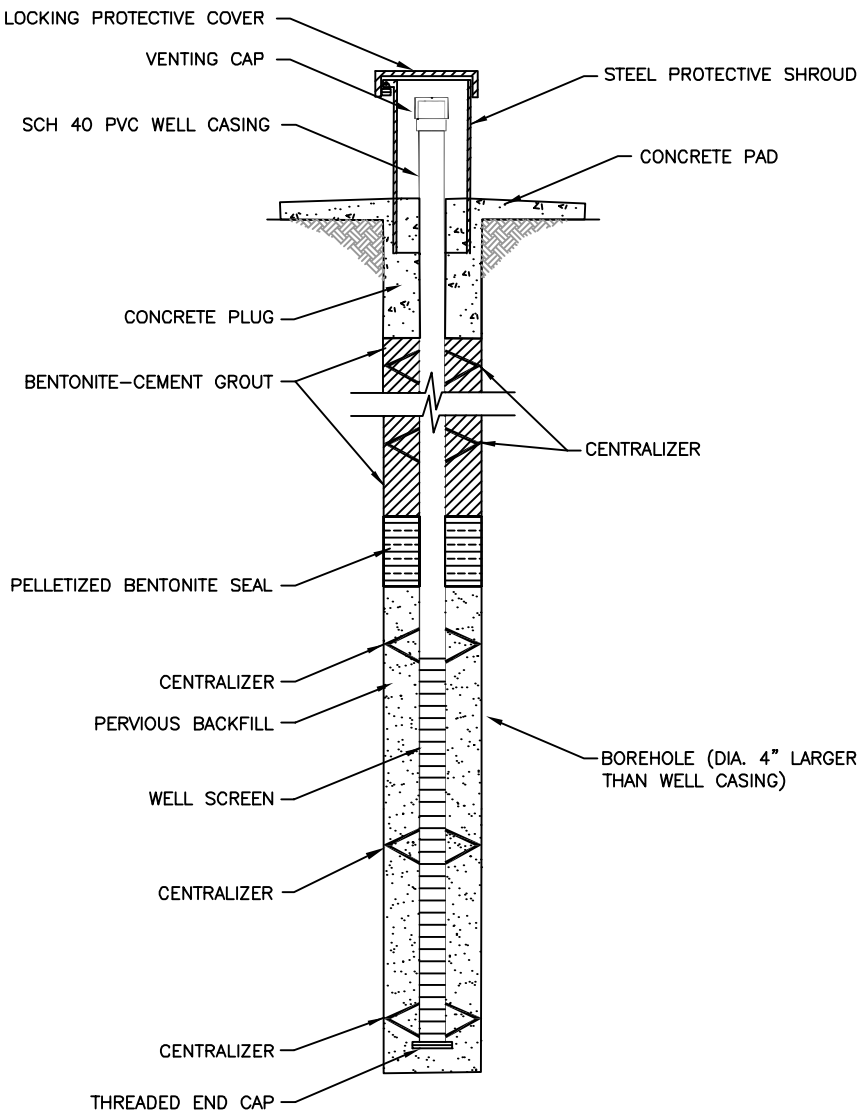
GROUNDWATER CONTOUR MAP
May 2019

Camino Real Landfill
Sunland Park, New Mexico

DATE DRAFTED: June 17, 2019	
FILENAME: I:\NEW MEXICO\Camino Real\Contour\2019\0519 GW MAP_recover.dwg	
DRAWN BY: KTC	FIGURE: 2
DRAFTED BY:	
CHECKED BY:	
APPROVED BY:	

Table V.2.3
Camino Real Landfill
Well Installation Specifications

1. The borehole will be drilled a minimum of 4 inches larger than the casing diameter to allow for the emplacement of sand and sealant.
2. Care shall be taken not to introduce contamination to the well.
3. The well will be developed such that groundwater flows freely through the screen and is not turbid, and all sediment is removed from the well.
4. The casing will, unless otherwise approved by the Secretary, consist of Schedule 40 or heavier threaded PVC pipe of not less than 4 inches:
   a. the casing will extend from the top of the screen to at least one foot above ground surface.
   b. the casing top will be protected by a cap and a locking shroud shall protect the exposed casing.
   c. the shroud will be large enough to allow easy access for removal of the plastic cap.
5. At a minimum, the screen will be at least a 20-foot section of machine slotted or other manufactured screen with a slot size of 0.01-inch. No on-site or hack-saw slotting will be permitted.
6. If the uppermost aquifer is unconfined, the top of the screen will be positioned 5 ft above the water table to allow for seasonal fluctuations.
7. If the uppermost aquifer is confined, the top of the screen will be positioned at the location of the geologic boundary between the top of the aquifer and the bottom of the confining unit.
8. At a minimum, the screen will be centralized at the top and the bottom.
9. At a minimum, the annular space from 2 ft below to 2 ft above the screen will be packed with sand:
   a. the sand will be clean and medium to coarse grained.
   b. the sand will be properly sized to prevent fines from entering the well.
   c. a tremmie pipe will be used for sand placement in deeper wells.
10. At a minimum, the annular space for at least 2 ft above the sand pack shall be grouted or sealed:
    a. pressure grouting with bentonite or cement using a tremmie pipe is preferred.
    b. alternatively, a bentonite seal may be installed using bentonite pellets, ¼ or ½ inch in size.
11. The annular space above the seal will be fully sealed using grout or bentonite to within 3 ft of the ground surface.
13. The remaining 3 ft will be filled with concrete (expanding cement).
14. A concrete slab with a minimum of a 2-foot radius and a 4-inch thickness will be installed around the shroud. The pad will be sloped such that rainfall and run-off flows are diverted away from the shroud.
15. A construction diagram and lithologic log for each monitoring well will be submitted to the Department within 90 days upon well completion and development (20.9.9.9.F NMAC). This documentation will also be maintained in the Facility Operating Record.
16. The location of the well casing will be determined within 1/10 of a foot, and the height above sea level at the top of the casing will be surveyed to within 1/100 of a foot by a registered New Mexico land surveyor.



PROPOSED GROUNDWATER MONITORING WELL

NOT TO SCALE

LEGEND

CASING: SCH 40 PVC

SCREEN: 0.010" MACHINE SLOT SCH 40 PVC

PERVIOUS BACKFILL: 10–20 COLORADO® SILICA SAND OR EQUIVALENT

ANNULAR SEAL: NEAT CEMENT WITH 2% TO 5% BENTONITE

NOTE: SPECIFIC VERTICAL DIMENSIONS FOR EACH NEW WELL WILL BE INCLUDED IN OSE AND NMED SUBMITTALS.

GROUNDWATER MONITORING WELL SCHEMATIC

CAMINO REAL LANDFILL
SUNLAND PARK, NEW MEXICO

GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd. NE
Suite 400
Rio Rancho, NM 87124
505-867-6990

DATE: 1/2/20	CAD:	PROJECT #: 010087.19
DRAWN BY: LCK	REVIEWED BY: MJC	FIGURE V.2.3
APPROVED BY: CWF	www.team-psc.com	

Unless otherwise specified, each monitoring well will be equipped with a dedicated, electrical submersible environmental sampling pump. Prior to pump installation, the total depth of the well will be measured and recorded. The electric motor lead will be continuous with no splices, and insulated with material specifically designed for environmental monitoring wells. The pump will be designed to control the flow and delivery of groundwater to the ground surface in order to collect samples that will be most representative of *in situ* water quality. Power for pump operation can be supplied by a generator equipped with a standard 110V outlet. The pump will be suspended from the well cap (equipped with a water discharge connection and minimum ¾" sounding/venting hole) by 1-inch-diameter SCH 80 PVC (or equivalent) water discharge pipe connected with stainless steel couples.

4.0 GROUNDWATER QUALITY

4.1 Background Groundwater Quality Data Evaluation

Background groundwater quality for CRLF was established in the *January 2006 Update*; which included an extensive evaluation of laboratory analytical data from over 45 monitoring events performed at the site from 1989 through 2005. During this timeframe, water quality data were evaluated from earlier parameter lists; full Table I (1995 Solid Waste Regulations) sampling; and verification re-sampling. Consistent with the 05/17/07 NMED-approved statistical approach (**Attachment V.2.B**), groundwater quality data for Wells A, B, D, E, F, and G were evaluated on an intrawell basis (i.e., by comparing each well to itself). The approved statistical approach included the use of proven methodologies presented in the *USEPA Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities* (*Interim Final Guidance, February 1989* and *Draft Addendum to Interim Final Guidance, July 1992*); as well as use of the trend analysis functions of the NMED-approved Sanitas™ software program. Through evaluation and statistical analysis of up to nine different datasets for each well from 1994 through 2003, upper tolerance limit values (UTLVs) were calculated, and assessment monitoring levels (AMLs) were established, for the entire suite of Table I inorganic parameters. The established AMLs were then used to evaluate groundwater monitoring data for potential AML exceedances during subsequent monitoring events (i.e., detection monitoring from 2006 through 2010).

From 2006 – 2010, semi-annual groundwater monitoring for Wells A, B, D, E, F, and G included the collection and analysis of samples for the entire suite of organic and inorganic parameters listed in Table I of the 1995 Regulations, and 20.9.9.20 NMAC Subsections A&C of the Rules. During this 5-year timeframe, the only notable water quality trend that was observed is that Well F exhibited elevated concentrations for chloride above its established AML. However, it has been successfully demonstrated that these concentrations are attributable to natural fluctuations in groundwater quality.

In addition, the nominal and intermittent detection of select metals in total form (e.g., chromium, iron, arsenic, manganese, etc.) above established AMLs in certain wells (e.g., Wells B, E, F, and G) has also been demonstrated, through several dissolved metals analyses, to be due to natural geochemical conditions (e.g., turbidity) in the aquifer. Sediments from the geological formations in which a well is installed may be entrained inadvertently in a groundwater sample when the sample is being collected. Elevated metals concentrations are likely a result of dissolution of those metals from sediment suspended in the samples. The sample preservation protocol requires that acid be added to the water sample, which promotes conditions suitable for dissolution of the metals from the suspended sediment. Field-filtered samples are more effective at detecting potential metals contributions to groundwater.

As mentioned previously, the 2006 established AMLs were updated in August 2010 to address changes to SWB policies and guidance documents, as well as the 2009 and 2010 SWB revisions to the GWPSs and regulatory presumptive AMLs for select inorganic monitoring parameters listed in Subsection A of 20.9.9.20 NMAC. The statistical methods to update these data are consistent with the methods used in the *January 2006 Update*. **Attachment V.2.C** provides a summary of the 2006 UTLVs and established AMLs, as well as the 2010 updates, for each well/Subsection A inorganic parameter combination. Site-wide established AMLs for each Subsection A organic parameter are also included in **Attachment V.2.C**. These established AMLs will be used as detection monitoring thresholds for future sampling events.

4.2 Groundwater Quality Summary

The results of the evaluation and statistical analysis of the background groundwater quality databases evaluated pursuant to the 2012 Groundwater Monitoring Plan Update indicated no impacts to groundwater quality by CRLF. The demonstrations presented in the NMED-approved *Request for Groundwater Monitoring Reduction* (05/16/11) showed that the approved, annual groundwater monitoring program for a reduced parameter list wasadequate to detect potential impacts, and to protect human health and the environment. The established AMLs for each parameter were based on valid data, subjected to rigorous and proven evaluation and statistical methods, and were indicative of *in situ* groundwater quality beneath the site.

4.3 Assessment Groundwater Monitoring 2016-2019

Annual groundwater monitoring proceeded at CRLF in accordance with the 2012 Updated Groundwater Monitoring plan until 2016, when 1,2-dichloroethane (1,1-DCA), tetrachloroethylene (PCE), trichloroethylene (TCE) and trichlorofluoromethane (freon-11) were detected in groundwater samples collected from Well G. In response to a NMED-SWB request dated March 31, 2017, confirmatory resampling of Well G was performed on May 9, 2017 in

conjunction with a regular annual groundwater monitoring event for the facility. Each of the four Volatile Organic Compounds (VOC's) originally detected in samples from Well G was detected and confirmed. Additionally, methylene chloride (MC) was detected. None of the VOC concentrations detected in the confirmation sample exceeded its Presumptive Assessment Monitoring Level (PAML) except TCE. None of the detected analytes exceeded a Corrective Action Level (CAL). No site-specific assessment monitoring level (SSAML) for methylene chloride had been established for Well G at that time; however, the reported concentration did not exceed the groundwater protection standard (GWPS), or the CAL.

An Assessment Monitoring Plan (AMP) was submitted on July 18, 2017 and approved in NMED-SWB correspondence dated September 6, 2017. In accordance with the approved AMP, groundwater samples were collected from Well G on November 15, 2017. Samples were analyzed for the complete list of analytes in Subsections B and C of 20.9.9.20 NMAC. Detected analytes included 7 VOCs, total organic carbon, one herbicide, 15 metals, radium, perchlorate and 13 inorganic compounds. Each of the detected analytes is included in the facility's approved alternate parameter list (**Table V.2.2**), except for four Subsection B analytes, including dichlorodifluoromethane, perchlorate, sulfide and dacthal. It was noted that TCE was detected at a concentration below its SSAML and the CAL during this sampling event. Chloride was noted to exceed its SSAML and uranium was found to exceed its PAML and CAL in the November 15, 2017 Well G samples. Results of the November 15, 2017 Well G Assessment monitoring event were provided to NMED-SWB on January 13, 2018. An Alternate Source Demonstration for chloride and uranium concentrations in Well G was submitted to NMED-SWB on March 29, 2018. The September 2018 groundwater monitoring event completed the fourth and final background monitoring event for additional analytes in Well G and Well D set forth in the July 18, 2017 AMP. A discussion of history of Assessment Monitoring associated with Well G detections is included in the 2018 Annual Groundwater Monitoring Report (Carel, 2018), and a copy of the report is included as **Attachment V.2.C.**

Well G is scheduled to be decommissioned prior to construction of Unit 4 waste cells. It is anticipated that the Groundwater Monitoring Plan and AMP will be amended to allow assessment monitoring to continue, with future downgradient assessment and detection monitoring data being obtained from Well F. Upgradient monitoring will continue, using Well D2 as the upgradient well.

5.0 GROUNDWATER SAMPLING AND STATISTICAL ANALYSIS

5.1 Groundwater Sampling

Groundwater sampling and analysis for CRLF will continue to be performed in accordance with 20.9.9.10 NMAC, and the U.S. Environmental Protection Agency's (EPA's) *Solid Waste Disposal Facility Criteria Technical Manual* (1998, EPA 530-R-93-017, revised April 13, 1998). This Plan serves to notify the Secretary that documentation for a sampling and analysis program has been placed in the Facility Operating Record.

5.2 Statistical Analysis

Periodically, it may be necessary to update the current established AMLs for select Subsection A inorganic parameters based on natural fluctuations in groundwater quality over time. In addition, when the appropriate number of background samples (i.e., a total of five independent samples) has been collected for future wells (e.g., Wells D2, H, I, and A2), these water quality data will be evaluated on an intrawell basis, consistent with current practice. The background groundwater monitoring database for these wells will be used to calculate UTLVs, and to assign established AMLs for each organic and inorganic parameter listed in 20.9.9.20 NMAC Subsection A, as well as background concentration values (BCVs) for each Subsection C parameter (with the exception of depth-to-water and groundwater elevation).

The statistical analyses used for these purposes may include limited application of the methods employed in the *January 2006 Update*, as well as methods commensurate with the *USEPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance, March 2009*, as appropriate. Statistical evaluations may also include utilization of the NMED-approved Sanitas™ software program, as applicable. Calculated UTLVs for Subsection A parameters that are above the regulatory presumptive AML will be established as the AML for that particular parameter. For UTLVs below the presumptive AML, the presumptive AML will be established as the AML. The established AMLs will then be used to evaluate groundwater monitoring data for potential AML exceedances and statistically significant increases (SSIs) in parameter concentrations for all active wells during subsequent monitoring events.

6.0 DETECTION MONITORING PROGRAM

6.1 Water Quality Assessment

The established AMLs for each well/parameter combination from the 08/06/10 *Groundwater Monitoring Report* are summarized in **Attachment V.2.**D and will be used to determine if an apparent SSI is evident for a particular parameter for detection monitoring events. Detection monitoring threshold values found to exceed their established AML for one or more sampling events will be assessed individually to determine if a source other than the landfill is a reasonable

cause for the apparent exceedance. If the groundwater quality results are below the established AML (or within the allowable range for pH), routine detection monitoring will continue. If an established AML has been exceeded, verification re-sampling will be performed as discussed in the following Section.

6.2 Verification Re-Sampling

Consistent with the requirements of 20.9.9.11.C(1) NMAC, when one or more Subsection A parameter(s) apparently exceeds its respective established AML for a specific sampling event, two actions will be initiated:

1. a notice that the groundwater quality result exceeded the established AML will be placed in the Facility Operating Record within 14 days of the observation.
2. the Secretary will be notified that the notice was placed in the Facility Operating Record.

After completion of the above notification activities, verification re-sampling (VRS) will be implemented within 90 days of the date of initial sampling to confirm if the original laboratory result was not the result of either a sampling and analysis error, or temporal/spatial variations in groundwater quality. During VRS, only the parameter(s) that exhibited an established AML exceedance will be analyzed.

If the results of VRS confirm that the concentration(s) of the parameter(s) of concern are not statistically significant, upon NMED approval, annual monitoring and reporting will continue. Consistent with the requirements of 20.9.9.11.C(3) NMAC, within 60 days after the finding, a report providing data that demonstrate that a source other than the landfill caused the AML exceedance (e.g., the result of an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality) will be prepared and certified by a Qualified Groundwater Scientist; and placed in the Facility Operating Record and submitted to NMED for specific approval. NMED will be notified of both the original and re-sampling results when the data are reported. If the results of VRS confirm the original analytical result, the two actions noted above will be implemented, and discussions with NMED will be initiated to develop a comprehensive list of measures to evaluate potential groundwater quality impacts.

6.3 Assessment Monitoring

CRLF will comply with the assessment monitoring requirements of 20.9.9.13.B NMAC, as well as the AML exceedance requirements of 20.9.9.10.M(2) and (3) NMAC. Assessment monitoring will be initiated if the results of VRS confirm that an established AML has been exceeded. Consistent with the requirements of 20.9.9.11.C(2) NMAC, an Assessment Monitoring Plan that meets the requirements of 20.9.9.13 NMAC will be submitted to NMED within 60 days of confirming that an established AML has been exceeded. Within 90 days of

verifying this finding, and annually thereafter, groundwater samples will be collected and analyzed for all constituents listed in Subsections B&C of 20.9.9.20 NMAC for each downgradient well. For any constituents detected in this analysis which did not have established AMLs, a minimum of four samples will be collected and analyzed to establish background groundwater quality within 120 days of commencing the assessment monitoring program.
Background concentrations for Subsection B parameters will be submitted to NMED for specific approval in accordance with 20.9.9.10.E NMAC. Consistent with the requirements of 20.9.9.13.D(1) NMAC, after background groundwater quality for the additional parameters has been established according to 20.9.9.13.B NMAC, NMED will be notified and the results placed into the Facility Operating Record within 14 days. In accordance with 20.9.9.13.D(2), within 90 days, and at least semi-annually, groundwater samples from all wells will be collected and analyzed for all constituents listed in Subsections A&C, as well as any Subsection B parameters that were detected. During the post-closure care period, samples will be collected from all wells and analyzed for all 20.9.9.20 NMAC Subsection B parameters no less frequently than once every 5 years.

If the concentration of each Subsection A parameter, and each detected Subsection B constituent, is shown to be at or below the established AML after two sampling events, NMED will be notified in writing and routine detection monitoring will resume. If the concentration of any constituent listed in 20.9.9.20 NMAC is above the AML, but below the corrective action level (CAL), assessment monitoring will continue in accordance with 20.9.9.13 NMAC. Corrective action levels for each Subsection A inorganic parameter/well combination, as well as site-wide CALs for each organic parameter, are listed in **Attachment V.2.D**. If one or more constituents listed in 20.9.9.20 NMAC is detected above the corresponding CAL in any sampling event, CRLF will:

1. within 14 days of this finding, notify NMED and all appropriate local government officials in writing
2. install at least 1 additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with 20.9.9.13 NMAC within 6 months
3. characterize the nature and extent of the release by installing additional monitoring wells as necessary within 1 year of the finding of the exceedance
4. notify area residents and land owners in the same manner as described in 20.6.2.4108.B NMAC
5. initiate an Assessment of Corrective Measures (ACM), as required by 20.9.9.15 NMAC, within 90 days

As allowed by 20.9.9.13.G NMAC, CRLF may demonstrate that a source other than the facility may have caused the contamination; or that the increase resulted from an error in sampling, analysis, statistical evaluation, or natural variation in ground water quality. A report

documenting this demonstration will be certified by a qualified groundwater scientist and submitted to NMED for review and specific approval. If the demonstration is specifically approved by NMED, CRLF will return to detection monitoring. Until the successful demonstration is made, CRLF will comply with 20.9.9.12 - 20.9.9.20 NMAC, including initiating an assessment of corrective action.

Consistent with 20.9.9.13.H NMAC, within 90 days after any AML exceedance during assessment monitoring, CRLF will identify the GWPS for each constituent in 20.9.9.20 NMAC that exceeded the AML in the groundwater that was not identified pursuant to 20.9.9.10.I NMAC. CRLF will propose for NMED approval GWPSs for any constituent that exceeded the AML pursuant to 20.9.9.13.B NMAC and 20.9.9.13.D(2) NMAC that does not have a maximum contaminant level (MCL) or numeric standard in New Mexico Water Quality Control Commission rules. CRLF will make a demonstration that the proposed standard will be protective of the public health and the environment, in accordance with 20.9.9.13.I NMAC.

Consistent with the requirements of 20.9.9.15 NMAC, upon finding that the concentration of any constituent listed in 20.9.9.20 NMAC has exceeded its respective CAL, CRLF will initiate an ACM. The ACM will be submitted to NMED within 180 days of the finding, and CRLF will continue to monitor in accordance with the assessment monitoring program as specified in 20.9.9.13 NMAC. The assessment will include the following demonstrations:

Table V.2.4
Camino Real Landfill
Assessment Monitoring Program Demonstrations

1. the extent and nature of contamination
2. the practical capabilities of remedial technologies in achieving compliance with groundwater protection standards and other objectives of the remedy
3. the availability of treatment or disposal capacity for wastes managed during implementation of the remedy
4. the desirability of utilizing technologies that are not currently available, but which may offer significant advantages over available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives
5. the potential risks to public health, welfare and the environment from exposure to contamination prior to completion of the remedy
6. the resource value of the aquifer, including:
    - current and future uses
    - proximity and withdrawal rate of users
    - groundwater quantity and quality
    - the potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents
    - the hydrogeologic characteristic of the facility and surrounding land

- groundwater removal and treatment costs
- the cost and availability of alternative water supplies

7. the practicable capability of the owner or operator
8. the performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts and control of exposure to any residual contamination
9. the time required to begin and complete the remedy
10. the costs of remedy implementation
11. the institutional requirements for local permits or other environmental or public health requirements that may substantially affect implementation of the remedy(ies)
12. the need for interim measures in accordance with the provisions of 20.9.9.17A(3) NMAC
13. an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives and evaluation factors of the remedy as described in 20.9.9.16 NMAC
14. other relevant factors

CRLF will discuss the results of the ACM, prior to the selection of a remedy, in a public meeting with interested and affected parties. Notice of the public meeting will be provided the same as that specified in the Solid Waste Act for permit applications and 20.9.9.13.G(4) NMAC. The public notice will also contain the following information:

Table V.2.5
Camino Real Landfill
Assessment Monitoring Public Notice Requirements

1. name, address, and telephone number of the owner or operator and contact person
2. name and location of the facility
3. meeting location, date, and time
4. nature and extent of the plume
5. brief description of the ACM and the preferred remedy(ies) of the owner or operator
6. location where the ACM can be reviewed
7. information regarding the opportunity to submit oral or written comments at the public meeting, and until 30 days after the public meeting, regarding the assessment and proposed remedy(ies) for consideration by NMED

CRLF will prepare a record of the public meeting and submit it to NMED.

7.0 MONITORING METHODOLOGY

7.1 Initial Observations

Prior to well purging activities, the sampling team will perform a visual inspection of each well. The following items will be noted and recorded on a "Field Notes Form" similar to that provided as **Attachment V.2.E**:

- Condition of well casing

- Condition of concrete pad and bollards (if installed)
- Presence and condition of protective casing, cover, lock, and external identification
- Weather conditions at time of sampling
- Evidence of vector harborage and odors
- Visibility of well

7.2 Groundwater Elevation Measurements

Following the visual inspection, the static water level in each well will be recorded on the Field Notes Form in order to calculate the volume of water to be purged prior to sampling. Depth-to-water measurements will be recorded to the nearest 0.01 foot each time groundwater sampling is performed, and will be referenced from permanently marked survey locations on the top of the well casing. All elevations will be referenced to the National Geodetic Vertical Datum. An electronic water level indicator calibrated to the nearest 0.01 foot will be used for static water level measurements. These data will be used to develop groundwater contour maps and flow directions, as well as to calculate groundwater gradients and velocities. The groundwater elevations will be measured within a period of time short enough to avoid temporal variations in groundwater flow which could interfere with accurate determination of groundwater flow rate and direction.

7.3 Well Evacuation

Each well will be purged using the dedicated submersible pump or, in the case of Well G, a low-flow dedicated bladder pump. In the event of pump malfunction, a Teflon®, PVC, or stainless steel bailer may be used for purging. In order to minimize well water agitation and volatilization of organic compounds, bailers will be equipped with bottom-emptying devices.

In order to ensure that samples collected are representative of the site's groundwater quality, stabilization of field parameters will be used as the primary criteria by which purging is deemed complete. For example, water will be purged from each well until pH, temperature, and specific conductance (SC), and have stabilized to within an acceptable range. As a guideline, stabilization will be considered complete after field parameters are within an acceptable range for three successive readings made several minutes apart as follows:

- pH: ± 0.1 standard units
- Temperature: ± 5%
- Specific conductance: ± 3%

In the event that stabilization of field parameters is not possible, a minimum of three well volumes will be removed, or the well will be purged dry, prior to sample collection. If a well is

purged dry, up to 24 hours will be allowed for the well to recharge prior to sample collection. Three well volumes will be calculated using the following formula:

V = (3) X [(TD-DTW) X (well diameter conversion factor)]

Where:

- V = three well volumes (gallons)
- TD = total depth of the well (feet), prior to pump installation
- DTW = static water level or depth-to-water in the casing (feet), prior to purging
- well diameter conversion factor = 0.65 for a 4-inch-diameter well

Equipment used for well purging will include the following:

- Well pump/bailer
- Electrical generator and/or motor used to supply power to the pump
- Disposable latex gloves for the sampling team
- Graduated container for purge volume measurements

The well purging procedure will be performed as follows:

Table V.2.6
Camino Real Landfill
Well Purging Procedure

1. Calibrate pH and SC meters in accordance with the manufacturer's specifications.
2. Record static water level measurements with decontaminated depth-to-water meter.
3. Calculate one well volume and three well volumes.
4. Begin purging at a low flow-rate (from 300-500 mL per minute or less).
5. Ensure that the purged water is diverted away from the well.
6. Purge water may also be collected and retained in plastic 5-gallon containers.
7. Record field parameter measurements at approximately 2-minute intervals.
8. Continue purging at a low flow rate and recording field measurements until 3 consecutive field measurements verify that stabilization of field parameters has occurred.
9. If stabilization of field parameters is not possible, remove 3 well volumes of water, or continue purging until the well is dry.

7.4 Sample Collection

Sampling will be performed using the dedicated submersible pump or, in the case of Well G, a low-flow portable pump. In the event of pump malfunction, a Teflon®, PVC, or stainless-steel bailer may be used for sampling. Sample bottles will be supplied by the laboratory performing the analysis and will be constructed of materials appropriate for the analytical tests to be performed. Appropriate preservatives will be added to the bottles by the laboratory before each sampling event. Groundwater samples will be collected immediately following purging for wells where stabilization of field parameters has occurred and the well continues to produce water.

If a well is pumped dry during purging, the sample will be collected within the subsequent 24-hour period. During sampling, the water flow rate delivered by the pump will be reduced to minimize agitation of the sample. The outlet of the sampling pump discharge tubing or bailer should not come into direct contact with the sample vial or the water within the vial. Groundwater samples will not be field-filtered. However, field-filtering may be conducted as a comparison to unfiltered samples to determine the effects of turbidity on metals concentrations. The filtering (using a filter medium size of 0.45 µm) is designed to remove entrained sediments to determine whether metals are either adsorbed onto the surfaces of entrained sediments or are a part of the mineral complex that makes up the sediments.

Sample bottles will be filled in an order based on the sensitivity of the parameters slated for analysis. For example, volatile organic compound (VOC) vials will be filled first, followed by bottles for the remaining organic analytes. Bottles for inorganic analytes will be filled after the organic bottles. Care should be taken to ensure that no air is entrapped in the sample vials to be analyzed for VOCs. The sample vial should be held at an angle so that aeration is minimized. A convex meniscus should form across the mouth of the filled vial. When the vial is capped, the vial should be inverted to ensure that no entrapped air is present. If entrapped air is present, the sample will be recollected in a new vial. The sampling team will wear gloves fabricated of inert materials that will not introduce contaminants into the sample bottles. Gloves will also be worn during sampling activities (e.g., well sounding and purging, sampling, equipment decontamination, etc.)

7.5 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

The procedures described in this Section are specifically prescribed for field decontamination of sampling equipment. All non-disposable field equipment that may potentially come in contact with any soil, sludge or water sample shall be decontaminated in order to minimize the potential for cross-contamination between sampling locations. Thorough decontamination of all sampling equipment shall be conducted before each sampling event. In addition, the sampling team will decontaminate all equipment in the field as required to prevent cross-contamination of samples. At a minimum, field sampling equipment should be decontaminated following the procedures listed below:

- Wash the equipment in a solution of non-phosphate detergent (e.g., Liquinox®) and/or distilled/deionized water, as appropriate. All surfaces that may come in direct contact with the samples should be washed. Use a clean Nalgene® and/or plastic tub to contain the wash solution and a scrub brush to mechanically remove loose particles. This step is necessary only for grossly contaminated equipment and should be repeated as necessary. Wear clean latex or plastic gloves during all washing and rinsing operations.
- Dry the equipment before use, to the extent practicable.

- Rinse twice with distilled/deionized water.
- Wrap equipment for transport with inert material (aluminum foil or plastic wrap) to prevent direct contact with potentially contaminated material.

The only equipment that should be subject to decontamination procedures are the portable sampling pump (as applicable), depth-to-water meter, specific conductance meter, pH meter, and temperature probe/meter. Typically, liquid and solid material generated from the decontamination process should be contained and disposed at an appropriate off-site location. Stainless steel or plastic stock tanks may be positioned at discrete, non-accessible locations around the site for temporary containment/evaporation of purge waters.

7.6 Instrument Calibration and Frequency

After sample collection is complete, the final pH, temperature, and SC measurements will be recorded in the field on the Field Notes Form. At a minimum, field instrumentation will be calibrated at the beginning of each day that sampling activities are performed. The instrument(s) will be capable of measuring pH to the nearest 0.1 standard unit (SU), temperature to the nearest tenth of a degree, and SC to at least 3 significant figures. Field instruments will be calibrated routinely in order to ensure that reliable data are generated. The calibration and maintenance of field equipment will be the responsibility of field personnel. Complete procedures for operating, maintaining, and calibrating instruments used in field measurements are provided in the manufacturer's instruction manual for each instrument. The personnel using field instruments are required to read, and be thoroughly familiar with, the procedures detailed in these manuals. Documentation of calibrations will be included on the Field Notes Form.

7.7 Sample Preservation and Handling

For metals analyses, the laboratory will supply new containers made of either fluorocarbon resin or polyethylene with polypropylene caps. For inorganic analyses, containers made of either polypropylene or glass will be used, depending on the specific parameter. For organic analyses, the laboratory will supply new glass bottles with fluorocarbon resin-lined caps that have been pre-cleaned and capped by the bottle supplier or manufacturer. Chemical reagents specific to the analyses to be performed will be placed into the appropriate bottles by the laboratory prior to sampling. Following sample collection and bottle labeling, the samples will be placed into a cooler with ice to maintain the sample temperature near 4°C until delivery to the laboratory.

7.8 Documentation of Sampling and Transport

Each sample bottle will have an identification label securely attached to it. The label will be sufficiently durable and remain legible when wet. At a minimum, the following information will appear on the label:

- Sample identification
- Sampler's name or initials
- Date and time of sample collection

- Project location
- Parameters for analysis or laboratory test method
- Laboratory name

If samples are to be shipped by a common carrier or third-party, then chain-of-custody seals will be placed on either the sample bottles or shipping container as a means to verify that the samples were not disturbed during transit.

7.9 Chain-of-Custody

Chain-of-custody records will be completed and will accompany all samples. The chain-of-custody records will include the following information:

Table V.2.7
Camino Real Landfill
Chain-of-Custody Information

1. Sample number and/or identification of well
2. Signature of collector
3. Date and time of collection
4. Sample type (e.g., groundwater)
5. Number of sample containers
6. The signature of person(s) involved in the chain of possession from the point of sampling until receipt by the laboratory that will perform the analyses
7. Inclusive dates and times of possession
8. Laboratory sample number (if different from field number)
9. Parameter and test method (EPA or equivalent)

7.10 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) includes the collection of trip blanks, field blanks, and field duplicates to ensure field sampling quality and laboratory reproducibility/precision. Each type of QA/QC sample is described briefly below:

- *Trip blanks* – Trip blanks will be used as a check on possible contamination originating from container preparation methods, shipment, handling, storage, or other site-specific conditions. Trip blanks typically consists of two 40-milliliter (mL) volatile organic analysis (VOA) vials filled with organic-free water. Trip blanks will be prepared by the laboratory and analyzed for VOCs using EPA Method 8260. Trip blanks are generally sent to the laboratory with each cooler containing the samples to be analyzed for VOCs.
- *Field Blanks* – Field blanks typically consist of a set of four VOA vials that are filled with distilled or deionized water at sampling locations that are proximate to possible sources of ambient sample contamination. These locations are variable from sampling event to sampling event and are predicated on the closest possible contaminant source at the time of sampling (e.g., generator exhaust, active fill face, noticeable ambient air contaminant sources, etc.).
- *Field Duplicates* – Field duplicates are samples collected in parallel at the same location using the same procedure as the original sample. The same container type, preservative, and sampling technique are used. These samples are submitted to the laboratory as

separate samples, and typically include the same number of VOA vials used for standard VOC analysis; but could also include sample bottles for other analytical parameters. The results of these samples are used to document the field sampling, preservation, and handling techniques; and to evaluate laboratory analytical precision.

Field duplicates are typically submitted as "blind" samples to the laboratory, and the chain-of-custody and laboratory analytical request forms for the field duplicates must not contain any indication that the samples are duplicates. Field duplicates should be collected from various wells used for the monitoring activity, not from the same well repeatedly.

In addition to analysis of QA/QC samples, cation-anion balance may be calculated for the groundwater samples, if appropriate. After all major cations and anions have been determined, the sum of cations should be equal to the sum of anions (in milliequivalents per liter). For waters of moderate total dissolved solids (TDS) concentration [i.e., 250 to 1,000 milligrams per liter (mg/L)], the difference between the two sums generally should not exceed 5% - 10% of the sum of cations plus anions.

8.0 DATA EVALUATION

8.1 Laboratory Data Evaluation

Each laboratory analytical report will provide internal laboratory QA/QC information, as well as sample-specific analytical data. The analytical laboratory currently performing groundwater analyses for CRLF is Hall Environmental Analysis Laboratory, Inc. (HEAL) of Albuquerque, NM. HEAL is nationally certified through the National Environmental Laboratory Accreditation Program (NELAC), the State of Arizona, and the State of New Mexico Drinking Water Bureau. A summary of HEAL's accreditation and commitment to QA/QC documentation for analytical reports is provided as **Attachment V.2.F**. Laboratory analytical data will be reviewed in order to confirm that the data meet QA/QC requirements, and this review will include:

- Cross-checking analyses requested in chain-of-custody documentation against analyses listed as performed in the laboratory report
- Checking computerized data entries
- Checking the adequacy of detection limits obtained in the laboratory against the laboratory method reporting limits (MRLs)
- Calculating cation-anion balances, if appropriate
- Reviewing the laboratory report case narrative that summarizes QA/QC issues that the laboratory has identified
- Reviewing laboratory analytical results for trip blanks, field blanks, and field duplicates samples

Procedures for reviewing and evaluating field and laboratory analytical data for groundwater samples to be performed after each sampling event include:

1. Identifying outliers or anomalies
2. Reviewing groundwater data for VOC detections

3. Comparing the results to regulatory presumptive AMLs and GWPSs
4. Comparing the results to previously calculated UTLVs using statistical analysis of historical well analytical data
5. Performing trend analyses, as appropriate

As part of the analytical data review, the results for each parameter will be compared with corresponding historical data to identify any anomalies or gross water quality changes. If a new result is outside of 20% of the historical range, the laboratory will re-evaluate the result to determine if there were any errors in procedures or reporting. New data will also be examined for anomalies. If a result is considered suspect, the laboratory will be requested to review results that differ from historical results, or that exceed certain regulatory requirements or QA/QC criteria. Further evaluation may include:

- Verification of proper field sampling protocol
- Verification of proper implementation of all laboratory analytical methods and QA/QC procedures
- Review of the acceptability of cation/anion balances, as appropriate
- Assessment of changes in water levels, hydraulic gradients, and other applicable hydrogeologic conditions
- Assessment of changes in facility operations

9.0 REGULATORY REPORTING

Pursuant to 20.9.9.10.N NMAC, the following information will be reported to NMED within 90 days following each sampling event, as applicable:

Table V.2.8
Camino Real Landfill
Groundwater Reporting Requirements

1. The constituents and parameter tested
2. The test method (U.S. EPA or equivalent) for each constituent and parameter
3. The groundwater protection standard (GWPS) for each constituent detected (if a numeric standard has been established)
4. The method detection limit (MDL) for each constituent
5. The practical quantitation limit (PQL) for each constituent and parameter
6. The well number and location for each sample
7. The laboratory ID sample number
8. Chain-of-custody documentation
9. The date sampled
10. The date received at the laboratory
11. The date analysis commenced
12. Results, with constituent or parameter, chemical abstract system number, concentration with units, approved established AML, GWPS, PQL, qualifier code (e.g., J, B, U, etc.), well number, and sample date
13. Sample preservation (field data) and field notes
14. Field blank results and trip blank results

15. Quality assurance/quality control (QA/QC) summary report (laboratory blanks, spike recoveries, etc.)
16. Anomaly report (non-conformance with QA/QC plan, corrective actions, etc.)
17. Laboratory review (signature and date)
18. An updated groundwater elevation contour map for the facility or, if groundwater elevation data are insufficient to contour, then the groundwater elevation for each monitoring well, prior to purging, reported on a well location map
19. The approved background concentration levels as determined in accordance with 20.9.9.10.E NMAC
20. A certification by a Qualified Groundwater Scientist that established AMLs have or have not been exceeded

CRLF will submit groundwater monitoring reports for each sampling event which will provide the following information:

Table V.2.9
Camino Real Landfill
Groundwater Monitoring Report Elements

1. Groundwater monitoring and analytical data
2. Comparison of established AMLs to analytical results
3. Statistical calculations and summaries, as applicable
4. A summary of the statistical results and/or any statistical increases, as applicable
5. Static water level readings for each monitoring well prior to purging
6. A summary of groundwater flow rate and direction, noting any changes or trends
7. A potentiometric surface elevation map based on water level measurements
8. A summary of the geochemical evaluations, noting any changes or trends in cation-anion balances (if appropriate), Piper (trilinear) diagrams, and general water quality for each monitoring well
9. A summary of any data problems, such as QA/QC failures, flagged data, or switched samples
10. Itemization of any activities resulting from the exceedance of a relevant standard or significant change in groundwater quality, such as re-sampling, submittal of additional assessment workplans, or implementation of corrective action measures
11. Copy of Field Notes Form

The report will be provided in either hard copy or electronic format on a compact disc [i.e., portable document format (.pdf)], as requested by NMED. This Plan has been developed consistent with the requirements of 20.9.9.9.C NMAC, and the certification statement of Mr. Michael J. Crepeau, P.E., a Qualified Groundwater Scientist, that the Plan was developed in compliance with 20.9.9 NMAC is provided as **Attachment V.2.G** on the form provided by NMED.

Attachment V.2.A
Monitoring Well Borehole Logs

Revised June 1971

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Sunland Park NuMex Landfill Owner's Well No. _____
Street or Post Office Address P. O. Box 580
City and State Sunland Park, NM 88063

Well was drilled under Permit No. LRG 6726 and is located in the:

a. _____ ¼ NW ¼ SE ¼ SW ¼ of Section 12 Township 29S Range 3E N.M.P.M.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor LarJon Drilling Company License No. 611

Address P. O. Box 925 Mesilla Park, New Mexico 88047

Drilling Began 1/20/88 Completed 1/28/88 Type tools Mud Rotary Size of hole 12-1/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 400 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 212 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
322	400	78	Sand & Sandy Clay	180

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
8	Steel		0	300	300	-	-	-
6	PVC		0	400	400		320	400

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
0	300	12-1/4	40	150	Pump
300	400	7-7/8	5 gal. Polymer		Pump

Section 5. PLUGGING RECORD

Plugging Contractor _____
Address _____
Plugging Method _____
Date Well Plugged _____
Plugging approved by:
_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

Date Received May 3, 1988

FOR USE OF STATE ENGINEER ONLY

Quad _____ FWL _____ FSL _____

File No. LRG-6726 Use CLOW Location No. 29S.3E.12.341

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	8	8	Blow Sand
8	49	41	Pink Sandy Clay
49	55	6	Clay
55	64	9	Sandy Clay
64	102	38	Sand
102	111	9	Tight Clay
111	204	93	Sandy Clay
204	208	4	Tight Clay
208	285	77	Sandy Clay
285	288	3	Tight Clay
288	313	25	Sandy Clay
313	320	7	Sand
320	322	2	Clay
322	340	18	Sandy Clay
340	347	7	Sand
347	376	29	Sandy Clay
376	392	16	Sand
392	400	8	Sandy Clay

Section 7. REMARKS AND ADDITIONAL INFORMATION

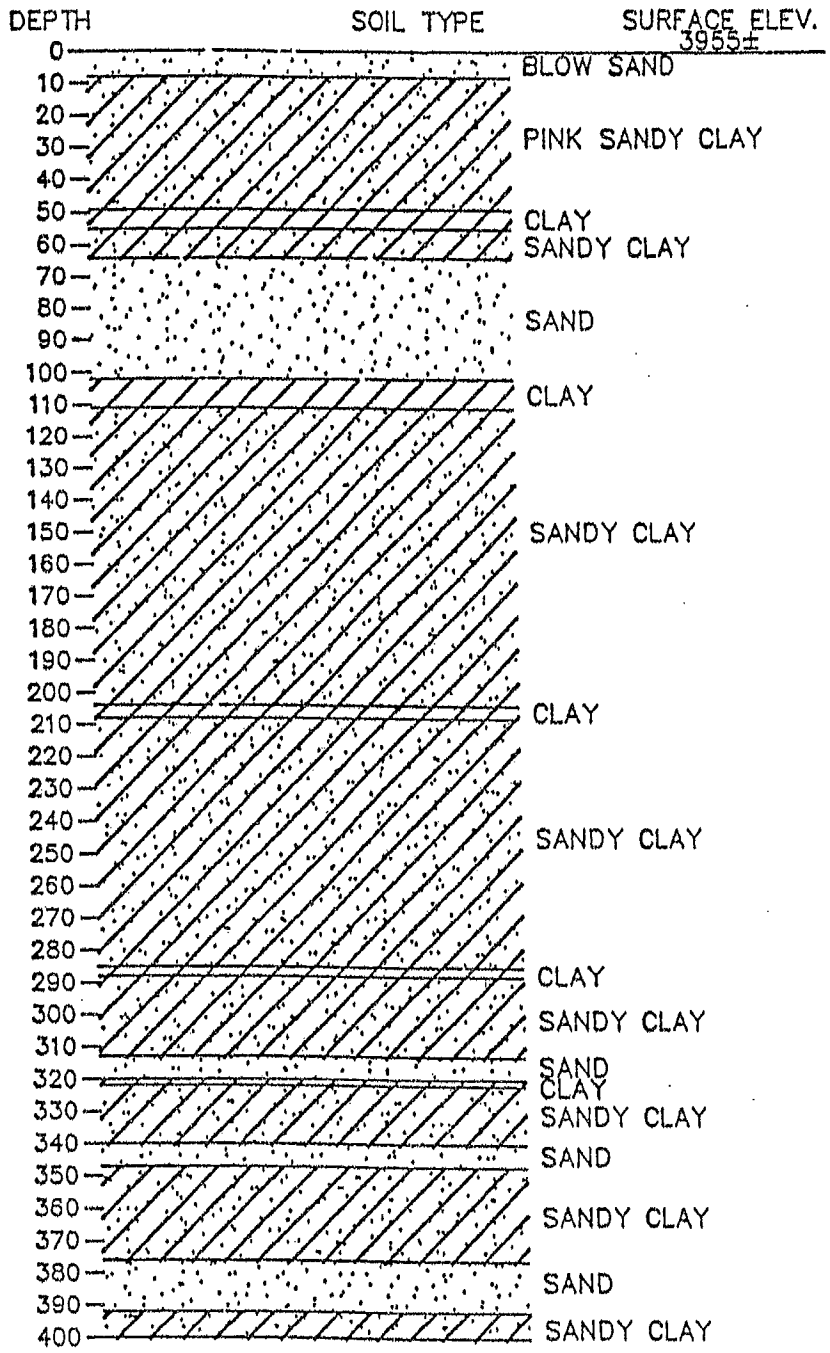
The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the abo described hole.

