PRELIMINARY BORROW
SOURCE MATERIALS INVESTIGATION
LEACH ORE AND WASTE ROCK STOCKPILES
DP-1341 CONDITION 79

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1.0 INTRODUCTION

The Tyrone Mine consists of an open pit copper mine and solution extraction/electrowinning facility located about 10 miles southwest of Silver City in Grant County, New Mexico (Fig. 1). Phelps Dodge Tyrone Inc. (Tyrone) is evaluating reclamation options with respect to meeting pertinent applicable requirements of the New Mexico Water Quality Control Act (NMWQA), the Water Quality Control Commission (NMWQCC) regulations, and the New Mexico Mining Act. Tyrone is permitted as an existing mine (No. GR010RE) with the New Mexico Mining and Minerals Division (MMD).

Golder Associates Inc. (Golder) prepared this report on behalf of Tyrone in response to Condition 79 of discharge permit DP-1341 issued by the New Mexico Environment Department (NMED). In addition, this report addresses the requirements of Condition L.5 of Permit Revision 01-1 to Permit No. GRE010RE. Condition 79 of DP-1341 requires the preparation of a Supplemental Borrow Materials Investigation (SBMI) for Tyrone as indicated below:

> *"Tyrone shall revise the borrow source materials investigation for the Leach Ore Stockpiles and Waste Rock Piles. In accordance with the schedule approved under Condition 74, Tyrone shall submit to NMED for approval a work plan including an implementation schedule, for a revised borrow source investigation materials investigation. The investigation shall be designed to consider the data needs for the cover performance evaluation described in Condition 75. The investigation shall, at a minimum, identify all borrow source locations and the collection of an adequate number of samples to establish the relevant physical and chemical characteristics of the borrow material proposed to be used for cover."*

Condition 79 of DP-1341 requires Tyrone to augment the borrow materials investigation for the leach ore stockpiles and waste rock piles to consider the data needs for the cover performance evaluation in Condition 75. Condition 75 requires that Tyrone "evaluate the type and thickness of proposed cover materials and to further characterize the physical and hydraulic properties of the proposed cover materials for the Leach Ore Stockpiles and Waste Rock Piles." Ultimately, these studies are designed to determine whether the cover systems comply with the NMWQA and NMWQCC regulations.

According to the DP-1341, Condition 17, the proposed cover for the waste rock piles and leach ore stockpiles is a store and release type that consists of a minimum of 36 inches of alluvium (e.g. Gila Conglomerate Formation) or other non-acid generating materials. Alternative covers at the waste rock piles and leach ore stockpiles are 24- and 48-inch thick store and release covers composed of earthen materials (e.g., leached cap, Gila Conglomerate, and local alluvial materials). If the proposed

cover design fails to comply with the NMWQA or NMWQCC regulations, then an alternative cover design will be proposed. Similarly, if the performance of an alternative cover is equivalent to the proposed cover it may be substituted for the proposed cover.

In Condition L.5, the MMD requires that Tyrone develop a volumetric analysis for cover availability including physical and chemical analyses, and a map showing the areal extent of borrow areas. Furthermore, Condition L.5 requires Tyrone to avoid acid generating materials if they occur on the 5A (1D) Stockpile.

1.1 Background

Potential cover materials identified at Tyrone include native soils, recent alluvium, residual Gila Conglomerate, Gila Conglomerate in the 5A Stockpile, and leached cap waste rock from the Little Rock Mine and the Copper Mountain Pit Expansion Area. The Gila Conglomerate and associated soils and leached cap are the principal cover materials identified for use at the Tyrone Mine. The Gila Conglomerate Formation is a mid-Miocene and mid-Pleistocene continental deposit that is widespread in southern New Mexico and Arizona. The composition of the Gila Conglomerate Formation varies locally depending on the source area lithology at the time of stripping and deposition. The Gila Conglomerate in the mine area consists largely of igneous intrusive rocks originating from the ancestral Big Burro Mountains; while the Gila Conglomerate in the Mangas Valley reflects the influence of volcanic and meta-sedimentary rocks from the Little Burro Mountains.

The leached cap represents igneous rocks that have undergone hypogene mineralization. Generally, hypogene mineralization results in rocks with low sulfide contents, high chalcopyrite to pyrite ratios and the occurrence of calcite. Hypogene mineralization explains why an oxide orebody formed in the Copper Mountain area instead of a sulfide orebody, and why the material has neutralizing potential.

The characteristics and suitability of the cover materials at Tyrone have been previously evaluated in the *Borrow Materials Investigation* (BMI) (DBS&A, 1997a), *Soil and Rock Suitability Assessment* (DBS&A, 1997a), *Preliminary Materials Characterization* (DBS&A, 1997b), *Supplemental Materials Characterization* (DBS&A, 1997c), and *Little Rock Mine Cover Design Report and Test Plot Work Plan* (Golder, 2004), *Copper Mountain Pit Expansion Leached Cap and Waste Rock Management Plan* (PDTI, 2005), and *Leached Cap Analysis and Vegetation Summary* (Golder, 2005).

Physically, the fine-earth fraction (i.e., < 2mm) of the Gila Conglomerate and associated soils is dominantly moderately coarse-textured and mainly represented by loamy sand and sandy loam textures. Fine-, moderately fine- and coarse-textured soils occur locally. In general, the coarse textured soils are more prevalent in and around the mine area, and the finer textured soils tend to occur on the flanks of the Little Burro Mountains east of the tailing ponds. The soils around Tyrone typically contain about 30 to 50 percent rock fragments (>2 mm diameter) by volume. Saturation percentages for the soils generally range from 18 to 75 percent.

Chemically, the Gila Conglomerate and associated soils have few inherent limitations. The pH of the soils range from about 5.0 to 7.8 and the salinity levels are low (0.2 to 3.8 dS/m). These materials are universally nonsodic and have favorable calcium to magnesium ratios. Soluble selenium and boron levels are low. The materials range from noncalcareous to calcareous and contain 0.5 to 9.2 percent $CaCO_3$ equivalent. The highest levels of $CaCO_3$ are found in the subsurface of the soils in the Mangas Valley.

The soils that will be used to cover the stockpiles and tailing impoundments will be excavated from numerous locations on the mine property. Additional materials characterization is planned as part of the ongoing test plot program.

1.2 Objectives

The intent of the work presented herein is to provide additional data on the physical and hydraulic characteristics of the cover materials proposed for use on the leach ore and waste rock stockpiles. More specifically, the materials characterization will:

- augment previous materials characterization studies conducted in the mine/stockpile unit, and
- refine the understanding of the volume of suitable materials in the 5A Stockpile.

Ultimately, this information will be used in reclamation planning and to facilitate the calibration of a soil water balance model for the reclaimed lands in this region.

2.0 METHODS

The methods used in this investigation are discussed below. Field methods are outlined in Section 2.1 and laboratory methods are detailed in Section 2.2.

2.1 Field Methods

Soil samples were collected from backhoe pits on the 5A Stockpile and from the No. 1 Stockpile Borrow Area (Plate 1). The sampling pits on the 5A Stockpile were excavated to a depth of at least 12 feet. The pits were described and samples were collected from the 0- to 6-foot and 6- to 12-foot depth intervals. Samples from the No. 1 Stockpile Borrow Area were collected by major horizon. The volume of oversize material (fragments >7.5 cm in diameter) was estimated from the walls of the pits (Soil Survey Division Staff, 1993). The samples collected for chemical and physical characterization were placed directly in gallon-size plastic bags (5 to 10 kg), while the soil hydraulic properties samples were collected in airtight 5-gallon plastic buckets (50 kg). The field logs for the 5A and No.1 Stockpile investigations are in Appendix A.

Samples of leached cap were collected from representative locations in the Valencia and West Main Pits and from the Savanna Stockpile (Plate 1). Samples (C79LC-1, C17LC-2, and C79LC-3) from the Valencia Pit were collected from pit walls and benches. Samples from the West Main Area were collected from a recently blasted bench (C79LC-4) and rubble pile below a high wall (C79LC-5). Samples from the Savanna Stockpile (C79LC-6 and -7) were collected from areas supporting volunteer vegetation.

2.2 Laboratory Analysis

The bulk soil samples collected for fine earth analysis were air-dried and passed through a 2 mm sieve at the laboratory. The less than 2 mm soil fraction was analyzed for the particle size distribution (Gee and Bauder, 1986); paste pH and electrical conductivity (Salinity Laboratory Staff, 1954); acid base account (ABA) (Sobeck et al., 1978); Olsen phosphorous (Agron 9, 1982); extractable nitrate (Agron. 9, 1982); and AB-DTPA extractable arsenic, cadmium, copper, mercury, and manganese. The samples were analyzed at Energy Laboratories in Billings, Montana (Appendix B).

Selected samples were analyzed for soil hydraulic properties at the Daniel B. Stephens & Associates (DBS&A) Laboratory in Albuquerque, New Mexico. The results and test methods are listed in

Appendix B. Leached cap samples representing materials from the Copper Mountain Pit Expansion were collected from materials transported to the 7A Stockpile test plot area (Plate 1).

3.0 5A STOCKPILE AND NO. 1 STOCKPILE BORROW CHARACTERIZATION

The 5A (formerly the No. 1D) Stockpile is currently an overburden and waste rock stockpile. Based on the current mine plan this area will continue to receive Gila Conglomerate excavated from the pit walls as mining progresses. The 5A Stockpile was identified as the primary source for cover material in the mine/stockpile units (DBS&A, 1997b). The 5A Stockpile is composed largely of overburden (Gila Conglomerate), however, some sulfide-and non-sulfide-bearing (leached cap) materials occur there. This section further refines the understanding of the composition of the 5A Stockpile. Existing exploration core data are interpreted in Section 3.1 and data from backhoe excavations are presented in Section 3.2.