Sonny Johnson
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted [illegible] district off

LOG OF NUMEX LANDFILL WELL "A"

NW 1/4, SE 1/4, SW 1/4 SEC.12 29S 3E NMPM.



611-070

LOG OF WELL-B

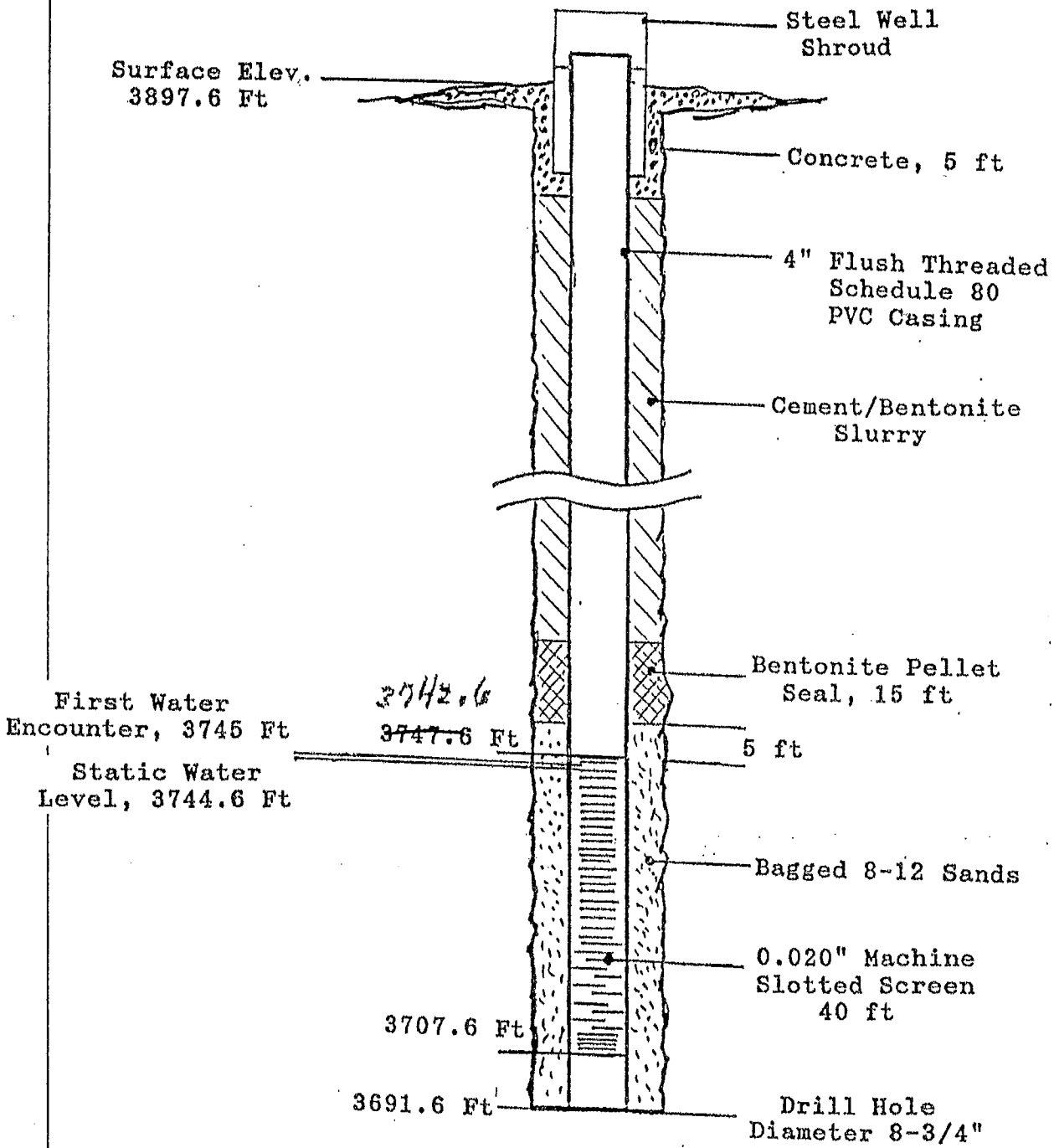
Location: Grid 18N, 31E
Surface Elevation: 3895.2 ft

Name: New Well B
Date: 08-22-90

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	30	30	Sand - tan, fine
30	40	10	Clay - brown
40	59	19	Sand - tan, silty
59	90	31	Sand and Clay
90	110	20	Clay and Sand - with some sandstone
110	126	16	Clay - brown, tight
126	157	31	Clay and Sand - with some sandstone
157	168	11	Sand - tan, coarser, water
168	170	2	Clay - brown, tight
170	184	14	Clay and Sand
184	206	22	Sand and Clay
			206 ft. total depth

Nu-Mex Landfill Ground Water Monitoring Well Details

Well-B



LOG OF WELL-C

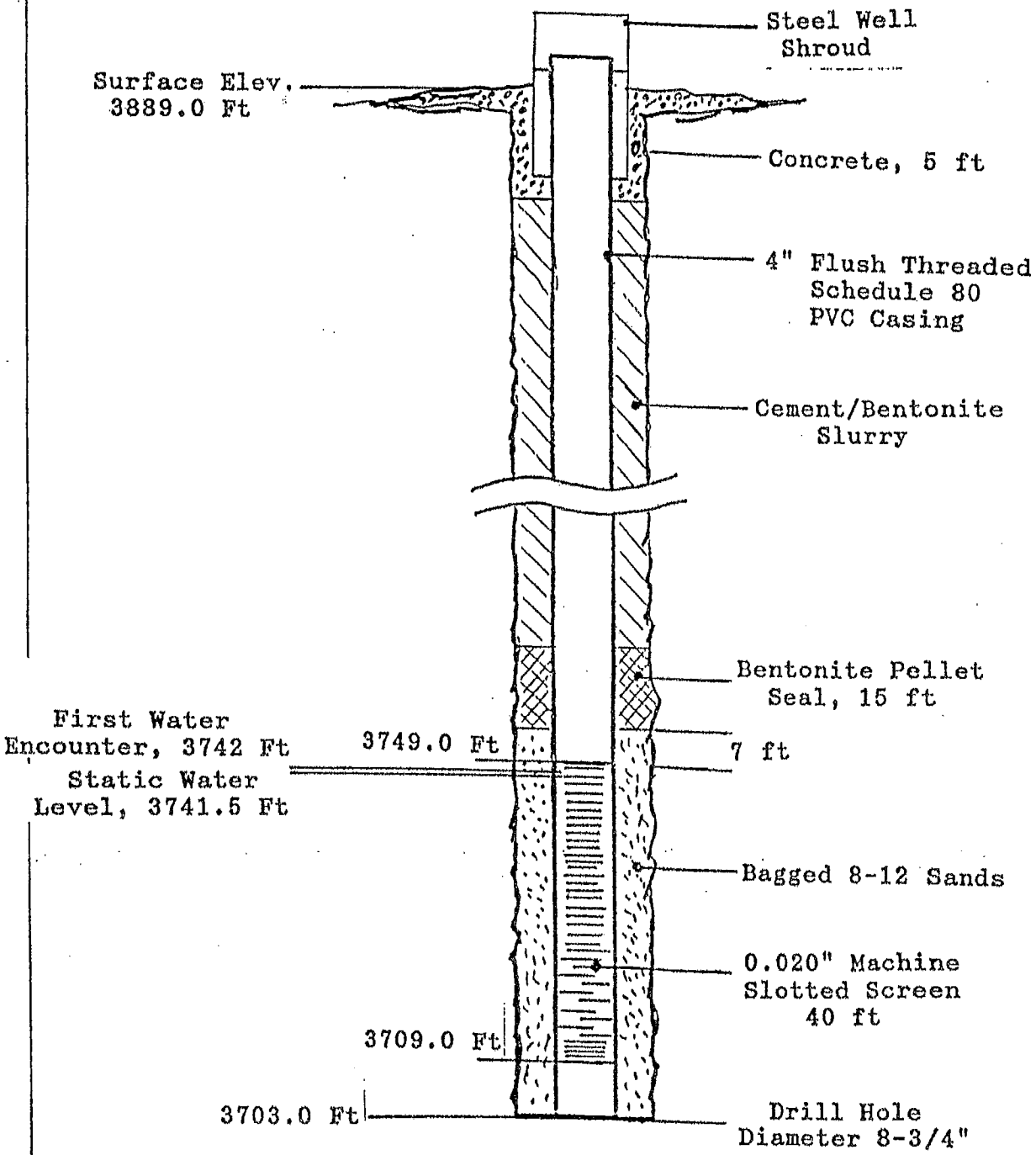
Location: Grid 10N, 46E
Surface Elevation: 3886.0 ft

Name: New Well C
Date: 08-25-90

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	26	26	Sand - tan, fine
26	55	24	Sand and Clay - interbedded layers
55	80	25	Sand - grey, with few clay layers
80	95	15	Clay and Sand
95	113	18	Clay - brown, tight
113	147	34	Clay and Sand
147	160	13	Sand - white, with some sandstone, water
160	185	25	Sand and Clay
			185 ft total depth

Nu-Mex Landfill Ground Water Monitoring Well Details

Well-C



LOG OF WELL D

Location: Grid 15S, 5E
Surface Elevation: 4128 ft

Name: New Well D
Date: 01-28-91

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
0	3	3	Top soil
3	8	5	Caliche - duracrust
8	25	17	Sand
25	31	6	Clay
31	44	13	Sandy Clay
44	65	21	Sand
65	90	25	Sand and Clay
90	140	50	Sandy Clay
140	155	15	Sand
155	176	21	Clay with some sand
176	206	30	Sand
206	226	20	Clay
226	235	9	Sand
235	242	7	Clay
242	255	13	Sand and Clay
255	265	10	Clay
265	280	15	Sand and Clay
280	293	13	Clay
293	305	12	Sand
305	311	6	Clay
311	320	9	Sand

LOG OF WELL D

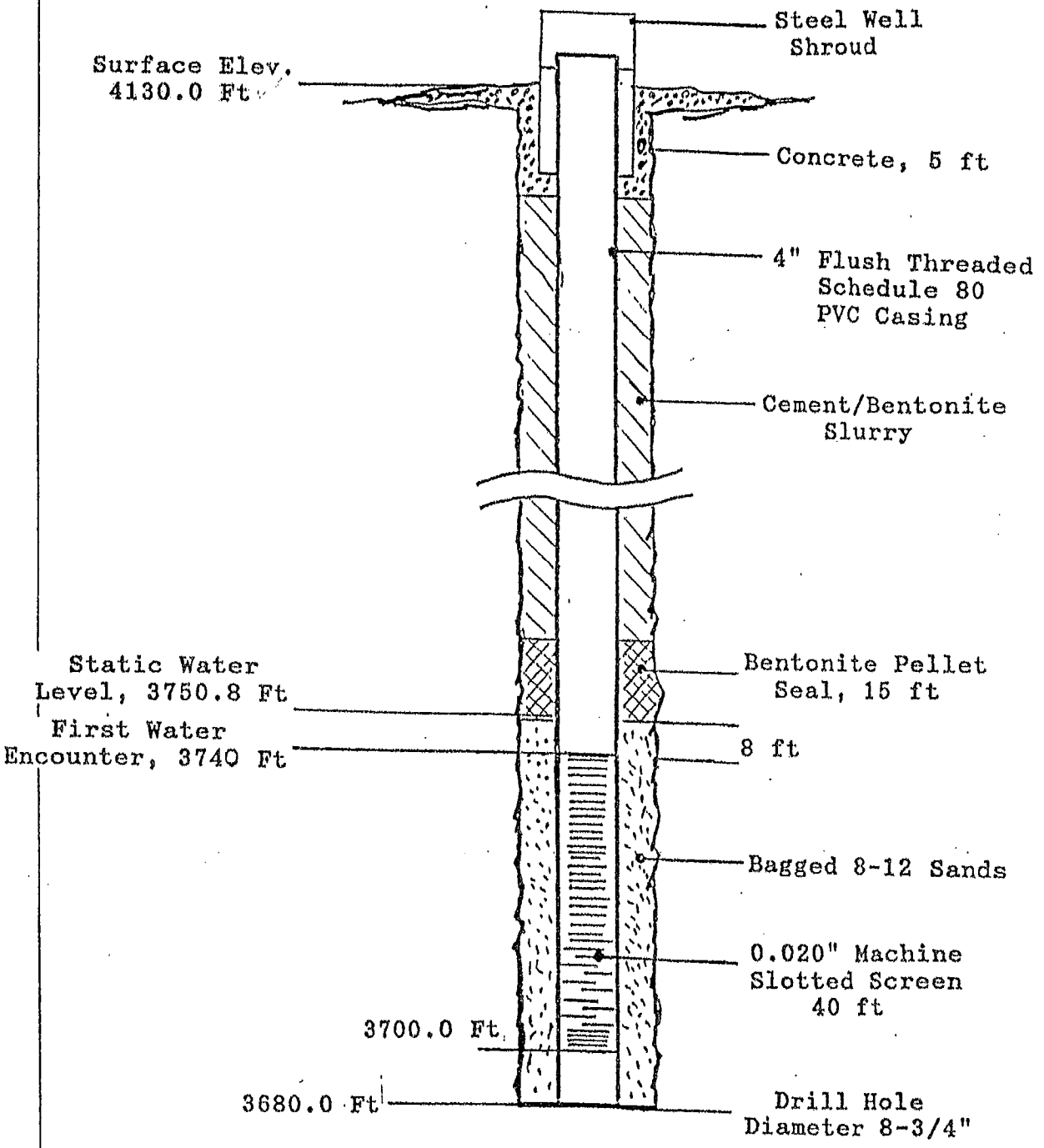
Location: Grid 15S, 5E
Surface Elevation: 4128 ft.

Name: New Well D
Date: 01-28-91

Depth (ft) From	To	Thickness (ft)	Soil Description and Remarks
320	330	10	Clay
330	340	10	Sand
340	350	10	Hard Clay
350	370	20	Sand
370	396	26	Hard Clay
396	412	16	Sand
412	420	8	Sand and Clay
420	423	3	Clay
423	441	18	Sand and some clay
441	443	3	Clay
443	450	7	Sand
			450 feet total depth

Nu-Mex Landfill Ground Water Monitoring Well Details

Well-D



Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-D2**	Page 1 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Centers, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.7 ft. at completion (below ground surface) water level data approximate	N: 105.24 E: 19.31 Elev.: 4133.28 top of steel well head	Logged by: DT Date started: 02/09/06 Date comp.: 02/11/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Topsoil and caliche	Quick, relatively quiet drilling to 95'
		Dune sand and caliche	
10		Silty sand	
		Silty sand	
20		Silty sand with caliche	
		Gravelly sand. Gravels are 3/8" or smaller, and consist of 50/50 quartz/mafics	
30		Sandy Siltstone	
		Silty, very coarse sandstone, 1/8" and smaller	
40		Sandy gravel. Gravels range from very coarse sandstone to 1/4"	
		Sandy gravel. Gravels are 1/2" and smaller	
50		Sandy coarse sandstone and gravels (from above?). Gravels still consist of 50/50 mixture of quartz and mafics	
		Silty coarse sandstone. Some gravels 1/2" and smaller	
60		Silty coarse sandstone	
		Very coarse sandstone with some gravels 1/2" and smaller. Lithology of gravels remains 50/50 quartzose/mafic	
70		Silty coarse sandstone and gravels 3/8" and smaller with calcite cementing. Some clay present.	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-D2**	Page 2 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Centers, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
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Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
80		Clay with some coarse sandstone lag	
		Sandy, silty, claystone	
		Silty claystone with some sandstone	
90		Silty, clayey, sandstone	
		Siltstone/claystone, grading to cemented gravels of 1/4" and smaller. Slight color change to a more grey color from a maroon color	Drilling more noisy. Contact with Hancock?
100		Claystone with some gravel lag	
		Coarse, poorly indurated, sandstone	
110		Coarse sandstone to 3/8" gravel	
		Coarse sandstone to 1/4" gravel	
120		Coarse, well-cemented, sandstone	
		Coarse, well-cemented, sandstone	
130		Coarse, well-cemented, sandstone	
		Coarse, well-cemented, sandstone	
140		Coarse, well-cemented, sandstone	
		Coarse, well-cemented, sandstone	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-D2**	Page 3 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Centers, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

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Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Coarse, well-cemented, sandstone. Clay lens at approximately 154' to 156'.	Drilling quiet and slow at 154' to 156'
		Coarse, well-cemented, sandstone	Drilling back to noisy and moderately quick
160		Small lens of kaolinite in a medium-grained to coarse-grained sandstone	Drilling becoming very slow and relatively quiet at approximately 164'
		Claystone with minimal fine-grained sandstone grading to a siltstone	
170		Claystone and siltstone	
		Claystone and siltstone	
180		Claystone and siltstone	
		Claystone and siltstone	
190		Claystone and siltstone	
		Claystone and siltstone and fine sandstone	Drilling becoming more noisy
200		Claystone and siltstone and fine sandstone	
		Claystone and siltstone and fine sandstone	
210		Claystone and siltstone and fine sandstone	
		Claystone	Drilling quiet and slow
220		Claystone	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-D2**	Page 4 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Centers, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
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Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
230		Claystone	
		Claystone with a small lens of gravel	Small zone of drill chatter, then back to quiet
		Claystone	
240		Mudstone	Drilling still rather slow but more noise
		Mudstone	
250		Mudstone	
		Mudstone	
		Mudstone	
260		Mudstone	
		Claystone	Drilling slow and quiet again
270		Claystone	
		Claystone	
280		Mudstone	Drilling slow with increased noise
		Siltstone to fine sandstone	Drilling quick with increased noise
290		Claystone	Drilling slow and quiet again
		Claystone	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-D2**	Page 5 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Centers, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
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Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Claystone to mudstone	Drilling speed and noise slightly increased
		Mudstone	
310		Mudstone	
		Mudstone	
320		Mudstone	
		Mudstone	
		Mudstone	
330		Mudstone	
		Mudstone	
340		Mudstone	
		Mudstone to a siltstone at 348'	Drilling quiet and fast
350		Claystone at 352'	Drilling quiet and slow
		Mudstone at 359'	Drilling noise and speed moderate
360		Coarse sandstone at 362'	Drilling noisy and fast
		Coarse sandstone	
370		Coarse sandstone to claystone to mudstone	Drilling noisy and relatively quick

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-D2**	Page 6 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Centers, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
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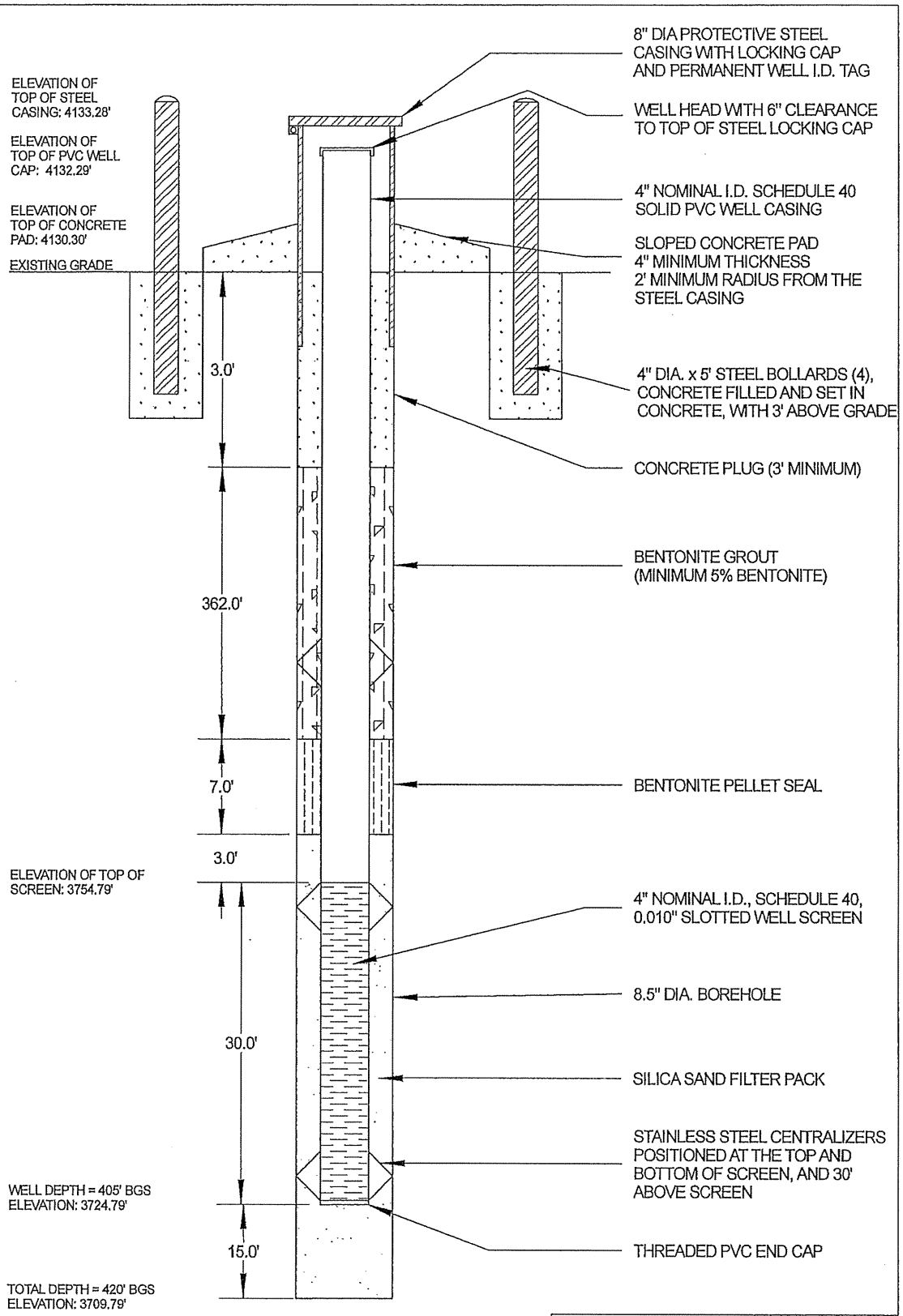
Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
380		Mudstone contacting a claystone/fine-grained sandstone shale at 380'.	Drilling somewhat less noisy
		Sandstone/claystone shale indicated by shale-like clay flakes in drill cuttings, and significant increase in borehole backfill, which is primarily the claystone flakes, once this zone is breached.	Drilling noisy and moderately quick again
390			
400		Claystone/sandstone shale, with a lens of claystone at 396' to 397' grading to a fine sandstone at 398' to 401'	Drilling quiet and slow at 396' to 397'
		Claystone/sandstone shale	Drilling fast and quiet at 398' to 401'
410		Claystone/sandstone shale	Drilling noisy and moderately quick at 401'
		Claystone/sandstone shale	
420		Claystone/sandstone shale	Total Depth at 420' bgs



NOT TO SCALE

MW - D2
WELL INSTALLATION SCHEMATIC

Camino Real Landfill
Sunland Park, New Mexico

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico
Phone: 505-867-6990
Fax: 505-867-6991

Prepared by: DJT	Date: 03/27/06	File: 111.05.02
Reviewed by: DJT	CAD: MWDetails.CAD	Figure 2

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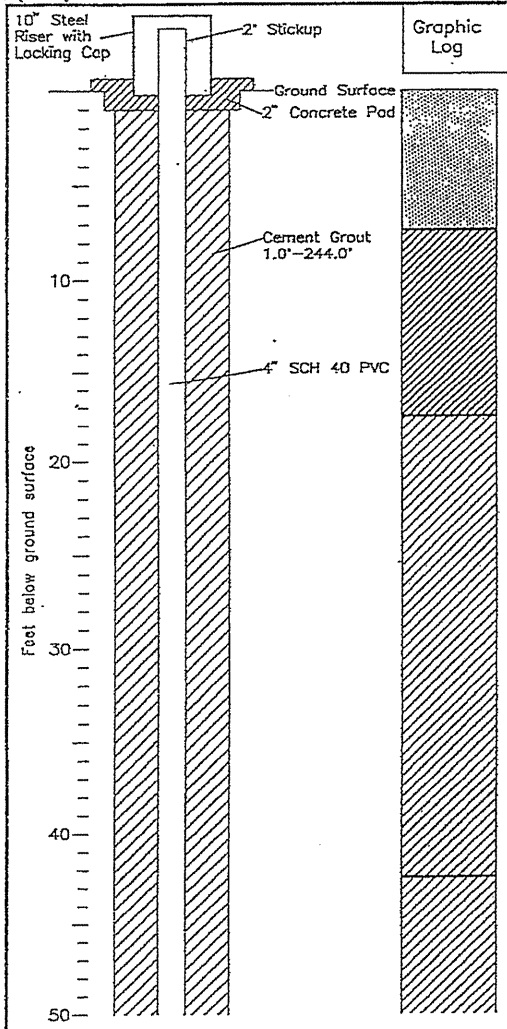

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA			
						SP–SW	5	– Silty sand; brown (10 YR 5/4); with silts 10–20%, <15% pebbles; well graded
						CH	10	– Clay; brown (7.5 YR 6/3); with <10% silts, <5% sand, <1% pebbles; high plasticity
						CH	15	– Same as above
						CL	20	– Silty clay; brown (7.5 YR 6/3); with 10–20% silt, <10% sand, <5% pebbles; moderate plasticity
						CL	25	– Same as above
						CL	30	– Silty clay; brown (7.5 YR 6/3); with <2% silts, <10% sand, <1% pebbles; moderate plasticity
						CL	35	– Silty clay; brown (7.5 YR 6/3); with <15% silt, <5% sand, <1% pebbles; slightly consolidated
						CL	40	– Same as above
						CL	45	– Clay; brown (7.5 YR 6/3); <10% silts, <5% sand, <1% pebbles; slightly consolidated

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

DANIEL B. STEPHENS & ASSOCIATES, INC.

CAMINO REAL LANDFILL
Well Log: MW-E

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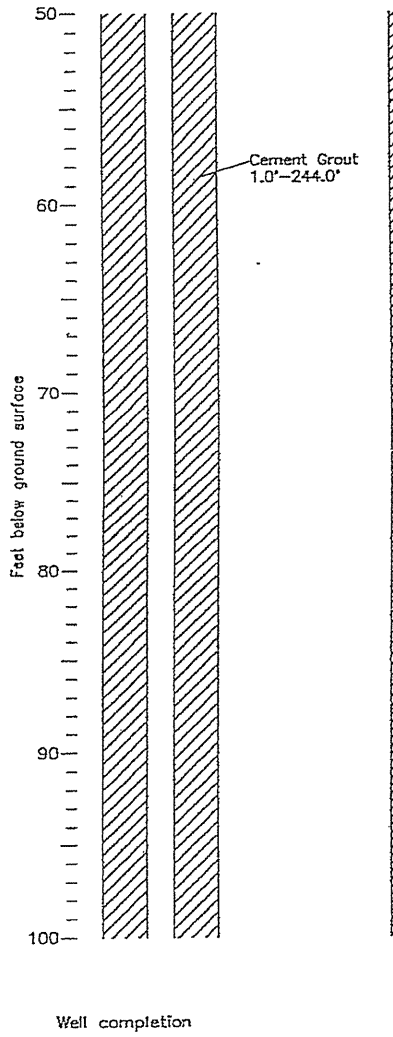

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CL	50	Same as above
						CL	55	Silty clay; brown (7.5 YR 6/3); with <20% clay, <10% sand; low plasticity
						CL	60	Same as above
						CL	65	Same as above
						CH	70	Clay; brown (7.5 YR 6/3); with <10% silt, <5% sand; high plasticity
						CL	75	Silty clay; brown (7.5 YR 4/3); with <20% silt, <5% sand; minor pebbles; moderate plasticity
						CL	80	Same as above
						CL	85	Same as above
						CH	90	Clay; brown (7.5 YR 6/3); with <10% silt, <5% sand, <1% minor pebbles; high plasticity; slightly consolidated
						CH	95	Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

DANIEL B. STEPHENS & ASSOCIATES, INC.

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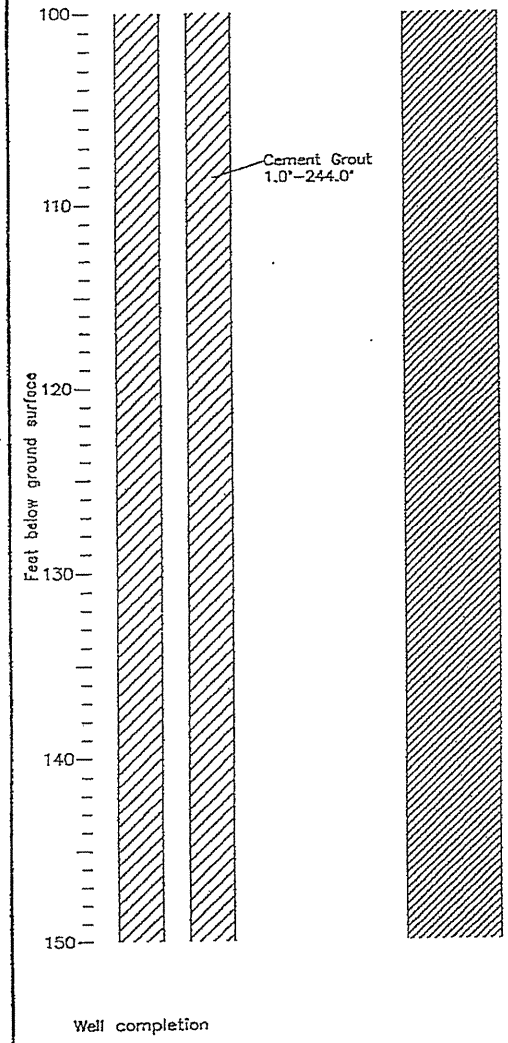

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	100	– Same as above
						CH	105	– Clay; brown (7.5 YR 6/3); with <10% silt, <5% sand; high plasticity; minor black silt–sized particles
						CH	110	– Same as above
						CH	115	– Same as above
						CH	120	– Same as above
						CH	125	– Same as above
						CH	130	– Same as above
						CH	135	– Same as above
						CH	140	– Same as above
						CH	145	– Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

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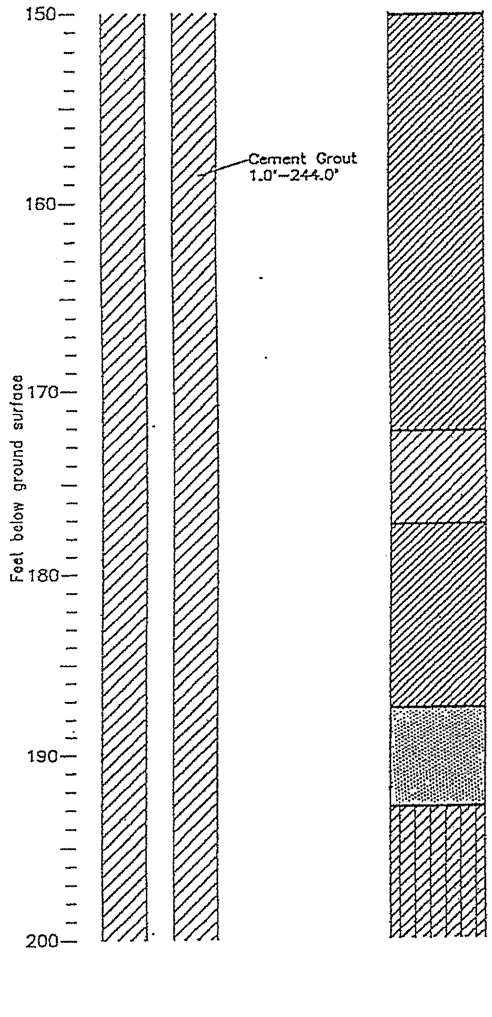

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	150	Clay; brown (7.5 YR 6/3); with <5% silt, <1% sand; high plasticity
						CH	155	Same as above
						CH	160	Same as above
						CH	165	Same as above
						CH	170	Same as above
						CL	175	Silty clay; brown (7.5 YR 6/3); with <10% silty clay, <5% sand; high plasticity
						CH	180	Clay; brown (7.5 YR 6/3); with <5% silt, <1% sand; high plasticity
						CH	185	Same as above; fine-grained sand
						SP-SM	190	Brown (7.5 YR 6/3) silty sand, poorly graded, 10–20% silt, <10% clay
						ML-CL	195	Clayey silt; brown (7.5 YR 6/3); with <20% clay, <5% very fine- grained sand

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–16–95
JN 5260

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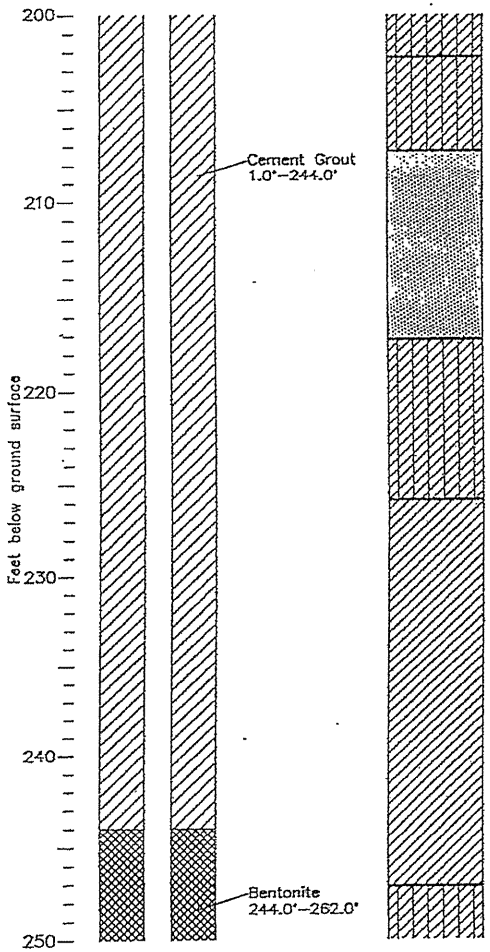

Well completion

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	ML–CL	200	Clayey silt; brown (7.5 YR 6/3); with <20% clay, <5% very fine– grained sand; minor pebbles
						ML–CL	205	Same as above
						SP–SM	210	Silty sand; brown (7.5 YR 6/3); with 10–20% silt; <5% clay; <1% minor pebbles; poorly graded
						SP–SM	215	Silty sand; brown (7.5 YR 6/3); with 10–20% silt, <5% clay; poorly graded
						ML–CL	220	Clayey silt; brown (7.5 YR 6/3); with <1% sand, <10% clay, <1% minor pebbles
						ML–CL	225	Same as above
						CL	230	Silty clay; brown (7.5 YR 6/3); with <20% silt, <10% very fine– grained sand; clay slightly consolidated; low plasticity
						CL	235	Same as above
						CL	240	Same as above
						CL	245	Silty clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine– grained sand; clay slightly consolidated; low plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–16–95
JN 5260

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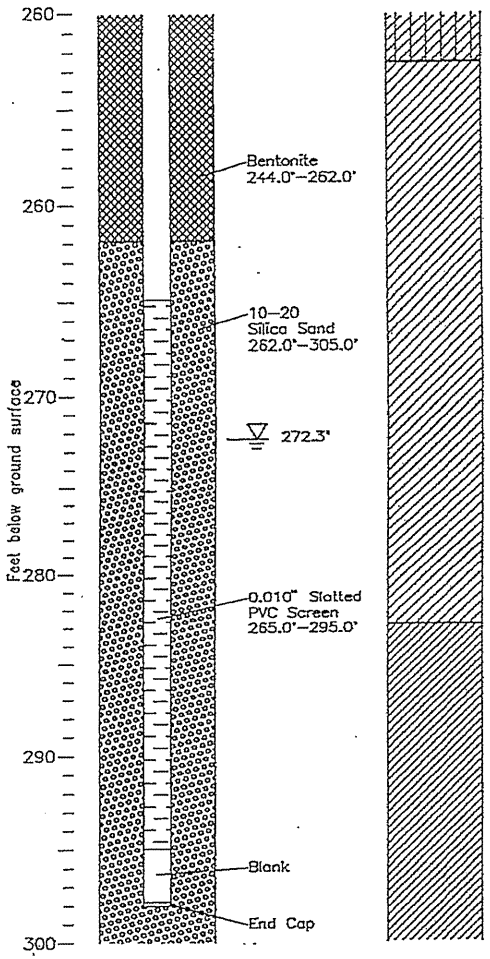

Well completion

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	ML–CL	250	Clayey silt; brown (7.5 YR 6/3); with <20% clay, <10% very fine– grained sand; clay slightly consolidated
						CL	255	Silty clay; brown (7.5 YR 6/3); with <20% silt, <5% very fine– grained sand, minor pebbles; clay slightly consolidated; moderate plasticity
						CL	260	Same as above
						CL	265	Silty clay; brown (7.5 YR 6/3); with <20% silt, <5% very fine– grained sand; clay slightly consolidated; moderate plasticity
						CL	270	Same as above
						CL	275	Same as above
						CL	280	Same as above
						CH	285	Clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine–grained sand; moderate plasticity
						CH	290	Clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine–grained sand; moderate plasticity
						CH	295	Clay; brown (7.5 YR 6/3); with <10% silt, <5% very fine–grained sand; clay slightly consolidated; high plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–16–95
JN 5260

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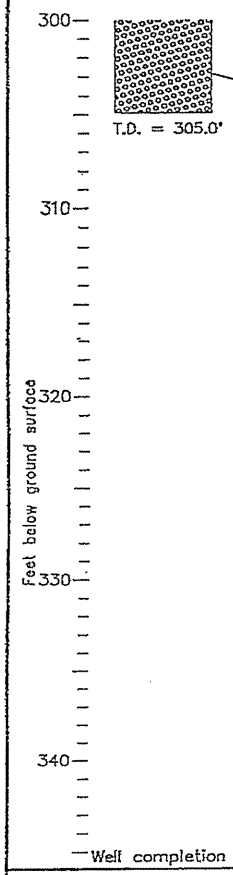

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	300	300 – Same as above
						CH	305	305 – Same as above

Graphic Log Symbols

SP – Poorly graded sands, gravelly sands, little or no fines

SM – Silty sands, sand–silt mixture

CA – Caliche, calcareous sands

ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity

SW – Well graded sands, gravelly sand, little or no fines

CH – Inorganic clays of high plasticity, fat clays

CL – Inorganic clays of moderate to low plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 11–3–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El: 4021.83 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-E

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–16–95
JN 5260

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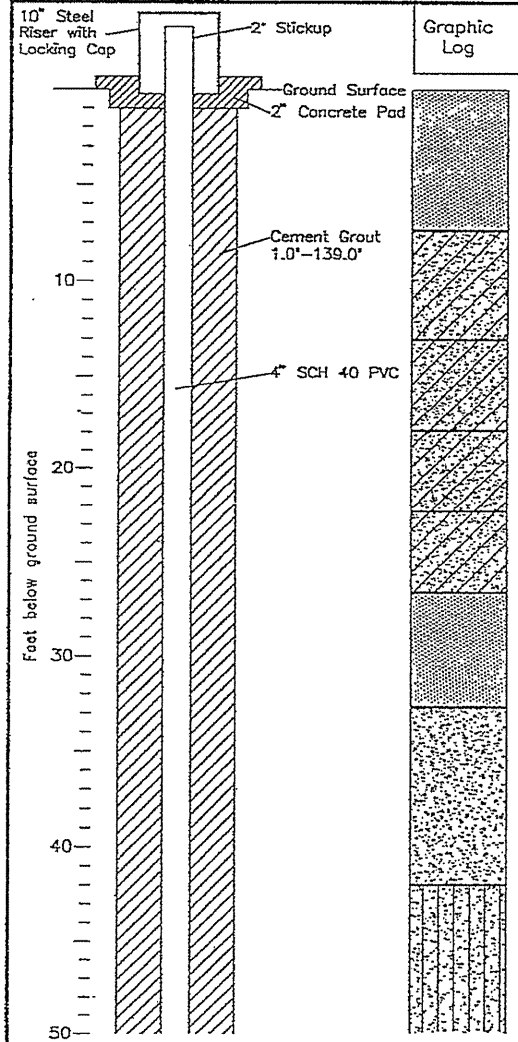

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA			
						SP	5	– Fill; sand; brown (7.5 YR 4/3); with <10% silt; <30% pebbles up to 1 cm long
						SC	10	– Silty sand with clay; medium brown (7.5 YR 4/3); with 20–30% fines; unconsolidated; poorly graded
						SC	15	– Silty sand with clay; medium brown (7.5 YR 4/3); with 20–30% fines; <10% pebble gravel; poorly graded
						SC	20	– Silty sand with clay; medium brown (7.5 YR 4/3); with 20–30% fines; <5% pebble gravel; poorly graded
						SC	25	– Silty sand with clay; brown (7.5 YR 4/3); with 20–30% fines; <1% pebbles; unconsolidated; poorly graded
						SP–SC	30	– Silty sand; brown (7.5 YR 4/3); with 10–20% silt, <5% pebbles; poorly graded
						SW	35	– Sand; brown (7.5 YR 4/3); with <5% silt, 10–20% pebbles; well graded
						SW	40	– Sand; brown (7.5 YR 4/3); with <5% silt, <10% clay, <5% pebbles; well graded
						SW–SM	45	– Sand; brown (7.5 YR 4/3); with <10–20% silt, <10% clay, <1% minor pebbles; well graded

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

DANIEL B. STEPHENS & ASSOCIATES, INC.