3.1 5A Stockpile Exploration Core Evaluation

The 5A Stockpile is located northeast of the No. 1B Stockpile on the north and northeast edge of the Main Pit (Plate 1). Because of its location immediately north of the Main Pit, where the ore was overlain by a thick sequence of Gila Conglomerate and leached cap, the 5A Stockpile received mostly mineral assemblages (MA)-0 (Gila Conglomerate), MA-1 (leached cap), and MA-2 (oxide). Because it was located near the primary crusher, the northern end of the 5A Stockpile received sulfide materials that were stockpiled for the concentrator (DBS&A, 1997b).

In the late-1990s, about 60 exploration holes were drilled through the 5A stockpile (Fig. 2). Tyrone's geologists logged the drill holes at 10-foot intervals and the materials were classified according to mineral assemblage. The estimated distribution of materials in the 5A Stockpile is presented in cross-section on Figure 3. The exploration data reveals that the stockpile is about 250-feet thick and is underlain by 350 to 600 feet of Gila Conglomerate Formation. As expected based on historical records, the northwestern half of the 5A Stockpile is likely to contain sulfides, even though it is still dominated by Gila Conglomerate and leached cap. The southeastern end of the stockpile is assumed to be dominated by Gila Conglomerate; however, additional drilling is needed to confirm this conclusion. For planning purposes the upper lift (about 50 feet thick) on the southern end of the 5A Stockpile is considered to be a readily available source of cover.

Drilling of an additional five holes on the southern end of the 5A Stockpile will begin in early November 2005. Drilling equipment availability limitations prevented initiation of this work as originally scheduled. The proposed drillhole locations are presented on Figure 2. Tyrone will provide the results of this investigation in an addendum to this report in December 2005.

3.2 Chemical and Physical Properties of Materials on the 5A stockpile

Golder sampled 14 backhoe pits on the 5A Stockpile as part of this investigation. The chemical and physical properties of the materials are listed in Tables 1 and 2. The data from previous Gila Conglomerate characterization studies are compiled in Appendix C (Tables C-1 to C-4).

The materials on the 5A Stockpile are moderately-coarse textured (sandy loams and loamy sands) with moderately high volumes of rock fragments (Table 1). With few exceptions, the materials are nonsaline, very slightly calcareous, and have low organic matter contents. The phosphorous and nitrate concentrations are low but considered adequate to support native and adapted plant species. The soils are predominantly neutral to slightly acid (pH 6.3 to 7.2), although several samples were strongly and very strongly acid (pH 4.3 to 5.7). The lower pH samples tended to be mixed Gila Conglomerate and waste rock and were generally located on the southern end of the stockpile.

The materials are universally non-acid generating based on the ABA data, which ranged from 0 to 6 t $CaCO_3$/kt (Table 2). AB-DTPA extractable copper was somewhat elevated with respect to the MMD guidelines in several samples. Like pH, the samples with elevated copper tend to be concentrated on the southern end of the stockpile.

Because of the uncertainty of the material characteristics on the northern half of the 5A Stockpile, only the upper lift (50 feet) on the southern end of the 5A Stockpile is considered feasible for use as cover at this time. Additional materials may be identified pending the results of the drilling investigation (Section 3.1).

3.3 Hydraulic Properties of the Gila Conglomerate

Infiltration, redistribution, and drainage of water are dependant on soil hydraulic properties. Key input parameters for the UNSAT-H model include saturated hydraulic conductivity (K_{sat}), van Genuchten coefficients, and water characteristic functions. The van Genutchen coefficients, used to relate wetness to matric suction and hydraulic conductivity, were developed using measured data and the RETC model (van Genutchen et al., 1997). The residual water content (θ_r) and saturated water content (θ_s) are empirical constants. Residual water is defined as water that will not contribute to liquid flow either because of strong adsorption or because the pores are unconnected. Saturated water content represents the maximum water content that a material can contain.

Soil hydraulic properties data were obtained as part of the Tyrone Mine cover design study (DBS&A, 1999). As part of that study, 11 samples of Gila Conglomerate, including two samples from the 5A Stockpile, were analyzed for moisture content, bulk density, porosity, saturated and unsaturated hydraulic conductivity, particle-size distribution, and soil-water characteristic curves. Saturated hydraulic conductivities ranged from a low of 7.6×10^{-6} cm/s to a high of 1.4×10^{-2} cm/s, mostly clustering within approximately one order of magnitude of 4×10^{-4} cm/s. Available water capacity (AWC) of these samples ranged from about 3 to 15 percent. Soil hydraulic properties data for Gila Conglomerate materials are included in Table C-2.

Three additional samples were collected from the 5A Stockpile for soil-hydraulic analyses, but the data are not available at this time. Tyrone will present the additional soil-hydraulic characterization data along with the supplemental drilling information (Section 3.1). Furthermore, additional soil-hydraulic data will be developed for the Gila Conglomerate in association with the test plots programs on the 3X Tailing Dam and No. 1 Stockpile.

3.4 No. 1 Stockpile Borrow Investigation

A borrow investigation was conducted near the No. 1 Stockpile to support reclamation planning for this facility. The chemical and physical data are listed in Table 3. The characteristics of the materials in the No. 1 Stockpile borrow area are consistent with the characteristics of the Gila Conglomerate in other areas of the mine.

4.0 LEACHED CAP

In the Tyrone Mine Area, leached cap (MA-1) is altered igneous intrusive rock (hypogene mineralization) that generally has low copper values and is considered waste rock from a mining perspective. The chemical and physical characteristics of this leached cap make it potentially suitable for use as a cover material. Leached cap from the Copper Mountain Pit Expansion and Little Rock Mine Areas have been extensively characterized and tentatively approved for use as cover in some portions of the mine (PDTI, 2005 and Golder, 2005). Besides the Copper Mountain and Little Rock Areas, leached cap occurs in the West Main and Valencia Pit Areas and on the Savanna Stockpile (Plate 1).

Overall, the materials from the Copper Mountain Area and Little Rock Mine are net-neutralizing and non acid generating. Laboratory analyses indicate that the overburden from the Copper Mountain and Little Rock Areas is relatively uniform and has few apparent limitations as a plant growth media when compared to the surrounding native soils (Tables C-5 through C-7). There are no apparent chemical limitations with respect to salinity in either the overburden or the native soils and the pH and extractable nitrate concentrations occur at similar levels in both materials. The overburden is moderately coarse textured and contains moderate volumes of rock fragments. The native soils exhibited similar characteristics and are moderately coarse textured with moderate amounts of rock fragments (PDTI, 2000 and 2005). Thus, the overburden from the Copper Mountain and Little Rock Mine Areas is considered to be a reasonable soil substitute relative to the native soils in the area.

4.1 Chemical and Physical Properties of Leached Cap

Leached cap samples were collected from the Valencia and West Mine Pit Areas and the Savanna Stockpile (Plate 1). These samples were collected to complement the work conducted in the Copper Mountain Pit Expansion Area (PDTI, 2005 and Golder, 2005). Chemical and physical data are listed in Table 4 and the laboratory reports are presented in Appendix B. The samples were medium-textured, nonsaline, strongly acid, and have low concentrations of selenium and boron (Table 4). The samples from the West Main and Valencia Areas had negative ABAs indicating the potential to form acidity (Table 5). The Valencia area samples had near neutral ABAs and are not considered acid forming. The negative ABAs and potential to form acidity in these leached cap samples is inconsistent with the leached cap materials that occur in the Copper Mountain and Little Rock Areas, which are typically acid neutralizing (i.e., positive ABA's).

The AB-DTPA extractable constituents are listed in Table 6. The leached cap samples from the Valencia, West Main, and Savanna Areas tend to yield somewhat elevated concentrations of AB-DTPA extractable copper and molybdenum relative to the MMD soil suitability guidelines (MMD, 1996). This result is consistent with the data from the Copper Mountain and Little Rock leached cap (Golder, 2005). The MMD guidelines notwithstanding, the leached cap is capable of supporting a diverse array of vegetation. Figure 4 is a photograph of the vegetation growing on the C79LC-7 sampling site on the Savanna Stockpile.

4.2 Soil Hydraulic Properties of the Leached Cap

Soil hydraulic analyses were performed on three samples of Copper Mountain leached cap. The data are summarized in Table 6 and the complete laboratory report is included in Appendix B. The saturated hydraulic conductivities of the samples are on the order of 10^{-3} cm/s. The saturated water content of the fine-earth fraction ranged between 0.45 and 0.47 cm^3/cm^3. The saturated water content of the whole soil samples ranged from 0.17 to 0.21 cm^3/cm^3 (Bouwer and Rice, 1984). The 15-bar water content ranged 0.06 and 0.07 cm^3/cm^3.for the fine-earth fraction and from 0.02 and 0.03 cm^3/cm^3 on a whole soil basis. The van Genuchten parameters (α and N) for the individual samples are presented in Table 7.

6.0 COVER MATERIAL VOLUMETRICS

The soils that will be used as cover in the Mine/Stockpile Unit may be excavated from numerous locations on the mine property. Tyrone's experience with cover excavation and placement on the No. 3X and 3 tailing impoundments revealed that flexibility in materials handling is critical to achieving quality control objectives and efficient management of cover soil resources. The exact location and configuration of the borrow areas will ultimately be determined during the final design and construction phases of the reclamation. Nonetheless, five Gila Conglomerate borrow areas around the Mine/Stockpile unit are identified on Plate 2 for planning purposes.

The borrow areas shown on Plate 2 represent potential borrow areas that could be used as cover sources. Borrow Areas A and B are located on relatively undisturbed lands and Tyrone may select alternative sources once they are more definitively identified. For instance, substantial volumes of residual Gila Conglomerate underlie the 5A and Savanna stockpiles. These materials could become available if mining progresses into the east side of the Main Pit, or if Tyrone elects to excavate borrow materials in this area. Thus, the use of the pit wall Gila Conglomerate or additional materials from the 5A Stockpile may eliminate the need to excavate borrow outside the current disturbance area of the mine.