CAMINO REAL LANDFILL
Well Log: MW-F

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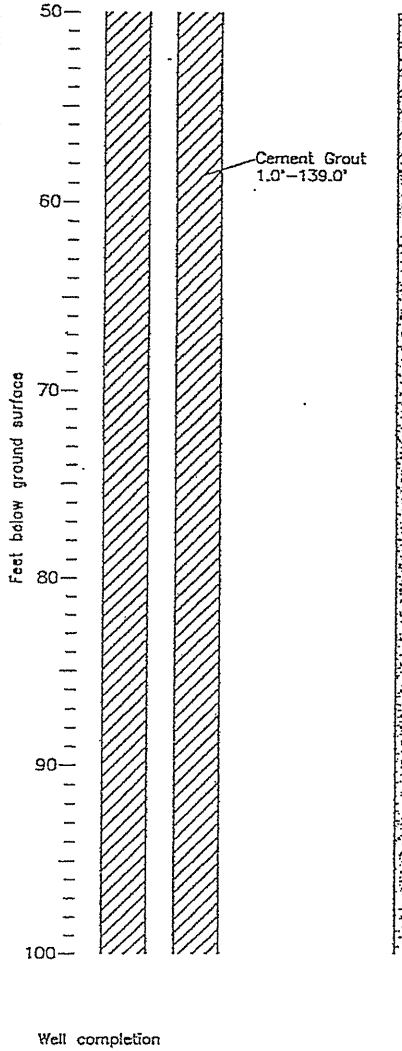

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SW–SM	50	Silty sand; brown (7.5 YR 4/3); with <15% silt, <15% clay; well graded
						SC	55	Clayey silty sand; brown (7.5 YR 4/3); with <10% silt, 10–20% clay, <1% minor pebbles; poorly graded
						SP	60	Sand; brown (7.5 YR 4/3); with <10% silt, 10–20% clay, <1% pebbles; poorly graded
						SW	65	Sand; brown (7.5 YR 4/3); with <10% silt, <10% clay, <1% pebbles; well graded
						SW	70	Sand; brown (7.5 YR 4/3); with <10% silt, <10% clay, <1% pebbles; well graded
						SW	75	Sand; brown (7.5 YR 4/3); with <10% silt, <15% clay, <5% pebbles; well graded
						SW	80	Same as above
						SW	85	Same as above
						SW	90	Same as above
						SW	95	Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

DANIEL B. STEPHENS & ASSOCIATES, INC.

CAMINO REAL LANDFILL
Well Log: MW-F

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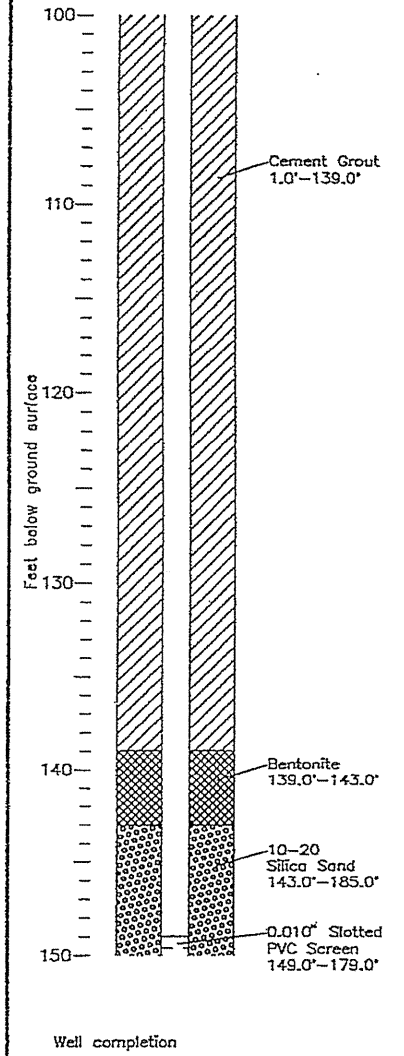

Well completion

Graphic Log	Packet Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SW	100	– Same as above
						SW	105	– Same as above
						ML–CL	110	– Silt with clay and sand; brown (7.5 YR 4/3); with sand <10%, clay 10–20%, pebbles <5%
						ML–CL	115	– Silt with clay and sand; brown (7.5 YR 4/3); with sand <10%, clay 10–20%
						CL	120	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, <1% minor pebbles; moderate plasticity
						CL	125	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, <1% minor pebbles; moderate plasticity
						CL	130	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, <10% sand, <5% pebbles
						CL	135	– Clay with silt; brown (7.5 YR 4/3); with <10% silt, 10–20% sand, 5–10% pebbles; well graded
						SP	140	– Sand; brown (7 YR 5/2); with silt 10–20%, <10% pebbles; well graded; minor black silt–sized particles (<1%)
						SP	145	– Same as above

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 185.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

CAMINO REAL LANDFILL
Well Log: MW-F

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–16–95
JN 5260

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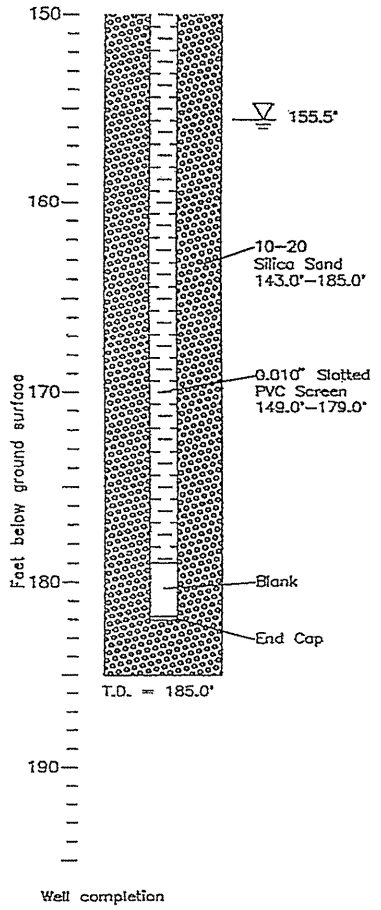

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SP	150	Sand with silt; brown (7 YR 5/2); 10–20% with silt, <5% clay; minor pebbles; poorly graded; minor black silt–sized particles
						SP	155	Same as above
						SP	160	Sand with silt; brown (7 YR 5/2); with silt 10–20%, <10% clay; minor pebbles; poorly graded
						ML	165	Silt; brown (7 YR 5/2); with 10–20% clay, <10% fine sand
						ML	170	Silt; brown (7.5 YR 5/3); with 10–20% clay, <10% fine sand; minor black silt–sized particles
						CL	175	Clay; brown (7.5 YR 4/2); with 10–20% silt, <10% fine sand; <5% black silt–sized particles
						CL	180	Same as above, except increase in black silt–sized particles 5–10%
						CL	185	Same as above

Graphic Log Symbols

- SP — Poorly graded sands, gravelly sands, little or no fines
- SM — Silty sands, sand–silt mixture
- CA — Caliche, calcareous sands
- ML — Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity
- SC — Clayey sands, sand–clay mixture
- SW — Well graded sands, gravelly sand, little or no fines
- CH — Inorganic clays of high plasticity, fat clays
- CL — Inorganic clays of moderate to low plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3896.95 fmsl

NA = Not applicable/Not available

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–16–95 JN 5260

CAMINO REAL LANDFILL
Well Log: MW-F

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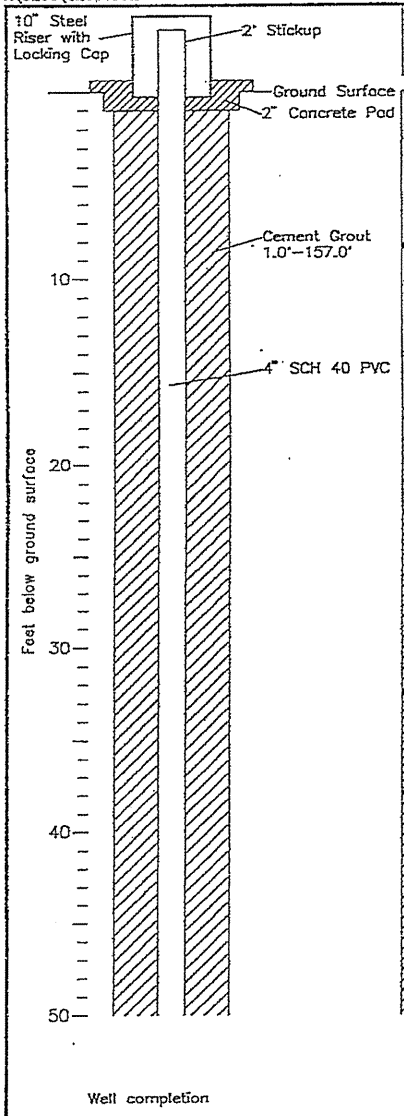

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA			
						SM	10	Silty fine sand; medium brown (5 YR 7/3); with 15–20% silt, <10% pebble gravel; unconsolidated, poorly graded
						SM	15	Silty sand with clay; medium brown (5 YR 7/3); with 20–30% fines, <10% pebble gravel; unconsolidated, poorly graded
						ML	20	Silt with clay; medium brown (5 YR 7/3); with <25% very fine–grained sand, <5% clay, <5% pebbles
						CL	25	Silty clay; medium brown (5 YR 7/3); with minor pebbles; moderate plasticity
						ML–CL	30	Silt with clay; medium brown (5 YR 7/3); with <15% very fine–grained sand; unconsolidated
						CH	35	Clay with silt; brown (5 YR 7/3); with <25% silt; <15% very fine–grained sand; moderately consolidated; high plasticity
						CL	40	Clay with silt; brown (5 YR 7/3); with 10–20% silt, <15% very fine–grained sand; moderately consolidated
						CL	45	Clay with silt; brown (5 YR 7/3); with <25% silt, <15% very fine–grained sand, <1% pebbles; moderate plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–17–95
JN 5260

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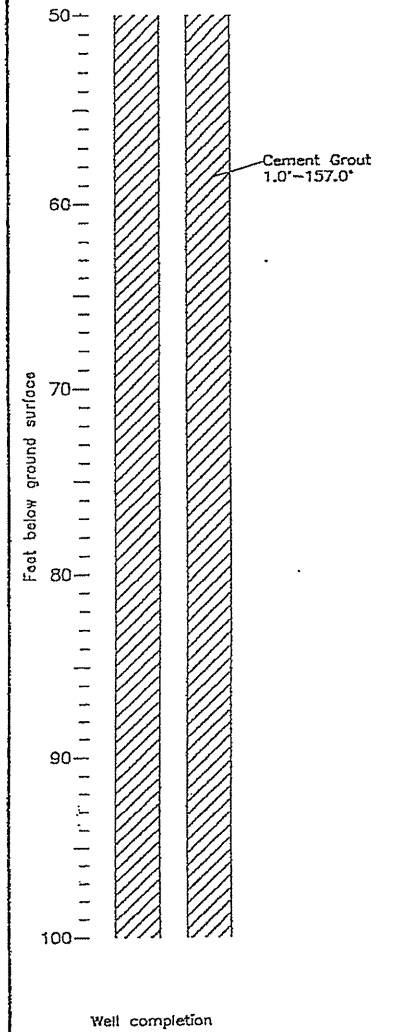

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CL	50	Clay with silt; brown (5 YR 7/3); with <10% silt, <10% very fine– grained sand, <1% minor pebbles; slightly consolidated; moderate plasticity
						CL	55	Clay with silt; brown (5 YR 7/3); with <10% silt; <10% very fine–grained sand; <1% minor pebbles; slightly consolidated; moderate plasticity
						CL	60	Clay; brown (5 YR 7/3); with 10–20% silt (possibly interbedded), 5–10% pebbles; clay slightly consolidated; moderate plasticity
						CL	65	Clay; brown (5 YR 7/3); with <10% silt; slightly consolidated; moderate plasticity
						CL	70	Clay; brown (5 YR 7/3); with 10–20% silt; 10% very fine–grained sand, <1% pebbles; moderate plasticity
						CL	75	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine–grained sand; moderate plasticity
						CL	80	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine–grained sand, <1% pebbles; moderate plasticity
						CH	85	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine–grained sand, <5% pebbles; high plasticity in the clay
						CH	90	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine–grained sand; high plasticity
						CH	95	Clay with silt; brown (7.5 YR 7/3); with <10% silt; <5% very fine–grained sand; high plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.

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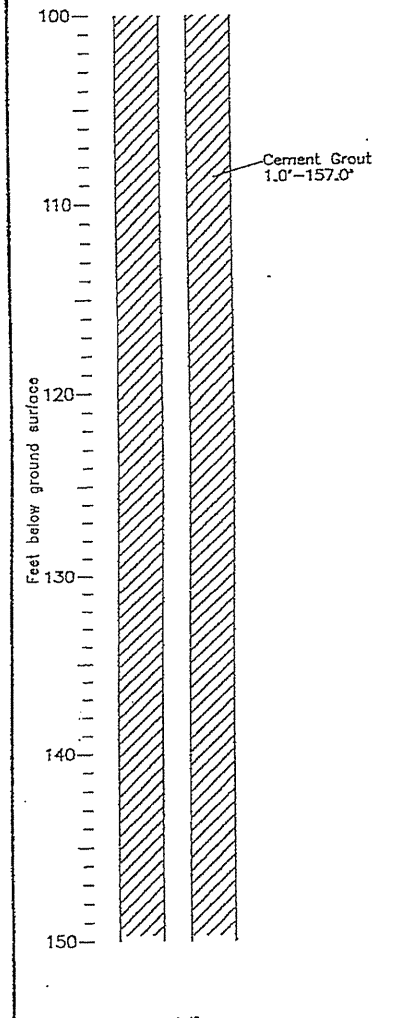

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	100	Clay with silt; brown (7.5 YR 7/3); with <10% silt, <5% very fine-grained sand; high plasticity
						CH	105	Clay with silt; brown (7.5 YR 7/3); with 10–20% silt, <5% very fine-grained sand, <1% minor pebbles; high plasticity
						SP–SM	110	Sand with silt; brown (7.5 YR 7/3); with <15% silt, <5% clay, <1% minor pebbles; low plasticity; poorly graded
						SP–SM	115	Sand with silt; brown (7.5 YR 7/3); with <10% silt, <10% clay; moderate plasticity; poorly graded
						CH	120	Clay with silt; brown (7.5 YR 7/3); with 10–20% silt, <10% sand; high plasticity
						CH	125	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt; <10% very fine-grained sand; moderate plasticity
						SW	130	Sand with silt; brown (7.5 YR 6/3); with <10% silt, <5% clay; well graded; very fine- to coarse-grained
						SW	135	Sand; brown (7.5 YR 6/3); very fine- to coarse-grained; sand with <10% silt; clay <10%; well graded
						SW	140	Sand; brown (7.5 YR 6/3); very fine- to coarse-grained; with <10% silt, clay <10%; well graded
						CH	145	Clay with silt; brown (7.5 YR 6/3); with <10% silt, <10% sand; high plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 185.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–17–95
JN 5260

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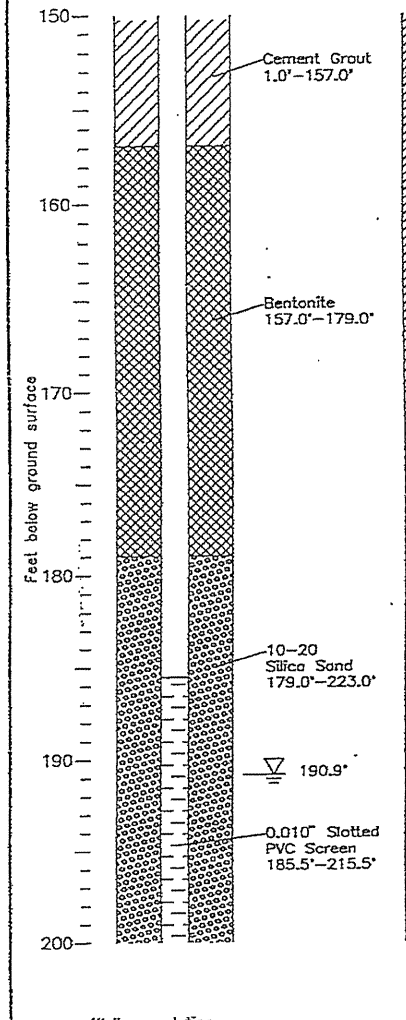

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	CH	150	Clay with silt; brown (7.5 YR 6/3); with <10% silt, <5% sand, <1% minor pebbles; high plasticity
						CH	155	Clay with silt; brown (7.5 YR 6/3); with <5% silt, <5% sand, <1% minor pebbles; high plasticity
						CH	160	Clay with silt; brown (7.5 YR 6/3); with <5% silt, <5% sand, <1% minor pebbles; high plasticity
						CH	165	Clay with silt; brown (7.5 YR 6/3); with <5% silt, <5% sand, <1% minor pebbles; high plasticity
						CL	170	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <10% sand, <5% pebbles; moderate plasticity in clay
						CL	175	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <10% sand, <5% pebbles; moderate plasticity
						CL	180	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <10% sand, <5% pebbles; moderate plasticity
						CL	185	Same as above
						CL	190	Same as above
						SW	195	Sand; brown (7.5 YR 6/3); very fine– to coarse–grained; with <10% silt, <10% clay, <5% pebbles; well graded

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 185.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.
11–17–95
JN 5260

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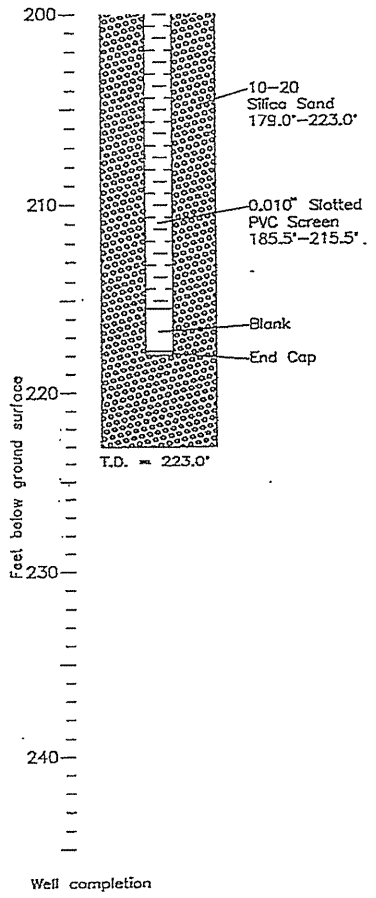

Graphic Log	Pocket Penetrometer (tons/ft²)	Sampling Device	Blow Counts (for 0.5 ft.)	Sample Recovery (ft)	Sample Interval (ft)	USCS Symbol	Depth (ft)	Descriptive Log
	NA	Grab sample of cuttings (all samples wet)	NA	NA	NA	SW	200	Sand; brown (7.5 YR 6/3); very fine– to coarse–grained; with <10% silt, <10% clay, <5% pebbles; well graded
						CL	205	Clay with silt; brown (7.5 YR 6/3); with 20% clay with silt, <10% sand, 5% pebbles; high plasticity
						CL	210	Clay with silt; brown (7.5 YR 6/3); with <10% silt, <5% sand, <1% minor pebbles; high plasticity
						CL	215	Clay with silt; brown (7.5 YR 6/3); with 10–20% silt, <5% sand, <5% pebbles
						CL	220	Same as above

Graphic Log Symbols

SP – Poorly graded sands, gravelly sands, little or no fines

SM – Silty sands, sand–silt mixture

CA – Caliche, calcareous sands

ML – Inorganic silts and very fine sands rock flour, silt or clayey fine sands, or clayey silt with slight plasticity

SW – Well graded sands, gravelly sand, little or no fines

CH – Inorganic clays of high plasticity, fat clays

CL – Inorganic clays of low to medium plasticity

Geologist: B. Hovda
Driller: Larjon
Date Completed: 10–28–95
Drilling Method: Mud rotary

Bit Diameter: 8.0 in. O.D.
Total Drill Depth: 305.0 ft.
Surface El.: 3935.77 fmsl

CAMINO REAL LANDFILL
Well Log: MW-G

DANIEL B. STEPHENS & ASSOCIATES, INC.
11-17-95
JN 5260

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: **MW-H**

File No.: 111.05.02

Client: Camino Real Environmental Center, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Caliche	Noisy, slow drilling
		Caliche	
10		Fine to medium-grained sandstone	Quick, relatively quiet drilling
		Medium to coarse-grained sandstone	
20		Coarse-grained sandstone to gravels 1/4" and smaller. Gravels are quartzose and mafic	
		Coarse-grained sandstone	
30		Coarse-grained sandstone	
		Coarse-grained sandstone	
40		Fine to medium-grained sandstone, with gravels 1/4" and smaller.	
		Same as above contacting claystone at 47'	Slow and smooth drilling
50		Claystone to fine to medium-grained sandstone at 54'	Fast and smooth drilling
		Medium to coarse-grained sandstone to 1/4" gravel at 59'	
60		Coarse-grained sandstone and small gravel (1/8")	
		Coarse-grained sandstone and small gravel (1/8")	
70		Coarse-grained sandstone up to 1/4" gravel	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-H**	Page 2 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Center, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface)	N: 1784.27	Logged by: DT	Drilling Contr.: Rodgers	Drilling Meth.: Mud-Rotary
381.5 ft. at completion (below ground surface)	E: 8.51	Date started: 02/21/06	Head Driller: John	Sampling Meth.: Grab
water level data approximate	Elev.: 4130.85 top of steel well head	Date comp.: 02/22/06	Assistant(s): Berto	

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
80		Coarse sandstone up to 1/4" gravel	
		Coarse sandstone up to 3/8" gravel	
		Coarse sandstone up to 1/4" gravel	
90		Coarse sandstone up to 1/4" gravel contacting a claystone at 93'.	Quiet and slow drilling. Contact with Hancock?
		Claystone	
100		Claystone to a mudstone	
		Mudstone	
110		Mudstone to a siltstone	Quicker but fairly quiet drilling
		Siltstone	
120		Siltstone to a fine sandstone	Fast and fairly noisy drilling
		Fine sandstone and claystone	
130		Fine sandstone to coarse sandstone to 1/4" gravel	
		1/4" gravel to a fine-grained sandstone with lenses of claystone and siltstone	
140		Medium to coarse sandstone with lenses of claystone	
		Medium to coarse sandstone up to 1/8" gravel with lenses of claystone	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-H**	Page 3 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Center, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Fine sandstone with lenses of claystone and siltstone	Relatively noisy and moderately fast drilling
		Fine sandstone with lenses of claystone and siltstone	
160		Fine to medium-grained sandstone with small claystone lenses	
		Fine to medium-grained sandstone with small claystone lenses	
170		Fine to medium-grained sandstone	
		Fine to medium-grained sandstone to a claystone/mudstone at 178'	
180		Fine to medium-grained sandstone with big flakes of mica	
		Fine to medium-grained sandstone	
190		Fine sandstone with claystone and siltstone lenses	
		Fine sandstone with claystone, siltstone, and a gravel lens	
200		Fine sandstone with claystone and siltstone lenses	
		Fine sandstone with claystone and siltstone lenses	
210		Fine sandstone with claystone and siltstone lenses	
		Claystone with very hard lenses of siltstone	
220		Fine sandstone	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-H**	Page 4 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Center, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
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Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Mudstone	
230		Mudstone	
		Fine to medium-grained sandstone	
240		Siltstone and claystone	
		Mudstone	
250		Fine sandstone with claystone lenses	
		Fine sandstone with claystone lenses	
260		Siltstone and claystone	
		Siltstone and claystone	
270		Siltstone and claystone	
		Siltstone and claystone	
280		Siltstone and claystone to claystone at 287'	
		Claystone	Slow and quiet drilling
290		Claystone	
		Claystone contacting a mudstone at 304'	

Gordon Environmental, Inc. *Consulting Engineers*	Log of Borehole No.: **MW-H**	Page 5 of 6
		File No.: 111.05.02
	Client: Camino Real Environmental Center, Inc. (CRECI)	
	Project: Site Assessment Boring Plan	

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
		Mudstone	More noisy and quicker drilling
		Mudstone to siltstone	
310		Siltstone	
		Siltstone and claystone	
320		Fine-grained sandstone with minor clay lenses	Noisy and moderately fast drilling
		Fine-grained sandstone with minor clay lenses	
330		Fine-grained sandstone with minor clay lenses	
		Fine-grained sandstone with minor clay lenses	
340		Fine-grained sandstone with minor clay lenses	
		Fine-grained sandstone with minor clay lenses	
350		Fine-grained sandstone with minor clay lenses	
		Fine-grained sandstone with minor clay lenses	
360		Mudstone	
		Fine-grained sandstone	
370		Claystone at 370'	Quiet and slow drilling

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: **MW-H**

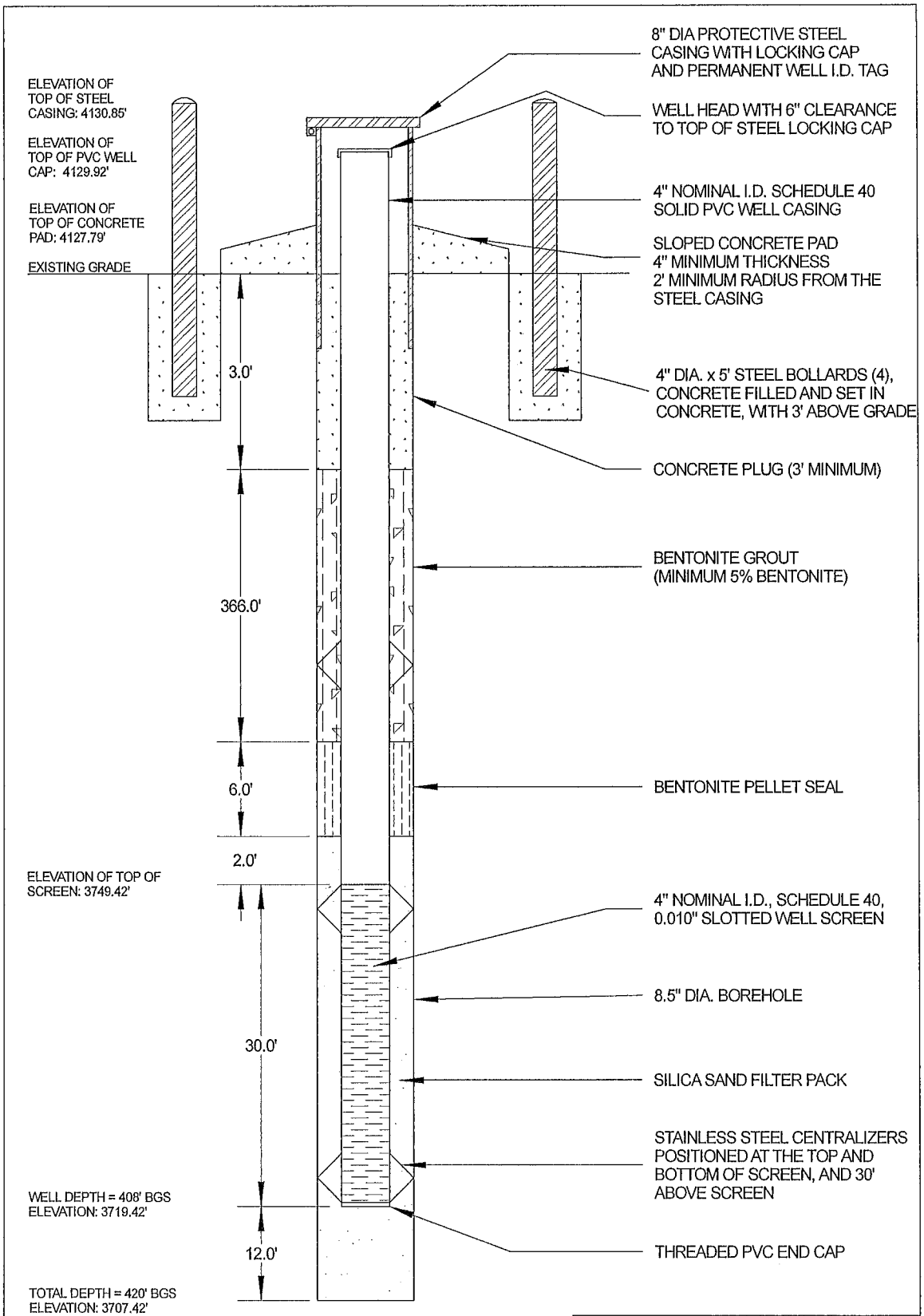
File No.: 111.05.02

Client: Camino Real Environmental Center, Inc. (CRECI)

Project: Site Assessment Boring Plan

Water Level Data	Location (UTM) and Elevation (FMSL)	Boring Data		
ND ft. while drilling (below ground surface) 381.5 ft. at completion (below ground surface) water level data approximate	N: 1784.27 E: 8.51 Elev.: 4130.85 top of steel well head	Logged by: DT Date started: 02/21/06 Date comp.: 02/22/06	Drilling Contr.: Rodgers Head Driller: John Assistant(s): Berto	Drilling Meth.: Mud-Rotary Sampling Meth.: Grab

Depth (fbgs)	Graphic Lithology	Soil/Lithology Description	Notes
380		Claystone contacting claystone/fine-grained sandstone shale at 379'. Sandstone/claystone shale is indicated by shale-like clay flakes in drill cuttings, and significant increase in borehole backfill, which is primarily the claystone flakes, once this zone is breached.	Drilling noisy and moderately fast
390			
		Claystone/fine-grained sandstone shale	
400		Approximately 1' of claystone at 400', grading to a fine-grainded sandstone to 405'.	Drilling quiet and slow at 400' to 401'
		Claystone/sandstone shale	Drilling moderately fast and noisy at 401' to 405'
410		Claystone/sandstone shale	Drilling noisy and moderately fast
		Claystone/sandstone shale	Total Depth at 420' bgs
420			



NOT TO SCALE

MW - H
WELL INSTALLATION SCHEMATIC

Camino Real Landfill
Sunland Park, New Mexico

213 S. Camino del Pueblo
Bernalillo, New Mexico
Phone: 505-867-6990
Fax: 505-867-6991

Prepared by: DJT	Date: 03/01/06	File: 111.05.02
Reviewed by: DJT	CAD:MWDetail.CAD	Figure 3

Attachment V.2.B

NMED Correspondence

(05/17/07)

(06/07/11)

MAY 2 1 2007

BILL RICHARDSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT
Solid Waste Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2855
Fax (505) 827-2836
Fed Ex (87505)

RON CURRY
SECRETARY

CINDY PADILLA
DEPUTY SECRETARY

May 17, 2007

Mr. Michael J. Crepeau
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

Re: Camino Real Landfill: NMED Approval of the Ground Water Monitoring Program Update, Use of Alternative Statistical Method, Groundwater Monitoring Upper Tolerance Limit Values (UTLVs) and Assessment Monitoring Level (AML) Tables

Dear Mr. Crepeau:

On May 2, 2007, the Solid Waste Bureau (Bureau) received your request to approve revisions to the site's groundwater monitoring program, specifically the Upper Tolerance Limit Values (UTLV) and Assessment Monitoring Level (AML) tables for groundwater monitoring at the Camino Real Landfill. The Bureau approves the ground water monitoring program update as specified below.

For this approval, the Bureau reviewed your submittal letter and attached tables, as well as sixteen (16) years of historical monitoring data and statistical methods used. Jerzy Kulis, Hydrologist determined that background levels and concentrations have been appropriately established for each parameter in each individual up-gradient and down-gradient well in accordance with 20 NMAC 9.1 Section 803.F. Additionally, he has confirmed that AMLs have been determined based on background water quality data as prescribed under 20 NMAC 9.1 Section 805.B.

To ensure that consistent sampling and analysis procedures provide an accurate representation of groundwater quality at all wells at the Camino Real Landfill, the approved UTLV and AML tables must be used by the owner/operator/and/or their representative for all future groundwater sampling events and data evaluation, effective of the date of receipt of this approval.

If you have any questions about this matter, contact me at 505-827-2775.

Sincerely

Auralie Ashley-Marx
Solid Waste Bureau Chief

AAM:jk

Cc: Camino Real File
Jerzy Kulis, Solid Waste Bureau, NMED
Roger Bristow, District Manager, Camino Real Landfill (Facility Operating Record)
Joe King, Project Manager, Waste Connections, Inc.
Tom Reilly, P.E., Regional Engineering Manager, Waste Connections, Inc.
Mark Turnbough, Ph.D..
Shannon Bacon, Esq., Sutin, Thayer & Browne
Darcy Frownfelter, Esq., Kemp Smith

NEW MEXICO
ENVIRONMENT DEPARTMENT

Office of the Secretary

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Governor

JOHN A. SANCHEZ
Lieutenant Governor

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www.nmenv.state.nm.us

DAVE MARTIN
Secretary

RAJ SOLOMON, P.E.
Deputy Secretary

June 7, 2011

Dr. Juan Carlos Tomás, Landfill Manager
Camino Real Environmental Center, Inc.
P.O. Box 580
Sunland Park, NM 88063-0580

Re: Request for Ground Water Monitoring Parameter Reduction and Monitoring Frequency, Camino Real Landfill, Sunland Park, New Mexico

Dear Dr. Tomás:

James Dyer, Hydrologist and I have reviewed the Ground Water Monitoring Parameter Reduction Request Report for the Camino Real Municipal Landfill (Landfill) prepared by Gordon Environmental Inc., received on May 19, 2011. The Landfill owner/operator submitted the following two specific approval requests:

- A reduction in sampling frequency from semi-annual to annual; and
- Approval of a reduced annual parameter sampling list based on statistical evaluation of 12 sampling events going back to April of 2005. The parameters requested to be removed from the detection monitoring list are those that have not been detected in this period, were detected infrequently at levels below the presumptive AML, or that were detections caused by bias of naturally suspended sediments in the water column, as demonstrated in Attachment 4, February 23, 2011 Groundwater Monitoring Report for the Camino Real Landfill. The analysis of this data and conclusions drawn are further supported by over 20 years of groundwater sampling analytical results at this site, and demonstrations provided in the report.

The Bureau grants specific approval to the owner/operator of the Camino Real Landfill in accordance with 20.9.2.13 and 20.9.9.11NMAC to collect ground water samples annually from the Landfill; and to analyze for the reduced parameter list as specified in the above referenced report. The approval is granted with the condition that all parameters in subsection A and C are sampled once every five years. The approval of these two requests is granted as it has been determined that the owner/operator has provided adequate demonstrations in the report for all of the required items specified in 20.9.9.11.A (2) NMAC. It is also noted that any inorganic parameters detected in leachate samples from the site were not included for exemption from the reduced parameter testing list; therefore these parameters must continue to be sampled annually.

Should you have any questions about this approval contact James Dyer at (505) 827-2677, or by e-mail at james.dyer@state.nm.us.

Sincerely,

Auralie Ashley-Marx
Chief, Solid Waste Bureau

cc: Michael J. Crepeau, P.E., Project Manager, Gordon Environmental, Inc.
Joey Vega, Enforcement Area III, Solid Waste Bureau

Attachment V.2.C

2018 CRLF Annual Groundwater Monitoring Report

November 12, 2018
Project No: 18-09-09

Mr. George Schuman
Permit Section Manager
NMED Solid Waste Bureau
Harold Runnels Bldg – Room N2150
P.O. Box 5469
Santa Fe, NM 87502-5469

Re: 2018 Annual Groundwater Monitoring Report; Camino Real Landfill; NMED Permit No. SWM-030738; Dona Ana County

Dear Mr. Schuman:

Please find attached two copies of the 2018 Annual Groundwater Detection Monitoring Report for the Camino Real Landfill. Details of the 2018 annual monitoring event as well as a discussion of statistical analysis results are contained in the report.

We trust that this information is acceptable to you. Please call Brady Stewart at (314) 486-4733 or Dr. Juan Carlos Tomas at (575) 589-9440 if you have any questions.

Sincerely,
THE CAREL CORPORATION

Kevin T. Carel, P.G.
President

Att: 2018 Annual Groundwater Monitoring Report

cc: Brady Stewart, P.E., Regional Engineer, Waste Connections
Dr. Juan Carlos Tomas, Landfill Manager, Camino Real Landfill

136 Pecan Street, Keller, Texas 76248
Telephone: 817.337.0112 • Facsimile: 817.337.0041

2018 ANNUAL GROUNDWATER MONITORING REPORT

CAMINO REAL LANDFILL

NMED Permit No. SWM-030738
Sunland Park, New Mexico

PROJECT NO. 18-09-09

Prepared for:

Camino Real Environmental Center, Inc.

November 2018

Prepared by

136 Pecan Street
Keller, Texas 76248
(817) 337-0112

CONTENTS

TABLES AND FIGURES

Tables

Figures

1 INTRODUCTION

The Camino Real Landfill is located one mile southwest of McNutt Road (NM 273) on Camino Real Boulevard in Sunland Park, New Mexico, (see Figure 1). The facility currently operates under New Mexico Environmental Department (NMED) Permit No. SWM-030738.

Groundwater monitoring at the site commenced during July 1989 with the semi-annual sampling and analysis of monitoring Well A (the site's water supply well) for select groundwater parameters. Wells B, C, and D were added to the network from 1990 to 1991. Three additional Wells (E, F, and G) were installed in October and November 1995 to enhance downgradient monitoring capabilities. In February 2006, Wells D2 and H were installed as a part of a landfill investigation program conducted for a March 2006 Permit Renewal. Well C was deleted from the monitoring program in 1997 and decommissioned on April 29, 2008, with NEMD approval.

Initial detections of 1,1-dichloroethane (1,1-DCA), tetrachloroethylene (PCE), trichloroethylene (TCE), and trichlorofluoromethane (freon-11) in ground water monitoring well G occurred during the 2016 annual groundwater monitoring event. The initial detections were not considered statistically significant unless confirmed by resampling. In a letter dated March 31, 2017, the NMED requested that confirmatory resampling be performed prior to May 31, 2017. The confirmatory resampling event for Well G was performed on May 9, 2017 in conjunction with the annual groundwater sampling event for the facility.

Each of the four originally detected VOCs in Well G were confirmed during the May 2017 confirmatory sampling event. In addition, methylene chloride (MC) was also detected in samples collected from Well G. None of the VOC concentrations for the May 2017 sampling event exceeded their respective Regulatory Presumptive Assessment Monitoring Level (AML) except for TCE. None of the detected VOC concentrations exceeded a Corrective Action Level (CAL) during the May 2017 event. No AML is established for methylene chloride and the reported concentration did not exceed the GWPS or CAL.

An Assessment Monitoring Plan was submitted on July 18, 2017 and approved by the NMED in a letter dated September 6, 2017. Assessment monitoring samples were collected from Well G on November 15, 2017. Samples for assessment monitoring parameters consisted of all analyzed constituents and parameters referenced and listed in Subsections B and C of 20.9.9.20 NMAC. The detected constituents consisted of seven

volatile organic compounds, total organic carbon, one herbicide, 15 metals, radium, 13 inorganic compounds and perchlorate. All of the detected constituents are listed on Table V.2.2 the facility's alternate parameter list and monitoring schedule except for four new Subsection B constituents: dichlorodifluoromethane, perchlorate, sulfide, and dacthal. It is noted that TCE was detected below its Assessment Monitoring Level (AML) and below the Corrective Action Level (CAL) during the November 2017 sampling event. The results of the assessment monitoring event were provided to the NMED in a letter dated January 13, 2018. Chloride exceeded its AML and uranium was detected above its AML and CAL in Well G during the assessment monitoring event. An alternate source demonstration for chloride and uranium concentrations in Well G was submitted on March 29, 2018.

Background monitoring was conducted for dichlorodifluoromethane, perchlorate, sulfide, and dacthal in Well G and upgradient Well D per a January 29, 2018 letter by the NMED and 20.9.9.13.B NMAC. The results for three previous background monitoring events were provided in letter reports dated March 15, May 25, and August 15, 2018. This event represents the fourth and final background monitoring event for the above mentioned constituents.

Groundwater monitoring and analysis at the site are being performed in accordance with the facility Groundwater Monitoring System Plan (GEI, 2012) and Title 20, Chapter 9, Part 9 of the New Mexico Administrative Code (NMAC). A copy of this report has been placed in the operating record for the facility.

2 GROUNDWATER MONITORING PROGRAM

2.1 Monitoring Network and Programs

The groundwater monitoring network at the Camino Real Landfill consisted of six (6) monitor wells: Well A, Well B, Well D, Well E, Well F, and Well G. Each well was monitored under a detection monitoring program during the 2018 sampling event except for Well G, which is in assessment monitoring. Well D2 and Well H were installed in February 2006 as part of a landfill investigation program conducted for a 2008 Permit Renewal/Modification. These wells are positioned generally upgradient of existing and future waste deposits. Currently Well D2 and Well H are being monitored for water levels only. Background sampling and analysis for Wells D2 and H will commence when the future waste filling sequence advances toward each well's location. Table 1 of this report provides a summary of monitor well construction information.

Table 1
Monitor Well Summary

Well	Date Installed	Site Grid Coordinates[1]		Total Well Depth ft. bgs	Filter-Packed Interval ft. bgs	Hydraulic Position
		North	East			
Well A	1/28/1988	4121.57	1629.92	400	320 – 400	Downgradient
Well B	8/22/1990	3665.662	3112.099	190	155 – 190	Downgradient
Well D	1/28/1991	469.624	562.672	430	390 – 430	Upgradient
Well D2	2/17/2006	105.02	19.31	405	375 – 405	Upgradient
Well E	11/3/1995	416.889	3377.561	298	265 – 295	Downgradient
Well F	10/28/1995	2644.209	4454.448	182	149 – 179	Downgradient
Well G	10/28/1995	1901.670	3642.710	218	185.5 – 215.5	Downgradient
Well H	2/26/2006	1783.99	8.47	408	378 – 408	Upgradient

Notes: bgs – below ground surface; MSL – mean sea level
1 – Location information based on site-specific coordinate system measured in feet. The axis of the coordinate system begins adjacent to the southwest corner of the site.

The current monitoring well network and programs are summarized on Table 2 - Monitoring Program Summary (pg. 4).

Table 2
Monitoring Program Summary

Well	Designation	Monitoring Status
Well A	Compliance	Detection
Well B	Compliance	Detection
Well D	Background (upgradient)	Detection
Well D2	Observation	Water Level Only
Well E	Compliance	Detection
Well F	Compliance	Detection
Well G	Compliance	Assessment
Well H	Observation	Water Level Only

2.2 Monitoring Schedule

Groundwater monitoring is conducted on an annual schedule for detection monitoring wells (GEI, 2011). This report presents details of the 2018 annual groundwater monitoring event for monitor wells: Well A, Well B, Well D, Well E, Well F, and Well G. Samples were collected on September 24 and 25, 2018. The next annual groundwater monitoring event is anticipated to occur in June 2019.

2.3 Monitoring Parameters

Detection monitoring parameters consisted of an alternate list of total metals, multiple inorganic compounds, volatile organic compounds (VOCs), and radium listed in Table V.2.2 of the facility Groundwater Monitoring System Plan (GEI, 2012) and in accordance with NMAC 20.9.9.20. Concentrations are determined down to the practical quantitation limits (PQLs) provided in the facility Groundwater Monitoring System Plan (GEI, 2012) and in compliance with NMAC 20.9.9.10(A).

As previously stated, samples from Wells D and G were also analyzed for dichlorodifluoromethane, perchlorate, sulfide, and dacthal.