In addition to the Gila Conglomerate cover sources, about 7 million tons of leached cap with net neutralizing potential is projected to be available in association with the Copper Mountain Pit Expansion (PDTI, 2005). Future exploration and mining may result in additional leached cap from the Valencia and West Main Pit Areas, although these materials are not accounted for in the current reclamation planning. Tyrone recognizes that the use of leached cap would be predicated on compliance with the materials handling plan for leached cap (PDTI, 2005) and MMD and NMED approval.

Other potential sources of cover materials that may ultimately become available include leached cap from the Little Rock Mine. More than 350,000 cubic yards (yd^3) of leached cap currently exists at the Little Rock Mine in the stockpiles that surround the open pit area (TTEMI, 2004). Once mining is initiated at Little Rock, about 70 million tons (44,000,000 yd^3) of leached cap waste rock is projected to be generated (PDTI, 2000), which could potentially be available for reclamation applications at the Tyrone Mine.

The cover requirement for the Mine/Stockpile Unit at Tyrone is approximately 15.5 million yd^3 based on the current permit requirements. More than 20.3 million yd^3 of Gila Conglomerate and leached cap cover materials have been conservatively identified at Tyrone (Table 8). Additional materials may be available from alternative leached cap sources and from the deposits of residual Gila Conglomerate. Thus, the total volume of materials designated for the Mine/Stockpile unit is more than that needed to cover these facilities. The surplus of cover material will ultimately allow for flexibility in siting borrow areas at Tyrone to account for operational considerations.

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TABLES

TABLE 1.
5A STOCKPILE PHYSICAL AND CHEMICAL PROPERTIES

Sample ID	Depth (ft bgs)	Type[1]	Particle Size Distribution (%)			Texture	Rock Fragments[2]		Saturation Percentage (% water)	Saturated Paste		$CaCO_3$ (%)	Phosphorus		Nitrate		Organic Matter (%)
			Sand	Silt	Clay		Lab (% vol)	Total (% vol)		pH	EC (dS/m)		mg/kg	lb/ac-ft	mg/kg	lb/ac-ft	
TP5A2	0.25-6	GC	76	15	9	SL	38	49	18.6	7.2	0.23	0.5	5	20	<1	<4	0.47
TP5A2	6-12	GC	79	12	9	SL	39	47	18.2	6.9	0.18	0.5	5	20	<1	<4	0.62
TP5A3	0-6	GC	75	15	10	SL	39	44	18.6	6.6	0.31	0.5	6	24	<1	<4	0.26
TP5A3	6-12	GC	79	11	10	SL	40	45	18.1	6.8	0.25	0.5	4	16	<1	<4	0.29
TP5A4	0-6	GC	79	13	8	LS	47	55	18.6	6.8	0.43	0.4	5	20	<1	<4	0.40
TP5A4	6-12	GC	79	13	8	LS	41	54	18.6	6.8	0.33	0.6	3	12	<1	<4	0.31
TP5A5	0-6	GC	74	15	11	SL	36	44	19.5	6.3	0.72	0.4	5	20	<1	<4	0.41
TP5A5	6-12	GC	79	13	8	LS	37	45	19.3	6.8	0.49	0.5	5	20	<1	<4	0.21
TP5A6	0-6	GC	76	15	9	SL	40	50	19.9	6.3	0.29	0.5	5	20	<1	<4	0.24
TP5A6	6-12	GC	83	10	7	LS	41	52	19.3	6.7	0.47	0.5	3	12	<1	<4	0.28
TP5A7	0-6	GC	73	18	9	SL	37	48	19.3	6.3	0.12	0.4	2	8	<1	<4	0.22
TP5A7	6-12	GC	75	16	9	SL	38	47	19.1	6.6	0.21	0.4	2	8	<1	<4	0.31
TP5A8	0-6	GC	78	13	9	SL	37	41	20.7	6.3	0.38	0.5	5	20	<1	<4	0.26
TP5A8	6-12	GC	75	14	11	SL	38	43	21.1	6.4	0.45	0.6	5	20	<1	<4	0.28
TP5A9	0-6	GC	80	13	7	LS	39	46	18.6	6.8	0.14	0.5	3	12	<1	<4	0.59
TP5A9	6-12	GC	76	16	8	SL	40	46	19.1	6.5	0.28	0.5	5	20	<1	<4	0.24
TP5A11	0-6	GC	73	16	11	SL	40	46	20.9	4.5	1.85	0.6	13	52	<1	<4	0.29
TP5A11	6-12	GC	73	16	11	SL	36	42	22.6	4.3	2.29	0.5	15	60	1	4	0.53
TP5A16	0-6	GC	77	14	9	SL	42	49	18.0	6.7	0.12	0.4	2	8	<1	<4	0.36
TP5A16	6-12	GC	79	13	8	LS	42	45	18.2	6.8	0.15	0.5	3	12	<1	<4	0.28
TP5A18	0-6	Mixed	73	17	10	SL	39	55	21.3	4.8	0.64	0.4	13	52	<1	<4	0.52
TP5A18	6-12	Mixed	73	15	12	SL	36	39	21.3	4.4	0.93	0.3	17	68	<1	<4	0.16
TP5A20	0-6	GC	73	16	11	SL	37	40	17.7	5.7	0.15	0.6	13	52	<1	<4	0.22
TP5A20	6-12	GC	75	16	9	SL	37	40	17.6	6.5	0.16	0.5	4	16	<1	<4	0.26
TP5A21	0-6	Mixed	67	20	13	SL	34	38	19.6	5.2	0.24	0.6	16	64	<1	<4	0.24
TP5A21	6-12	Mixed	64	21	15	SL	31	41	24.1	5.0	0.36	0.4	12	48	<1	<4	0.24
TP5A24	0-6	Mixed	69	16	15	SL	31	36	22.9	4.4	0.38	0.4	18	72	<1	<4	0.40
TP5A24	6-12	Mixed	75	14	11	SL	35	40	21.6	4.7	0.62	0.5	11	44	<1	<4	0.29