2.4 Monitor Well Purging

Water-levels were measured in the monitor wells on September 24 and 25, 2018, prior to purging except for Well A (the facility's water supply well) which has a sealed wellhead that prohibits a water level measurement. The sealed casing of Well A prohibits access and the typical purging methods (i.e. removal of three casing volumes of water) are not used. However, Well A is consistently flushed via use as a water supply well. After water-level measurements were completed, each well was purged with a dedicated submersible. Well G was purged and sampled using low flow techniques due to limited yield. Purging for all wells continued until stabilization of pH, specific conductance, temperature, and turbidity was achieved. Measurements were recorded on field data sheets; copies of which are provided in Appendix A. Figure 2 provides the water-level elevations for the sampled zone.

2.5 Monitor Well Sampling

All wells were sampled by means of dedicated submersible pump. Samples were collected in bottles provided by the laboratory, labeled, and placed in insulated coolers with sufficient ice to maintain the temperature as close as possible to 4°C. All wells produced a sufficient volume of water for sampling and analysis of the required parameters during 2018 annual monitoring event. Final field measurements for samples collected during the 2018 annual groundwater monitoring event are provided on the field data sheets in Appendix A.

2.6 Monitor Well Inspection and Maintenance Program

A monitor well preventive maintenance program is in place at this facility to ensure proper operation and usability of the groundwater monitor wells. During each sampling event, all monitor wells are inspected visually to determine the integrity of the pads, protective casings, locks and wellhead assemblies. Any issues are noted on field forms and provided to facility personnel.

3 SITE HYDROGEOLOGY SUMMARY

3.1 Regional and Site Geology

According to information provided in the Groundwater Monitoring Plan (GEI, 2012) and other published geologic reports of the southern New Mexico area, the CRLF site is situated on the southeastern flank of the Mesilla Basin and the western edge of the Rio Grande Valley. The topography of the landfill area generally slopes to the northeast at an average of approximately 300 feet per mile. According to the New Mexico Bureau of Geology and Mineral Resources, the southwestern portion of the site is underlain by the Upper Santa Fe Group. The northeastern portion of the site is underlain by Piedmont alluvial deposits.

The Upper Santa Fe Group includes Camp Rice and Fort Hancock Formations. It is middle Pleistocene to uppermost Miocene in age and is composed of primarily unconsolidated sand and gravel. The Piedmont alluvial deposits are upper and middle Quaternary in age. They were deposited by higher gradient tributaries bordering major stream valleys (e.g. the Rio Grande), alluvial veneers of the piedmont slope, and alluvial fans. The subsurface deposits are reportedly comprised of inter-bedded medium to very fine-grained sands with silt, silty sands, and sands. Reddish-brown clay layers are inter-bedded locally, as are caliche, carbonate nodules, and carbonate-cemented sands. The sediment clay content generally increases with increased depth based on boring logs and soils laboratory testing.

3.2 Site Hydrogeology

Based upon borings and soil samples analyzed in 1995 and 2006, the uppermost saturated zone occurs in the Fort Hancock Formation (GEI, 2016). The depth to groundwater varies primarily as a function of surface topography; and measured groundwater depths range from approximately 159 feet to 387 feet below ground surface. The approximate 228-foot difference is due primarily to surface topography differences across the site.

3.3 Groundwater Flow Gradient and Rate

The groundwater flow rate and direction in the uppermost water-bearing zone has been determined for the subject sampling event. In general, groundwater at the facility flows to the northeast. Figure 2 provides the water-level elevations for the uppermost water-bearing zone for September 24 and 25, 2018.

Hydraulic gradients were estimated for various parts of the site from the water-level measurements collected during this sampling event. The gradient for a particular part of the site is determined by calculating the difference between the groundwater contours (head difference) and dividing by the horizontal distance between the contours. The values are

in ft./ft.; multiply by 5,280 for the gradient in feet per mile. Minimum and maximum rates of groundwater movement were estimated using the groundwater velocity equation (Driscoll, 1986).

$$v = 2{,}830Ki/n_e$$

Where:

v = groundwater velocity (ft./day);
K = hydraulic conductivity (cm/sec);
i = hydraulic gradient (ft./ft.);
n_e = effective porosity (percent); and
2,830 converts cm/sec to ft./day

The hydraulic conductivity for the uppermost water-bearing zone was estimated by GEI (2016) to be 1.0×10^{-3} cm/sec. The hydraulic gradient was estimated to be 0.0016 ft./ft. for the uppermost water-bearing zone from Figure 2. An effective porosity in the Fort Hancock Formation has been estimated at 15 percent (GEI 2016). Using the equation and the values described above, the estimated groundwater velocity (with flow direction) for the uppermost water-bearing zone is:

$$v = \frac{2830 \text{ x } 1.00\text{E-}03 \text{ x } 0.0016 \text{ x } 365}{15\%}$$

v = 11.02 ft./year (northeasterly)

4 DISCUSSION OF LABORATORY ANALYSES

Laboratory analyses were conducted by Hall Environmental Analysis Laboratory, Inc., of Albuquerque, New Mexico. Laboratory reports are provided in Appendix B. This section discusses the analytical results in terms of laboratory quality control.

4.1 Field Quality Assurance/Quality Control Samples

Field quality-assurance/quality-control (QA/QC) samples consisted of one trip blank, one field blank, and one monitor well duplicate sample. The trip blank was prepared with deionized (DI) water by the laboratory, carried to the site, and returned to the lab in a sample cooler. The field blank was prepared with DI water at Well F. The monitor well duplicate sample was collected at Well E. The trip and field blanks were analyzed for VOCs only. The monitor well duplicate sample was analyzed for all detection monitoring constituents.

The trip and field blanks did not indicate problems with procedures as all constituents were below reporting limits. The duplicate sample was taken from Well E and analyzed for organic and inorganic parameters. Appendix C provides the relative percent difference (RPD) between the original and duplicate sample results for inorganic parameters in Well E. The RPD is a calculated value used to compare original and duplicate sample results and provide an estimate of analytical precision. The original and duplicate sample results for Well E indicate that analytical results show reasonable precision and demonstrate overall consistency for all parameters except for aluminum. Field QA/QC results will continue to be closely monitored.

4.2 Laboratory Quality Assurance/Quality Control

The laboratory performed internal QA/QC analyses. Selected QA/QC analyses are described below. A laboratory case narrative and analysis checklist is prepared each analytical event. The laboratory case narrative and QA/QC checklist for the annual monitoring event are provided in Appendix B. The case narrative includes the chain of custody document.

General laboratory QA/QC consists of method blanks, matrix spikes, and laboratory control samples. Additional QA/QC samples may also be analyzed as necessary or required. In general, method blanks are analyzed to determine whether contamination resulting from the analytical process occurred. Matrix spikes are analyzed to document method bias in the sample matrix. Matrix spike duplicates are used to document the method precision and bias in the sample matrix. Laboratory control samples and laboratory control sample duplicates, composed of reagent spikes, are utilized to document laboratory

performance. Sample duplicates are analyzed to test method precision. Results, narratives, and summary information meets applicable laboratory certification and NMAC criteria.

5 STATISTICAL ANALYSIS OF GROUNDWATER DATA

Groundwater data for the constituents listed in Table V.2.2 of the facility Groundwater Monitoring System Plan (GEI, 2012) were evaluated as required by NMAC 20.9.9.20. The full laboratory analytical reports are provided as Appendix B.

5.1 Detection Monitoring

All wells are currently in detection monitoring except for Well G.

5.1.1 Metals and Inorganic Indicator Parameters

Metal and inorganic constituent concentrations were evaluated by comparison to the established Assessment Monitoring Level (AML) and established Upper Tolerance Limit Value (UTLV). AMLs and UTLVs were determined by Gordon Environmental, Inc. (GEI, 2016). The analytical results for each constituent, along with its respective AML and UTLV, are provided in Appendix D. A constituent is considered to be a statistical exceedance if the concentration exceeds its established UTLV. If a UTLV has not been established for a particular constituent, the concentration is considered a statistical exceedance if it exceeds the established AML. A few constituent concentrations were greater than AMLs during the September 2018 sampling event; however, none of those constituents exceeded the established UTLV except for chloride and total dissolved solids (TDS) in samples from Well D. Constituents exceeding their established UTVL are summarized in Table 3.

Table 3
Detection Monitoring Exceedance Summary

Well	Constituent	Result (mg/L)	Established AML	Established UTVL
D	chloride	250	212	230
D	TDS	1,370	1,239	1,290

Notes: TDS – total dissolved solids

Well D is a background (upgradient) well and the chloride and TDS concentrations cannot reasonably be affected by a release from the facility. Hence, the elevated chloride and TDS concentrations are attributed to natural variation.

5.1.2 Organic Compounds

Evaluation of volatile organic compounds (VOCs) and phenolics is accomplished by comparing analytical results to PQLs. An initial detection is based on any VOC or phenolic observed at a concentration at or above the PQL. No VOCs or phenolics were detected in any of the detection monitoring wells during the September 2018 sampling event.

5.2 Assessment Monitoring

As previously stated, Well G is undergoing assessment monitoring in response to verified detections of volatile organic compounds 1,1-DCA, PCE, TCE, freon-11. Well G is situated proximal to Unit 2 and is situated within the limits of future fill area Unit 4. As such Well G is not located at the permit boundary.

5.2.1 Background Concentrations

Wells G and D have been undergoing background monitoring for dichlorodifluoromethane, perchlorate, sulfide, and dacthal in response to a NMED letter dated January 29, 2018. This sampling event represents the fourth and final background monitoring event for the four new assessment parameters. A summary of the background monitoring results is provided below.

Table 4 Background Monitoring Results

Well	Date	CFC-12	Dacthal	Sulfide	Perchlorate
Well D	2/12/2018	1.1	<0.1	0.194	0.108
	5/1/2018	<1	<0.02	<0.19	0.0979
	7/23/2018	13	<0.1	<0.19	0.0771
	9/24/2018	<1	<0.1	<0.19	0.113
Well G	11/5/2017	6.39	0.183	0.236	0.572
	2/12/2018	5.4	0.178	<0.19	0.653
	5/1/2018	5	0.233	<0.19	0.712
	7/24/2018	3.8	0.174	<0.19	0.744
	9/25/2018	3.9	0.184	<0.2	0.715
BCV		7.05	0.1	0.194	0.099
AML		7.05	0.1	0.194	0.099
GWPS		1,000[(1)]	3500[(2)]	NA	25.6[(3)]
CAL		1,000[(1)]	3500[(2)]	NA	25.6[(3)]

Notes:

CFC-12 – dichlodifluoromethane
BCV – Background Concentration Value
AML – Assessment Monitoring Level
CAL – Corrective Action Level
NA – Not Available
(1) National Library of Medicine, Toxnet Toxicology Data Network
(2) USEPA Drinking Water Health Advisory for Dacthal and Dacthal Degradetes
(3) USEPA Technical Fact Sheet - Perchlorate

Background Concentration Values (BCVs) and Assessment Monitoring Levels (AMLs) were calculated per (GEI 2016a). Groundwater Protection Standards (GWPSs) and Corrective Action Levels (CALs) were derived from USEPA publications.

5.2.2 Comparisons to Regulatory Standards

Appendix E provides a summary of assessment monitoring results for Well G with regulatory standards. Per 20.9.9.13.F NMAC, if the concentration of any constituent in 20.9.9.20 NMAC is above the AML, but below the CAL, the facility will continue assessment monitoring. Additionally, per 20.9.9.13.G NMAC, if one or more constituents in 20.9.9.20 NMAC is detected above the CAL during any sampling event, the facility is to follow the procedures set forth in 20.9.9.13.G NMAC unless an alternate source demonstration is submitted.

Three constituents have concentrations that exceed their respective AML in Well G, chloride, total dissolved solids and perchlorate. Chloride was the only constituent to exceed a CAL. Chloride is a main constituent of natural salts which can occur as primary deposits, secondary mineralization, or dissolved aqueous components, especially in arid to semi-arid regions and/or under evaporative conditions. Chloride concentrations in Well G have previously been demonstrated to be influenced by natural groundwater variation (The Carel Corp., March 2018). Additionally, chloride concentrations occur at similar and greater concentration in other site wells (e.g. Well F). The chloride concentrations in Well F have also been attributed to natural fluctuations in groundwater quality (GEI, 2016b).

It is noted that there is not an established primary maximum contaminant level (MCL) for chloride. Rather, a secondary drinking water standard exists. The secondary standard for chloride is 250 mg/L and is based on aesthetic considerations, such as taste, color, and odor. According to a USEPA publication "*Secondary Drinking Water Standards: Guidance for Nuisance Chemicals*" (USEPA, 2018), constituents with secondary drinking water standards such as chloride are not considered a risk to human health.

Further, because Well G is an interior well and is located within a future disposal cell, the facility is evaluating the potential decommissioning of Well G and installation of a replacement well that is located outside of the permitted limits of waste and at the point of compliance. A request to modify the groundwater monitoring network may be submitted pending the outcome of the evaluation.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

None of the constituent concentrations in detection monitoring wells exceeded statistical limits except for chloride and TDS in background Well D. Given that Well D is situated hydraulically upgradient of the landfill, the chloride and TDS concentrations cannot reasonably be affected by a release from the facility. Hence, the elevated chloride and TDS concentrations are attributed to natural variation. No organic compounds were detected in any of the detection monitoring wells during the September 2018 sampling event.

Well G is undergoing assessment monitoring. This sampling event represents the fourth and final background monitoring event for the assessment monitoring parameters (i.e. 20.9.9020 NMAC Subsection B Constituents) in Well G and upgradient Well D. Background Concentration Values (BCVs) and Assessment Monitoring Levels (AMLs) were calculated and Groundwater Protection Standards (GWPSs) and Corrective Action Levels (CALs) were derived from USEPA publications.

Three constituents have concentrations that exceed their respective AML in Well G: chloride, total dissolved solids and perchlorate. Chloride was the only constituent to exceed a CAL.

6.2 Recommendations

It is recommended that Well G continue in assessment monitoring and not be subject to the additional response actions in 20.9.9.13.G NMAC based on the following:

- Well G is located within future fill area Unit 4 and not at the point of compliance.
- Chloride exceedences have previously been demonstrated to be the result of natural variability of the groundwater.
- Chloride is naturally occurring and is a main constituent of natural salts which can occur as primary deposits, secondary mineralization, or dissolved aqueous components, especially in arid to semi-arid regions and/or under evaporative conditions.
- There is not an established primary maximum contaminant level (MCL) for chloride. Rather, a secondary drinking water standard exists. The secondary standard for chloride is 250 mg/L and is based on aesthetic considerations, such as taste, color, and odor.
- According to a USEPA publication "*Secondary Drinking Water Standards: Guidance for Nuisance Chemicals*" (USEPA, 2018), chloride is not considered to present a risk to human health.
- The potential decommissioning of Well G and installation of a replacement well that is located outside of the permitted limits of waste and at the point of compliance.

7 QUALIFIED GROUNDWATER SCIENTIST CERTIFICATION

General Site Information

Site: Camino Real Landfill

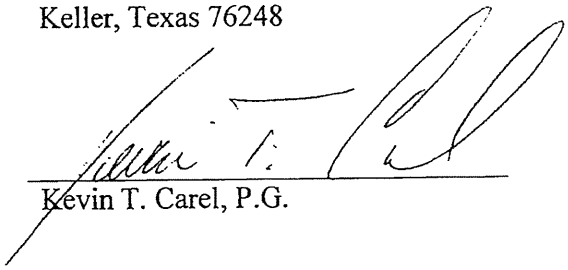
Site Location: Sunland Park New Mexico

Permit No.: SW 00-(10)M

Qualified Groundwater Scientist Statement

I, Kevin T. Carel, am a qualified groundwater scientist as defined in 20.9.9 NMAC. I have prepared this groundwater monitoring report and the supporting data contained herein. In my professional opinion, the information provided in this report is true and accurate. Statistically significant changes were noted for chloride and total dissolved solids in Well D. Five VOCs (1,1-dichloroethane, methylene chloride, tetrachloroethylene, trichloroethylene and trichlorofluromethane) were detected in Well G. Background concentrations other regulatory standards for 20.9.9020 NMAC Subsection B Constituents are provided. Chloride in Well G is the only constituent to exceed a corrective action level. Continued assessment monitoring is recommended based on the location of Well G, the absence of a primary maximum contaminant level (MCL) and other basic information regarding chloride. The only warranty made by me in connection with this document is that I have used the degree of care and skill ordinarily exercised under similar conditions by reputable members of my profession, practicing in similar localities. No other warranty, expressed or implied, is intended.

Firm/Address: The Carel Corporation
136 Pecan Street
Keller, Texas 76248

Signature: 

Kevin T. Carel, P.G.

Date: 11-12-18

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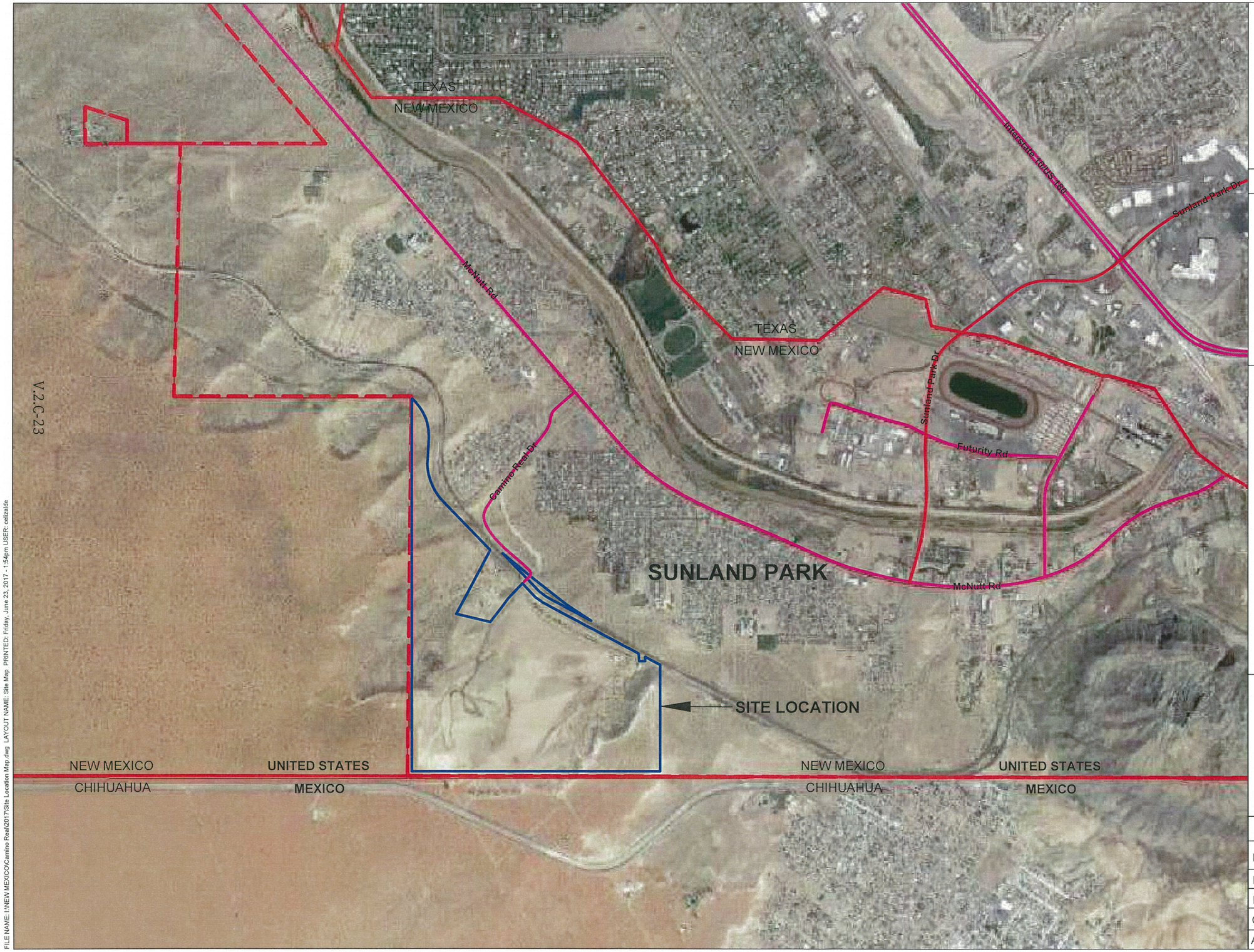
USEPA, 2018. Secondary Drinking Water Standards: Guidance for Nuisance Chemicals, https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals.

FIGURES



V.2.C-23

The CAREL CORPORATION
136 Pecan Street, Keller, TX 76248

LEGEND

- City of Sunland Park
- State Boundary
- Site Boundary
- Major Roads

N

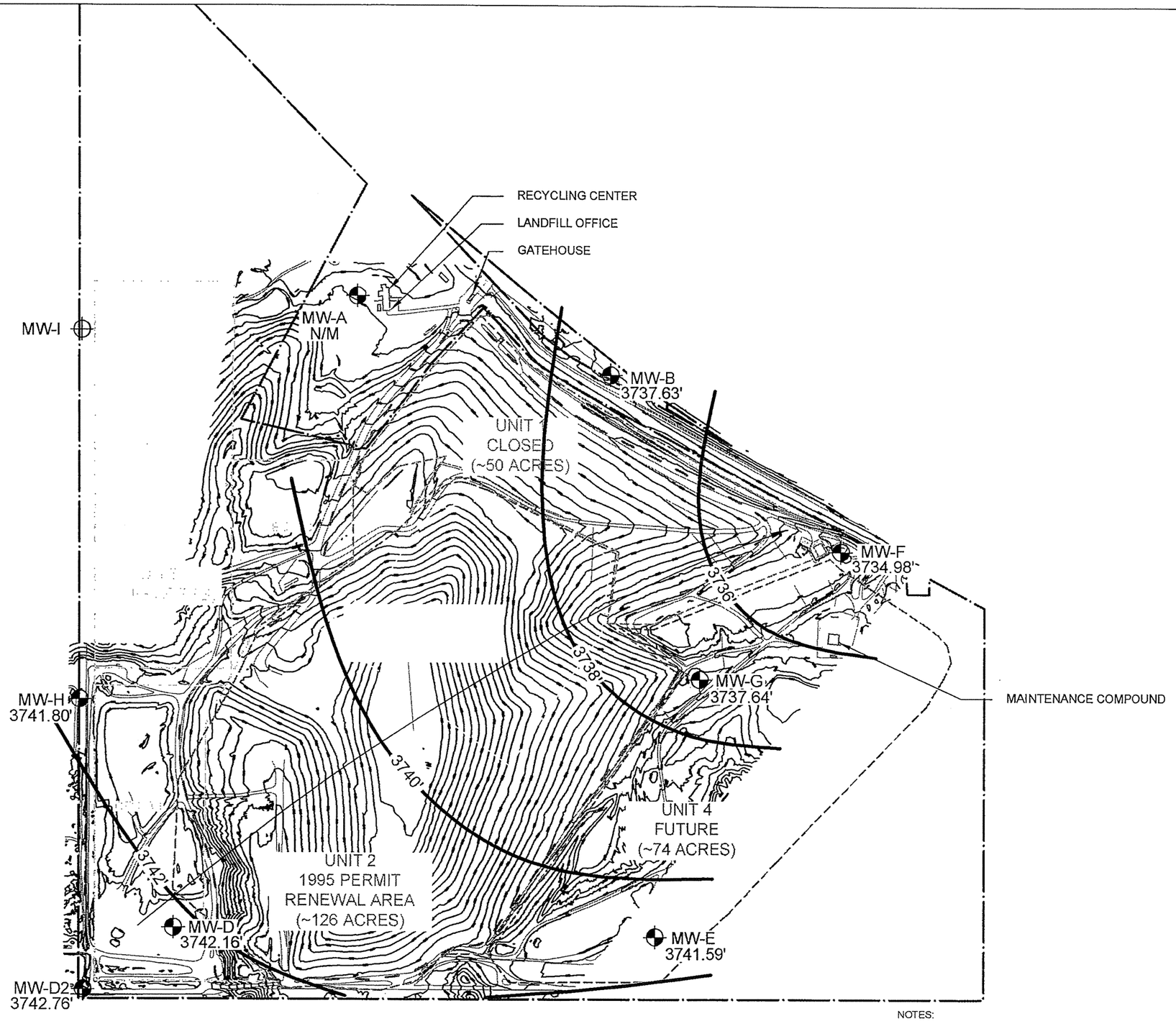
SCALE:
0 1000 2000
FEET

SITE LOCATION MAP

Camino Real Landfill
Sunland Park, New Mexico

DATE: June 20, 2017	
FILENAME: I:\NEW MEXICO\Camino Real\2017\Site Location Map.dwg	
DRAWN BY: KMO	FIGURE: 1
DRAFTED BY: CE	
CHECKED BY: KTC	
APPROVED BY:	

FILE NAME: I:\NEW MEXICO\Camino Real\2017\Site Location Map.dwg LAYOUT NAME: Site Map PRINTED: Friday, June 23, 2017 - 1:54pm USER: celizalde



NOTES:
1. WATER LEVELS MEASURED SE[T/ 24 AND 25, 2018.
2. N/M - GROUNDWATER ELEVATION NOT MEASURED.

The CAREL CORPORATION
136 Pecan Street, Keller, TX 76248

LEGEND

- FACILITY BOUNDARY
- 3990 TOPOGRAPHICAL CONTOURS
- MONITORING WELL
- GROUNDWATER CONTOURS
- PROPOSED MONITORING WELL
- APPROXIMATE LIMITS OF WASTE

N

SCALE: 0 300 600 FEET

GROUNDWATER CONTOUR MAP

September 2018

Camino Real Landfill

Sunland Park, New Mexico

DATE DRAFTED	October 3, 2018
FILENAME:	I:\NEW MEXICO\Camino Real\Contour\New folder\0918 GW MAP.dwg
DRAWN BY:	KMO
DRAFTED BY:	KTC
CHECKED BY:	KTC
APPROVED BY:	

FIGURE: **2**

APPENDIX A

GROUNDWATER SAMPLING FIELD DATA SHEETS

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: A

Project Number: 18-09-09

Project: 2018 Annual GME

Personnel: K. Carel

Date: 9-25-18

Weather Conditions: Sunny Air Temp: 68

WELL DATA:

Casing Diameter: 2 (in) ☑ PVC ☐ Other:

DEPTH TO: Static Water Level (WL): ~~[illegible]~~ (ft) Well Bottom: ~~[illegible]~~ (ft)

DATUM: ☑ Top of Well Casing ☐ Top of Protective Casing ☐ Other:

CONDITION: Is well clearly labeled? ☐ Yes ☑ No

Is prot. casing in good cond.? (not bent or corroded) ☐ Yes ☑ No

Is concrete pad intact? (not cracked or frost heaved) ☐ Yes ☑ No

Is concrete pad covered with soil/debris? ☐ Yes ☑ No

Is padlock functional? ☐ Yes ☑ No Is inner casing intact? ☐ Yes ☑ No

Is inner casing properly capped and vented? ☐ Yes ☑ No Is Reference Point present? ☐ Yes ☑ No

PURGE DATA:

Low-Flow Purging Used? ☐ Yes ☐ No

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other: {if no – Water Standing in Well N.A (gal)

MATERIALS: Type of Pump: ~~QED Well Wizard~~ To be Purged N/A (gal)

Tubing: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other:

PURGING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

PROCEDURES: Pump & Tubing Vol.: (ml) Pumping Rate: (ml/min)

CALIBRATION: pH Meter Model: Meter S/N: Time:

Cond. Meter Model: Same Meter S/N: Same Time: Same

TIME SERIES DATA:

Time:	0620	0622	0624	0628	0630		
Cum. Volume Removed (ml)	Start	0.25	0.5	0.75	1.0		
Temp. (°C):	---	20.81	20.86	25.04	25.02		
pH (s.u.):	---	6.69	7.76	7.89	7.89		
Spec. Cond. (µmhos/cm):	---	2650	2660	2440	2430		
Turbidity (NTU):	---	0	0	0	0		
DO (mg/L)	---	8.49	8.67	7.77	7.77		
ORP (mV)	---	136	127	131	131		

SAMPLING DATA:

Sample Collection Time: ~~[illegible]~~

Water Level at Time of Sample: 0630

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other:

SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

APPEARANCE: ☐ Clear Turbid (NTU): 0 Color: ☐ Contains Immiscible Liquid

FIELD DETERMINATIONS: Temp. (°C): 25.02 pH (s.u.): 7.89 Spec. Cond. (µmhos/cm): 2430

☐ Background ☑ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS:

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Date: 9-25-18

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: B
Project Number: 18-09-09

Project: 2018 Annual GME
Personnel: K. Card

Date: 9-24-18 Time: _____
Weather Conditions: Sunny Air Temp.: 80 °F

Calibration: pH Meter Model: Horiba U-52 Meter S/N: P216DC44 Time: 1425
Conductivity Meter Model: same Meter S/N: same Time: same

WELL DATA:

Casing Diameter: 4 (in.) ☐ PVC ☐ Other:
DEPTH TO : Static Water: 159.34 ft. Well Bottom: 190 ft.
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other: _____
CONDITION Is Well clearly labeled? ☑ Yes ☐ No
Is Prot. Casing in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No Reference Point ? ☑ Yes ☐ No

VOLUME OF WATER: $(d/24)^2$ (23.5)(TD-WL) = One Well Volume (2"=0.163; 4"=0.653)
Standing in well: 20 gal. To be purged: 60 gal.

PURGE DATA:

METHOD: ☐ Bladder Pump ☑ Submersible Pump ☐ Bailer ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☐ Other: _____
PURGING EQUIPMENT: ☐ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
TIME SERIES DATA:

Time:	0618/10	1820	1825	1830			
Cum. Volume (gal):	start	20	40	60			
Temp. (☐°C ☐°F):		26.47	26.37	26.29			
pH (Std. Units):		7.49	7.51	7.51			
Spec. Cond. (µmhos/cm)		2250	2240	2240			
Turbidity (NTU):		6.9	1.6	0.4			
Other:							

Pumping Rate: ~2 gal/min. Elapsed Time: 20 Volume Pumped: 60 gal.

SAMPLING DATA:

Sample Collection Time: 1830 Date: _____
Water Level at Time of Sample Collection: 160.2 ft.
METHOD: ☐ Bladder Pump ☐ Submersible Pump ☐ Bailer ☑ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☐ Other: _____
SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
APPEARANCE: ☑ Clear ☐ Turbidity (NTU)_____ ☐ Color: _____
FIELD DETERMINATIONS: Temp. (☑ °C ☐ °F): 26.29 pH (SU): 7.51 Spec. Cond. (µmhos/cm): 2240

☐ Background ☑ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS: Some rust on well seal bolts may fall into well
~~Trip Blank~~

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: K. Card Date: 9-24-18

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: 15
Project Number: 18-09-09

Project: 2018 Annual GME Date: 9-24-18 Time: _____
Personnel: K. Carel Weather Conditions: Sunny Air Temp.: 92 °F

Calibration: pH Meter Model: Horiba U-52 Meter S/N: P216DCF4 Time: 1425
Conductivity Meter Model: same Meter S/N: same Time: same

WELL DATA:

Casing Diameter: 4 (in.) ☐ PVC ☐ Other:
DEPTH TO : Static Water: 387.95 ft. Well Bottom: 415 ft.
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other: _____
CONDITION Is Well clearly labeled? ☑ Yes ☐ No
Is Prot. Casing in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No Reference Point ? ☑ Yes ☐ No

VOLUME OF WATER: $(d/24)^2$ (23.5)(TD-WL) = One Well Volume (2"=0.163; 4"=0.653)

Standing in well: 17.7 gal. To be purged: 53 gal.

PURGE DATA:

METHOD: ☐ Bladder Pump ☑ Submersible Pump ☐ Bailer ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☐ Other: _____
PURGING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
TIME SERIES DATA:

Time:	1505	1510	1515	1520			
Cum. Volume (gal):	Start	20	40	60			
Temp. (☐°C ☐°F):		26.85	26.71	26.64			
pH (Std. Units):		6.32	6.91	7.12			
Spec. Cond. (µmhos/cm)		1710	1820	1880			
Turbidity (NTU):		0	0	0			
Other:							

Pumping Rate: ~4 gal/min. Elapsed Time: 15 Volume Pumped: 60 gal.

SAMPLING DATA:

Sample Collection Time: 1520 Date: 9-24
Water Level at Time of Sample Collection: 388.2 ft.
METHOD: ☐ Bladder Pump ☑ Submersible Pump ☐ Bailer ☐ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
APPEARANCE: ☒ Clear ☐ Turbidity (NTU) 0 ☐ Color: _____
FIELD DETERMINATIONS: Temp. (☑ °C ☐ °F): 26.64 pH (SU): 7.12 Spec. Cond. (µmhos/cm): 1880

☐ Background ☑ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS:

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Karen T. Carel Date: 9-24-18

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: D2

Project Number: 18-09-09

Project: 2018 Annual GME

Personnel: K. Cole

Date: 9-24-18

Weather Conditions: Sunny Air Temp: 90

WELL DATA:

Casing Diameter: ____ (in) ☑ PVC ☐ Other:

DEPTH TO: Static Water Level (WL): 389.53 (ft) Well Bottom: ____ (ft)

DATUM: ☑ Top of Well Casing ☐ Top of Protective Casing ☐ Other: ____

CONDITION: Is well clearly labeled? ☐ Yes ☐ No

Is prot. casing in good cond.? (not bent or corroded) ☐ Yes ☐ No

Is concrete pad intact? (not cracked or frost heaved) ☐ Yes ☐ No

Is concrete pad covered with soil/debris? ☐ Yes ☐ No

Is padlock functional? ☐ Yes ☐ No Is inner casing intact? ☐ Yes ☐ No

Is inner casing properly capped and vented? ☐ Yes ☐ No Is Reference Point present? ☐ Yes ☐ No

PURGE DATA:

Low-Flow Purging Used? ☐ Yes ☐ No

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other: ____ (if no – Water Standing in Well ____ (gal)

MATERIALS: Type of Pump: QED Well Wizard To be Purged ____ (gal)

Tubing: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: ____

PURGING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

PROCEDURES: Pump & Tubing Vol.: ____ (ml) Pumping Rate: ____ (ml/min)

CALIBRATION: pH Meter Model: ____ Meter S/N: ____ Time: ____

Cond. Meter Model: Same Meter S/N: Same Time: Same

TIME SERIES DATA:

Time:							
Cum. Volume Removed (ml)	Start						
Temp. (°C):	---						
pH (s.u.):	---						
Spec. Cond. (µmhos/cm):	---						
Turbidity (NTU):	---						
DO (mg/L)	---						
ORP (mV)	---						

Low Flow

Water

Only

SAMPLING DATA:

Sample Collection Time: ____

Water Level at Time of Sample: ____

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other: ____

SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

APPEARANCE: ☐ Clear Turbid (NTU): ____ Color: ____ ☐ Contains Immiscible Liquid

FIELD DETERMINATIONS: Temp. (°C): ____ pH (s.u.): ____ Spec. Cond. (µmhos/cm): ____

☐ Background ☐ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS: ____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: [signature] Date: 9-24-18

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: E
Project Number: 18-09-09

Project: 2018 Annual GME Date: 9-24-18 Time: _____
Personnel: K. Carel Weather Conditions: Sunny Air Temp.: 90 °F

Calibration: pH Meter Model: Horiba U-52 Meter S/N: P216DCEE Time: 1425
Conductivity Meter Model: same Meter S/N: same Time: same

WELL DATA:

Casing Diameter: 4 (in.) ☐ PVC ☐ Other:
DEPTH TO : Static Water: 280.05 ft. Well Bottom: 298 ft.
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other: _____
CONDITION Is Well clearly labeled? ☑ Yes ☐ No
Is Prot. Casing in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No Reference Point ? ☑ Yes ☐ No

VOLUME OF WATER: $(d/24)^2$ (23.5)(TD-WL) = One Well Volume (2"=0.163; 4"=0.653)

Standing in well: 11.72 gal. To be purged: 35 gal.

PURGE DATA:

METHOD: ☐ Bladder Pump ☑ Submersible Pump ☐ Bailer ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
PURGING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
TIME SERIES DATA:

Time:	1637	1644	1706	1725			
Cum. Volume (gal):	start	12	24	36			
Temp. (☐°C ☐°F):		26.46	27.65	28.14			
pH (Std. Units):		7.49	7.36	7.40			
Spec. Cond. (µmhos/cm)		2330	2330	2330			
Turbidity (NTU):		53	62.1	15.0			
Other:							

Pumping Rate: ~1.7 gal/min. Elapsed Time: 48 Volume Pumped: ~~60~~ 36 gal.

SAMPLING DATA:

Sample Collection Time: 1725 Date: 9-24-18
Water Level at Time of Sample Collection: 281.3 ft.
METHOD: ☐ Bladder Pump ☑ Submersible Pump ☐ Bailer ☐ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
APPEARANCE: ☑ Clear ☐ Turbidity (NTU) 15.0 ☐ Color: _____
FIELD DETERMINATIONS: Temp. (☑ °C ☐ °F): 28.19 pH (SU): 7.40 Spec. Cond. (µmhos/cm): 2330

☐ Background ☑ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS: Pump dried during purging
Dup collected here

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 9-24-18

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: F
Project Number: 18-09-09

Project: 2018 Annual GME Date: 9-24-18 Time: _____
Personnel: K. Corel Weather Conditions: Sunny Air Temp.: 75 °F

Calibration: pH Meter Model: Horiba U-52 Meter S/N: P216DCFU Time: 1425
Conductivity Meter Model: same Meter S/N: same Time: same

WELL DATA:

Casing Diameter: 4 (in.) ☐ PVC ☐ Other:
DEPTH TO : Static Water: 161.70 ft. Well Bottom: 182 ft.
DATUM: ☐ Top of Protective Casing ☑ Top of Well Casing ☐ Other: _____
CONDITION Is Well clearly labeled? ☑ Yes ☐ No
Is Prot. Casing in Good Cond.? (not bent or corroded) ☑ Yes ☐ No
Is Concrete Pad Intact? (not cracked or frost heaved) ☑ Yes ☐ No
Is Padlock Functional? ☑ Yes ☐ No Is Inner Casing Intact? ☑ Yes ☐ No
Is Inner Casing Properly Capped and Vented? ☑ Yes ☐ No Reference Point ? ☐ Yes ☐ No

VOLUME OF WATER: $(d/24)^2$ (23.5)(TD-WL) = One Well Volume (2"=0.163; 4"=0.653)
Standing in well: 13.2 gal. To be purged: 39.8 gal.

PURGE DATA:

METHOD: ☐ Bladder Pump ☑ Submersible Pump ☐ Bailer ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
PURGING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
TIME SERIES DATA:

Time:	1910	1915	1920	1925	1930		
Cum. Volume (gal):	Start	~~5~~ 10	20	30	40		
Temp. (☐°C ☐°F):		~~7.35~~ 25.12	26.31	26.62	26.58		
pH (Std. Units):		~~1050~~ 7.35	7.08	7.20	7.24		
Spec. Cond. (µmhos/cm)		1050	2270	2500	2530		
Turbidity (NTU):		11	30.50	9.0	7.3		
Other:							

Pumping Rate: ~2 gal/min. Elapsed Time: 20 Volume Pumped: 40 gal.

SAMPLING DATA:

Sample Collection Time: 1930 Date: 9-24-18
Water Level at Time of Sample Collection: _____ ft.
METHOD: ☐ Bladder Pump ☑ Submersible Pump ☐ Bailer ☐ Other: _____
MATERIALS: Pump/Bailer: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☐ Other: _____
Tubing/Rope: ☐ Teflon® ☐ Stainless Steel ☐ PVC ☑ Other: _____
SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field Cleaned ☐ Disposable
APPEARANCE: ☑ Clear ☐ Turbidity (NTU) 7.3 ☐ Color: _____
FIELD DETERMINATIONS: Temp. (☑ °C ☐ °F): 26.58 pH (SU): 7.24 Spec. Cond. (µmhos/cm): 2530

☐ Background ☑ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS:

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: _____ Date: 9-24-18

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: 6

Project Number: 18-09-09

Project: 2018 Annual GME

Personnel: K Carel

Date: 9-25-18

Weather Conditions: Sunny Air Temp: 70

WELL DATA:

Casing Diameter: 4 (in) ☑ PVC ☐ Other:

DEPTH TO: Static Water Level (WL): 197.72 (ft) Well Bottom: 226 (ft)

DATUM: ☑ Top of Well Casing ☑ Top of Protective Casing ☐ Other:

CONDITION: Is well clearly labeled? ☑ Yes ☐ No

Is prot. casing in good cond.? (not bent or corroded) ☑ Yes ☐ No

Is concrete pad intact? (not cracked or frost heaved) ☑ Yes ☐ No

Is concrete pad covered with soil/debris? ☐ Yes ☑ No

Is padlock functional? ☑ Yes ☐ No Is inner casing intact? ☑ Yes ☐ No

Is inner casing properly capped and vented? ☑ Yes ☐ No Is Reference Point present? ☑ Yes ☐ No

PURGE DATA: Low-Flow Purging Used? ☑ Yes ☐ No

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other: {if no – Water Standing in Well (gal)

MATERIALS: Type of Pump: QED Well Wizard To be Purged (gal)

Tubing: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other:

PURGING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

PROCEDURES: Pump & Tubing Vol.: 2423 (ml) Pumping Rate: 220 (ml/min)

CALIBRATION: pH Meter Model: Horiba U-52 Meter S/N: Time:

Cond. Meter Model: Same Meter S/N: Same Time: Same

TIME SERIES DATA:

Time:	0720	0725	0730	0735	0740	0745	
Cum. Volume Removed (ml)	Start	1100	2200	3300	4400	5500	
Temp. (°C):	---	22.70	21.17	21.15	21.77	23.01	
pH (s.u.):	---	7.29	7.20	7.20	7.26	6.79	
Spec. Cond. (µmhos/cm):	---	2280	2280	2300	2310	2290	
Turbidity (NTU):	---	136	131	130	0	0	
DO (mg/L)	---	13.00	14.31	5.12	4.02	2.68	
ORP (mV)	---	231	226	226	202	214	

SAMPLING DATA:

Sample Collection Time: 0745

Water Level at Time of Sample: 202.4

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other:

SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

APPEARANCE: ☑ Clear Turbid (NTU): 0 Color: ☐ Contains Immiscible Liquid

FIELD DETERMINATIONS: Temp. (°C): 23.01 pH (s.u.): 6.79 Spec. Cond. (µmhos/cm): 2290

☐ Background ☑ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS:

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: Date: 9-25-18

Camino Real Landfill

Sunland Park, New Mexico

GROUNDWATER SAMPLING FIELD DATA SHEET

Well Number: H

Project Number: 18-09-09

Project: 2018 Annual GME

Personnel: K. Cook

Date: 9-24-18

Weather Conditions: Sunny Air Temp: 90

WELL DATA:

Casing Diameter: ____ (in) ☑ PVC ☐ Other:

DEPTH TO: Static Water Level (WL): 388.12 (ft) Well Bottom: ____ (ft)

DATUM: ☑ Top of Well Casing ☐ Top of Protective Casing ☐ Other: ____

CONDITION: Is well clearly labeled? ☐ Yes ☐ No

Is prot. casing in good cond.? (not bent or corroded) ☐ Yes ☐ No

Is concrete pad intact? (not cracked or frost heaved) ☐ Yes ☐ No

Is concrete pad covered with soil/debris? ☐ Yes ☐ No

Is padlock functional? ☐ Yes ☐ No Is inner casing intact? ☐ Yes ☐ No

Is inner casing properly capped and vented? ☐ Yes ☐ No Is Reference Point present? ☐ Yes ☐ No

PURGE DATA: Low-Flow Purging Used? ☐ Yes ☐ No

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other: ____ {if no – Water Standing in Well ____ (gal)

MATERIALS: Type of Pump: QED Well Wizard To be Purged ____ (gal)

Tubing: ☑ Teflon® ☐ Polyethylene ☐ Polypropylene ☐ Other: ____

PURGING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

PROCEDURES: Pump & Tubing Vol.: ____ (ml) Pumping Rate: ____ (ml/min)

CALIBRATION: pH Meter Model: ____ Meter S/N: ____ Time: ____

Cond. Meter Model: Same Meter S/N: Same Time: Same

TIME SERIES DATA:

Time:							
Cum. Volume Removed (ml)	Start						
Temp. (°C):	---						
pH (s.u.):	---						
Spec. Cond. (µmhos/cm):	---						
Turbidity (NTU):	---						
DO (mg/L)	---						
ORP (mV)	---						

Water Level Only

SAMPLING DATA:

Sample Collection Time: ____

Water Level at Time of Sample: ____

METHOD: ☑ Bladder Pump ☐ Bailer ☐ Other: ____

SAMPLING EQUIPMENT: ☑ Dedicated ☐ Prepared Off-Site ☐ Field-Cleaned

APPEARANCE: ☐ Clear Turbid (NTU): ____ Color: ____ ☐ Contains Immiscible Liquid

FIELD DETERMINATIONS: Temp. (°C): ____ pH (s.u.): ____ Spec. Cond. (µmhos/cm): ____

☐ Background ☐ Detection ☐ Assessment ☐ Quarterly ☐ Other

REMARKS: ____

I certify that this sample was collected and handled in accordance with applicable regulatory and project protocols.

Signature: [signature] Date: 9-24-18

APPENDIX B

LABORATORY REPORTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 30, 2018

Kevin Carel
Carel Corporation
136 Pecan St
Keller, TX 76248
TEL: (817) 337-0112
FAX

RE: Camino Real Landfill 2018 Annual GME and ASMT Backgro OrderNo.: 1809G79

Dear Kevin Carel:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/27/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1809G79**
Date Reported: **10/30/2018**

CLIENT: Carel Corporation
Project: Camino Real Landfill 2018 Annual GME
Lab ID: 1809G79-001 **Matrix:** AQUEOUS

Client Sample ID: Well D
Collection Date: 9/24/2018 3:20:00 PM
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Arsenic	0.0027	0.0010		mg/L	1	10/2/2018 9:53:52 AM	A54564
Selenium	0.012	0.0010		mg/L	1	10/2/2018 9:53:52 AM	A54564
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Fluoride	0.24	0.10		mg/L	1	10/8/2018 3:52:10 PM	R54731
Chloride	250	10		mg/L	20	10/8/2018 4:05:01 PM	R54731
Sulfate	630	10		mg/L	20	10/8/2018 4:05:01 PM	R54731
Nitrate+Nitrite as N	1.7	1.0		mg/L	5	10/8/2018 5:35:05 PM	R54731
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	1900	5.0		µmhos/c	1	10/3/2018 10:30:23 AM	R54645
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	45.08	20.00		mg/L Ca	1	10/3/2018 10:30:23 AM	R54645
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/3/2018 10:30:23 AM	R54645
Total Alkalinity (as CaCO3)	45.08	20.00		mg/L Ca	1	10/3/2018 10:30:23 AM	R54645
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1370	20.0	*	mg/L	1	10/1/2018 4:20:00 PM	40669
TOTAL NITROGEN						Analyst: **SRM**	
Nitrogen, Total	1.7	1.0		mg/L	1	10/18/2018 3:00:00 PM	R54985
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.75		H	pH units	1	10/3/2018 10:30:23 AM	R54645
SM 4500 NORG C: TKN						Analyst: **CJS**	
Nitrogen, Kjeldahl, Total	ND	1.0		mg/L	1	10/16/2018 9:50:00 AM	40989
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	ND	0.020		mg/L	1	10/19/2018 5:45:38 PM	A55053
Barium	0.022	0.0020		mg/L	1	10/18/2018 9:17:45 PM	C55001
Boron	0.32	0.040		mg/L	1	10/18/2018 9:17:45 PM	C55001
Calcium	180	10		mg/L	10	10/18/2018 9:19:55 PM	C55001
Chromium	ND	0.0060		mg/L	1	10/18/2018 9:17:45 PM	C55001
Iron	0.077	0.020		mg/L	1	10/19/2018 5:45:38 PM	A55053
Magnesium	18	1.0		mg/L	1	10/18/2018 9:17:45 PM	C55001
Potassium	10	1.0		mg/L	1	10/18/2018 9:17:45 PM	C55001
Sodium	230	10		mg/L	10	10/18/2018 9:19:55 PM	C55001
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well D
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 3:20:00 PM
Lab ID: 1809G79-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 5:06:36 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 5:06:36 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well D
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 3:20:00 PM
Lab ID: 1809G79-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I							Analyst: **DJF**
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 5:06:36 PM	LF54527
Surr: 1,2-Dichloroethane-d4	90.1	70-130		%Rec	1	9/28/2018 5:06:36 PM	LF54527
Surr: 4-Bromofluorobenzene	95.4	70-130		%Rec	1	9/28/2018 5:06:36 PM	LF54527
Surr: Dibromofluoromethane	89.7	70-130		%Rec	1	9/28/2018 5:06:36 PM	LF54527
Surr: Toluene-d8	95.7	70-130		%Rec	1	9/28/2018 5:06:36 PM	LF54527
TOTAL PHENOLICS BY SW-846 9067							Analyst: **CLP**
Phenolics	ND	2.7		µg/L	1	10/19/2018	41105

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: TRIP BLANK
Project: Camino Real Landfill 2018 Annual GME
Collection Date:
Lab ID: 1809G79-002
Matrix: TRIP BLANK
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: DJF	
Benzene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 5:35:54 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 5:35:54 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 5:35:54 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: TRIP BLANK
Project: Camino Real Landfill 2018 Annual GME
Collection Date:
Lab ID: 1809G79-002
Matrix: TRIP BLANK
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 5:35:54 PM	LF54527
Surr: 1,2-Dichloroethane-d4	90.8	70-130		%Rec	1	9/28/2018 5:35:54 PM	LF54527
Surr: 4-Bromofluorobenzene	94.1	70-130		%Rec	1	9/28/2018 5:35:54 PM	LF54527
Surr: Dibromofluoromethane	86.2	70-130		%Rec	1	9/28/2018 5:35:54 PM	LF54527
Surr: Toluene-d8	88.6	70-130		%Rec	1	9/28/2018 5:35:54 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181002023
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1809G79
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181002023-001	**Sampling Date**	9/24/2018	**Date/Time Received**	10/2/2018 12:02 PM
Client Sample ID	1809G79-001E / WELL D	**Sampling Time**	3:20 PM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
perchlorate	0.113	ug/L	0.05	10/10/2018 11:37:00 AM	MER	EPA 331.0	

Sample Number	181002023-002	**Sampling Date**	9/24/2018	**Date/Time Received**	10/2/2018 12:02 PM
Client Sample ID	1809G79-001F / WELL D	**Sampling Time**	3:20 PM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Sulfide	ND	mg/L	0.19	10/18/2018 1:30:00 PM	ETL	SM4500S2F	

Sample Number	181002023-003	**Sampling Date**	9/24/2018	**Date/Time Received**	10/2/2018 12:02 PM
Client Sample ID	1809G79-001G / WELL D	**Sampling Time**	3:20 PM		10/8/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Dacthal	ND	ug/L	0.1	10/12/2018 10:23:00 PM	MAH	EPA 515.4	

Authorized Signature

Todd Tarusclo, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0026; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169 ID:WA00169 WA:C595; MT:Cert0095; FL(NELAP): E87 1099

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1809G79
Pace Project No.: 30266929

Sample: 1809G79-001 Well D Lab ID: **30266929001** Collected: 09/24/18 15:20 Received: 10/03/18 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.499 ± 0.462 (0.704) C:NA T:91%**	pCi/L	10/16/18 19:51	13982-63-3	
Radium-228	EPA 904.0	**0.601 ± 0.458 (0.900) C:70% T:76%**	pCi/L	10/12/18 11:03	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G79
Pace Project No.: 30266929

QC Batch: 315727 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30266929001

METHOD BLANK: 1541354 Matrix: Water
Associated Lab Samples: 30266929001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.113 ± 0.351 (0.679) C:NA T:85%	pCi/L	10/16/18 19:51	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G79
Pace Project No.: 30266929

QC Batch: 315728 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30266929001

METHOD BLANK: 1541355 Matrix: Water
Associated Lab Samples: 30266929001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.473 ± 0.381 (0.757) C:73% T:81%	pCi/L	10/12/18 11:03	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1809G79
Pace Project No.: 30266929

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

Date: 10/17/2018 10:06 AM

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID MB-C	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828532 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Boron	ND	0.040								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LLLCS-C	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828533 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	101	50	150			
Boron	ND	0.040	0.04000	0	94.6	50	150			
Calcium	ND	1.0	0.5000	0	111	50	150			
Chromium	ND	0.0060	0.006000	0	86.0	50	150			
Magnesium	ND	1.0	0.5000	0	99.5	50	150			
Potassium	ND	1.0	0.5000	0	93.9	50	150			
Sodium	ND	1.0	0.5000	0	108	50	150			

Sample ID LCS-C	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828534 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.6	85	115			
Boron	0.49	0.040	0.5000	0	98.1	85	115			
Calcium	51	1.0	50.00	0	102	85	115			
Chromium	0.47	0.0060	0.5000	0	94.2	85	115			
Magnesium	47	1.0	50.00	0	95.0	85	115			
Potassium	46	1.0	50.00	0	92.8	85	115			
Sodium	49	1.0	50.00	0	98.0	85	115			

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829987 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829987 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID LLLCS-A	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829988 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	102	50	150			
Iron	ND	0.020	0.02000	0	96.8	50	150			

Sample ID LCS-A	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829989 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	108	85	115			
Iron	0.48	0.020	0.5000	0	96.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID	MB-A	SampType:	MBLK	TestCode:	EPA 200.8: Metals					
Client ID:	PBW	Batch ID:	A54564	RunNo:	54564					
Prep Date:		Analysis Date:	10/2/2018	SeqNo:	1809165	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID	MSLLLCS-A	SampType:	LCSLL	TestCode:	EPA 200.8: Metals					
Client ID:	BatchQC	Batch ID:	A54564	RunNo:	54564					
Prep Date:		Analysis Date:	10/2/2018	SeqNo:	1809166	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	98.4	50	150			
Selenium	0.0010	0.0010	0.001000	0	102	50	150			

Sample ID	MSLCS-A	SampType:	LCS	TestCode:	EPA 200.8: Metals					
Client ID:	LCSW	Batch ID:	A54564	RunNo:	54564					
Prep Date:		Analysis Date:	10/2/2018	SeqNo:	1809167	Units:	mg/L			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.0	85	115			
Selenium	0.024	0.0010	0.02500	0	94.2	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R54731	RunNo: 54731							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816788	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R54731	RunNo: 54731							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816789	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	96.0	90	110			
Chloride	4.7	0.50	5.000	0	94.0	90	110			
Sulfate	9.4	0.50	10.00	0	93.8	90	110			
Nitrate+Nitrite as N	3.5	0.20	3.500	0	99.2	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
Acetone	ND	10								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	2.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	0.50								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	2.5								
Styrene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
Vinyl chloride	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I							
Client ID: PBW	Batch ID: LF54527	RunNo: 54527							
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386	Units: µg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Acrylonitrile	ND	10								
Bromochloromethane	ND	2.0								
Iodomethane	ND	10								
trans-1,4-Dichloro-2-butene	ND	10								
Vinyl acetate	ND	10								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.0	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.7	70	130			
Surr: Toluene-d8	9.2		10.00		92.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles, Table I							
Client ID: LCSW	Batch ID: LF54527	RunNo: 54527							
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807388	Units: µg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	18	1.0	20.00	0	91.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.7	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		89.1	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.1	70	130			
Surr: Toluene-d8	9.0		10.00		90.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID	MB-41105	SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	PBW	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829372	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	ND	2.5								

Sample ID	LCS-41105	SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSW	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829373	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	109	53.3	138			

Sample ID	LCSD-41105	SampType:	LCSD		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSS02	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829374	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	113	53.3	138	3.74	21	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID	lcs-1 98.3uS eC	SampType:	LCS		TestCode:	SM2510B: Specific Conductance				
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812552	Units:	µmhos/cm		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	99	5.0	98.30	0	100	80	120			

Sample ID	1809g79-001c dup	SampType:	DUP		TestCode:	SM2510B: Specific Conductance				
Client ID:	Well D	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812554	Units:	µmhos/cm		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	1900	5.0						0.532	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID 1809g79-001c dup	SampType: DUP			TestCode: SM4500-H+B / 9040C: pH						
Client ID: Well D	Batch ID: R54645			RunNo: 54645						
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812507		Units: pH units				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.76									H

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID	mb-1 alk	SampType:	MBLK		TestCode:	SM2320B: Alkalinity				
Client ID:	PBW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812578	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID	lcs-1 alk	SampType:	LCS		TestCode:	SM2320B: Alkalinity				
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812579	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.60	20.00	80.00	0	95.8	90	110			

Sample ID	mb-2 alk	SampType:	MBLK		TestCode:	SM2320B: Alkalinity				
Client ID:	PBW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812602	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID	lcs-2 alk	SampType:	LCS		TestCode:	SM2320B: Alkalinity				
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812603	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.80	20.00	80.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID MB-40669	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: PBW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808571 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID LCS-40669	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: LCSW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808572 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G79

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and A

Sample ID	MB-40989	SampType:	MBLK		TestCode:	SM 4500 Norg C: TKN				
Client ID:	PBW	Batch ID:	40989		RunNo:	54950				
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826092	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	ND	1.0								

Sample ID	LCS-40989	SampType:	LCS		TestCode:	SM 4500 Norg C: TKN				
Client ID:	LCSW	Batch ID:	40989		RunNo:	54950				
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826093	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.8	1.0	10.00	0	98.0	80	120			

Sample ID	1809G79-001CMS	SampType:	MS		TestCode:	SM 4500 Norg C: TKN				
Client ID:	Well D	Batch ID:	40989		RunNo:	54950				
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826096	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.4	1.0	10.00	0	93.8	75	125			

Sample ID	1809G79-001CMSD	SampType:	MSD		TestCode:	SM 4500 Norg C: TKN				
Client ID:	Well D	Batch ID:	40989		RunNo:	54950				
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826097	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.7	1.0	10.00	0	96.6	75	125	2.94	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CAREL CORPORATION Work Order Number: 1809G79 RcptNo: 1

Received By: Erin Melendrez 9/27/2018 8:55:00 AM

Completed By: Ashley Gallegos 9/28/2018 8:28:43 AM

Reviewed By: JAB 09/28/18

Labeled by: JAB 09/28/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	FedEx		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 5 (1) (<2 or >12 unless noted)

Adjusted? No

Checked by: JAB 09/28/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.9	Good	Yes			

Chain-of-Custody Record

Client: The Carel Corporation
136 Pecan Street
Mailing Address: Keller, TX 76248

Phone #: 817-337-0112
email or Fax#: Kevin.Carel@theCarelCorporation.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☒ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: Camino Real Landfill - 2018 Annual GME & Asst Background
Project #: 18-09-09
Project Manager:
Sampler:
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1809C19	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO3,NO2,PO4,SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached List	Air Bubbles (Y or N)
9-24-18																			
~~9-24-18~~	1520	GW	Well ID	20	Various	-001												X	
—	—	W	Trip Blank	3	HCl	-002										X			

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
9-26-18	1400		FedEx Exp 9/27/18	9/27/18	0855	
Date:	Time:	Relinquished by:	Received by:	Date	Time	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

GROUNDWATER MONITORING PARAMETER LIST, CAMINO REAL LANDFILL

	Well A	Well B	Well D	Well D2-1	Well D2-2	Well D2-3	Well D2-4	Well E	Well F	Well G	Dup	Field Blank	Trip Blank	Reserve
Organic Parameters														
Acetone	X	X	X					X	X	X	X	X	X	X
Acrylonitrile	X	X	X					X	X	X	X	X	X	X
Benzene	X	X	X					X	X	X	X	X	X	X
Bromochloromethane	X	X	X					X	X	X	X	X	X	X
Bromodichloromethane	X	X	X					X	X	X	X	X	X	X
Bromoform	X	X	X					X	X	X	X	X	X	X
Methyl bromide (Bromomethane)	X	X	X					X	X	X	X	X	X	X
2-Butanone (Methyl ethyl ketone - MEK)	X	X	X					X	X	X	X	X	X	X
Carbon Disulfide	X	X	X					X	X	X	X	X	X	X
Carbon Tetrachloride	X	X	X					X	X	X	X	X	X	X
Chlorobenzene	X	X	X					X	X	X	X	X	X	X
Chloroethane (Ethyl Chloride)	X	X	X					X	X	X	X	X	X	X
Chloroform (Trichloromethane)	X	X	X					X	X	X	X	X	X	X
Methyl chloride (Chloromethane)	X	X	X					X	X	X	X	X	X	X
Dibromochloromethane	X	X	X					X	X	X	X	X	X	X
Methylene Bromide (Dibromomethane)	X	X	X					X	X	X	X	X	X	X
o-Dichlorobenzene (1,2-)	X	X	X					X	X	X	X	X	X	X
p-Dichlorobenzene (1,4-)	X	X	X					X	X	X	X	X	X	X
trans-1,4-Dichloro-2-butene	X	X	X					X	X	X	X	X	X	X
1,1-Dichloroethane	X	X	X					X	X	X	X	X	X	X
1,2-Dichloroethane (EDC)	X	X	X					X	X	X	X	X	X	X
1,1-Dichloroethene (1,1-DCE)	X	X	X					X	X	X	X	X	X	X
cis-1,2-Dichloroethene	X	X	X					X	X	X	X	X	X	X
trans-1,2-Dichloroethene	X	X	X					X	X	X	X	X	X	X
Methylene chloride (Dichloromethane)	X	X	X					X	X	X	X	X	X	X
1,2-Dichloropropane	X	X	X					X	X	X	X	X	X	X
cis-1,3-Dichloropropene	X	X	X					X	X	X	X	X	X	X
trans-1,3-Dichloropropene	X	X	X					X	X	X	X	X	X	X
Ethylbenzene	X	X	X					X	X	X	X	X	X	X
2-Hexanone	X	X	X					X	X	X	X	X	X	X
Methyl Iodide (Iodomethane)	X	X	X					X	X	X	X	X	X	X
4-Methyl-2-pentanone (MIBK)	X	X	X					X	X	X	X	X	X	X
Styrene	X	X	X					X	X	X	X	X	X	X
1,1,1,2-Tetrachloroethane	X	X	X					X	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	X	X	X					X	X	X	X	X	X	X
Tetrachloroethene (PCE)	X	X	X					X	X	X	X	X	X	X
Toluene	X	X	X					X	X	X	X	X	X	X
1,1,1-Trichloroethane (TCA)	X	X	X					X	X	X	X	X	X	X
1,1,2-Trichloroethane	X	X	X					X	X	X	X	X	X	X
Trichloroethene (1,1,2-Trichloroethylene, TCE)	X	X	X					X	X	X	X	X	X	X
Trichlorofluoromethane (CFC 11)	X	X	X					X	X	X	X	X	X	X
1,2,3-Trichloropropane	X	X	X					X	X	X	X	X	X	X
Vinyl Acetate	X	X	X					X	X	X	X	X	X	X
Vinyl Chloride	X	X	X					X	X	X	X	X	X	X
Xylenes (Total)	X	X	X					X	X	X	X	X	X	X
Phenolics	X	X	X					X	X	X	X			X
Heavy Metals														
Arsenic, As	X	X	X					X	X	X	X			X
Barium, Ba	X	X	X					X	X	X	X			X
Chromium, Cr	X	X	X					X	X	X	X			X
Selenium, Se	X	X	X					X	X	X	X			X
Aluminum, Al	X	X	X					X	X	X	X			X
Boron, B	X	X	X					X	X	X	X			X
Chloride, Cl-	X	X	X					X	X	X	X			X
Fluoride, F	X	X	X					X	X	X	X			X
Iron, Fe	X	X	X					X	X	X	X			X
Nitrate as N, NO_3-N	X	X	X					X	X	X	X			X
Sulfate, SO_4	X	X	X					X	X	X	X			X
Radioactivity														
Combined Radium, Ra 226 & Ra 228	X	X	X					X	X	X	X			X
Inorganic Chemicals														
Calcium, Ca	X	X	X					X	X	X	X			X
Magnesium, Mg	X	X	X					X	X	X	X			X
Potassium, K	X	X	X					X	X	X	X			X
Sodium, Na	X	X	X					X	X	X	X			X
Total Nitrogen, TN	X	X	X					X	X	X	X			X
Bicarbonate Alkalinity, HCO3 (as $CaCO_3$)	X	X	X					X	X	X	X			X
Total Dissolved Solids, TDS	X	X	X					X	X	X	X			X
Additional Background Monitoring Parameters														
CFC-12			X							X	X			X
Methyl			X							X	X			X
Perchlorate			X							X	X			X
Sulfide			X							X	X			X
Physical Parameters														
pH	X	X	X					X	X	X	X			X
Specific Conductance	X	X	X					X	X	X	X			X
Temperature (field)	X	X	X					X	X	X	X			X
Depth to Water (field)	X	X	X					X	X	X	X			X

Notes for Laboratory:

1. Use historical practical quantitation/reporting limits
2. Please deliver containers to: Camino Real Landfill, 1000 Camino Real Blvd., Sunland Park, New Mexico 88063
3. Call Kevin Creel at 817.991.7370 if you have questions

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 23, 2018

Kevin Carel
Carel Corporation
136 Pecan St
Keller, TX 76248
TEL: (817) 337-0112
FAX

RE: Camino Real Landfill 2018 Annual GME and 4th Asmt OrderNo.: 1809G81

Dear Kevin Carel:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/27/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1809G81**
Date Reported: **10/23/2018**

CLIENT: Carel Corporation
Project: Camino Real Landfill 2018 Annual GME
Lab ID: 1809G81-001 **Matrix:** AQUEOUS

Client Sample ID: Well B
Collection Date: 9/24/2018 6:30:00 PM
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Arsenic	0.0031	0.0010		mg/L	1	10/2/2018 9:56:14 AM	A54564
Selenium	0.013	0.0010		mg/L	1	10/2/2018 9:56:14 AM	A54564
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Fluoride	0.20	0.10		mg/L	1	10/8/2018 4:17:53 PM	R54731
Chloride	310	10		mg/L	20	10/8/2018 4:30:46 PM	R54731
Sulfate	800	10		mg/L	20	10/8/2018 4:30:46 PM	R54731
Nitrate+Nitrite as N	1.7	1.0		mg/L	5	10/8/2018 5:47:57 PM	R54731
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	2200	5.0		µmhos/c	1	10/3/2018 10:43:19 AM	R54645
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	42.60	20.00		mg/L Ca	1	10/3/2018 10:43:19 AM	R54645
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/3/2018 10:43:19 AM	R54645
Total Alkalinity (as CaCO3)	42.60	20.00		mg/L Ca	1	10/3/2018 10:43:19 AM	R54645
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1670	20.0	*	mg/L	1	10/1/2018 4:20:00 PM	40669
TOTAL NITROGEN						Analyst: **SRM**	
Nitrogen, Total	1.7	1.0		mg/L	1	10/18/2018 3:00:00 PM	R54985
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.72		H	pH units	1	10/3/2018 10:43:19 AM	R54645
SM 4500 NORG C: TKN						Analyst: **CJS**	
Nitrogen, Kjeldahl, Total	ND	1.0		mg/L	1	10/16/2018 9:50:00 AM	40989
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	ND	0.020		mg/L	1	10/19/2018 5:47:50 PM	A55053
Barium	0.021	0.0020		mg/L	1	10/18/2018 9:21:54 PM	C55001
Boron	0.35	0.040		mg/L	1	10/18/2018 9:21:54 PM	C55001
Calcium	210	10		mg/L	10	10/18/2018 9:23:51 PM	C55001
Chromium	ND	0.0060		mg/L	1	10/18/2018 9:21:54 PM	C55001
Iron	0.54	0.020	*	mg/L	1	10/19/2018 5:47:50 PM	A55053
Magnesium	18	1.0		mg/L	1	10/18/2018 9:21:54 PM	C55001
Potassium	11	1.0		mg/L	1	10/18/2018 9:21:54 PM	C55001
Sodium	290	10		mg/L	10	10/18/2018 9:23:51 PM	C55001
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well B
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 6:30:00 PM
Lab ID: 1809G81-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 6:05:10 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 6:05:10 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527

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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well B
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 6:30:00 PM
Lab ID: 1809G81-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I							Analyst: **DJF**
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
Surr: 4-Bromofluorobenzene	89.6	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
Surr: Dibromofluoromethane	89.1	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
Surr: Toluene-d8	94.0	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
TOTAL PHENOLICS BY SW-846 9067							Analyst: **CLP**
Phenolics	ND	2.6		µg/L	1	10/19/2018	41105

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1809G81
Pace Project No.: 30266920

Sample: 1809G81-001 Well B **Lab ID: 30266920001** Collected: 09/24/18 18:30 Received: 10/03/18 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0788 ± 0.512 (1.03) C:NA T:87%**	pCi/L	10/12/18 21:23	13982-63-3	
Radium-228	EPA 904.0	**0.337 ± 0.370 (0.775) C:76% T:82%**	pCi/L	10/12/18 12:40	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G81
Pace Project No.: 30266920

QC Batch: 315634
QC Batch Method: EPA 903.1
Associated Lab Samples: 30266920001

Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226

METHOD BLANK: 1540450
Associated Lab Samples: 30266920001

Matrix: Water

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.088 ± 0.401 (0.815) C:NA T:81%	pCi/L	10/12/18 21:08	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G81
Pace Project No.: 30266920

QC Batch: 315637 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30266920001

METHOD BLANK: 1540458 Matrix: Water
Associated Lab Samples: 30266920001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.509 ± 0.304 (0.549) C:75% T:89%	pCi/L	10/12/18 12:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1809G81
Pace Project No.: 30266920

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

Date: 10/15/2018 02:04 PM

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-C	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828532 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Boron	ND	0.040								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LLLCS-C	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828533 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	101	50	150			
Boron	ND	0.040	0.04000	0	94.6	50	150			
Calcium	ND	1.0	0.5000	0	111	50	150			
Chromium	ND	0.0060	0.006000	0	86.0	50	150			
Magnesium	ND	1.0	0.5000	0	99.5	50	150			
Potassium	ND	1.0	0.5000	0	93.9	50	150			
Sodium	ND	1.0	0.5000	0	108	50	150			

Sample ID LCS-C	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828534 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.6	85	115			
Boron	0.49	0.040	0.5000	0	98.1	85	115			
Calcium	51	1.0	50.00	0	102	85	115			
Chromium	0.47	0.0060	0.5000	0	94.2	85	115			
Magnesium	47	1.0	50.00	0	95.0	85	115			
Potassium	46	1.0	50.00	0	92.8	85	115			
Sodium	49	1.0	50.00	0	98.0	85	115			

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829987 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								

Qualifiers:

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829987 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID LLLCS-A	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829988 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	102	50	150			
Iron	ND	0.020	0.02000	0	96.8	50	150			

Sample ID LCS-A	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829989 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	108	85	115			
Iron	0.48	0.020	0.5000	0	96.3	85	115			

Qualifiers:

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-A	SampType: MBLK	TestCode: EPA 200.8: Metals
Client ID: PBW	Batch ID: A54564	RunNo: 54564
Prep Date:	Analysis Date: 10/2/2018	SeqNo: 1809165 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID MSLLLCS-A	SampType: LCSLL	TestCode: EPA 200.8: Metals
Client ID: BatchQC	Batch ID: A54564	RunNo: 54564
Prep Date:	Analysis Date: 10/2/2018	SeqNo: 1809166 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	98.4	50	150			
Selenium	0.0010	0.0010	0.001000	0	102	50	150			

Sample ID MSLCS-A	SampType: LCS	TestCode: EPA 200.8: Metals
Client ID: LCSW	Batch ID: A54564	RunNo: 54564
Prep Date:	Analysis Date: 10/2/2018	SeqNo: 1809167 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.0	85	115			
Selenium	0.024	0.0010	0.02500	0	94.2	85	115			

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBW	Batch ID: R54731	RunNo: 54731
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816788 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSW	Batch ID: R54731	RunNo: 54731
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816789 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	96.0	90	110			
Chloride	4.7	0.50	5.000	0	94.0	90	110			
Sulfate	9.4	0.50	10.00	0	93.8	90	110			
Nitrate+Nitrite as N	3.5	0.20	3.500	0	99.2	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
Acetone	ND	10								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	2.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	0.50								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	2.5								
Styrene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
Vinyl chloride	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Acrylonitrile	ND	10								
Bromochloromethane	ND	2.0								
Iodomethane	ND	10								
trans-1,4-Dichloro-2-butene	ND	10								
Vinyl acetate	ND	10								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.0	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.7	70	130			
Surr: Toluene-d8	9.2		10.00		92.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: LCSW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807388 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	18	1.0	20.00	0	91.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.7	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		89.1	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.1	70	130			
Surr: Toluene-d8	9.0		10.00		90.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-41105	SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	PBW	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829372	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	ND	2.5								

Sample ID	LCS-41105	SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSW	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829373	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	109	53.3	138			

Sample ID	LCSD-41105	SampType:	LCSD		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSS02	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829374	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	113	53.3	138	3.74	21	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1809G81**

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	lcs-1 98.3uS eC	SampType:	LCS		TestCode:	SM2510B: Specific Conductance					
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812552	Units:	µmhos/cm			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity		99	5.0	98.30	0	100	80	120			

Sample ID	1809g81-001c dup	SampType:	DUP		TestCode:	SM2510B: Specific Conductance					
Client ID:	Well B	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812556	Units:	µmhos/cm			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity		2200	5.0						0.675	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1809G81**

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID 1809g81-001c dup	SampType: DUP			TestCode: SM4500-H+B / 9040C: pH						
Client ID: Well B	Batch ID: R54645			RunNo: 54645						
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812509		Units: pH units				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.71									H

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID mb-1 alk	SampType: MBLK			TestCode: SM2320B: Alkalinity					
Client ID: PBW	Batch ID: R54645			RunNo: 54645					
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812578		Units: mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID lcs-1 alk	SampType: LCS			TestCode: SM2320B: Alkalinity					
Client ID: LCSW	Batch ID: R54645			RunNo: 54645					
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812579		Units: mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.60	20.00	80.00	0	95.8	90	110			

Sample ID mb-2 alk	SampType: MBLK			TestCode: SM2320B: Alkalinity					
Client ID: PBW	Batch ID: R54645			RunNo: 54645					
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812602		Units: mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID lcs-2 alk	SampType: LCS			TestCode: SM2320B: Alkalinity					
Client ID: LCSW	Batch ID: R54645			RunNo: 54645					
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812603		Units: mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.80	20.00	80.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40669	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: PBW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808571 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID LCS-40669	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: LCSW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808572 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-40989	SampType:	MBLK		TestCode:	SM 4500 Norg C: TKN				
Client ID:	PBW	Batch ID:	40989		RunNo:	54950				
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826092	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	ND	1.0								

Sample ID	LCS-40989	SampType:	LCS		TestCode:	SM 4500 Norg C: TKN				
Client ID:	LCSW	Batch ID:	40989		RunNo:	54950				
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826093	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.8	1.0	10.00	0	98.0	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CAREL CORPORATION Work Order Number: 1809G81 RcptNo: 1

Received By: Erin Melendrez 9/27/2018 8:55:00 AM

Completed By: Ashley Gallegos 9/28/2018 8:46:31 AM

Reviewed By: JC 9-28-18

labeled by: JAB 09/28/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	FedEx		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 5 (6)
(≤2 or ≥12 unless noted)
Adjusted? No
Checked by: JAB 09/28/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.4	Good	Yes			

Chain-of-Custody Record

Client: The Carel Corporation

Mailing Address: 136 Pecan Street
Keller, TX 76248

Phone #: 817.337.0112

email or Fax#: KCarel@gmail.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☒ NELAP ☐ Other

☒ EDD (Type) Sanitas

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Camino Real Landfill
2018 Annual GME & 4th Asmt

Project #: 18-09-09

Project Manager: Kevin Carel

Sampler: Kevin Carel

On Ice: ☐ Yes ☐ No

Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1809G81	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached List				Air Bubbles (Y or N)
9-24-18	1330	GW	Well B	17	Various	-001												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9-26	1400	Kevin L. Carel	[signature] FedEx EAH 9/27/18	9/27/18	0855
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

GROUNDWATER MONITORING PARAMETER LIST, CAMINO REAL LANDFILL

	Well A	Well B	Well D	Well D-1	Well D-2	Well D-3	Well D-4	Well E	Well F	Well G	Dup	Field Blank	Trip Blank	Reserve
Organic Parameters														
Acetone	X	X	X					X	X	X	X	X	X	X
Acrylonitrile	X	X	X					X	X	X	X	X	X	X
Benzene	X	X	X					X	X	X	X	X	X	X
Bromochloromethane	X	X	X					X	X	X	X	X	X	X
Bromodichloromethane	X	X	X					X	X	X	X	X	X	X
Bromoform	X	X	X					X	X	X	X	X	X	X
Methyl bromide (Bromomethane)	X	X	X					X	X	X	X	X	X	X
2-Butanone (Methyl ethyl ketone - MEK)	X	X	X					X	X	X	X	X	X	X
Carbon Disulfide	X	X	X					X	X	X	X	X	X	X
Carbon Tetrachloride	X	X	X					X	X	X	X	X	X	X
Chlorobenzene	X	X	X					X	X	X	X	X	X	X
Chloroethane (Ethyl Chloride)	X	X	X					X	X	X	X	X	X	X
Chloroform (Trichloromethane)	X	X	X					X	X	X	X	X	X	X
Methyl chloride (Chloromethane)	X	X	X					X	X	X	X	X	X	X
Dibromochloromethane	X	X	X					X	X	X	X	X	X	X
Methylene bromide (Dibromomethane)	X	X	X					X	X	X	X	X	X	X
o-Dichlorobenzene (1,2-)	X	X	X					X	X	X	X	X	X	X
p-Dichlorobenzene (1,4-)	X	X	X					X	X	X	X	X	X	X
trans-1,4-Dichloro-2-butene	X	X	X					X	X	X	X	X	X	X
1,1-Dichloroethane	X	X	X					X	X	X	X	X	X	X
1,2-Dichloroethane (EDC)	X	X	X					X	X	X	X	X	X	X
1,1-Dichloroethene (1,1-DCE)	X	X	X					X	X	X	X	X	X	X
cis-1,2-Dichloroethene	X	X	X					X	X	X	X	X	X	X
trans-1,2-Dichloroethene	X	X	X					X	X	X	X	X	X	X
Methylene chloride (Dichloromethane)	X	X	X					X	X	X	X	X	X	X
1,2-Dichloropropane	X	X	X					X	X	X	X	X	X	X
cis-1,3-Dichloropropene	X	X	X					X	X	X	X	X	X	X
trans-1,3-Dichloropropene	X	X	X					X	X	X	X	X	X	X
Ethylbenzene	X	X	X					X	X	X	X	X	X	X
2-Hexanone	X	X	X					X	X	X	X	X	X	X
Methyl Iodide (Iodomethane)	X	X	X					X	X	X	X	X	X	X
4-Methyl-2-pentanone (MIBK)	X	X	X					X	X	X	X	X	X	X
Styrene	X	X	X					X	X	X	X	X	X	X
1,1,1,2-Tetrachloroethane	X	X	X					X	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	X	X	X					X	X	X	X	X	X	X
Tetrachloroethene (PCE)	X	X	X					X	X	X	X	X	X	X
Toluene	X	X	X					X	X	X	X	X	X	X
1,1,1-Trichloroethane (TCA)	X	X	X					X	X	X	X	X	X	X
1,1,2-Trichloroethane	X	X	X					X	X	X	X	X	X	X
Trichloroethene (1,1,2-Trichloroethylene, TCE)	X	X	X					X	X	X	X	X	X	X
Trichlorofluoromethane (CFC 11)	X	X	X					X	X	X	X	X	X	X
1,2,3-Trichloropropane	X	X	X					X	X	X	X	X	X	X
Vinyl Acetate	X	X	X					X	X	X	X	X	X	X
Vinyl Chloride	X	X	X					X	X	X	X	X	X	X
Xylenes (Total)	X	X	X					X	X	X	X	X	X	X
Phenolics	X	X	X					X	X	X	X			X
Heavy Metals														
Arsenic, As	X	X	X					X	X	X	X			X
Barium, Ba	X	X	X					X	X	X	X			X
Chromium, Cr	X	X	X					X	X	X	X			X
Selenium, Se	X	X	X					X	X	X	X			X
Aluminum, Al	X	X	X					X	X	X	X			X
Boron, B	X	X	X					X	X	X	X			X
Chloride, Cl-	X	X	X					X	X	X	X			X
Fluoride, F	X	X	X					X	X	X	X			X
Iron, Fe	X	X	X					X	X	X	X			X
Nitrate as N, NO_3-N	X	X	X					X	X	X	X			X
Sulfide, SO_4	X	X	X					X	X	X	X			X
Radioactivity														
Combined Radium, Ra 226 & Ra 228	X	X	X					X	X	X	X			X
Inorganic Chemicals														
Calcium, Ca	X	X	X					X	X	X	X			X
Magnesium, Mg	X	X	X					X	X	X	X			X
Potassium, K	X	X	X					X	X	X	X			X
Sodium, Na	X	X	X					X	X	X	X			X
Total Nitrogen, TN	X	X	X					X	X	X	X			X
Bicarbonate Alkalinity, HCO_3 (as $CaCO_3$)	X	X	X					X	X	X	X			X
Total Dissolved Solids, TDS	X	X	X					X	X	X	X			X
Additional Background Monitoring Parameters														
CFC-12			X							X	X			X
Diethyl			X							X	X			X
Perchlorate			X							X	X			X
Sulfide			X							X	X			X
Physical Parameters														
pH	X	X	X					X	X	X	X			X
Specific Conductance	X	X	X					X	X	X	X			X
Temperature (field)	X	X	X					X	X	X	X			X
Depth to Water (field)	X	X	X					X	X	X	X			X

Notes for Laboratory:

1. Use historical practical quantitation/reporting limits
2. Please deliver containers for Camino Real Landfill, 1000 Camino Real Blvd., Sunland Park, New Mexico 88063
3. Call Kevin Carel at 817.991.7370 if you have questions

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 23, 2018

Kevin Carel
Carel Corporation
136 Pecan St
Keller, TX 76248
TEL: (817) 337-0112
FAX

RE: Camino Real Landfill 2018 Annual GME and 4th Asmt OrderNo.: 1809G81

Dear Kevin Carel:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/27/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1809G81**
Date Reported: **10/23/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Project: Camino Real Landfill 2018 Annual GME
Lab ID: 1809G81-001 **Matrix:** AQUEOUS

Client Sample ID: Well B
Collection Date: 9/24/2018 6:30:00 PM
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Arsenic	0.0031	0.0010		mg/L	1	10/2/2018 9:56:14 AM	A54564
Selenium	0.013	0.0010		mg/L	1	10/2/2018 9:56:14 AM	A54564
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Fluoride	0.20	0.10		mg/L	1	10/8/2018 4:17:53 PM	R54731
Chloride	310	10		mg/L	20	10/8/2018 4:30:46 PM	R54731
Sulfate	800	10		mg/L	20	10/8/2018 4:30:46 PM	R54731
Nitrate+Nitrite as N	1.7	1.0		mg/L	5	10/8/2018 5:47:57 PM	R54731
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	2200	5.0		µmhos/c	1	10/3/2018 10:43:19 AM	R54645
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	42.60	20.00		mg/L Ca	1	10/3/2018 10:43:19 AM	R54645
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/3/2018 10:43:19 AM	R54645
Total Alkalinity (as CaCO3)	42.60	20.00		mg/L Ca	1	10/3/2018 10:43:19 AM	R54645
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1670	20.0	*	mg/L	1	10/1/2018 4:20:00 PM	40669
TOTAL NITROGEN						Analyst: **SRM**	
Nitrogen, Total	1.7	1.0		mg/L	1	10/18/2018 3:00:00 PM	R54985
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.72		H	pH units	1	10/3/2018 10:43:19 AM	R54645
SM 4500 NORG C: TKN						Analyst: **CJS**	
Nitrogen, Kjeldahl, Total	ND	1.0		mg/L	1	10/16/2018 9:50:00 AM	40989
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	ND	0.020		mg/L	1	10/19/2018 5:47:50 PM	A55053
Barium	0.021	0.0020		mg/L	1	10/18/2018 9:21:54 PM	C55001
Boron	0.35	0.040		mg/L	1	10/18/2018 9:21:54 PM	C55001
Calcium	210	10		mg/L	10	10/18/2018 9:23:51 PM	C55001
Chromium	ND	0.0060		mg/L	1	10/18/2018 9:21:54 PM	C55001
Iron	0.54	0.020	*	mg/L	1	10/19/2018 5:47:50 PM	A55053
Magnesium	18	1.0		mg/L	1	10/18/2018 9:21:54 PM	C55001
Potassium	11	1.0		mg/L	1	10/18/2018 9:21:54 PM	C55001
Sodium	290	10		mg/L	10	10/18/2018 9:23:51 PM	C55001
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well B
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 6:30:00 PM
Lab ID: 1809G81-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: DJF	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 6:05:10 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 6:05:10 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well B
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 6:30:00 PM
Lab ID: 1809G81-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 6:05:10 PM	LF54527
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
Surr: 4-Bromofluorobenzene	89.6	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
Surr: Dibromofluoromethane	89.1	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
Surr: Toluene-d8	94.0	70-130		%Rec	1	9/28/2018 6:05:10 PM	LF54527
TOTAL PHENOLICS BY SW-846 9067						Analyst: **CLP**	
Phenolics	ND	2.6		µg/L	1	10/19/2018	41105

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1809G81
Pace Project No.: 30266920

Sample: 1809G81-001 Well B **Lab ID: 30266920001** Collected: 09/24/18 18:30 Received: 10/03/18 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0788 ± 0.512 (1.03) C:NA T:87%**	pCi/L	10/12/18 21:23	13982-63-3	
Radium-228	EPA 904.0	**0.337 ± 0.370 (0.775) C:76% T:82%**	pCi/L	10/12/18 12:40	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G81
Pace Project No.: 30266920

QC Batch: 315634 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30266920001

METHOD BLANK: 1540450 Matrix: Water
Associated Lab Samples: 30266920001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.088 ± 0.401 (0.815) C:NA T:81%	pCi/L	10/12/18 21:08	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G81
Pace Project No.: 30266920

QC Batch: 315537 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30266920001

METHOD BLANK: 1540458 Matrix: Water
Associated Lab Samples: 30266920001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.509 ± 0.304 (0.549) C:75% T:89%	pCi/L	10/12/18 12:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1809G81
Pace Project No.: 30266920

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

Date: 10/15/2018 02:04 PM

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-C	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828532 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Boron	ND	0.040								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LLLCS-C	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828533 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	101	50	150			
Boron	ND	0.040	0.04000	0	94.6	50	150			
Calcium	ND	1.0	0.5000	0	111	50	150			
Chromium	ND	0.0060	0.006000	0	86.0	50	150			
Magnesium	ND	1.0	0.5000	0	99.5	50	150			
Potassium	ND	1.0	0.5000	0	93.9	50	150			
Sodium	ND	1.0	0.5000	0	108	50	150			

Sample ID LCS-C	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828534 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.6	85	115			
Boron	0.49	0.040	0.5000	0	98.1	85	115			
Calcium	51	1.0	50.00	0	102	85	115			
Chromium	0.47	0.0060	0.5000	0	94.2	85	115			
Magnesium	47	1.0	50.00	0	95.0	85	115			
Potassium	46	1.0	50.00	0	92.8	85	115			
Sodium	49	1.0	50.00	0	98.0	85	115			

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829987 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-A	SampType:	MBLK	TestCode:	EPA Method 200.7: Metals					
Client ID:	PBW	Batch ID:	A55053	RunNo:	55053					
Prep Date:		Analysis Date:	10/19/2018	SeqNo:	1829987	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID	LLLCS-A	SampType:	LCSLL	TestCode:	EPA Method 200.7: Metals					
Client ID:	BatchQC	Batch ID:	A55053	RunNo:	55053					
Prep Date:		Analysis Date:	10/19/2018	SeqNo:	1829988	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	102	50	150			
Iron	ND	0.020	0.02000	0	96.8	50	150			

Sample ID	LCS-A	SampType:	LCS	TestCode:	EPA Method 200.7: Metals					
Client ID:	LCSW	Batch ID:	A55053	RunNo:	55053					
Prep Date:		Analysis Date:	10/19/2018	SeqNo:	1829989	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	108	85	115			
Iron	0.48	0.020	0.5000	0	96.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-A	SampType: MBLK	TestCode: EPA 200.8: Metals
Client ID: PBW	Batch ID: A54564	RunNo: 54564
Prep Date:	Analysis Date: 10/2/2018	SeqNo: 1809165 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID MSLLLCS-A	SampType: LCSLL	TestCode: EPA 200.8: Metals
Client ID: BatchQC	Batch ID: A54564	RunNo: 54564
Prep Date:	Analysis Date: 10/2/2018	SeqNo: 1809166 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	98.4	50	150			
Selenium	0.0010	0.0010	0.001000	0	102	50	150			

Sample ID MSLCS-A	SampType: LCS	TestCode: EPA 200.8: Metals
Client ID: LCSW	Batch ID: A54564	RunNo: 54564
Prep Date:	Analysis Date: 10/2/2018	SeqNo: 1809167 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.0	85	115			
Selenium	0.024	0.0010	0.02500	0	94.2	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G81

Hall Environmental Analysis Laboratory, Inc.