Notes:

[1] GC = Gila Conglomerate; Mixed = Gila Conglomerate mixed with undifferentiated waste rock

[2] Dry sieve lab data converted to % volume for rock fragments <3"; Total rock fragments includes field estimate of materials >3"

ft bgs = feet below ground surface

dS/m = deciSiemens per meter

mg/kg = milligrams per kilogram

lb/ac-ft = pounds per acre-foot

TABLE 2.
5A STOCKPILE ACID-BASE ACCOUNT AND AB-DTPA EXTRACTIONS

Sample ID	Depth (ft bgs)	Type[1]	Saturated Paste pH	Acid-Base Account ($t\ CaCO_3/kt$)			Extractable Sulfur Forms (%)					AB-DTPA Extracts (mg/kg)							
				ANP	AGP[2]	ABA	H_2O	HCL	HNO_3	Residual	Total	As	Cd	Cu	Hg	Mn	Mo	Ni	Pb
TP5A2	0.25-6	GC	7.2	5	0	5	0.01	<0.01	0.01	<0.01	0.02	0.03	<0.1	1.4	<0.1	0.6	<0.1	<0.1	0.3
TP5A2	6-12	GC	6.9	5	0	5	<0.01	0.01	0.01	<0.01	0.02	0.03	<0.1	1.9	<0.1	0.7	<0.1	<0.1	0.3
TP5A3	0-6	GC	6.6	5	0	5	0.01	<0.01	0.01	<0.01	0.02	0.04	<0.1	2.0	<0.1	0.8	0.1	<0.1	0.4
TP5A3	6-12	GC	6.8	5	0	5	0.02	<0.01	<0.01	<0.01	0.02	0.04	<0.1	1.4	<0.1	0.5	0.1	<0.1	0.3
TP5A4	0-6	GC	6.8	4	0	4	0.02	<0.01	<0.01	<0.01	0.02	0.03	<0.1	1.2	<0.1	0.6	0.1	<0.1	0.3
TP5A4	6-12	GC	6.8	6	0	6	<0.01	0.01	0.01	<0.01	0.02	0.03	<0.1	1.5	<0.1	0.7	0.1	<0.1	0.3
TP5A5	0-6	GC	6.3	4	0	4	0.01	0.01	0.02	<0.01	0.04	0.03	<0.1	7.8	<0.1	4.1	<0.1	<0.1	0.4
TP5A5	6-12	GC	6.8	5	0	5	<0.01	0.01	0.01	<0.01	0.02	0.04	<0.1	2.2	<0.1	1.0	<0.1	<0.1	0.3
TP5A6	0-6	GC	6.3	5	0	5	0.01	<0.01	0.02	<0.01	0.03	0.04	<0.1	4.6	<0.1	1.1	<0.1	<0.1	0.6
TP5A6	6-12	GC	6.7	5	0	5	0.01	0.01	<0.01	<0.01	0.02	0.05	<0.1	1.1	<0.1	0.6	<0.1	<0.1	0.3
TP5A7	0-6	GC	6.3	4	0	4	0.01	<0.01	<0.01	<0.01	0.01	0.03	0.1	10.8	<0.1	1.1	<0.1	<0.1	0.5
TP5A7	6-12	GC	6.6	4	0	4	0.05	<0.01	<0.01	<0.01	0.05	0.03	0.1	18.6	<0.1	0.7	<0.1	<0.1	0.3
TP5A8	0-6	GC	6.3	5	0	5	0.03	<0.01	<0.01	<0.01	0.03	0.03	<0.1	3.2	<0.1	1.2	0.1	<0.1	0.5
TP5A8	6-12	GC	6.4	6	0	6	0.02	<0.01	<0.01	<0.01	0.02	0.03	<0.1	2.7	<0.1	1.0	0.1	<0.1	0.5
TP5A9	0-6	GC	6.8	5	0	5	0.02	<0.01	<0.01	<0.01	0.02	0.03	<0.1	1.9	<0.1	0.7	<0.1	<0.1	0.4
TP5A9	6-12	GC	6.5	5	0	5	0.02	<0.01	<0.01	<0.01	0.02	0.04	<0.1	3.3	<0.1	1.4	<0.1	<0.1	0.4
TP5A11	0-6	GC	4.5	6	0	6	0.03	0.01	0.01	0.02	0.07	0.03	0.1	28.1	<0.1	9.9	<0.1	0.1	0.6
TP5A11	6-12	GC	4.3	5	1	4	0.02	0.01	0.02	0.01	0.06	0.03	0.1	27.3	<0.1	8.8	<0.1	0.1	0.6
TP5A16	0-6	GC	6.7	4	0	4	0.02	<0.01	<0.01	<0.01	0.02	0.03	<0.1	1.7	<0.1	0.6	0.1	<0.1	0.4
TP5A16	6-12	GC	6.8	5	0	5	0.03	<0.01	<0.01	<0.01	0.03	0.03	<0.1	2.1	<0.1	0.8	0.1	<0.1	0.3
TP5A18	0-6	Mixed	4.8	4	1	3	0.02	<0.01	0.02	0.02	0.06	0.05	0.1	99.4	<0.1	9.5	<0.1	0.1	0.5
TP5A18	6-12	Mixed	4.4	3	1	2	0.04	<0.01	0.02	0.08	0.14	0.04	<0.1	187.0	<0.1	3.0	<0.1	<0.1	0.4
TP5A20	0-6	GC	5.7	6	0	6	0.01	0.01	0.01	<0.01	0.03	0.02	<0.1	15.3	<0.1	6.1	<0.1	0.1	0.4
TP5A20	6-12	GC	6.5	5	0	5	0.01	<0.01	<0.01	<0.01	0.01	<0.02	<0.1	3.8	<0.1	0.9	<0.1	<0.1	0.3
TP5A21	0-6	Mixed	5.2	6	1	5	0.02	<0.01	0.02	0.02	0.06	<0.02	<0.1	20.4	<0.1	3.5	<0.1	0.1	0.7
TP5A21	6-12	Mixed	5.0	4	0	0	0.07	<0.01	<0.01	0.12	0.19	<0.02	<0.1	23.3	<0.1	4.8	0.2	0.1	0.7
TP5A24	0-6	Mixed	4.4	4	1	3	0.05	<0.01	0.03	0.05	0.13	<0.02	0.2	46.9	<0.1	17.9	0.2	0.2	1.3
TP5A24	6-12	Mixed	4.7	5	0	5	0.04	<0.01	0.01	0.02	0.07	0.02	0.2	34.2	<0.1	9.6	0.1	0.2	0.9