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R54731	RunNo: 54731							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816788	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R54731	RunNo: 54731							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816789	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	96.0	90	110			
Chloride	4.7	0.50	5.000	0	94.0	90	110			
Sulfate	9.4	0.50	10.00	0	93.8	90	110			
Nitrate+Nitrite as N	3.5	0.20	3.500	0	99.2	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
Acetone	ND	10								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	2.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	0.50								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	2.5								
Styrene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
Vinyl chloride	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Acrylonitrile	ND	10								
Bromochloromethane	ND	2.0								
Iodomethane	ND	10								
trans-1,4-Dichloro-2-butene	ND	10								
Vinyl acetate	ND	10								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.0	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.7	70	130			
Surr: Toluene-d8	9.2		10.00		92.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: LCSW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807388 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	18	1.0	20.00	0	91.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.7	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		89.1	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.1	70	130			
Surr: Toluene-d8	9.0		10.00		90.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-41105	SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	PBW	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829372	Units:	µg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics		ND	2.5								

Sample ID	LCS-41105	SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	LCSW	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829373	Units:	µg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics		11	2.5	10.00	0	109	53.3	138			

Sample ID	LCSD-41105	SampType:	LCSD		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	LCSS02	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829374	Units:	µg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics		11	2.5	10.00	0	113	53.3	138	3.74	21	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	lcs-1 98.3uS eC	SampType:	LCS		TestCode:	SM2510B: Specific Conductance				
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812552	Units:	µmhos/cm		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	99	5.0	98.30	0	100	80	120			

Sample ID	1809g81-001c dup	SampType:	DUP		TestCode:	SM2510B: Specific Conductance				
Client ID:	Well B	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812556	Units:	µmhos/cm		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	2200	5.0						0.675	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G81

Hall Environmental Analysis Laboratory, Inc.

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID 1809g81-001c dup	SampType: DUP			TestCode: SM4500-H+B / 9040C: pH						
Client ID: Well B	Batch ID: R54645			RunNo: 54645						
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812509	Units: pH units					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.71									H

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	mb-1 alk	SampType:	MBLK	TestCode:	SM2320B: Alkalinity					
Client ID:	PBW	Batch ID:	R54645	RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018	SeqNo:	1812578	Units:	mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID	lcs-1 alk	SampType:	LCS	TestCode:	SM2320B: Alkalinity					
Client ID:	LCSW	Batch ID:	R54645	RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018	SeqNo:	1812579	Units:	mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.60	20.00	80.00	0	95.8	90	110			

Sample ID	mb-2 alk	SampType:	MBLK	TestCode:	SM2320B: Alkalinity					
Client ID:	PBW	Batch ID:	R54645	RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018	SeqNo:	1812602	Units:	mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID	lcs-2 alk	SampType:	LCS	TestCode:	SM2320B: Alkalinity					
Client ID:	LCSW	Batch ID:	R54645	RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018	SeqNo:	1812603	Units:	mg/L CaCO3			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.80	20.00	80.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1809G81**

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40669	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: PBW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808571 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID LCS-40669	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: LCSW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808572 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G81

23-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-40989	SampType:	MBLK		TestCode:	SM 4500 Norg C: TKN					
Client ID:	PBW	Batch ID:	40989		RunNo:	54950					
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826092	Units:	mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total		ND	1.0								

Sample ID	LCS-40989	SampType:	LCS		TestCode:	SM 4500 Norg C: TKN					
Client ID:	LCSW	Batch ID:	40989		RunNo:	54950					
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826093	Units:	mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total		9.8	1.0	10.00	0	98.0	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CAREL CORPORATION Work Order Number: 1809G81 RcptNo: 1

Received By: Erin Melendrez 9/27/2018 8:55:00 AM

Completed By: Ashley Gallegos 9/28/2018 8:46:31 AM

Reviewed By: JC 9-28-18

labeled by: JAB 09/28/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	FedEx		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 5 (6)
(<2 or >12 unless noted)
Adjusted? No
Checked by: JAB 09/28/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.4	Good	Yes			

Chain-of-Custody Record

Client: The Carel Corporation

Mailing Address: 136 Pecan Street
Keller, TX 76248

Phone #: 817.337.0112

email or Fax#: KCarel@gmail.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☒ NELAP ☐ Other _____

☒ EDD (Type) Sanitas

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Corrino Real Landfill
2018 Annual GME & 4th Asmt

Project #:
18-09-09

Project Manager:
Kevin Carel

Sampler: Kevin Carel

On Ice: ☒ Yes ☐ No

Sample Temperature: 0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1809C81	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	X See Attached List				Air Bubbles (Y or N)
9-24-18	1330	GW	Well B	17	Various	-001												X				

Date: 9-26 Time: 1400 Relinquished by: Kevin Carel

Received by: Fedex EXH 9/27/18 Date 9/27/18 Time 0855

Date: Time: Relinquished by:

Received by: Date Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

GROUNDWATER MONITORING PARAMETER LIST, CAMINO REAL LANDFILL

	Well A	Well B	Well D	Well D-1	Well D-2	Well D-3	Well D-4	Well E	Well F	Well G	Dup	Field Blank	Trip Blank	Reserve
Organic Parameters														
Acetone	X	X	X					X	X	X	X	X	X	X
Acrylonitrile	X	X	X					X	X	X	X	X	X	X
Benzene	X	X	X					X	X	X	X	X	X	X
Bromochloroethane	X	X	X					X	X	X	X	X	X	X
Bromodichloromethane	X	X	X					X	X	X	X	X	X	X
Bromoform	X	X	X					X	X	X	X	X	X	X
Methyl bromide (Bromomethane)	X	X	X					X	X	X	X	X	X	X
2-Butanone (Methyl ethyl ketone - MEK)	X	X	X					X	X	X	X	X	X	X
Carbon Disulfide	X	X	X					X	X	X	X	X	X	X
Carbon Tetrachloride	X	X	X					X	X	X	X	X	X	X
Chlorobenzene	X	X	X					X	X	X	X	X	X	X
Chloroethane (Ethyl Chloride)	X	X	X					X	X	X	X	X	X	X
Chloroform (Trichloromethane)	X	X	X					X	X	X	X	X	X	X
Methyl chloride (Chloromethane)	X	X	X					X	X	X	X	X	X	X
Dibromochloromethane	X	X	X					X	X	X	X	X	X	X
Methylene bromide (Dibromomethane)	X	X	X					X	X	X	X	X	X	X
o-Dichlorobenzene (1,2-)	X	X	X					X	X	X	X	X	X	X
p-Dichlorobenzene (1,4-)	X	X	X					X	X	X	X	X	X	X
trans-1,4-Dichloro-2-butene	X	X	X					X	X	X	X	X	X	X
1,1-Dichloroethane	X	X	X					X	X	X	X	X	X	X
1,2-Dichloroethane (EDC)	X	X	X					X	X	X	X	X	X	X
1,1-Dichloroethene (1,1-DCE)	X	X	X					X	X	X	X	X	X	X
cis-1,2-Dichloroethene	X	X	X					X	X	X	X	X	X	X
trans-1,2-Dichloroethene	X	X	X					X	X	X	X	X	X	X
Methylene chloride (Dichloromethane)	X	X	X					X	X	X	X	X	X	X
1,2-Dichloropropane	X	X	X					X	X	X	X	X	X	X
cis-1,3-Dichloropropene	X	X	X					X	X	X	X	X	X	X
trans-1,3-Dichloropropene	X	X	X					X	X	X	X	X	X	X
Ethylbenzene	X	X	X					X	X	X	X	X	X	X
2-Hexanone	X	X	X					X	X	X	X	X	X	X
Methyl iodide (Iodoethane)	X	X	X					X	X	X	X	X	X	X
4-Methyl-2-pentanone (MIBK)	X	X	X					X	X	X	X	X	X	X
Styrene	X	X	X					X	X	X	X	X	X	X
1,1,1,2-Tetrachloroethane	X	X	X					X	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	X	X	X					X	X	X	X	X	X	X
Tetrachloroethene (PCE)	X	X	X					X	X	X	X	X	X	X
Toluene	X	X	X					X	X	X	X	X	X	X
1,1,1-Trichloroethane (TCA)	X	X	X					X	X	X	X	X	X	X
1,1,2-Trichloroethane	X	X	X					X	X	X	X	X	X	X
Trichloroethene (1,1,2-Trichloroethylene, TCE)	X	X	X					X	X	X	X	X	X	X
Trichlorofluoromethane (CFC 11)	X	X	X					X	X	X	X	X	X	X
1,2,3-Trichloropropane	X	X	X					X	X	X	X	X	X	X
Vinyl Acetate	X	X	X					X	X	X	X	X	X	X
Vinyl Chloride	X	X	X					X	X	X	X	X	X	X
Xylenes (Total)	X	X	X					X	X	X	X	X	X	X
Phenolics	X	X	X					X	X	X	X			X
Heavy Metals														
Arsenic, As	X	X	X					X	X	X	X			X
Beryllium, Be	X	X	X					X	X	X	X			X
Chromium, Cr	X	X	X					X	X	X	X			X
Selenium, Se	X	X	X					X	X	X	X			X
Aluminum, Al	X	X	X					X	X	X	X			X
Boron, B	X	X	X					X	X	X	X			X
Chloride, Cl-	X	X	X					X	X	X	X			X
Fluoride, F	X	X	X					X	X	X	X			X
Iron, Fe	X	X	X					X	X	X	X			X
Nitrate as N, NO3-N	X	X	X					X	X	X	X			X
Sulfide, SO4	X	X	X					X	X	X	X			X
Radioactivity														
Combined Radium, Ra 226 & Ra 228	X	X	X					X	X	X	X			X
Inorganic Chemicals														
Calcium, Ca	X	X	X					X	X	X	X			X
Magnesium, Mg	X	X	X					X	X	X	X			X
Potassium, K	X	X	X					X	X	X	X			X
Sodium, Na	X	X	X					X	X	X	X			X
Total Nitrogen, TN	X	X	X					X	X	X	X			X
Bicarbonate Alkalinity, HCO3 (as CaCO3)	X	X	X					X	X	X	X			X
Total Dissolved Solids, TDS	X	X	X					X	X	X	X			X
Additional Background Monitoring Parameters														
CFC-12			X							X	X			X
Diethyl			X							X	X			X
Perchlorate			X							X	X			X
Sulfide			X							X	X			X
Physical Parameters														
pH	X	X	X					X	X	X	X			X
Specific Conductance	X	X	X					X	X	X	X			X
Temperature (field)	X	X	X					X	X	X	X			X
Depth to Water (field)	X	X	X					X	X	X	X			X

Notes for Laboratory:

1. Use historical practical quantitation/reporting limits
2. Please deliver containers to: Camino Real Landfill, 1000 Camino Real Blvd., Sunland Park, New Mexico 88063
3. Call Kevin Carel at 817.991.7370 if you have questions

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 22, 2018

Kevin Carel
Carel Corporation
136 Pecan St
Keller, TX 76248
TEL: (817) 337-0112
FAX

RE: Camino Real Landfill 2018 Annual GME and 4th Asmt OrderNo.: 1809G90

Dear Kevin Carel:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/27/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1809G90**
Date Reported: **10/22/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: MW-E
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 5:25:00 PM
Lab ID: 1809G90-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **DBK**	
Arsenic	0.0097	0.0010		mg/L	1	10/4/2018 2:06:12 PM	40784
Selenium	0.015	0.0010		mg/L	1	10/4/2018 2:06:12 PM	40784
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.46	0.10		mg/L	1	10/8/2018 7:33:39 PM	R54729
Chloride	260	10		mg/L	20	10/8/2018 7:46:04 PM	R54729
Sulfate	900	10		mg/L	20	10/8/2018 7:46:04 PM	R54729
Nitrate+Nitrite as N	2.9	1.0		mg/L	5	10/8/2018 8:48:08 PM	R54729
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	2300	5.0		µmhos/c	1	10/3/2018 11:03:24 AM	R54645
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	47.88	20.00		mg/L Ca	1	10/3/2018 11:03:24 AM	R54645
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/3/2018 11:03:24 AM	R54645
Total Alkalinity (as CaCO3)	47.88	20.00		mg/L Ca	1	10/3/2018 11:03:24 AM	R54645
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1740	40.0	*D	mg/L	1	10/1/2018 4:20:00 PM	40669
TOTAL NITROGEN						Analyst: **SRM**	
Nitrogen, Total	2.9	1.0		mg/L	1	10/18/2018 3:00:00 PM	R54985
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.69		H	pH units	1	10/3/2018 11:03:24 AM	R54645
SM 4500 NORG C: TKN						Analyst: **CJS**	
Nitrogen, Kjeldahl, Total	ND	1.0		mg/L	1	10/16/2018 9:50:00 AM	40989
EPA METHOD 200.7: METALS						Analyst: **JLF**	
Aluminum	0.14	0.020		mg/L	1	10/6/2018 8:14:56 PM	40784
Barium	0.017	0.0020		mg/L	1	10/6/2018 8:14:56 PM	40784
Boron	0.52	0.040		mg/L	1	10/6/2018 8:14:56 PM	40784
Calcium	190	10		mg/L	10	10/12/2018 4:53:50 PM	40784
Chromium	0.090	0.0060		mg/L	1	10/6/2018 8:14:56 PM	40784
Iron	4.0	0.20	*	mg/L	10	10/12/2018 4:53:50 PM	40784
Magnesium	26	1.0		mg/L	1	10/6/2018 8:14:56 PM	40784
Potassium	11	1.0		mg/L	1	10/6/2018 8:14:56 PM	40784
Sodium	270	10		mg/L	10	10/12/2018 4:53:50 PM	40784
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: MW-E
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 5:25:00 PM
Lab ID: 1809G90-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 7:03:26 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 7:03:26 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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Hall Environmental Analysis Laboratory, Inc.

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Lab ID: 1809G90-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I							Analyst: **DJF**
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 7:03:26 PM	LF54527
Surr: 1,2-Dichloroethane-d4	93.9	70-130		%Rec	1	9/28/2018 7:03:26 PM	LF54527
Surr: 4-Bromofluorobenzene	94.0	70-130		%Rec	1	9/28/2018 7:03:26 PM	LF54527
Surr: Dibromofluoromethane	91.2	70-130		%Rec	1	9/28/2018 7:03:26 PM	LF54527
Surr: Toluene-d8	87.7	70-130		%Rec	1	9/28/2018 7:03:26 PM	LF54527
TOTAL PHENOLICS BY SW-846 9067							Analyst: **CLP**
Phenolics	ND	2.6		µg/L	1	10/19/2018	41105

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Pace Analytical
www.pacelabs.com

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1809G90
Pace Project No.: 30266918

Sample: 1809G90-001 Well E **Lab ID: 30266918001** Collected: 09/24/18 17:25 Received: 10/03/18 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.166 ± 0.399 (0.997)** **C:NA T:84%**	pCi/L	10/12/18 21:23	13982-63-3	
Radium-228	EPA 904.0	**0.672 ± 0.408 (0.674)** **C:73% T:82%**	pCi/L	10/12/18 12:41	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G90
Pace Project No.: 30266918

QC Batch: 315634 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30266918001

METHOD BLANK: 1540450 Matrix: Water
Associated Lab Samples: 30266918001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.068 ± 0.401 (0.815) C:NA T:81%	pCi/L	10/12/18 21:08	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G99
Pace Project No.: 30266918

QC Batch: 315637 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30266918001

METHOD BLANK: 1540458 Matrix: Water
Associated Lab Samples: 30266918001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.509 ± 0.304 (0.549) C:75% T:89%	pCi/L	10/12/18 12:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg PA 15601
(724)850-5600

QUALIFIERS

Project: 1809G90
Pace Project No.: 30266918

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

Date: 10/15/2018 02:04 PM

QC SUMMARY REPORT

WO#: 1809G90

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40784 SampType: MBLK TestCode: EPA Method 200.7: Metals

Client ID: PBW Batch ID: 40784 RunNo: 54686

Prep Date: 10/3/2018 Analysis Date: 10/5/2018 SeqNo: 1814517 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Barium	ND	0.0020								
Boron	ND	0.040								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								

Sample ID LLLCS-40784 SampType: LCSLL TestCode: EPA Method 200.7: Metals

Client ID: BatchQC Batch ID: 40784 RunNo: 54686

Prep Date: 10/3/2018 Analysis Date: 10/5/2018 SeqNo: 1814518 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	149	50	150			
Barium	0.0022	0.0020	0.002000	0	112	50	150			
Boron	0.040	0.040	0.04000	0	101	50	150			
Calcium	ND	1.0	0.5000	0	98.4	50	150			
Chromium	ND	0.0060	0.006000	0	94.7	50	150			
Iron	0.020	0.020	0.02000	0	101	50	150			
Magnesium	ND	1.0	0.5000	0	97.3	50	150			
Potassium	ND	1.0	0.5000	0	123	50	150			

Sample ID LCS-40784 SampType: LCS TestCode: EPA Method 200.7: Metals

Client ID: LCSW Batch ID: 40784 RunNo: 54686

Prep Date: 10/3/2018 Analysis Date: 10/5/2018 SeqNo: 1814519 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.55	0.020	0.5000	0	110	85	115			
Barium	0.49	0.0020	0.5000	0	98.4	85	115			
Boron	0.49	0.040	0.5000	0	97.1	85	115			
Calcium	47	1.0	50.00	0	94.6	85	115			
Chromium	0.48	0.0060	0.5000	0	95.8	85	115			
Iron	0.48	0.020	0.5000	0	95.7	85	115			
Magnesium	48	1.0	50.00	0	96.0	85	115			
Potassium	48	1.0	50.00	0	95.0	85	115			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- B Analyte detected in the associated Method Blank
- D Sample Diluted Due to Matrix
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- PQL Practical Quanitative Limit
- RL Reporting Detection Limit
- S % Recovery outside of range due to dilution or matrix
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G90

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40784	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: 40784	RunNo: 54856
Prep Date: 10/3/2018	Analysis Date: 10/12/2018	SeqNo: 1822895 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LLLCS-40784	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: 40784	RunNo: 54856
Prep Date: 10/3/2018	Analysis Date: 10/12/2018	SeqNo: 1822896 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	131	50	150			
Calcium	ND	1.0	0.5000	0	103	50	150			
Iron	0.022	0.020	0.02000	0	112	50	150			
Magnesium	ND	1.0	0.5000	0	101	50	150			
Potassium	ND	1.0	0.5000	0	116	50	150			
Sodium	ND	1.0	0.5000	0	122	50	150			

Sample ID LCS-40784	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: 40784	RunNo: 54856
Prep Date: 10/3/2018	Analysis Date: 10/12/2018	SeqNo: 1822897 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.55	0.020	0.5000	0	110	85	115			
Calcium	48	1.0	50.00	0	95.3	85	115			
Iron	0.49	0.020	0.5000	0	97.1	85	115			
Magnesium	48	1.0	50.00	0	96.1	85	115			
Potassium	48	1.0	50.00	0	96.4	85	115			
Sodium	50	1.0	50.00	0	100	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G90

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-40784	SampType: MBLK		TestCode: EPA 200.8: Metals						
Client ID:	PBW	Batch ID: 40784		RunNo: 54649						
Prep Date:	10/3/2018	Analysis Date: 10/4/2018		SeqNo: 1812705		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID	MSLLLCS-40784	SampType: LCSLL		TestCode: EPA 200.8: Metals						
Client ID:	BatchQC	Batch ID: 40784		RunNo: 54649						
Prep Date:	10/3/2018	Analysis Date: 10/4/2018		SeqNo: 1812707		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	99.5	50	150			
Selenium	ND	0.0010	0.001000	0	0	50	150			S

Sample ID	MSLCS-40784	SampType: LCS		TestCode: EPA 200.8: Metals						
Client ID:	LCSW	Batch ID: 40784		RunNo: 54649						
Prep Date:	10/3/2018	Analysis Date: 10/4/2018		SeqNo: 1812709		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.8	85	115			
Selenium	0.023	0.0010	0.02500	0	92.2	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G90

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBW	Batch ID: R54729	RunNo: 54729
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816200 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSW	Batch ID: R54729	RunNo: 54729
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816201 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Chloride	4.9	0.50	5.000	0	98.4	90	110			
Sulfate	9.6	0.50	10.00	0	96.5	90	110			
Nitrate+Nitrite as N	3.6	0.20	3.500	0	103	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G90

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
Acetone	ND	10								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	2.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	0.50								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	2.5								
Styrene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
Vinyl chloride	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G90

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Acrylonitrile	ND	10								
Bromochloromethane	ND	2.0								
Iodomethane	ND	10								
trans-1,4-Dichloro-2-butene	ND	10								
Vinyl acetate	ND	10								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.0	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.7	70	130			
Surr: Toluene-d8	9.2		10.00		92.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: LCSW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807388 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	18	1.0	20.00	0	91.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.7	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		89.1	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.1	70	130			
Surr: Toluene-d8	9.0		10.00		90.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G90

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-41105	SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	PBW	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829372	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	ND	2.5								

Sample ID	LCS-41105	SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSW	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829373	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	109	53.3	138			

Sample ID	LCSD-41105	SampType:	LCSD		TestCode:	Total Phenolics by SW-846 9067				
Client ID:	LCSS02	Batch ID:	41105		RunNo:	55031				
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829374	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	113	53.3	138	3.74	21	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G90

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	lcs-1 98.3uS eC	SampType:	LCS		TestCode:	SM2510B: Specific Conductance					
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812552	Units:	µmhos/cm			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity		99	5.0	98.30	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G90

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID mb-1 alk	SampType: MBLK			TestCode: SM2320B: Alkalinity						
Client ID: PBW	Batch ID: R54645			RunNo: 54645						
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812578		Units: mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID lcs-1 alk	SampType: LCS			TestCode: SM2320B: Alkalinity						
Client ID: LCSW	Batch ID: R54645			RunNo: 54645						
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812579		Units: mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.60	20.00	80.00	0	95.8	90	110			

Sample ID mb-2 alk	SampType: MBLK			TestCode: SM2320B: Alkalinity						
Client ID: PBW	Batch ID: R54645			RunNo: 54645						
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812602		Units: mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID lcs-2 alk	SampType: LCS			TestCode: SM2320B: Alkalinity						
Client ID: LCSW	Batch ID: R54645			RunNo: 54645						
Prep Date:	Analysis Date: 10/3/2018			SeqNo: 1812603		Units: mg/L CaCO3				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.80	20.00	80.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G90

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40669	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: PBW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808571 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID LCS-40669	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: LCSW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808572 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G90

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40989	SampType: MBLK	TestCode: SM 4500 Norg C: TKN
Client ID: PBW	Batch ID: 40989	RunNo: 54950
Prep Date: 10/12/2018	Analysis Date: 10/16/2018	SeqNo: 1826092 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	ND	1.0								

Sample ID LCS-40989	SampType: LCS	TestCode: SM 4500 Norg C: TKN
Client ID: LCSW	Batch ID: 40989	RunNo: 54950
Prep Date: 10/12/2018	Analysis Date: 10/16/2018	SeqNo: 1826093 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.8	1.0	10.00	0	98.0	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CAREL CORPORATION Work Order Number: 1809G90 RcptNo: 1

Received By: Erin Melendrez 9/27/2018 8:55:00 AM

Completed By: Ashley Gallegos 9/28/2018 9:11:15 AM

Reviewed By: JG 9.28.18

labeled by: JAB 09/28/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	FedEx		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 5 (<2 or >12 unless noted)

Adjusted? No

Checked by: JAB 09/28/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.1	Good	Yes			

Chain-of-Custody Record

Client: The Carel Corporation

Mailing Address: 136 Pecan Street
Keller TX 76248

Phone #: 817 ~~994~~ 337.0112

email or Fax#: KCarel@gmail.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☒ NELAP ☐ Other

☒ EDD (Type) Santas

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Camino Real Landfill 2018 Annual GWE & 4th Asmt

Project #: 18-09-09

Project Manager: Kevin Carel

Sampler: Kevin Carel

On Ice: ☒ Yes ☐ No

Sample Temperature: [redacted]

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached List				Air Bubbles (Y or N)
9-24-18	1725	GW	MW-E	17	Various	-001												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9-26-18	1400		Fedex ENM	9/27/18	0855
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

GROUNDWATER MONITORING PARAMETER LIST, CAMINO REAL LANDFILL

	Well A	Well B	Well D	Well D-1	Well D-2	Well D-3	Well E	Well F	Well G	Bmp	Field Blank	Trip Blank	Reserve
Organic Parameters													
Acetone	X	X	X			X	X	X	X	X	X	X	X
Acrylonitrile	X	X	X			X	X	X	X	X	X	X	X
Benzene	X	X	X			X	X	X	X	X	X	X	X
Bromochloromethane	X	X	X			X	X	X	X	X	X	X	X
Bromodichloromethane	X	X	X			X	X	X	X	X	X	X	X
Bromoform	X	X	X			X	X	X	X	X	X	X	X
Methyl bromide (Bromomethane)	X	X	X			X	X	X	X	X	X	X	X
2-Butanone (Methyl ethyl ketone - MEK)	X	X	X			X	X	X	X	X	X	X	X
Carbon Disulfide	X	X	X			X	X	X	X	X	X	X	X
Carbon Tetrachloride	X	X	X			X	X	X	X	X	X	X	X
Chlorobenzene	X	X	X			X	X	X	X	X	X	X	X
Chloroethane (Ethyl Chloride)	X	X	X			X	X	X	X	X	X	X	X
Chloroform (Trichloromethane)	X	X	X			X	X	X	X	X	X	X	X
Methyl chloride (Chloromethane)	X	X	X			X	X	X	X	X	X	X	X
Dibromochloromethane	X	X	X			X	X	X	X	X	X	X	X
Methylene Bromide (Dibromomethane)	X	X	X			X	X	X	X	X	X	X	X
o-Dichlorobenzene (1,2-)	X	X	X			X	X	X	X	X	X	X	X
p-Dichlorobenzene (1,4-)	X	X	X			X	X	X	X	X	X	X	X
trans-1,4-Dichloro-2-butene	X	X	X			X	X	X	X	X	X	X	X
1,1-Dichloroethane	X	X	X			X	X	X	X	X	X	X	X
1,2-Dichloroethane (EDC)	X	X	X			X	X	X	X	X	X	X	X
1,1-Dichloroethene (1,1-DCE)	X	X	X			X	X	X	X	X	X	X	X
cis-1,2-Dichloroethene	X	X	X			X	X	X	X	X	X	X	X
trans-1,2-Dichloroethene	X	X	X			X	X	X	X	X	X	X	X
Methylene chloride (Dichloromethane)	X	X	X			X	X	X	X	X	X	X	X
1,2-Dichloropropane	X	X	X			X	X	X	X	X	X	X	X
cis-1,3-Dichloropropene	X	X	X			X	X	X	X	X	X	X	X
trans-1,3-Dichloropropene	X	X	X			X	X	X	X	X	X	X	X
Ethylbenzene	X	X	X			X	X	X	X	X	X	X	X
2-Hexanone	X	X	X			X	X	X	X	X	X	X	X
Methyl iodide (Iodomethane)	X	X	X			X	X	X	X	X	X	X	X
4-Methyl-2-pentanone (MIBK)	X	X	X			X	X	X	X	X	X	X	X
Styrene	X	X	X			X	X	X	X	X	X	X	X
1,1,1,2-Tetrachloroethane	X	X	X			X	X	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	X	X	X			X	X	X	X	X	X	X	X
Tetrachloroethene (PCE)	X	X	X			X	X	X	X	X	X	X	X
Toluene	X	X	X			X	X	X	X	X	X	X	X
1,1,1-Trichloroethane (TCA)	X	X	X			X	X	X	X	X	X	X	X
1,1,2-Trichloroethane	X	X	X			X	X	X	X	X	X	X	X
Trichloroethene (1,1,2-Trichloroethylene, TCE)	X	X	X			X	X	X	X	X	X	X	X
Trichlorofluoromethane (CFC 11)	X	X	X			X	X	X	X	X	X	X	X
1,2,3-Trichloropropane	X	X	X			X	X	X	X	X	X	X	X
Vinyl Acetate	X	X	X			X	X	X	X	X	X	X	X
Vinyl Chloride	X	X	X			X	X	X	X	X	X	X	X
Xylenes (Total)	X	X	X			X	X	X	X	X	X	X	X
Phenolics	X	X	X			X	X	X	X	X			X
Heavy Metals													
Arsenic, As	X	X	X			X	X	X	X	X			X
Barium, Ba	X	X	X			X	X	X	X	X			X
Chromium, Cr	X	X	X			X	X	X	X	X			X
Selenium, Se	X	X	X			X	X	X	X	X			X
Aluminum, Al	X	X	X			X	X	X	X	X			X
Boron, B	X	X	X			X	X	X	X	X			X
Chloride, Cl-	X	X	X			X	X	X	X	X			X
Fluoride, F	X	X	X			X	X	X	X	X			X
Iron, Fe	X	X	X			X	X	X	X	X			X
Nitrate as N, NO3-N	X	X	X			X	X	X	X	X			X
Sulfate, SO4	X	X	X			X	X	X	X	X			X
Radioactivity													
Combined Radium, Ra 226 & Ra 228	X	X	X			X	X	X	X	X			X
Inorganic Chemicals													
Calcium, Ca	X	X	X			X	X	X	X	X			X
Magnesium, Mg	X	X	X			X	X	X	X	X			X
Potassium, K	X	X	X			X	X	X	X	X			X
Sodium, Na	X	X	X			X	X	X	X	X			X
Total Nitrogen, TN	X	X	X			X	X	X	X	X			X
Bicarbonate Alkalinity, HCO3 (as CaCO3)	X	X	X			X	X	X	X	X			X
Total Dissolved Solids, TDS	X	X	X			X	X	X	X	X			X
Additional Background Monitoring Parameters													
CFC-12			X			X			X	X			X
Diethyl			X			X			X	X			X
Perchlorate			X			X			X	X			X
Sulfide			X			X			X	X			X
Physical Parameters													
pH	X	X	X			X	X	X	X	X			X
Specific Conductance	X	X	X			X	X	X	X	X			X
Temperature (field)	X	X	X			X	X	X	X	X			X
Depth to Water (field)	X	X	X			X	X	X	X	X			X

Notes for Laboratory:

1. Use historical practical quantitation/reporting limits.
2. Please deliver containers to: Camino Real Landfill, 1000 Camino Real Blvd., Sunland Park, New Mexico 88063
3. Call Kevin Carel at 817.991.7370 if you have questions

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 30, 2018

Kevin Carel
Carel Corporation
136 Pecan St
Keller, TX 76248
TEL: (817) 337-0112
FAX

RE: Camino Real Landfill 2018 Annual GME and 4th Asmt OrderNo.: 1809G92

Dear Kevin Carel:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/27/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1809G92**
Date Reported: **10/30/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well G
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/25/2018 7:45:00 AM
Lab ID: 1809G92-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Arsenic	0.0021	0.0010		mg/L	1	10/3/2018 12:05:15 PM	A54602
Selenium	0.0016	0.0010		mg/L	1	10/3/2018 12:05:15 PM	A54602
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.12	0.10		mg/L	1	10/8/2018 7:58:29 PM	R54729
Chloride	350	25		mg/L	50	10/9/2018 4:58:52 PM	R54771
Sulfate	340	10		mg/L	20	10/8/2018 8:10:54 PM	R54729
Nitrate+Nitrite as N	1.1	1.0		mg/L	5	10/8/2018 9:00:33 PM	R54729
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	2200	5.0		µmhos/c	1	10/3/2018 11:12:06 AM	R54645
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	332.2	20.00		mg/L Ca	1	10/3/2018 11:12:06 AM	R54645
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/3/2018 11:12:06 AM	R54645
Total Alkalinity (as CaCO3)	332.2	20.00		mg/L Ca	1	10/3/2018 11:12:06 AM	R54645
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1480	20.0	*	mg/L	1	10/1/2018 4:20:00 PM	40669
TOTAL NITROGEN						Analyst: **SRM**	
Nitrogen, Total	1.1	1.0		mg/L	1	10/18/2018 3:00:00 PM	R54985
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.27		H	pH units	1	10/3/2018 11:12:06 AM	R54645
SM 4500 NORG C: TKN						Analyst: **CJS**	
Nitrogen, Kjeldahl, Total	ND	1.0		mg/L	1	10/16/2018 9:50:00 AM	40989
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	ND	0.020		mg/L	1	10/19/2018 5:51:57 PM	A55053
Barium	0.031	0.0020		mg/L	1	10/18/2018 9:38:14 PM	C55001
Boron	0.50	0.040		mg/L	1	10/18/2018 9:38:14 PM	C55001
Calcium	190	10		mg/L	10	10/18/2018 9:40:22 PM	C55001
Chromium	ND	0.0060		mg/L	1	10/18/2018 9:38:14 PM	C55001
Iron	ND	0.020		mg/L	1	10/19/2018 5:51:57 PM	A55053
Magnesium	22	1.0		mg/L	1	10/18/2018 9:38:14 PM	C55001
Potassium	12	1.0		mg/L	1	10/18/2018 9:38:14 PM	C55001
Sodium	280	10		mg/L	10	10/18/2018 9:40:22 PM	C55001
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well G
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/25/2018 7:45:00 AM
Lab ID: 1809G92-001 **Matrix:** AQUEOUS **Received Date:** 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Dichlorodifluoromethane	3.9	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,1-Dichloroethane	9.8	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 7:32:32 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Methylene Chloride	2.9	2.5		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Tetrachloroethene (PCE)	4.5	0.50		µg/L	1	9/28/2018 7:32:32 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Trichloroethene (TCE)	4.0	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Trichlorofluoromethane	7.5	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Well G
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/25/2018 7:45:00 AM
Lab ID: 1809G92-001
Matrix: AQUEOUS
Received Date: 9/27/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 7:32:32 PM	LF54527
Surr: 1,2-Dichloroethane-d4	91.2	70-130		%Rec	1	9/28/2018 7:32:32 PM	LF54527
Surr: 4-Bromofluorobenzene	90.3	70-130		%Rec	1	9/28/2018 7:32:32 PM	LF54527
Surr: Dibromofluoromethane	87.0	70-130		%Rec	1	9/28/2018 7:32:32 PM	LF54527
Surr: Toluene-d8	91.5	70-130		%Rec	1	9/28/2018 7:32:32 PM	LF54527
TOTAL PHENOLICS BY SW-846 9067						Analyst: **CLP**	
Phenolics	ND	2.6		µg/L	1	10/19/2018	41105

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181002025
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1809G92
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181002025-001	**Sampling Date**	9/25/2018	**Date/Time Received**	10/2/2018 12:05 PM
Client Sample ID	1809G92-001E / WELL G	**Sampling Time**	7:45 AM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
perchlorate	0.715	ug/L	0.05	10/10/2018 11:45:00 AM	MER	EPA 331.0	

Sample Number	181002025-002	**Sampling Date**	9/25/2018	**Date/Time Received**	10/2/2018 12:05 PM
Client Sample ID	1809G92-001F / WELL G	**Sampling Time**	7:45 AM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Sulfide	ND	mg/L	0.2	10/18/2018 1:30:00 PM	ETL	SM4500S2F	

Sample Number	181002025-003	**Sampling Date**	9/25/2018	**Date/Time Received**	10/2/2018 12:05 PM
Client Sample ID	1809G92-001G / WELL G	**Sampling Time**	7:45 AM		10/8/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Dalthal	0.184	ug/L	0.1	10/12/2018 10:55:00 PM	MAH	EPA 515.4	

Authorized Signature

Todd Tarascio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1809G92
Pace Project No.: 30266919

Sample: 1809G92-001 Well G Lab ID: 30266919001 Collected: 09/25/18 07:45 Received: 10/03/18 10:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.282 ± 0.430 (1.13) C:NA T:76%	pCi/L	10/12/18 21:23	13982-63-3	
Radium-228	EPA 904.0	1.01 ± 0.521 (0.927) C:69% T:76%	pCi/L	10/12/18 12:40	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809C82
Pace Project No.: 30266919

QC Batch: 315634 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30266919001

METHOD BLANK: 1540450 Matrix: Water
Associated Lab Samples: 30266919001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.088 ± 0.401 (0.815) C:NA T:81%	pCi/L	10/12/18 21:08	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G02
Pace Project No.: 30266919

QC Batch: 315637 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30266919001

METHOD BLANK: 1540458 Matrix: Water
Associated Lab Samples: 30266919001

Parameter	Act ± Unc (MDC) Car Trac	Units	Analyzed	Qualifiers
Radium-228	0.509 ± 0.304 (0.549) C:75% T:89%	pCi/L	10/12/18 12:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1800G92
Pace Project No.: 30265915

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.
Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

Date: 10/15/2018 02:04 PM

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-C	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828532 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Boron	ND	0.040								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LLLCS-C	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828533 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	101	50	150			
Boron	ND	0.040	0.04000	0	94.6	50	150			
Calcium	ND	1.0	0.5000	0	111	50	150			
Chromium	ND	0.0060	0.006000	0	86.0	50	150			
Magnesium	ND	1.0	0.5000	0	99.5	50	150			
Potassium	ND	1.0	0.5000	0	93.9	50	150			
Sodium	ND	1.0	0.5000	0	108	50	150			

Sample ID LCS-C	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828534 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.6	85	115			
Boron	0.49	0.040	0.5000	0	98.1	85	115			
Calcium	51	1.0	50.00	0	102	85	115			
Chromium	0.47	0.0060	0.5000	0	94.2	85	115			
Magnesium	47	1.0	50.00	0	95.0	85	115			
Potassium	46	1.0	50.00	0	92.8	85	115			
Sodium	49	1.0	50.00	0	98.0	85	115			

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829987 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829987 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID LLLCS-A	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829988 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	102	50	150			
Iron	ND	0.020	0.02000	0	96.8	50	150			

Sample ID LCS-A	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: A55053	RunNo: 55053
Prep Date:	Analysis Date: 10/19/2018	SeqNo: 1829989 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	108	85	115			
Iron	0.48	0.020	0.5000	0	96.3	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-A	SampType: MBLK	TestCode: EPA 200.8: Metals
Client ID: PBW	Batch ID: A54602	RunNo: 54602
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1811124 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID MSLLLCS-A	SampType: LCSLL	TestCode: EPA 200.8: Metals
Client ID: BatchQC	Batch ID: A54602	RunNo: 54602
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1811125 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	96.8	50	150			
Selenium	ND	0.0010	0.001000	0	99.6	50	150			

Sample ID MSLCS-A	SampType: LCS	TestCode: EPA 200.8: Metals
Client ID: LCSW	Batch ID: A54602	RunNo: 54602
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1811126 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.2	85	115			
Selenium	0.023	0.0010	0.02500	0	92.7	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBW	Batch ID: R54729	RunNo: 54729
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816200 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSW	Batch ID: R54729	RunNo: 54729
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816201 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Sulfate	9.6	0.50	10.00	0	96.5	90	110			
Nitrate+Nitrite as N	3.6	0.20	3.500	0	103	90	110			

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions
Client ID: PBW	Batch ID: R54771	RunNo: 54771
Prep Date:	Analysis Date: 10/9/2018	SeqNo: 1818749 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions
Client ID: LCSW	Batch ID: R54771	RunNo: 54771
Prep Date:	Analysis Date: 10/9/2018	SeqNo: 1818750 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.1	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G92

Hall Environmental Analysis Laboratory, Inc.

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
Acetone	ND	10								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	2.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	0.50								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	2.5								
Styrene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
Vinyl chloride	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G92

Hall Environmental Analysis Laboratory, Inc.