Notes:

[1] GC = Gila Conglomerate; Mixed = Gila Conglomerate mixed with undifferentiated waste rock

[2] AGP calculated from HNO_3 extractable sulfur

ANP = acid-neutralization potential, in tons $CaCO_3$ per 1,000 tons

AGP = acid-generation potential, in tons $CaCO_3$ per 1,000 tons

ABA = acid-base accounting = ANP - AGP, in tons $CaCO_3$ per 1,000 tons

TABLE 3.
NO. 1 STOCKPILE BORROW MATERIALS CHEMICAL AND PHYSICAL PROPERTIES

Sample ID	Depth (ft bgs)	Rock Fragments[1]		Particle Size Distribution (%)			Texture	Saturation Percent (% water)	Saturated Paste		$CaCO_3$ (%)	Phosphorus		Nitrate		Organic Matter (%)
		Lab (Vol %)	Total (Vol %)	Sand	Silt	Clay			pH	EC (dS/m)		mg/kg	lb/ac-ft	mg/kg	lb/ac-ft	
TP1B1	0-0.75	16	19	63	24	13	SL	18.6	5.2	0.18	0.3	14	56	<1	<4	1.14
TP1B1	0.75-6	39	44	77	10	13	SL	21.8	7.1	0.47	0.5	6	24	<1	<4	0.34
TP1B1	6-11	35	51	77	12	11	SL	21.1	6.9	0.58	0.4	6	24	<1	<4	0.22
TP1B1	11-12	39	49	73	14	13	SL	21.1	7.2	0.92	0.5	7	28	<1	<4	0.45
TP1B2	0-1	20	20	63	24	13	SL	21.4	5.8	0.38	0.7	14	56	2	8	1.76
TP1B2	1-4	25	25	73	14	13	SL	22.8	7.3	0.49	1	2	8	<1	<4	0.41
TP1B2	4-8	27	27	78	15	7	LS	22.2	7.5	0.57	1.5	1	4	<1	<4	0.38
TP1B2	8-13	27	27	83	10	7	LS	23.3	7.6	0.74	1	3	12	<1	<4	0.38
TP1B3	0-2	14	14	49	22	29	SCL	41.3	6.3	0.26	0.8	3	12	1	4	2.0
TP1B3	2-4	25	25	61	19	20	SCL	31.5	7.3	0.51	1.8	<1	<4	<1	<4	0.67
TP1B3	4-7	29	29	72	18	10	SL	28.4	7.8	0.64	3.6	1	4	<1	<4	0.16
TP1B3	7-13	38	38	59	18	23	SCL	37.2	7	2.82	2	12	48	<1	<4	0.12
TP1B4	0-2	13	13	67	22	11	SL	19.8	5.6	0.41	0.6	7	28	3	12	1.12
TP1B4	2-4	27	27	71	11	18	SL	28.5	7.1	0.57	0.9	1	4	1	4	0.4
TP1B4	4-10	36	36	79	9	12	SL	22.1	7.2	1.26	1	3	12	<1	<4	0.21
TP1B4	10-13	27	27	82	8	10	LS	19.8	6.9	0.27	0.7	2	8	<1	<4	0.43
TP1B5	0-0.6	13	13	58	23	19	SL	25.3	5.6	0.37	0.8	3	12	<1	<4	2.72
TP1B5	0.6-1.5	22	22	50	16	34	SCL	42.1	5.1	0.19	0.7	2	8	<1	<4	1.71
TP1B5	1.5-4.5	28	28	67	16	17	SL	24.3	6.4	0.31	0.8	<1	<4	<1	<4	0.57
TP1B5	4.5-13	33	33	75	12	13	SL	24.3	7.6	1.41	1	3	12	<1	<4	0.26