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Acrylonitrile	ND	10								
Bromochloromethane	ND	2.0								
Iodomethane	ND	10								
trans-1,4-Dichloro-2-butene	ND	10								
Vinyl acetate	ND	10								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.0	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.7	70	130			
Surr: Toluene-d8	9.2		10.00		92.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: LCSW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807388 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	18	1.0	20.00	0	91.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.7	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		89.1	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.1	70	130			
Surr: Toluene-d8	9.0		10.00		90.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-41105	SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	PBW	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829372	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Phenolics	ND	2.5									

Sample ID	LCS-41105	SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	LCSW	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829373	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Phenolics	11	2.5	10.00	0	109	53.3	138				

Sample ID	LCSD-41105	SampType:	LCSD		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	LCSS02	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829374	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Phenolics	11	2.5	10.00	0	113	53.3	138	3.74	21		

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1809G92**

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	lcs-1 98.3uS eC	SampType:	LCS		TestCode:	SM2510B: Specific Conductance					
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812552	Units:	µmhos/cm			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity		99	5.0	98.30	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	mb-1 alk	SampType:	MBLK		TestCode:	SM2320B: Alkalinity					
Client ID:	PBW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812578	Units:	mg/L CaCO3			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)		ND	20.00								

Sample ID	lcs-1 alk	SampType:	LCS		TestCode:	SM2320B: Alkalinity					
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812579	Units:	mg/L CaCO3			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)		76.60	20.00	80.00	0	95.8	90	110			

Sample ID	mb-2 alk	SampType:	MBLK		TestCode:	SM2320B: Alkalinity					
Client ID:	PBW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812602	Units:	mg/L CaCO3			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)		ND	20.00								

Sample ID	lcs-2 alk	SampType:	LCS		TestCode:	SM2320B: Alkalinity					
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812603	Units:	mg/L CaCO3			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)		77.80	20.00	80.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40669	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: PBW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808571 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID LCS-40669	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: LCSW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808572 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G92

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-40989	SampType:	MBLK		TestCode:	SM 4500 Norg C: TKN					
Client ID:	PBW	Batch ID:	40989		RunNo:	54950					
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826092	Units:	mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total		ND	1.0								

Sample ID	LCS-40989	SampType:	LCS		TestCode:	SM 4500 Norg C: TKN					
Client ID:	LCSW	Batch ID:	40989		RunNo:	54950					
Prep Date:	10/12/2018	Analysis Date:	10/16/2018		SeqNo:	1826093	Units:	mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total		9.8	1.0	10.00	0	98.0	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CAREL CORPORATION Work Order Number: 1809G92 RcptNo: 1

Received By: Erin Melendrez 9/27/2018 8:55:00 AM

Completed By: Ashley Gallegos 9/28/2018 9:15:17 AM

Reviewed By: JC 9.28.18 Labeled by: JAB 09/28/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	FedEx		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 5 (2 or >12 unless noted)

Adjusted? No

Checked by: JAB 09/28/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Yes			

Chain-of-Custody Record

Client: The Carel Corporation

Mailing Address: 136 Pecan Street
Keller, TX 76248

Phone #: 817.337.0112

email or Fax#: KCarel@gmail.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☒ NELAP ☐ Other _____

☒ EDD (Type) Sanitas

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Camino Real Landfill 2018 Annual GME & 4th Asmt

Project #: 18-09-09

Project Manager: Kevin Carel

Sampler: Kevin Carel

On Ice: ☒ Yes ☐ No

Sample Temperature: 4.6 °C

HEAL No. 1809529

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached List				Air Bubbles (Y or N)
~~9-25-18~~	~~0745~~	G																				
9-25-18	0745	GW	Well G	20	Various	-001												X				

Date: 9-26-18 Time: 1400 Relinquished by: Received by: FedEx Ground 9/27/18 Date: 9/27/18 Time: 0855

Date: Time: Relinquished by: Received by: Date: Time:

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

GROUNDWATER MONITORING PARAMETER LIST, CAMINO REAL LANDFILL

	Well A	Well B	Well D	Well D2-1	Well D2-2	Well D2-3	Well D2-4	Well E	Well F	Well G	Dup	Field Blank	Trip Blank	Reserve
Organic Parameters														
Acetone	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Acrylonitrile	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Benzene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bromochloromethane	X	· X	X	X	X	X	X	X	X	X	X	X	X	X
Bromodichloromethane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bromoform	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methyl bromide (Bromomethane)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2-Butanone (Methyl ethyl ketone - MEK)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Carbon Disulfide	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Carbon Tetrachloride	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chlorobenzene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chloroethane (Ethyl Chloride)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chloroform (Trichloromethane)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methyl chloride (Chloromethane)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dibromochloromethane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methylene Bromide (Dibromomethane)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
o-Dichlorobenzene (1,2-)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
p-Dichlorobenzene (1,4-)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
trans-1,4-Dichloro-2-butene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,1-Dichloroethane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,2-Dichloroethane (EDC)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,1-Dichloroethene (1,1-DCE)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
cis-1,2-Dichloroethene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
trans-1,2-Dichloroethene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methylene chloride (Dichloromethane)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,2-Dichloropropane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
cis-1,3-Dichloropropene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
trans-1,3-Dichloropropene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ethylbenzene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2-Hexanone	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methyl iodide (Iodomethane)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4-Methyl-2-pentanone (MIBK)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Styrene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,1,1,2-Tetrachloroethane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tetrachloroethene (PCE)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Toluene	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,1,1-Trichloroethane (TCA)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,1,2-Trichloroethane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trichloroethene (1,1,2-Trichloroethylene, TCE)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trichlorofluoromethane (CFC 11)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,2,3-Trichloropropane	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Vinyl Acetate	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Vinyl Chloride	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Xylenes (Total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Phenolics	X	X	X	X	X	X	X	X	X	X	X			X
Heavy Metals														
Arsenic, As	X	X	X	X	X	X	X	X	X	X	X			X
Barium, Ba	X	X	X	X	X	X	X	X	X	X	X			X
Chromium, Cr	X	X	X	X	X	X	X	X	X	X	X			X
Selenium, Se	X	X	X	X	X	X	X	X	X	X	X			X
Aluminum, Al	X	X	X	X	X	X	X	X	X	X	X			X
Boron, B	X	X	X	X	X	X	X	X	X	X	X			X
Chloride, Cl-	X	X	X	X	X	X	X	X	X	X	X			X
Fluoride, F	X	X	X	X	X	X	X	X	X	X	X			X
Iron, Fe	X	X	X	X	X	X	X	X	X	X	X			X
Nitrate as N, NO_3-N	X	X	X	X	X	X	X	X	X	X	X			X
Sulfate, SO_4	X	X	X	X	X	X	X	X	X	X	X			X
Radioactivity														
Combined Radium, Ra 226 & Ra 228	X	X	X	X	X	X	X	X	X	X	X			X
Inorganic Chemicals														
Calcium, Ca	X	X	X	X	X	X	X	X	X	X	X			X
Magnesium, Mg	X	X	X	X	X	X	X	X	X	X	X			X
Potassium, K	X	X	X	X	X	X	X	X	X	X	X			X
Sodium, Na	X	X	X	X	X	X	X	X	X	X	X			X
Total Nitrogen, TN	X	X	X	X	X	X	X	X	X	X	X			X
Bicarbonate Alkalinity, HCO_3 (as $CaCO_3$)	X	X	X	X	X	X	X	X	X	X	X			X
Total Dissolved Solids, TDS	X	X	X	X	X	X	X	X	X	X	X			X
Additional Background Monitoring Parameters														
CFC-12			X	X	X	X	X			X	X			X
Dertial			X	X	X	X	X			X	X			X
Perchlorate			X	X	X	X	X			X	X			X
Sulfide			X	X	X	X	X			X	X			X
Physical Parameters														
pH	X	X	X	X	X	X	X	X	X	X	X			X
Specific Conductance	X	X	X	X	X	X	X	X	X	X	X			X
Temperature (field)	X	X	X	X	X	X	X	X	X	X	X			X
Depth to Water (field)	X	X	X	X	X	X	X	X	X	X	X			X

Notes for Laboratory:

1. Use historical practical quantitation/reporting limits
2. Please deliver containers to: Camino Real Landfill, 1000 Camino Real Blvd., Sunland Park, New Mexico 88063
3. Call Kevin Cawl at 817.991.7370 if you have questions

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 30, 2018

Kevin Carel
Carel Corporation
136 Pecan St
Keller, TX 76248
TEL: (817) 337-0112
FAX

RE: Camino Real Landfill 2018 Annual GME and 4th Asmt OrderNo.: 1809G93

Dear Kevin Carel:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/28/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1809G93**
Date Reported: **10/30/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Dup
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 5:25:00 PM
Lab ID: 1809G93-001 **Matrix:** AQUEOUS **Received Date:** 9/28/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **ELS**	
Arsenic	0.0096	0.0010		mg/L	1	10/3/2018 12:07:40 PM	A54602
Selenium	0.016	0.0010		mg/L	1	10/3/2018 12:07:40 PM	A54602
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.45	0.10		mg/L	1	10/8/2018 8:23:18 PM	R54729
Chloride	270	10		mg/L	20	10/8/2018 8:35:43 PM	R54729
Sulfate	910	10		mg/L	20	10/8/2018 8:35:43 PM	R54729
Nitrate+Nitrite as N	2.8	1.0		mg/L	5	10/8/2018 9:50:11 PM	R54729
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	2300	5.0		µmhos/c	1	10/3/2018 11:29:50 AM	R54645
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	48.88	20.00		mg/L Ca	1	10/3/2018 11:29:50 AM	R54645
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/3/2018 11:29:50 AM	R54645
Total Alkalinity (as CaCO3)	48.88	20.00		mg/L Ca	1	10/3/2018 11:29:50 AM	R54645
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1730	40.0	*D	mg/L	1	10/1/2018 4:20:00 PM	40669
TOTAL NITROGEN						Analyst: **SRM**	
Nitrogen, Total	2.8	1.0		mg/L	1	10/18/2018 3:00:00 PM	R54985
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.54		H	pH units	1	10/3/2018 11:29:50 AM	R54645
SM 4500 NORG C: TKN						Analyst: **CJS**	
Nitrogen, Kjeldahl, Total	ND	1.0		mg/L	1	10/17/2018 11:30:00 AM	41032
EPA METHOD 200.7: METALS						Analyst: **pmf**	
Aluminum	0.022	0.020		mg/L	1	10/23/2018 5:18:21 PM	A55103
Barium	0.016	0.0020		mg/L	1	10/18/2018 9:54:06 PM	C55001
Boron	0.52	0.040		mg/L	1	10/18/2018 9:54:06 PM	C55001
Calcium	230	10		mg/L	10	10/18/2018 9:56:04 PM	C55001
Chromium	0.077	0.0060		mg/L	1	10/18/2018 9:54:06 PM	C55001
Iron	3.3	0.10	*	mg/L	5	10/24/2018 3:20:08 PM	A55135
Magnesium	27	1.0		mg/L	1	10/18/2018 9:54:06 PM	C55001
Potassium	12	1.0		mg/L	1	10/18/2018 9:54:06 PM	C55001
Sodium	290	10		mg/L	10	10/18/2018 9:56:04 PM	C55001
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Dup
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 5:25:00 PM
Lab ID: 1809G93-001 **Matrix:** AQUEOUS **Received Date:** 9/28/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 8:01:37 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 8:01:37 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Dup
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 5:25:00 PM
Lab ID: 1809G93-001
Matrix: AQUEOUS
Received Date: 9/28/2018 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 8:01:37 PM	LF54527
Surr: 1,2-Dichloroethane-d4	89.6	70-130		%Rec	1	9/28/2018 8:01:37 PM	LF54527
Surr: 4-Bromofluorobenzene	90.5	70-130		%Rec	1	9/28/2018 8:01:37 PM	LF54527
Surr: Dibromofluoromethane	88.4	70-130		%Rec	1	9/28/2018 8:01:37 PM	LF54527
Surr: Toluene-d8	93.8	70-130		%Rec	1	9/28/2018 8:01:37 PM	LF54527
TOTAL PHENOLICS BY SW-846 9067						Analyst: **CLP**	
Phenolics	ND	2.6		µg/L	1	10/19/2018	41105

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181002061
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1809G93
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181002061-001	**Sampling Date**	9/24/2018	**Date/Time Received**	10/2/2018 12:04 PM
Client Sample ID	1809G93-001E / DUP	**Sampling Time**	5:25 PM	**Extraction Date**	
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
perchlorate	0.319	ug/L	0.05	10/10/2018 10:39:00 AM	MER	EPA 331.0	

Sample Number	181002061-002	**Sampling Date**	9/24/2018	**Date/Time Received**	10/2/2018 12:04 PM
Client Sample ID	1809G93-001G / DUP	**Sampling Time**	5:25 PM	**Extraction Date**	10/8/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Bromide	ND	ug/L	0.1	10/12/2018 11:27:00 PM	MAH	EPA 515.4	

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP) E87893; ID:ID00013; MT:CERT0029; NH: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA01169; ID:WA00168; WA:C595; MT:Cert0095; FL(NELAP): E071099

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1809G93
Pace Project No.: 30267153

Sample: 1809G93-001H Dup Lab ID: 30267153001 Collected: 09/24/18 17:25 Received: 10/04/18 10:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.164 ± 0.509 (0.965) C:NA T:85%	pCi/L	10/12/18 21:53	13982-63-3	
Radium-228	EPA 904.0	0.269 ± 0.386 (0.831) C:75% T:79%	pCi/L	10/12/18 12:42	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G93
Pace Project No: 30267153

QC Batch: 315834 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30267153001

METHOD BLANK: 1540450 Matrix: Water
Associated Lab Samples: 30267153001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.088 ± 0.401 (0.815) C:NA T:81%	pCi/L	10/12/18 21:08	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809G93
Pace Project No.: 30267153

QC Batch: 315637 | Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 | Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30267153001

METHOD BLANK: 1540458 | Matrix: Water
Associated Lab Samples: 30267153001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.509 ± 0.304 (0.549) C:75% T:89%	pCi/L	10/12/18 12:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1809G93
Pace Project No.: 30267153

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

Date: 10/15/2018 02:06 PM

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-C	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828532 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Boron	ND	0.040								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LLLCS-C	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828533 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.0020	0.0020	0.002000	0	101	50	150			
Boron	ND	0.040	0.04000	0	94.6	50	150			
Calcium	ND	1.0	0.5000	0	111	50	150			
Chromium	ND	0.0060	0.006000	0	86.0	50	150			
Magnesium	ND	1.0	0.5000	0	99.5	50	150			
Potassium	ND	1.0	0.5000	0	93.9	50	150			
Sodium	ND	1.0	0.5000	0	108	50	150			

Sample ID LCS-C	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: C55001	RunNo: 55001
Prep Date:	Analysis Date: 10/18/2018	SeqNo: 1828534 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	97.6	85	115			
Boron	0.49	0.040	0.5000	0	98.1	85	115			
Calcium	51	1.0	50.00	0	102	85	115			
Chromium	0.47	0.0060	0.5000	0	94.2	85	115			
Magnesium	47	1.0	50.00	0	95.0	85	115			
Potassium	46	1.0	50.00	0	92.8	85	115			
Sodium	49	1.0	50.00	0	98.0	85	115			

Sample ID MB-A	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: A55103	RunNo: 55103
Prep Date:	Analysis Date: 10/23/2018	SeqNo: 1832197 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								

Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	LLLCS-A	SampType:	LCSLL	TestCode:	EPA Method 200.7: Metals					
Client ID:	BatchQC	Batch ID:	A55103	RunNo:	55103					
Prep Date:		Analysis Date:	10/23/2018	SeqNo:	1832198	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	87.6	50	150			

Sample ID	LCS-A	SampType:	LCS	TestCode:	EPA Method 200.7: Metals					
Client ID:	LCSW	Batch ID:	A55103	RunNo:	55103					
Prep Date:		Analysis Date:	10/23/2018	SeqNo:	1832199	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	106	85	115			

Sample ID	MB-A	SampType:	MBLK	TestCode:	EPA Method 200.7: Metals					
Client ID:	PBW	Batch ID:	A55135	RunNo:	55135					
Prep Date:		Analysis Date:	10/24/2018	SeqNo:	1832884	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID	LLLCS-A	SampType:	LCSLL	TestCode:	EPA Method 200.7: Metals					
Client ID:	BatchQC	Batch ID:	A55135	RunNo:	55135					
Prep Date:		Analysis Date:	10/24/2018	SeqNo:	1832885	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.021	0.020	0.02000	0	103	50	150			

Sample ID	LCS-A	SampType:	LCS	TestCode:	EPA Method 200.7: Metals					
Client ID:	LCSW	Batch ID:	A55135	RunNo:	55135					
Prep Date:		Analysis Date:	10/24/2018	SeqNo:	1832886	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.49	0.020	0.5000	0	97.9	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-A	SampType: MBLK	TestCode: EPA 200.8: Metals
Client ID: PBW	Batch ID: A54602	RunNo: 54602
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1811124 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID MSLLLCS-A	SampType: LCSLL	TestCode: EPA 200.8: Metals
Client ID: BatchQC	Batch ID: A54602	RunNo: 54602
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1811125 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	96.8	50	150			
Selenium	ND	0.0010	0.001000	0	99.6	50	150			

Sample ID MSLCS-A	SampType: LCS	TestCode: EPA 200.8: Metals
Client ID: LCSW	Batch ID: A54602	RunNo: 54602
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1811126 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.2	85	115			
Selenium	0.023	0.0010	0.02500	0	92.7	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R54729	RunNo: 54729							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816200	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R54729	RunNo: 54729							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816201	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.52	0.10	0.5000	0	104	90	110			
Chloride	4.9	0.50	5.000	0	98.4	90	110			
Sulfate	9.6	0.50	10.00	0	96.5	90	110			
Nitrate+Nitrite as N	3.6	0.20	3.500	0	103	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: **1809G93**

Hall Environmental Analysis Laboratory, Inc.

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles, Table I**
Client ID: **PBW**	Batch ID: **LF54527**	RunNo: **54527**
Prep Date:	Analysis Date: **9/28/2018**	SeqNo: **1807386** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
Acetone	ND	10								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	2.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	0.50								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	2.5								
Styrene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
Vinyl chloride	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Acrylonitrile	ND	10								
Bromochloromethane	ND	2.0								
Iodomethane	ND	10								
trans-1,4-Dichloro-2-butene	ND	10								
Vinyl acetate	ND	10								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.0	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.7	70	130			
Surr: Toluene-d8	9.2		10.00		92.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: LCSW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807388 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	18	1.0	20.00	0	91.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.7	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		89.1	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.1	70	130			
Surr: Toluene-d8	9.0		10.00		90.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-41105	SampType:	MBLK		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	PBW	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829372	Units:	µg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics		ND	2.5								

Sample ID	LCS-41105	SampType:	LCS		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	LCSW	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829373	Units:	µg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics		11	2.5	10.00	0	109	53.3	138			

Sample ID	LCSD-41105	SampType:	LCSD		TestCode:	Total Phenolics by SW-846 9067					
Client ID:	LCSS02	Batch ID:	41105		RunNo:	55031					
Prep Date:	10/19/2018	Analysis Date:	10/19/2018		SeqNo:	1829374	Units:	µg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics		11	2.5	10.00	0	113	53.3	138	3.74	21	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809G93

Hall Environmental Analysis Laboratory, Inc.

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	lcs-1 98.3uS eC	SampType:	LCS		TestCode:	SM2510B: Specific Conductance					
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812552	Units:	µmhos/cm			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity		99	5.0	98.30	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	mb-1 alk	SampType:	MBLK		TestCode:	SM2320B: Alkalinity				
Client ID:	PBW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812578	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID	lcs-1 alk	SampType:	LCS		TestCode:	SM2320B: Alkalinity				
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812579	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.60	20.00	80.00	0	95.8	90	110			

Sample ID	mb-2 alk	SampType:	MBLK		TestCode:	SM2320B: Alkalinity				
Client ID:	PBW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812602	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID	lcs-2 alk	SampType:	LCS		TestCode:	SM2320B: Alkalinity				
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645				
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812603	Units:	mg/L CaCO3		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.80	20.00	80.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40669	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: PBW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808571 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID LCS-40669	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: LCSW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808572 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809G93

30-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-41032	SampType:	MBLK		TestCode:	SM 4500 Norg C: TKN				
Client ID:	PBW	Batch ID:	41032		RunNo:	54947				
Prep Date:	10/16/2018	Analysis Date:	10/17/2018		SeqNo:	1826047	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	ND	1.0								

Sample ID	LCS-41032	SampType:	LCS		TestCode:	SM 4500 Norg C: TKN				
Client ID:	LCSW	Batch ID:	41032		RunNo:	54947				
Prep Date:	10/16/2018	Analysis Date:	10/17/2018		SeqNo:	1826048	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.8	1.0	10.00	0	98.0	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CAREL CORPORATION Work Order Number: 1809G93 RcptNo: 1

Received By: Erin Melendrez 9/28/2018 8:55:00 AM

Completed By: Ashley Gallegos 9/28/2018 9:18:34 AM

Reviewed By: JUG 28 18

labeled by: JAB 09/29/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	FedEx		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 6;1 (<2 or >12 unless noted)

Adjusted? No

Checked by: JAB 09/29/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

16. Additional remarks: Poured off from 001C container 1 of 2 about 125mLs for perchlorate ~~Test~~ analysis.

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.7	Good	Yes			

Chain-of-Custody Record

Client: The Carel Corporation

Mailing Address: 136 Pecan Street
Keller, TX 76248

Phone #: 817.337.0112

email or Fax#: kcarel@gmail.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☒ NELAP ☐ Other ______

☒ EDD (Type) Sanitas

Turn-Around Time:
☒ Standard ☐ Rush ______

Project Name: Camino Real Landfill
2018 Annual GME + 4th Asmt

Project #: 18-09-09

Project Manager: Kevin Carel

Sampler: Kevin Carel

On Ice:

Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. [illegible]	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached (list)				Air Bubbles (Y or N)
9-24-18	1725	GW	Duplicate (Dup)	17	Various	-001												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9-26-18	1400	[signature]	[signature] FedEx EDH 9/27/18	9/27/18	0855
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

GROUNDWATER MONITORING PARAMETER LIST, CAMINO REAL LANDFILL

	Well A	Well B	Well D	Well E	Well F	Well G	Dup	Field Blank	Trip Blank	Reserve
Organic Parameters										
Acetone	X	X	X	X	X	X	X	X	X	X
Acrylonitrile	X	X	X	X	X	X	X	X	X	X
Benzene	X	X	X	X	X	X	X	X	X	X
Bromochloromethane	X	X	X	X	X	X	X	X	X	X
Bromodichloromethane	X	X	X	X	X	X	X	X	X	X
Bromoform	X	X	X	X	X	X	X	X	X	X
Methyl bromide (Bromomethane)	X	X	X	X	X	X	X	X	X	X
2-Butanone (Methyl ethyl ketone – MEK)	X	X	X	X	X	X	X	X	X	X
Carbon Disulfide	X	X	X	X	X	X	X	X	X	X
Carbon Tetrachloride	X	X	X	X	X	X	X	X	X	X
Chlorobenzene	X	X	X	X	X	X	X	X	X	X
Chloroethane (Ethyl Chloride)	X	X	X	X	X	X	X	X	X	X
Chloroform (Trichloromethane)	X	X	X	X	X	X	X	X	X	X
Methyl chloride (Chloromethane)	X	X	X	X	X	X	X	X	X	X
Dibromochloromethane	X	X	X	X	X	X	X	X	X	X
Methylene Bromide (Dibromomethane)	X	X	X	X	X	X	X	X	X	X
o-Dichlorobenzene (1,2-)	X	X	X	X	X	X	X	X	X	X
p-Dichlorobenzene (1,4-)	X	X	X	X	X	X	X	X	X	X
trans-1,4-Dichloro-2-butene	X	X	X	X	X	X	X	X	X	X
1,1-Dichloroethane	X	X	X	X	X	X	X	X	X	X
1,2-Dichloroethane (EDC)	X	X	X	X	X	X	X	X	X	X
1,1-Dichloroethene (1,1-DCE)	X	X	X	X	X	X	X	X	X	X
cis-1,2-Dichloroethene	X	X	X	X	X	X	X	X	X	X
trans-1,2-Dichloroethene	X	X	X	X	X	X	X	X	X	X
Methylene chloride (Dichloromethane)	X	X	X	X	X	X	X	X	X	X
1,2-Dichloropropane	X	X	X	X	X	X	X	X	X	X
cis-1,3-Dichloropropene	X	X	X	X	X	X	X	X	X	X
trans-1,3-Dichloropropene	X	X	X	X	X	X	X	X	X	X
Ethylbenzene	X	X	X	X	X	X	X	X	X	X
2-Hexanone	X	X	X	X	X	X	X	X	X	X
Methyl bromide (Bromomethane)	X	X	X	X	X	X	X	X	X	X
4-Methyl-2-pentanone (MIBK)	X	X	X	X	X	X	X	X	X	X
Styrene	X	X	X	X	X	X	X	X	X	X
1,1,1,2-Tetrachloroethane	X	X	X	X	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	X	X	X	X	X	X	X	X	X	X
Tetrachloroethene (PCE)	X	X	X	X	X	X	X	X	X	X
Toluene	X	X	X	X	X	X	X	X	X	X
1,1,1-Trichloroethane (TCA)	X	X	X	X	X	X	X	X	X	X
1,1,2-Trichloroethane	X	X	X	X	X	X	X	X	X	X
Trichloroethene (1,1,2-Trichloroethylene, TCE)	X	X	X	X	X	X	X	X	X	X
Trichlorofluoromethane (CFC 11)	X	X	X	X	X	X	X	X	X	X
1,2,3-Trichloropropane	X	X	X	X	X	X	X	X	X	X
Vinyl Acetate	X	X	X	X	X	X	X	X	X	X
Vinyl Chloride	X	X	X	X	X	X	X	X	X	X
Xylenes (Total)	X	X	X	X	X	X	X	X	X	X
Phenolics	X	X	X	X	X	X	X			X
Heavy Metals										
Arsenic, As	X	X	X	X	X	X	X			X
Barium, Ba	X	X	X	X	X	X	X			X
Chromium, Cr	X	X	X	X	X	X	X			X
Selenium, Se	X	X	X	X	X	X	X			X
Aluminum, Al	X	X	X	X	X	X	X			X
Boron, B	X	X	X	X	X	X	X			X
Chloride, Cl	X	X	X	X	X	X	X			X
Fluoride, F	X	X	X	X	X	X	X			X
Iron, Fe	X	X	X	X	X	X	X			X
Nitrate as N, NO_3-N	X	X	X	X	X	X	X			X
Sulfate, SO_4	X	X	X	X	X	X	X			X
Radioactivity										
Combined Radium, Ra 226 & Ra 228	X	X	X	X	X	X	X			X
Inorganic Chemicals										
Calcium, Ca	X	X	X	X	X	X	X			X
Magnesium, Mg	X	X	X	X	X	X	X			X
Potassium, K	X	X	X	X	X	X	X			X
Sodium, Na	X	X	X	X	X	X	X			X
Total Nitrogen, TN	X	X	X	X	X	X	X			X
Bicarbonate Alkalinity, HCO_3 (as $CaCO_3$)	X	X	X	X	X	X	X			X
Total Dissolved Solids, TDS	X	X	X	X	X	X	X			X
Additional Background Monitoring Parameters										
CFC-12			X			X	X			X
Diethyl			X			X	X			X
Perchlorate			X			X	X			X
Sulfide			X			X	X			X
Physical Parameters										
pH	X	X	X	X	X	X	X			X
Specific Conductance	X	X	X	X	X	X	X			X
Temperature (field)	X	X	X	X	X	X	X			X
Depth to Water (field)	X	X	X	X	X	X	X			X

Notes for Laboratory:

1. Use historical practical quantitation/reporting limits
2. Please deliver containers to: Camino Real Landfill, 1600 Camino Real Blvd., Sunland Park, New Mexico 88063
3. Call Kevin Corel at 817.591.7370 if you have questions

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 22, 2018

Kevin Carel
Carel Corporation
136 Pecan St
Keller, TX 76248
TEL: (817) 337-0112
FAX

RE: Camino Real Landfill 2018 Annual GME and 4th Asmt OrderNo.: 1809H06

Dear Kevin Carel:

Hall Environmental Analysis Laboratory received 2 sample(s) on 9/28/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1809H06**
Date Reported: **10/22/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Project: Camino Real Landfill 2018 Annual GME
Lab ID: 1809H06-001 **Matrix:** AQUEOUS

Client Sample ID: MW-F
Collection Date: 9/24/2018 7:30:00 PM
Received Date: 9/28/2018 8:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS						Analyst: **DBK**	
Arsenic	0.0055	0.0010		mg/L	1	10/4/2018 6:01:14 PM	40801
Selenium	0.019	0.0010		mg/L	1	10/4/2018 6:01:14 PM	40801
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Fluoride	0.31	0.10		mg/L	1	10/9/2018 1:16:19 AM	R54708
Chloride	400	25		mg/L	50	10/9/2018 5:11:43 PM	R54771
Sulfate	730	10		mg/L	20	10/9/2018 1:53:33 AM	R54708
Nitrate+Nitrite as N	2.7	1.0		mg/L	5	10/9/2018 2:18:22 AM	R54708
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	2500	5.0		µmhos/c	1	10/3/2018 11:39:13 AM	R54645
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	56.32	20.00		mg/L Ca	1	10/3/2018 11:39:13 AM	R54645
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	10/3/2018 11:39:13 AM	R54645
Total Alkalinity (as CaCO3)	56.32	20.00		mg/L Ca	1	10/3/2018 11:39:13 AM	R54645
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1880	20.0	*	mg/L	1	10/1/2018 4:20:00 PM	40669
TOTAL NITROGEN						Analyst: **SRM**	
Nitrogen, Total	2.7	1.0		mg/L	1	10/18/2018 3:00:00 PM	R54985
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.63		H	pH units	1	10/3/2018 11:39:13 AM	R54645
SM 4500 NORG C: TKN						Analyst: **CJS**	
Nitrogen, Kjeldahl, Total	ND	1.0		mg/L	1	10/16/2018 9:50:00 AM	40989
EPA METHOD 200.7: METALS						Analyst: **JLF**	
Aluminum	0.13	0.020		mg/L	1	10/6/2018 8:30:56 PM	40801
Barium	0.056	0.0020		mg/L	1	10/6/2018 8:30:56 PM	40801
Boron	0.41	0.040		mg/L	1	10/6/2018 8:30:56 PM	40801
Calcium	230	10		mg/L	10	10/12/2018 5:11:35 PM	40801
Chromium	0.012	0.0060		mg/L	1	10/6/2018 8:30:56 PM	40801
Iron	0.77	0.020	*	mg/L	1	10/12/2018 5:09:51 PM	40801
Magnesium	30	1.0		mg/L	1	10/6/2018 8:30:56 PM	40801
Potassium	11	1.0		mg/L	1	10/6/2018 8:30:56 PM	40801
Sodium	290	10		mg/L	10	10/12/2018 5:11:35 PM	40801
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: MW-F
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 7:30:00 PM
Lab ID: 1809H06-001 **Matrix:** AQUEOUS **Received Date:** 9/28/2018 8:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 8:30:41 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 8:30:41 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: MW-F
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 7:30:00 PM
Lab ID: 1809H06-001 **Matrix:** AQUEOUS **Received Date:** 9/28/2018 8:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I							Analyst: **DJF**
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 8:30:41 PM	LF54527
Surr: 1,2-Dichloroethane-d4	92.4	70-130		%Rec	1	9/28/2018 8:30:41 PM	LF54527
Surr: 4-Bromofluorobenzene	90.7	70-130		%Rec	1	9/28/2018 8:30:41 PM	LF54527
Surr: Dibromofluoromethane	90.0	70-130		%Rec	1	9/28/2018 8:30:41 PM	LF54527
Surr: Toluene-d8	96.9	70-130		%Rec	1	9/28/2018 8:30:41 PM	LF54527
TOTAL PHENOLICS BY SW-846 9067							Analyst: **CLP**
Phenolics	ND	2.7		µg/L	1	10/19/2018	41105

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Field Blank
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 7:35:00 PM
Lab ID: 1809H06-002
Matrix: AQUEOUS
Received Date: 9/28/2018 8:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Toluene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Ethylbenzene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Acetone	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Bromodichloromethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Bromoform	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Bromomethane	ND	2.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
2-Butanone	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Carbon disulfide	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Carbon Tetrachloride	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Chlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Chloroethane	ND	2.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Chloroform	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Chloromethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
cis-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Dibromochloromethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Dibromomethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,1-Dichloroethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,1-Dichloroethene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,2-Dichloropropane	ND	0.50		µg/L	1	9/28/2018 8:59:42 PM	LF54527
2-Hexanone	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
4-Methyl-2-pentanone	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Methylene Chloride	ND	2.5		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Styrene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,1,2,2-Tetrachloroethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Tetrachloroethene (PCE)	ND	0.50		µg/L	1	9/28/2018 8:59:42 PM	LF54527
trans-1,2-DCE	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Trichlorofluoromethane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
1,2,3-Trichloropropane	ND	1.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Carel Corporation
Client Sample ID: Field Blank
Project: Camino Real Landfill 2018 Annual GME
Collection Date: 9/24/2018 7:35:00 PM
Lab ID: 1809H06-002 **Matrix:** AQUEOUS **Received Date:** 9/28/2018 8:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES, TABLE I						Analyst: DJF	
Vinyl chloride	ND	0.40		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Xylenes, Total	ND	2.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Acrylonitrile	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Bromochloromethane	ND	2.0		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Iodomethane	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
trans-1,4-Dichloro-2-butene	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Vinyl acetate	ND	10		µg/L	1	9/28/2018 8:59:42 PM	LF54527
Surr: 1,2-Dichloroethane-d4	89.7	70-130		%Rec	1	9/28/2018 8:59:42 PM	LF54527
Surr: 4-Bromofluorobenzene	91.8	70-130		%Rec	1	9/28/2018 8:59:42 PM	LF54527
Surr: Dibromofluoromethane	86.1	70-130		%Rec	1	9/28/2018 8:59:42 PM	LF54527
Surr: Toluene-d8	91.9	70-130		%Rec	1	9/28/2018 8:59:42 PM	LF54527

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1809H06
Pace Project No.: 30266922

Sample: 1809H06-001 Well F | Lab ID: 30266922001 | Collected: 09/24/18 19:30 | Received: 10/03/18 10:10 | Matrix: Water
PWS: | Site ID: | Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.091 ± 0.471 (1.09) C:NA T:82%**	pCi/L	10/12/18 21:37	13982-63-3	
Radium-228	EPA 904.0	**1.44 ± 0.539 (0.826) C:74% T:83%**	pCi/L	10/12/18 12:41	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809H06
Pace Project No.: 30266922

QC Batch: 315634 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30266922001

METHOD BLANK: 1540450 Matrix: Water
Associated Lab Samples: 30266922001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.088 ± 0.401 (0.815) C:NA T:81%	pCi/L	10/12/18 21:08	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1809H06
Pace Project No.: 30266922

QC Batch: 315637 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30266922001

METHOD BLANK: 1540458 Matrix: Water
Associated Lab Samples: 30266922001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.509 ± 0.304 (0.549) C:75% T:89%	pCi/L	10/12/18 12:41	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1809H06
Pace Project No.: 30266922

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

Date: 10/15/2018 02:05 PM

QC SUMMARY REPORT

WO#: **1809H06**

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40801	SampType: MBLK	TestCode: EPA Method 200.7: Metals
Client ID: PBW	Batch ID: 40801	RunNo: 54686
Prep Date: 10/4/2018	Analysis Date: 10/5/2018	SeqNo: 1814520 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Barium	ND	0.0020								
Boron	ND	0.040								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								

Sample ID LLLCS-40801	SampType: LCSLL	TestCode: EPA Method 200.7: Metals
Client ID: BatchQC	Batch ID: 40801	RunNo: 54686
Prep Date: 10/4/2018	Analysis Date: 10/5/2018	SeqNo: 1814521 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	106	50	150			
Barium	ND	0.0020	0.002000	0	92.0	50	150			
Boron	ND	0.040	0.04000	0	98.8	50	150			
Calcium	ND	1.0	0.5000	0	97.1	50	150			
Chromium	ND	0.0060	0.006000	0	94.8	50	150			
Iron	0.022	0.020	0.02000	0	108	50	150			
Magnesium	ND	1.0	0.5000	0	96.2	50	150			
Potassium	ND	1.0	0.5000	0	114	50	150			

Sample ID LCS-40801	SampType: LCS	TestCode: EPA Method 200.7: Metals
Client ID: LCSW	Batch ID: 40801	RunNo: 54686
Prep Date: 10/4/2018	Analysis Date: 10/5/2018	SeqNo: 1814525 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	107	85	115			
Barium	0.48	0.0020	0.5000	0	96.5	85	115			
Boron	0.48	0.040	0.5000	0	95.4	85	115			
Calcium	46	1.0	50.00	0	91.8	85	115			
Chromium	0.48	0.0060	0.5000	0	95.4	85	115			
Iron	0.47	0.020	0.5000	0	94.3	85	115			
Magnesium	47	1.0	50.00	0	93.4	85	115			
Potassium	46	1.0	50.00	0	92.5	85	115			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809H06

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40801	SampType: MBLK	TestCode: EPA Method 200.7: Metals							
Client ID: PBW	Batch ID: 40801	RunNo: 54856							
Prep Date: 10/4/2018	Analysis Date: 10/12/2018	SeqNo: 1822898	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID LLLCS-40801	SampType: LCSLL	TestCode: EPA Method 200.7: Metals							
Client ID: BatchQC	Batch ID: 40801	RunNo: 54856							
Prep Date: 10/4/2018	Analysis Date: 10/12/2018	SeqNo: 1822902	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020	0.01000	0	131	50	150			
Calcium	ND	1.0	0.5000	0	99.0	50	150			
Iron	0.022	0.020	0.02000	0	110	50	150			
Magnesium	ND	1.0	0.5000	0	98.7	50	150			
Potassium	ND	1.0	0.5000	0	117	50	150			
Sodium	ND	1.0	0.5000	0	131	50	150			

Sample ID LCS-40801	SampType: LCS	TestCode: EPA Method 200.7: Metals							
Client ID: LCSW	Batch ID: 40801	RunNo: 54856							
Prep Date: 10/4/2018	Analysis Date: 10/12/2018	SeqNo: 1822903	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.55	0.020	0.5000	0	109	85	115			
Calcium	47	1.0	50.00	0	94.3	85	115			
Iron	0.47	0.020	0.5000	0	94.4	85	115			
Magnesium	48	1.0	50.00	0	96.3	85	115			
Potassium	48	1.0	50.00	0	95.0	85	115			
Sodium	49	1.0	50.00	0	98.1	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809H06

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	MB-40801	SampType:	MBLK		TestCode:	EPA 200.8: Metals				
Client ID:	PBW	Batch ID:	40801		RunNo:	54649				
Prep Date:	10/4/2018	Analysis Date:	10/4/2018		SeqNo:	1812754	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID	MSLLLCS-40801	SampType:	LCSLL		TestCode:	EPA 200.8: Metals				
Client ID:	BatchQC	Batch ID:	40801		RunNo:	54649				
Prep Date:	10/4/2018	Analysis Date:	10/4/2018		SeqNo:	1812755	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	99.9	50	150			
Selenium	0.0012	0.0010	0.001000	0	116	50	150			

Sample ID	MSLCS-40801	SampType:	LCS		TestCode:	EPA 200.8: Metals				
Client ID:	LCSW	Batch ID:	40801		RunNo:	54649				
Prep Date:	10/4/2018	Analysis Date:	10/4/2018		SeqNo:	1812756	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	94.8	85	115			
Selenium	0.022	0.0010	0.02500	0	89.4	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809H06

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R54708	RunNo: 54708							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816752	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R54708	RunNo: 54708							
Prep Date:	Analysis Date: 10/8/2018	SeqNo: 1816753	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.54	0.10	0.5000	0	109	90	110			
Sulfate	9.5	0.50	10.00	0	95.0	90	110			
Nitrate+Nitrite as N	3.6	0.20	3.500	0	102	90	110			

Sample ID 1809H06-001CMS	SampType: ms	TestCode: EPA Method 300.0: Anions							
Client ID: MW-F	Batch ID: R54708	RunNo: 54708							
Prep Date:	Analysis Date: 10/9/2018	SeqNo: 1816763	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.79	0.10	0.5000	0.3146	95.5	66.7	127			

Sample ID 1809H06-001CMSD	SampType: msd	TestCode: EPA Method 300.0: Anions							
Client ID: MW-F	Batch ID: R54708	RunNo: 54708							
Prep Date:	Analysis Date: 10/9/2018	SeqNo: 1816764	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.80	0.10	0.5000	0.3146	96.9	66.7	127	0.906	20	

Sample ID MB	SampType: mblk	TestCode: EPA Method 300.0: Anions							
Client ID: PBW	Batch ID: R54771	RunNo: 54771							
Prep Date:	Analysis Date: 10/9/2018	SeqNo: 1818749	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions							
Client ID: LCSW	Batch ID: R54771	RunNo: 54771							
Prep Date:	Analysis Date: 10/9/2018	SeqNo: 1818750	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.1	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1809H06**

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
Acetone	ND	10								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	2.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	0.50								
2-Hexanone	ND	10								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	2.5								
Styrene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
Tetrachloroethene (PCE)	ND	0.50								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	1.0								
Vinyl chloride	ND	0.40								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809H06

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: PBW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807386 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	ND	2.0								
Acrylonitrile	ND	10								
Bromochloromethane	ND	2.0								
Iodomethane	ND	10								
trans-1,4-Dichloro-2-butene	ND	10								
Vinyl acetate	ND	10								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	8.8		10.00		88.0	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.7	70	130			
Surr: Toluene-d8	9.2		10.00		92.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles, Table I
Client ID: LCSW	Batch ID: LF54527	RunNo: 54527
Prep Date:	Analysis Date: 9/28/2018	SeqNo: 1807388 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	18	1.0	20.00	0	91.6	70	130			
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.7	70	130			
Trichloroethene (TCE)	16	1.0	20.00	0	82.0	70	130			
Surr: 1,2-Dichloroethane-d4	8.9		10.00		89.1	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	8.7		10.00		87.1	70	130			
Surr: Toluene-d8	9.0		10.00		90.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809H06

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-41105	SampType: MBLK	TestCode: Total Phenolics by SW-846 9067
Client ID: PBW	Batch ID: 41105	RunNo: 55031
Prep Date: 10/19/2018	Analysis Date: 10/19/2018	SeqNo: 1829372 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	ND	2.5								

Sample ID LCS-41105	SampType: LCS	TestCode: Total Phenolics by SW-846 9067
Client ID: LCSW	Batch ID: 41105	RunNo: 55031
Prep Date: 10/19/2018	Analysis Date: 10/19/2018	SeqNo: 1829373 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	109	53.3	138			

Sample ID LCSD-41105	SampType: LCSD	TestCode: Total Phenolics by SW-846 9067
Client ID: LCSS02	Batch ID: 41105	RunNo: 55031
Prep Date: 10/19/2018	Analysis Date: 10/19/2018	SeqNo: 1829374 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phenolics	11	2.5	10.00	0	113	53.3	138	3.74	21	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809H06

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID	lcs-1 98.3uS eC	SampType:	LCS		TestCode:	SM2510B: Specific Conductance					
Client ID:	LCSW	Batch ID:	R54645		RunNo:	54645					
Prep Date:		Analysis Date:	10/3/2018		SeqNo:	1812552	Units:	µmhos/cm			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity		99	5.0	98.30	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1809H06**

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID mb-1 alk	SampType: MBLK	TestCode: SM2320B: Alkalinity							
Client ID: PBW	Batch ID: R54645	RunNo: 54645							
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1812578	Units: mg/L CaCO3						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID lcs-1 alk	SampType: LCS	TestCode: SM2320B: Alkalinity							
Client ID: LCSW	Batch ID: R54645	RunNo: 54645							
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1812579	Units: mg/L CaCO3						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.60	20.00	80.00	0	95.8	90	110			

Sample ID mb-2 alk	SampType: MBLK	TestCode: SM2320B: Alkalinity							
Client ID: PBW	Batch ID: R54645	RunNo: 54645							
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1812602	Units: mg/L CaCO3						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID lcs-2 alk	SampType: LCS	TestCode: SM2320B: Alkalinity							
Client ID: LCSW	Batch ID: R54645	RunNo: 54645							
Prep Date:	Analysis Date: 10/3/2018	SeqNo: 1812603	Units: mg/L CaCO3						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	77.80	20.00	80.00	0	97.3	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1809H06

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40669	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: PBW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808571 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID LCS-40669	SampType: LCS	TestCode: SM2540C MOD: Total Dissolved Solids
Client ID: LCSW	Batch ID: 40669	RunNo: 54548
Prep Date: 9/28/2018	Analysis Date: 10/1/2018	SeqNo: 1808572 Units: mg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

WO#: 1809H06

Hall Environmental Analysis Laboratory, Inc.

22-Oct-18

Client: Carel Corporation

Project: Camino Real Landfill 2018 Annual GME and 4t

Sample ID MB-40989	SampType: MBLK	TestCode: SM 4500 Norg C: TKN							
Client ID: PBW	Batch ID: 40989	RunNo: 54950							
Prep Date: 10/12/2018	Analysis Date: 10/16/2018	SeqNo: 1826092	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	ND	1.0								

Sample ID LCS-40989	SampType: LCS	TestCode: SM 4500 Norg C: TKN							
Client ID: LCSW	Batch ID: 40989	RunNo: 54950							
Prep Date: 10/12/2018	Analysis Date: 10/16/2018	SeqNo: 1826093	Units: mg/L						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Kjeldahl, Total	9.8	1.0	10.00	0	98.0	80	120			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CAREL CORPORATION Work Order Number: 1809H06 RcptNo: 1

Received By: Erin Melendrez 9/28/2018 8:50:00 AM

Completed By: Ashley Gallegos 9/28/2018 10:13:01 AM

Reviewed By: JO 9.28.18

labeled by: JAG 09/28/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	FedEx		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: 5 (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? NO
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: JAG 9/28/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.6	Good	Yes			

Chain-of-Custody Record

Client: The Carel Corporation

Mailing Address: 136 Pecan Street
Keller, TX 76248

Phone #: 817.337.0112

email or Fax#: KCarel@gmail.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☒ NELAP ☐ Other

☒ EDD (Type) Sanitas

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Camino Real Landfill
2018 Annual GME & 4th Asmt.

Project #:
18-09-09

Project Manager:
Kevin Carel

Sampler: Kevin Carel

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.5+0.0(CF)=0.5

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1809G406	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	See Attached List				Air Bubbles (Y or N)
9-14-18	1930	GW	MW-F	17	Various	-001												X				
9-14-18	1935	W	Field Blank	6	HCl	-002											X					

Date:	Time:	Relinquished by:	Received by:	Date	Time
			FedEx Exp 9/28/18	9/28/18	0850
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

APPENDIX C

DUPLICATE SAMPLE ANALYSIS

Appendix C
Duplicate Sample Analysis

Constituent (mg/L)	PQL	5xPQL	Duplicate	MW-E	RPD or Absolute Difference
Arsenic, As	0.001	0.005	0.0096	0.0097	1.04
Selenium, Se	0.001	0.005	0.016	0.015	6.45
Fluoride, F	0.1	0.5	0.45	0.46	2.20
Chloride, Cl-	10	50	270	260	3.77
Nitrate as N, NO_3-N	1	5	2.8	2.9	3.51
Sulfate, SO_4^{2-}	10	50	910	900	1.10
Total Dissolved Solids, TDS	40	200	1730	1740	0.58
Aluminum , Al	0.02	0.1	0.022	0.14	145.68
Barium, Ba	0.002	0.01	0.016	0.017	6.06
Boron, B	0.04	0.2	0.52	0.52	0.00
Chromium, Cr	0.006	0.03	0.077	0.09	15.57
Iron, Fe	0.1	0.5	3.3	4	19.18
Combined Radium (pCi/L)	0.674	3.37	<0.831	0.872	NC
Bicarbonate, HCO3 (as CaCO3)	20	100	48.88	47.88	2.07
Total Nitrogen, TN	1	5	2.8	2.9	3.51
Calcium, Ca	10	50	230	190	19.05
Magnesium, Mg	1	5	27	26	3.77
Potassium, K	1	5	12	11	8.70
Sodium, Na	10	50	290	270	7.14

Notes:

$$RPD = [\ |S-D|/(S+D)/2\ ] \times 100$$

Where,
RPD - Relative Percent Difference
S - Sample Result (original sample)
D - Duplicate Sample Result
A control limit of 20% for the RPD is used for original and duplicate sample values >5x the RL.
A control limit of the RL is used if either the original or duplicate sample value is <5x the RL.
PQL - Practical Quantation Limit
ND - Not Detected
NC - Not Calculated

APPENDIX D

SUMMARY OF METALS AND INORGANIC PARAMETER STATISTICAL RESULTS

APPENDIX D
CAMINO REAL LANDFILL
SUMMARY OF METAL AND INORGANIC PARAMETER STATISTICAL RESULTS

Subsection A Parameters	Well A			Well B			Well D			Well E			Well F			GWPS
	Analytical Result	Established AML	Established UTLV	Analytical Result	Established AML	Established UTLV	Analytical Result	Established AML	Established UTLV	Analytical Result	Established AML	Established UTLV	Analytical Result	Established AML	Established UTLV	
Arsenic, As	**0.012**	0.011	0.014	0.0031	0.0051	0.007	0.0027	0.005	NA	**0.0097**	0.009	0.013	0.0055	0.006	0.0064	0.01
Selenium, Se	0.0027	0.025	NA	0.013	0.025	NA	0.012	0.025	NA	0.015	0.025	NA	0.019	0.025	0.034	0.05
Fluoride, F	0.3	0.8	1.12	0.2	0.8	0.86	0.24	0.8	0.88	0.46	0.8	NA	0.31	0.8	0.89	1.6
Chloride, Cl-	**350**	319	396	**310**	267	315	***250***	212	230	260	274	328	**400**	364	429	250.0
Nitrate as N, NO_3-N	<1	5	NA	1.7	5	NA	1.7	5	NA	2.9	5	NA	2.7	5	NA	10
Sulfate, SO_4^{2-}	760	771	902	**800**	706	836	630	557	658	900	924	1,069	730	756	890	600.0
Total Dissolved Solids, TDS	**1690**	1,630	1,759	**1670**	1,521	1,680	***1370***	1,239	1,290	1740	1,829	2,026	**1880**	1,767	1,964	1,000.0
Aluminum , Al	<0.02	3.75	NA	<0.02	3.75	NA	<0.020	3.75	NA	0.14	3.75	NA	0.13	3.75	NA	5.0
Barium, Ba	0.017	0.5	NA	0.021	0.5	NA	0.022	0.5	NA	0.017	0.5	NA	0.056	0.5	NA	1
Boron, B	0.4	0.5625	NA	0.35	0.5625	NA	0.32	0.5625	NA	0.52	0.57	0.60	0.41	0.5625	NA	0.75
Chromium, Cr	<0.0060	0.025	NA	<0.0060	0.14	0.17	<0.0060	0.025	NA	**0.09**	0.08	0.12	0.012	0.025	0.038	0.05
Iron, Fe	0.066	0.75	1.09	0.54	1.46	9.4	0.077	0.75	NA	**4**	3.5	4.97	0.77	1.91	8.70	1.0
Combined Radium (pCi/L)	<0.829	2.5	NA	<0.775	2.5	5.05	1.1	2.5	2.82	0.872	2.5	NA	1.44	2.5	2.96	5
Field pH (standard units)	7.89	6 - 9	6 - 9	7.51	6 - 9	6 - 9	7.12	6 - 9	6 - 9	7.4	6 - 9	6 - 9	7.24	6 - 9	6 - 9	6 - 9
Subsection C Parameters																
Bicarbonate, HCO3 (as CaCO3)	28.48	---	---	42.6	---	---	45.08	---	---	47.88	---	---	56.32	---	---	---
Total Nitrogen, TN	<1	---	---	1.7	---	---	1.7	---	---	2.9	---	---	2.7	---	---	---
Calcium, Ca	140	---	---	210	---	---	180	---	---	190	---	---	230	---	---	---
Magnesium, Mg	2.8	---	---	18	---	---	18	---	---	26	---	---	30	---	---	---
Potassium, K	5.9	---	---	11	---	---	10	---	---	11	---	---	11	---	---	---
Sodium, Na	420	---	---	290	---	---	230	---	---	270	---	---	290	---	---	---
Field SC (µS/cm)	2430	---	---	2240	---	---	1880	---	---	2330	---	---	2530	---	---	---
Field Temperature (deg C)	25.02	---	---	26.29	---	---	26.64	---	---	28.19	---	---	26.58	---	---	---

Notes:

1 All units mg/L unless otherwise noted.
2 AML - Assessment Monitoring Level
3 UTLV - Upper Tolerance Limit Value
4 GWPS - Groundwater Protection Standard
5 Bold values exceed AML
6 Bold and italic values exceed both AML and UTLV
7 AMLs and UTLVs established by GEI, 2016
8 --- - AML or UTLV not established

APPENDIX E

ASSESSMENT MONITORING RESULTS
WELL G

APPENDIX E

ASSESSMENT MONITORING RESULTS, WELL G, CAMINO REAL LANDFILL

Constituent	Units	9/25/2018 Result	AML	GWPS	CAL	20.9.9.20 NMAC Subsection		
						A	B	C
Organic Parameters								
Acetone	µg/L	<10	195	---	195	x		
Acrylonitrile	µg/L	<10	390	---	390			
Benzene	µg/L	<1	2.5	5	5			
Bromochloromethane	µg/L	<2	---	3.9	3.9			
Bromodichloromethane	µg/L	<1	---	9.75	9.75			
Bromoform	µg/L	<1	---	29.25	29.25			
Methyl bromide (Bromomethane)	µg/L	<2	---	39	39			
2-Butanone (Methyl ethyl ketone - MEK)	µg/L	<1	---	19.5	19.5			
Carbon Disulfide	µg/L	<10	---	195	195			
Carbon Tetrachloride	µg/L	<1	2.5	5	5			
Chlorobenzene	µg/L	<1	50	100	100			
Chloroethane (Ethyl Chloride)	µg/L	<2	19.5	---	19.5			
Chloroform (Trichloromethane)	µg/L	<1	50	100	100			
Methyl chloride (Chloromethane)	µg/L	<1	1.95	---	1.95	x		
Dichlorodifluoromethane (CFC-12)	µg/L	3.9	7.05[4]	1000[1]	1000[1]		x	
Dibromochloromethane	µg/L	<1	9.75	---	9.75	x		
Methylene Bromide (Dibromomethane)	µg/L	<1	39	---	39	x		
o-Dichlorobenzene (1,2-)	µg/L	<1	300	600	600	x		
p-Dichlorobenzene (1,4-)	µg/L	<1	37.5	75	75	x		
trans-1,4-Dichloro-2-butene	µg/L	<10	195	---	195	x		
1,1-Dichloroethane	µg/L	9.8	12.5	25	25	x		
1,2-Dichloroethane (EDC)	µg/L	<1	2.5	5	5	x		
1,1-Dichloroethene (1,1-DCE)	µg/L	<1	2.5	5	5	x		
cis-1,2-Dichloroethene	µg/L	<1	35	70	70	x		
trans-1,2-Dichloroethene	µg/L	<1	50	100	100	x		
Methylene chloride (Dichloromethane)	µg/L	2.9	2.5	5	5	x		
1,2-Dichloropropane	µg/L	<0.5	2.5	5	5	x		
cis-1,3-Dichloropropene	µg/L	<1	39	---	39	x		
trans-1,3-Dichloropropene	µg/L	<1	19.5	---	19.5	x		
Ethylbenzene	µg/L	<1	350	700	700	x		
2-Hexanone	µg/L	<10	97.5	---	97.5	x		
Methyl iodide (Iodomethane)	µg/L	<10	78	---	78	x		
4-Methyl-2-pentanone (MIBK)	µg/L	<10	29.25	---	29.25	x		
Styrene	µg/L	<1	50	100	100	x		
1,1,1,2-Tetrachloroethane	µg/L	<1	9.75	---	9.75	x		
1,1,2,2-Tetrachloroethane	µg/L	<1	5	10	10	x		
Tetrachloroethene (PCE)	µg/L	4.5	2.5	5	5	x		
Toluene	µg/L	<1	375	750	750	x		
1,1,1-Trichloroethane (TCA)	µg/L	<1	30	60	60	x		
1,1,2-Trichloroethane	µg/L	<1	2.5	5	5	x		
Trichloroethene (1,1,2-Trichloroethylene, TCE)	µg/L	4.0	2.5	5	5	x		
Trichlorofluoromethane (CFC 11)	µg/L	7.5	19.5	---	19.5	x		
1,2,3-Trichloropropane	µg/L	<1	19.5	---	19.5	x		
Vinyl Acetate	µg/L	<10	97.5	---	97.5	x		
Vinyl Chloride	µg/L	<0.4	0.5	1	1	x		
Xylenes (Total)	µg/L	<2	310	620	620	x		
Phenolics	µg/L	<2.6	<3.75	5	5			x

Constituent	Units	9/25/2018 Result	AML	GWPS	CAL	20.9.9.20 NMAC Subsection		
						A	B	C
Dacthal	µg/L	0.0184	0.1[4]	3500[2]	3500[2]		x	
Heavy Metals								
Antimony	mg/L		0.01	0.006	0.006			
Aluminum, Al	mg/L	0.02	3.75	5	5	x		
Arsenic, As	mg/L	0.0021	0.01	0.01	0.01	x		
Barium, Ba	mg/L	0.002	0.5	1.0	1.0	x		
Boron, B	mg/L	0.04	0.5625	0.75	0.75	x		
Chromium, Cr	mg/L	0.006	0.26	0.05	0.26	x		
Iron, Fe	mg/L	<0.020	2.32	1.0	2.3	x		
Selenium, Se	mg/L	0.0016	0.025	0.05	0.05	x		
Radioactivity								
Combined Radium, Ra 226 & Ra 228	pCi/L	1.01	5.1	5.0	5.10	x		
Inorganic Chemicals								
Calcium, Ca	mg/L	190	---	---	---			x
Magnesium, Mg	mg/L	22	---	---	---			x
Fluoride, F	mg/L	0.12	3.34	1.6	3.34	x		
Potassium, K	mg/L	12	---	---	---			x
Sodium, Na	mg/L	280	---	---	---			x
Total Nitrogen, TN	mg/L	1.1	---	---	---			x
Bicarbonate Alkalinity, HCO_3 (as $CaCO_3$)	mg/L	332.2	---	---	---			x
Total Alkalinity	mg/L	332.2	---	---	---			x
Total Dissolved Solids, TDS	mg/L	**1480**	1120	1000	1946	x		
Other								
Perchlorate	µg/L	**0.715**	0.099[4]	25.6[3]	25.6[3]		x	
Physical Parameters								
pH	std. units	6.79	6 - 9	6 - 9	6 - 9	x		
Specific Conductance	µmhos/cm	2290	---	---	---	---	---	---
Temperature (field)	deg. C	23.07	---	---	---	---	---	---
Depth to Water (field)	feet	197.72	---	---	---	---	---	---

Notes:

AML - Assessment Monitoring Level

GWPS - Groundwater Protection Standard

CAL - Corrective Action Level

Bold values exceed their respective AML

<u>Underlined</u> values exceed their respective CAL

Groundwater Standards derived from Groundwater Monitoring System Plan for Camino Real Landfill unless otherwise stated

(1) –National Library of Medicene, Toxnet Noxicology Data Network

(2) – USEPA Drinking Water Health Advisory for Dacthal and Dacthal Degradetes

(3) - USEPA Technical Fact Sheet - Perchlorate

(4) - Calculated from 2018 background data.

Attachment V.2.D
Detection Monitoring Thresholds

ATTACHMENT V.2.D
DETECTION MONITORING THRESHOLDS
CAMINO REAL LANDFILL
WELL A

SUBSECTION A PARAMETERS							
Analyte	**Units**	**Approved PQL/MRL**	**Calculated UTLV**	**Presumptive AML**	**Established AML**	**GWPS**	**CAL**
Heavy Metals							
Antimony, Sb	mg/L	0.003	0.003	0.003	0.003	0.006	0.006
Arsenic, As	mg/L	0.005	0.0132	0.005	0.0132	0.01	0.0132
Barium, Ba	mg/L	0.02	0.044	0.5	0.5	1.0	1.0
Beryllium, Be	mg/L	0.002	0.002	0.002	0.002	0.004	0.004
Cadmium, Cd	mg/L	0.002	0.002	0.0025	0.0025	0.005	0.005
Chromium, Cr	mg/L	0.01	0.011	0.025	0.025	0.05	0.05
Cobalt, Co	mg/L	0.025	0.03	0.0375	0.0375	0.05	0.05
Copper, Cu	mg/L	0.06	0.015	0.75	0.75	1.0	1.0
Lead, Pb	mg/L	0.01	0.01	0.025	0.025	0.05	0.05
Nickel, Ni	mg/L	0.05	0.05	0.15	0.15	0.2	0.2
Selenium, Se	mg/L	0.005	0.0019	0.025	0.025	0.05	0.05
Silver, Ag	mg/L	0.01	0.01	0.025	0.025	0.05	0.05
Thallium, Tl	mg/L	0.001	0.0011	0.001	0.0011	0.002	0.002
Vanadium, V	mg/L	0.08	0.033	--	0.156	--	0.156
Zinc, Zn	mg/L	0.05	0.204	7.5	7.5	10	10
Other Inorganic Chemicals							
Aluminum, Al	mg/L	0.15	0.086	3.75	3.75	5.0	5.0
Boron, B	mg/L	0.5	1.34	0.5625	1.34	0.75	1.34
Chloride, Cl^-	mg/L	5.0	350	187.5	350	250	350
Cyanide, CN^-	mg/L	0.1	0.1	0.1	0.1	0.2	0.2
Fluoride, Fl	mg/L	0.4	2.54	0.8	2.54	1.6	2.54
Iron, Fe	mg/L	0.1	0.67	0.75	0.75	1.0	1.0
Manganese, Mn	mg/L	0.03	0.061	0.15	0.15	0.2	0.2
Mercury, Hg	mg/L	0.001	0.0029	0.001	0.0029	0.002	0.0029
Molybdenum, Mo	mg/L	0.75	0.05	0.75	0.75	1.0	1.0
Nitrate as N, NO_3-N	mg/L	1.0	0.11	5.0	5.0	10	10
Sulfate, SO_4^{2-}	mg/L	5.0	1,061	450	1,061	600	1,061
Uranium, U	mg/L	0.015	0.018	0.015	0.018	0.03	0.03
Radioactivity							
Combined Radium	pCi/L	2.5	7.46	2.5	7.46	5.0	7.46
Physical Parameters							
pH	SU	0.1	7.05 - 9.03	6 - 9	6 - 9.03	6 - 9	6 - 9.03
Total Dissolved Solids, TDS	mg/L	50	1,676	750	1,676	1,000	1,676

Notes:

PQL/MRL: Practical Quantitation Limit, also referred to as the laboratory method reporting limit (MRL)

Calculated UTLV: Calculated Upper Tolerance Limit Value

Presumptive AML: Presumptive Assessment Monitoring Level; 20.9.9.20 NMAC (Revised 05/05/10)

Established AML: Established Assessment Monitoring Level. Assigned the higher value of either the Calculated UTLV or Presumptive AML.

GWPS: Groundwater Protection Standard; 20.9.9.20 NMAC (Revised 05/05/10)

CAL: Corrective Action Level. Assigned the higher value of either the Established AML or the GWPS.

pCi/L: pico Curies per liter

SU: Standard units

The Established AML of 0.156 mg/L for vanadium is calculated as 1.95 x the laboratory MRL, as prescribed in "Note 6" of 20.9.9.20 NMAC "*Groundwater Monitoring Parameter List*" (Revised 05/05/10).

\\Data1\Projects\2019\0087.19\03_DSGN\03_REPT\03_GW_Moniitor_Plan_Vol_V.2\Att. V.2.D_InorgDetList\Well A

ATTACHMENT V.2.D
DETECTION MONITORING THRESHOLDS
CAMINO REAL LANDFILL
WELL B

SUBSECTION A PARAMETERS							
Analyte	**Units**	**Approved PQL/MRL**	**Calculated UTLV**	**Presumptive AML**	**Established AML**	**GWPS**	**CAL**
Heavy Metals							
Antimony, Sb	mg/L	0.003	0.02	0.003	0.02	0.006	0.02
Arsenic, As	mg/L	0.005	0.01	0.005	0.01	0.01	0.01
Barium, Ba	mg/L	0.02	0.052	0.5	0.5	1.0	1.0
Beryllium, Be	mg/L	0.002	0.002	0.002	0.002	0.004	0.004
Cadmium, Cd	mg/L	0.002	0.002	0.0025	0.0025	0.005	0.005
Chromium, Cr	mg/L	0.01	0.038	0.025	0.038	0.05	0.05
Cobalt, Co	mg/L	0.025	0.03	0.0375	0.0375	0.05	0.05
Copper, Cu	mg/L	0.06	0.035	0.75	0.75	1.0	1.0
Lead, Pb	mg/L	0.01	0.006	0.025	0.025	0.05	0.05
Nickel, Ni	mg/L	0.05	0.05	0.15	0.15	0.2	0.2
Selenium, Se	mg/L	0.005	0.022	0.025	0.025	0.05	0.025
Silver, Ag	mg/L	0.01	0.01	0.025	0.025	0.05	0.05
Thallium, Tl	mg/L	0.001	0.014	0.001	0.014	0.002	0.014
Vanadium, V	mg/L	0.08	0.016	--	0.156	--	0.156
Zinc, Zn	mg/L	0.05	0.47	7.5	7.5	10	10
Other Inorganic Chemicals							
Aluminum, Al	mg/L	0.15	0.149	3.75	3.75	5.0	5.0
Boron, B	mg/L	0.5	0.427	0.5625	0.5625	0.75	0.75
Chloride, Cl^-	mg/L	5.0	536	187.5	536	250	536
Cyanide, CN^-	mg/L	0.1	0.1	0.1	0.1	0.2	0.2
Fluoride, Fl	mg/L	0.4	2.09	0.8	2.09	1.6	2.09
Iron, Fe	mg/L	0.1	0.438	0.75	0.75	1.0	1.0
Manganese, Mn	mg/L	0.03	0.055	0.15	0.15	0.2	0.2
Mercury, Hg	mg/L	0.001	0.0028	0.001	0.0028	0.002	0.0028
Molybdenum, Mo	mg/L	0.75	0.092	0.75	0.75	1.0	1.0
Nitrate as N, NO_3-N	mg/L	1.0	3.21	5.0	5.0	10	10
Sulfate, SO_4^{2-}	mg/L	5.0	1,090	450	1,090	600	1,090
Uranium, U	mg/L	0.015	0.027	0.015	0.027	0.03	0.03
Radioactivity							
Combined Radium	pCi/L	2.5	18.4	2.5	18.4	5.0	18.4
Physical Parameters							
pH	SU	0.1	7.06 - 8.04	6 - 9	6 - 9	6 - 9	6 - 9
Total Dissolved Solids, TDS	mg/L	50	1,694	750	1,694	1,000	1,694

Notes:

PQL/MRL: Practical Quantitation Limit, also referred to as the laboratory method reporting limit (MRL)

Calculated UTLV: Calculated Upper Tolerance Limit Value

Presumptive AML: Presumptive Assessment Monitoring Level; 20.9.9.20 NMAC (Revised 05/05/10)

Established AML: Established Assessment Monitoring Level. Assigned the higher value of either the Calculated UTLV or Presumptive AML.

GWPS: Groundwater Protection Standard; 20.9.9.20 NMAC (Revised 05/05/10)

CAL: Corrective Action Level. Assigned the higher value of either the Established AML or the GWPS.

pCi/L: pico Curies per liter

SU: Standard units

The Established AML of 0.156 mg/L for vanadium is calculated as 1.95 x the laboratory MRL, as prescribed in "Note 6" of 20.9.9.20 NMAC "*Groundwater Monitoring Parameter List*" (Revised 05/05/10).

ATTACHMENT V.2.D
DETECTION MONITORING THRESHOLDS
CAMINO REAL LANDFILL
WELL D

SUBSECTION A PARAMETERS							
Analyte	**Units**	**Approved PQL/MRL**	**Calculated UTLV**	**Presumptive AML**	**Established AML**	**GWPS**	**CAL**
Heavy Metals							
Antimony, Sb	mg/L	0.003	0.003	0.003	0.003	0.006	0.006
Arsenic, As	mg/L	0.005	0.0028	0.005	0.005	0.01	0.01
Barium, Ba	mg/L	0.02	0.037	0.5	0.5	1.0	1.0
Beryllium, Be	mg/L	0.002	0.002	0.002	0.002	0.004	0.004
Cadmium, Cd	mg/L	0.002	0.002	0.0025	0.0025	0.005	0.005
Chromium, Cr	mg/L	0.01	0.01	0.025	0.025	0.05	0.05
Cobalt, Co	mg/L	0.025	0.03	0.0375	0.0375	0.05	0.05
Copper, Cu	mg/L	0.06	0.036	0.75	0.75	1.0	1.0
Lead, Pb	mg/L	0.01	0.034	0.025	0.034	0.05	0.05
Nickel, Ni	mg/L	0.05	0.05	0.15	0.15	0.2	0.2
Selenium, Se	mg/L	0.005	0.016	0.025	0.025	0.05	0.025
Silver, Ag	mg/L	0.01	0.01	0.025	0.025	0.05	0.05
Thallium, Tl	mg/L	0.001	0.001	0.001	0.001	0.002	0.002
Vanadium, V	mg/L	0.08	0.12	--	0.156	--	0.156
Zinc, Zn	mg/L	0.05	0.196	7.5	7.5	10	10
Other Inorganic Chemicals							
Aluminum, Al	mg/L	0.15	0.093	3.75	3.75	5.0	5.0
Boron, B	mg/L	0.5	1.32	0.5625	1.32	0.75	1.32
Chloride, Cl^-	mg/L	5.0	454	187.5	454	250	454
Cyanide, CN^-	mg/L	0.1	0.1	0.1	0.1	0.2	0.2
Fluoride, Fl	mg/L	0.4	1.67	0.8	1.67	1.6	1.67
Iron, Fe	mg/L	0.1	0.83	0.75	0.83	1.0	1.0
Manganese, Mn	mg/L	0.03	0.118	0.15	0.15	0.2	0.2
Mercury, Hg	mg/L	0.001	0.001	0.001	0.001	0.002	0.002
Molybdenum, Mo	mg/L	0.75	0.11	0.75	0.75	1.0	1.0
Nitrate as N, NO_3-N	mg/L	1.0	3.74	5.0	5.0	10	10
Sulfate, SO_4^{2-}	mg/L	5.0	1,205	450	1,205	600	1,205
Uranium, U	mg/L	0.015	0.022	0.015	0.022	0.03	0.03
Radioactivity							
Combined Radium	pCi/L	2.5	2.94	2.5	2.94	5.0	5.0
Physical Parameters							
pH	SU	0.1	6.22 - 9.07	6 - 9	6 - 9.07	6 - 9	6 - 9.07
Total Dissolved Solids, TDS	mg/L	50	1,428	750	1,428	1,000	1,428

Notes:

PQL/MRL: Practical Quantitation Limit, also referred to as the laboratory method reporting limit (MRL)

Calculated UTLV: Calculated Upper Tolerance Limit Value

Presumptive AML: Presumptive Assessment Monitoring Level; 20.9.9.20 NMAC (Revised 05/05/10)

Established AML: Established Assessment Monitoring Level. Assigned the higher value of either the Calculated UTLV or Presumptive AML.

GWPS: Groundwater Protection Standard; 20.9.9.20 NMAC (Revised 05/05/10)

CAL: Corrective Action Level. Assigned the higher value of either the Established AML or the GWPS.

pCi/L: pico Curies per liter

SU: Standard units

The Established AML of 0.156 mg/L for vanadium is calculated as 1.95 x the laboratory MRL, as prescribed in "Note 6" of 20.9.9.20 NMAC "*Groundwater Monitoring Parameter List*" (Revised 05/05/10).

ATTACHMENT V.2.D
DETECTION MONITORING THRESHOLDS
CAMINO REAL LANDFILL
WELL E

SUBSECTION A PARAMETERS							
Analyte	**Units**	**Approved PQL/MRL**	**Calculated UTLV**	**Presumptive AML**	**Established AML**	**GWPS**	**CAL**
Heavy Metals							
Antimony, Sb	mg/L	0.003	0.008	0.003	0.008	0.006	0.008
Arsenic, As	mg/L	0.005	0.011	0.005	0.011	0.01	0.011
Barium, Ba	mg/L	0.02	0.032	0.5	0.5	1.0	1.0
Beryllium, Be	mg/L	0.002	0.002	0.002	0.002	0.004	0.004
Cadmium, Cd	mg/L	0.002	0.002	0.0025	0.0025	0.005	0.005
Chromium, Cr	mg/L	0.01	0.461	0.025	0.461	0.05	0.461
Cobalt, Co	mg/L	0.025	0.03	0.0375	0.0375	0.05	0.05
Copper, Cu	mg/L	0.06	0.06	0.75	0.75	1.0	1.0
Lead, Pb	mg/L	0.01	0.024	0.025	0.025	0.05	0.05
Nickel, Ni	mg/L	0.05	0.05	0.15	0.15	0.2	0.2
Selenium, Se	mg/L	0.005	0.022	0.025	0.025	0.05	0.05
Silver, Ag	mg/L	0.01	0.01	0.025	0.025	0.05	0.05
Thallium, Tl	mg/L	0.001	0.001	0.001	0.001	0.002	0.002
Vanadium, V	mg/L	0.08	0.011	--	0.156	--	0.156
Zinc, Zn	mg/L	0.05	0.178	7.5	7.5	10	10
Other Inorganic Chemicals							
Aluminum, Al	mg/L	0.15	3.0	3.75	3.75	5.0	5.0
Boron, B	mg/L	0.5	1.0	0.5625	1.0	0.75	1.0
Chloride, Cl^-	mg/L	5.0	358	187.5	358	250	358
Cyanide, CN^-	mg/L	0.1	0.1	0.1	0.1	0.2	0.2
Fluoride, Fl	mg/L	0.4	3.15	0.8	3.15	1.6	3.15
Iron, Fe	mg/L	0.1	6.5	0.75	6.5	1.0	6.5
Manganese, Mn	mg/L	0.03	0.033	0.15	0.15	0.2	0.2
Mercury, Hg	mg/L	0.001	0.001	0.001	0.001	0.002	0.002
Molybdenum, Mo	mg/L	0.75	0.75	0.75	0.75	1.0	1.0
Nitrate as N, NO_3-N	mg/L	1.0	3.04	5.0	5.0	10	10
Sulfate, SO_4^{2-}	mg/L	5.0	1,389	450	1,389	600	1,389
Uranium, U	mg/L	0.015	0.015	0.015	0.015	0.03	0.03
Radioactivity							
Combined Radium	pCi/L	2.5	2.74	2.5	2.74	5.0	2.74
Physical Parameters							
pH	SU	0.1	5.91 - 9.29	6 - 9	5.91 - 9.29	6 - 9	5.91 - 9.29
Total Dissolved Solids, TDS	mg/L	50	2,036	750	2,036	1,000	2,036

Notes:

PQL/MRL: Practical Quantitation Limit, also referred to as the laboratory method reporting limit (MRL)

Calculated UTLV: Calculated Upper Tolerance Limit Value

Presumptive AML: Presumptive Assessment Monitoring Level; 20.9.9.20 NMAC (Revised 05/05/10)

Established AML: Established Assessment Monitoring Level. Assigned the higher value of either the Calculated UTLV or Presumptive AML.

GWPS: Groundwater Protection Standard; 20.9.9.20 NMAC (Revised 05/05/10)

CAL: Corrective Action Level. Assigned the higher value of either the Established AML or the GWPS.

pCi/L: pico Curies per liter

SU: Standard units

The Established AML of 0.156 mg/L for vanadium is calculated as 1.95 x the laboratory MRL, as prescribed in "Note 6" of 20.9.9.20 NMAC "*Groundwater Monitoring Parameter List*" (Revised 05/05/10).

ATTACHMENT V.2.D
DETECTION MONITORING THRESHOLDS
CAMINO REAL LANDFILL
WELL F

SUBSECTION A PARAMETERS							
Analyte	**Units**	**Approved PQL/MRL**	**Calculated UTLV**	**Presumptive AML**	**Established AML**	**GWPS**	**CAL**
Heavy Metals							
Antimony, Sb	mg/L	0.003	0.014	0.003	0.014	0.006	0.014
Arsenic, As	mg/L	0.005	0.076	0.005	0.076	0.01	0.076
Barium, Ba	mg/L	0.02	0.19	0.5	0.5	1.0	1.0
Beryllium, Be	mg/L	0.002	0.007	0.002	0.007	0.004	0.007
Cadmium, Cd	mg/L	0.002	0.007	0.0025	0.007	0.005	0.007
Chromium, Cr	mg/L	0.01	0.024	0.025	0.025	0.05	0.05
Cobalt, Co	mg/L	0.025	0.03	0.0375	0.0375	0.05	0.05
Copper, Cu	mg/L	0.06	0.06	0.75	0.75	1.0	1.0
Lead, Pb	mg/L	0.01	0.021	0.025	0.025	0.05	0.05
Nickel, Ni	mg/L	0.05	0.05	0.15	0.15	0.2	0.2
Selenium, Se	mg/L	0.005	0.087	0.025	0.087	0.05	0.087
Silver, Ag	mg/L	0.01	0.053	0.025	0.053	0.05	0.053
Thallium, Tl	mg/L	0.001	0.001	0.001	0.001	0.002	0.002
Vanadium, V	mg/L	0.08	0.007	--	0.156	--	0.156
Zinc, Zn	mg/L	0.05	0.113	7.5	7.5	10	10
Other Inorganic Chemicals							
Aluminum, Al	mg/L	0.15	3.0	3.75	3.75	5.0	5.0
Boron, B	mg/L	0.5	0.617	0.5625	0.617	0.75	0.75
Chloride, Cl^-	mg/L	5.0	332	187.5	332	250	332
Cyanide, CN^-	mg/L	0.1	0.1	0.1	0.1	0.2	0.2
Fluoride, Fl	mg/L	0.4	2.55	0.8	2.55	1.6	2.55
Iron, Fe	mg/L	0.1	3.23	0.75	3.23	1.0	3.23
Manganese, Mn	mg/L	0.03	0.31	0.15	0.31	0.2	0.31
Mercury, Hg	mg/L	0.001	0.001	0.001	0.001	0.002	0.002
Molybdenum, Mo	mg/L	0.75	0.75	0.75	0.75	1.0	1.0
Nitrate as N, NO_3-N	mg/L	1.0	5.08	5.0	5.08	10	10
Sulfate, SO_4^{2-}	mg/L	5.0	1,063	450	1,063	600	1,063
Uranium, U	mg/L	0.015	0.022	0.015	0.022	0.03	0.03
Radioactivity							
Combined Radium	pCi/L	2.5	7.41	2.5	7.41	5.0	7.41
Physical Parameters							
pH	SU	0.1	6.10 - 9.04	6 - 9	6 - 9.04	6 - 9	6 - 9.04
Total Dissolved Solids, TDS	mg/L	50	1,976	750	1,976	1,000	1,976

Notes:

PQL/MRL: Practical Quantitation Limit, also referred to as the laboratory method reporting limit (MRL)

Calculated UTLV: Calculated Upper Tolerance Limit Value

Presumptive AML: Presumptive Assessment Monitoring Level; 20.9.9.20 NMAC (Revised 05/05/10)

Established AML: Established Assessment Monitoring Level. Assigned the higher value of either the Calculated UTLV or Presumptive AML.

GWPS: Groundwater Protection Standard; 20.9.9.20 NMAC (Revised 05/05/10)

CAL: Corrective Action Level. Assigned the higher value of either the Established AML or the GWPS.

pCi/L: pico Curies per liter

SU: Standard units

The Established AML of 0.156 mg/L for vanadium is calculated as 1.95 x the laboratory MRL, as prescribed in "Note 6" of 20.9.9.20 NMAC "*Groundwater Monitoring Parameter List*" (Revised 05/05/10).

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ATTACHMENT V.2.D
DETECTION MONITORING THRESHOLDS - INORGANIC PARAMETERS
CAMINO REAL LANDFILL
WELL G

SUBSECTION A PARAMETERS							
Analyte	**Units**	**Approved PQL/MRL**	**Calculated UTLV**	**Presumptive AML**	**Established AML**	**GWPS**	**CAL**
Heavy Metals							
Antimony, Sb	mg/L	0.003	0.01	0.003	0.01	0.006	0.01
Arsenic, As	mg/L	0.005	0.01	0.005	0.01	0.01	0.01
Barium, Ba	mg/L	0.02	0.19	0.5	0.5	1.0	1.0
Beryllium, Be	mg/L	0.002	0.002	0.002	0.002	0.004	0.004
Cadmium, Cd	mg/L	0.002	0.003	0.0025	0.003	0.005	0.005
Chromium, Cr	mg/L	0.01	0.26	0.025	0.26	0.05	0.26
Cobalt, Co	mg/L	0.025	0.03	0.0375	0.0375	0.05	0.05
Copper, Cu	mg/L	0.06	0.06	0.75	0.75	1.0	1.0
Lead, Pb	mg/L	0.01	0.013	0.025	0.025	0.05	0.05
Nickel, Ni	mg/L	0.05	0.05	0.15	0.15	0.2	0.2
Selenium, Se	mg/L	0.005	0.024	0.025	0.025	0.05	0.05
Silver, Ag	mg/L	0.01	0.01	0.025	0.025	0.05	0.05
Thallium, Tl	mg/L	0.001	0.002	0.001	0.002	0.002	0.002
Vanadium, V	mg/L	0.08	0.013	--	0.156	--	0.156
Zinc, Zn	mg/L	0.05	0.12	7.5	7.5	10	10
Other Inorganic Chemicals							
Aluminum, Al	mg/L	0.15	3.0	3.75	3.75	5.0	5.0
Boron, B	mg/L	0.5	0.5	0.5625	0.5625	0.75	0.75
Chloride, Cl^-	mg/L	5.0	332	187.5	332	250	332
Cyanide, CN^-	mg/L	0.1	0.1	0.1	0.1	0.2	0.2
Fluoride, Fl	mg/L	0.4	3.34	0.8	3.34	1.6	3.34
Iron, Fe	mg/L	0.1	2.32	0.75	2.32	1.0	2.32
Manganese, Mn	mg/L	0.03	0.03	0.15	0.15	0.2	0.2
Mercury, Hg	mg/L	0.001	0.001	0.001	0.001	0.002	0.002
Molybdenum, Mo	mg/L	0.75	0.75	0.75	0.75	1.0	1.0
Nitrate as N, NO_3-N	mg/L	1.0	4.33	5.0	5.0	10	10.0
Sulfate, SO_4^{2-}	mg/L	5.0	925	450	925	600	925
Uranium, U	mg/L	0.015	0.019	0.015	0.019	0.03	0.03
Radioactivity							
Combined Radium	pCi/L	2.5	5.10	2.5	5.10	5.0	5.10
Physical Parameters							
pH	SU	0.1	6.27 - 8.65	6 - 9	6 - 9	6 - 9	6 - 9
Total Dissolved Solids, TDS	mg/L	50	1,946	750	1,946	1,000	1,946

Notes:

PQL/MRL: Practical Quantitation Limit, also referred to as the laboratory method reporting limit (MRL)

Calculated UTLV: Calculated Upper Tolerance Limit Value

Presumptive AML: Presumptive Assessment Monitoring Level; 20.9.9.20 NMAC (Revised 05/05/10)

Established AML: Established Assessment Monitoring Level. Assigned the higher value of either the Calculated UTLV or Presumptive AML.

GWPS: Groundwater Protection Standard; 20.9.9.20 NMAC (Revised 05/05/10)

CAL: Corrective Action Level. Assigned the higher value of either the Established AML or the GWPS.

pCi/L: pico Curies per liter

SU: Standard units

The Established AML of 0.156 mg/L for vanadium is calculated as 1.95 x the laboratory MRL, as prescribed in "Note 6" of 20.9.9.20 NMAC "*Groundwater Monitoring Parameter List*" (Revised 05/05/10).

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Attachment V.2.E
Field Notes Form

GROUNDWATER MONITORING FIELD NOTES FORM

Site: Camino Real Landfill

Samplers: _____

Observers: _____

Site/Well Condition: _____

Well ID: _____

Total Depth: _____

Depth-to-water: _____

Measured from: _____

Date: _____

Ambient Temperature: _____

Wind Direction/Speed: _____

Recent Precipitation: _____

Equipment Information

Sampling Method:

One Well Volume (feet, gallons)

(_____ - _____) = _____ feet

(Total Depth - DTW) = well column

_____ x 0.64 = _____ gallons

(Well Column x 0.64) = 1 well-volume

Three Well Volumes

_____ x 3 = _____ gallons

1 well-volume x 3 = 3 well-volumes

Pump Make:

Pump On: _____ Water Out: _____

Generator Fuel:				Electric Pump
	Beginning	Mid	Final	
Hz				
disch. Rate				

Time	Gallons Removed	°C	pH	SC units_____	Observations	Pumping Rate

Sample Start: _____ Field Blank: _____

Sample End: _____ Duplicate: _____

Sample Out: _____ Filtered: _____

Notes: _____

Sampler(s): _____ _____

Name Name

_____ _____

Signature Signature

Attachment V.2.F

Hall Environmental Analysis Laboratory Accreditation

Hall Environmental Analysis Laboratory, Inc.

February 29, 2012

Mike Crepeau
Gordon Environmental, Inc.
213 S. Camino de Pueblo
Bernalillo, NM 87004

Dear Mr. Mike Crepeau,

Hall Environmental Analysis Laboratory (HEAL) is a full service environmental testing laboratory located in Albuquerque, NM that employs 35 chemists, technicians, and administrative personnel. HEAL is a qualified laboratory as defined under the Underground Storage Tank Regulations of the State of New Mexico Environmental Improvement Board (USTR 1201) and the State of New Mexico Water Quality Control Commission Regulations. HEAL offers volatile organic, semi volatile organic, and metals analysis in-house. HEAL is nationally certified through the National Environmental Laboratory Accreditation Program (NELAC),The State of Arizona and the New Mexico Drinking Water Bureau. HEAL has been approved by the State of New Mexico Environment Department Solid Waste Bureau to perform analyses for solid waste facilities and generators in New Mexico.

Hall Environmental Analysis Laboratory, Inc. maintains a QA/QC program to demonstrate the precision and accuracy of analyses. The records of all parameters including but not limited to that necessary for a QA/QC program are maintained for a minimum of 3 years. Individual quality control for every analyte reported is performed. All analytical practices at HEAL are conducted using the highest standard of quality control. The methods used are listed in EPA/s "Guidelines Establishing Test Procedures for the Analysis of Pollutants,: Title 40 Code of Federal Regulations Part 136 (40 CFR Part 136), Tables 1A through 1E, and SW 846, 3rd Edition, Volume 1A through 1C. Analytical results are reported in accordance with NELAC Chapter 5 Quality Standards, as well as the requirements specified in 20.9.9.10.H NMAC. HEAL water testing procedures are compliant with the requirements specified in 20.9.9.18 NMAC. All sample analyses are completed in accordance with best management practices and our QA/QC plan.

We would be pleased to provide you with a copy of our accreditations, the detailed QA/QC plan, statement of qualifications, and professional resumes upon request. If you have any additional questions, or require additional information, please feel free to call.

If you have any additional questions, or require additional information, please feel free to call.

Sincerely,

Andy Freeman
Laboratory Manager

Attachment V.2.G
Qualified Groundwater Scientist Certification

ATTACHMENT V.2.G

GROUNDWATER MONITORING SYSTEM PLAN
CAMINO REAL LANDFILL
February 2020 Application for Permit Renewal: Section 2, Volume V

QUALIFIED GROUNDWATER SCIENTIST CERTIFICATION

This is to certify that, to the best of my knowledge and belief, the attached Groundwater Monitoring System Plan for the Camino Real Landfill is accurate and complete. I am a Qualified Groundwater Scientist pursuant to 20.9.9 NMAC.

Clay Kilmer Date: 2/19/2020

Signature of Qualified Groundwater Scientist

L. Clay Kilmer, P.G.
Project Manager
ckilmer@team-psc.com
Gordon Environmental-PSC Inc.
333 Rio Rancho Blvd. NE, Ste 400
Rio Rancho, New Mexico 87124
(505) 867-6990