Notes:

1 Dry sieve lab data converted to % volume for rock fragments <3"; Total rock fragments includes field estimate of materials >3"

ft bgs = feet below ground surface

dS/m = deciSiemens per meter

mg/kg = milligrams per kilogram

lb/ac-ft = pounds per acre-foot

TABLE 4.
CHEMICAL AND PHYSICAL PROPERTIES OF
VALENCIA, WEST MAIN, AND SAVANNA STOCKPILE LEACHED CAP

Sample ID	Particle Size Distribution *(%)*				Texture	Saturated Paste		Saturation Percentage *(% water)*	Hot Water Soluble	
	Rock Fragments[a] *(% vol)*	Sand	Silt	Clay		pH	EC *(dS/m)*		Selenium *(mg/kg)*	Boron *(mg/kg)*
Valencia										
C79LC-1	55	47	28	25	L	5.0	0.29	36.8	<0.05	<0.02
C79LC-2	60	60	19	21	SCL	5.6	0.37	32.3	<0.05	<0.02
C79LC-3	65	56	21	23	SCL	5.8	0.39	29.3	<0.05	<0.02
West Main										
C79LC-4	55	56	21	23	SCL	4.8	1.68	30.1	<0.05	<0.02
C79LC-5	60	50	26	24	SCL	4.5	1.14	27.0	<0.05	<0.02
Savanna Stockpile										
C79LC-6	55	36	34	30	CL	5.4	0.54	26.5	<0.05	<0.02
C79LC-7	50	46	31	23	L	4.9	0.49	21.7	<0.05	<0.02

Notes:
[a] field estimate of total rock fragments
dS/m = deciSiemens per meter
mg/kg = milligrams per kilograms

TABLE 5.
ACID-BASE ACCOUNT FOR VALENCIA, WEST MAIN,
AND SAVANNA STOCKPILE LEACHED CAP

Sample ID	Acid-Base Account *(t $CaCO_3$/kt)*			Extractable Sulfur Forms *(%)*				
	ANP	AGP[a]	ABA	H_2O	HCL	HNO_3	Residual	Total
Valencia								
C79LC-1	1	1	0	0.02	0.01	0.03	0.01	0.07
C79LC-2	2	2	0	0.04	0.01	0.05	<0.01	0.10
C79LC-3	1	1	0	<0.01	0.01	0.04	0.01	0.06
West Main								
C79LC-4	0	13	-13	0.02	<0.01	0.40	0.41	0.83
C79LC-5	2	15	-13	0.05	<0.01	0.49	0.12	0.66
Savanna Stockpile								
C79LC-6	1	3	-2	<0.01	<0.01	0.09	0.19	0.28
C79LC-7	1	5	-4	0.03	<0.01	0.16	0.31	0.50

Notes:
[a] AGP calculated from HNO_3 extractable sulfur
ANP = acid-neutralization potential, in tons $CaCO_3$ per 1,000 tons
AGP = acid-generation potential, in tons $CaCO_3$ per 1,000 tons
ABA = acid-base accounting = ANP - AGP, in tons $CaCO_3$ per 1,000 tons
$CaCO_3$ = calcium carbonate

TABLE 6.
AB-DTPA EXTRACTABLE CONSTIUENTS FOR
VALENCIA, WEST MAIN, AND SAVANNA STOCKPILE LEACHED CAP

Sample ID	*mg/kg*							
	As	**Cd**	**Cu**	**Pb**	**Mn**	**Hg**	**Mo**	**Ni**
Valencia								
C79LC-1	<1	0.54	270	0.20	36.4	<0.05	0.22	0.25
C79LC-2	<1	0.27	110	0.34	23.5	<0.05	0.37	0.09
C79LC-3	<1	0.06	145	0.09	1.2	<0.05	0.45	0.02
West Main								
C79LC-4	<1	0.03	102	0.58	12.2	<0.05	0.21	0.06
C79LC-5	<1	0.40	170	2.34	38.7	<0.05	1.29	0.15
Savanna Stockpile								
C79LC-6	<1	0.28	99	3.30	11.0	<0.05	0.24	0.09
C79LC-7	<1	0.22	68	1.43	16.8	<0.05	0.16	0.08

Notes:
mg/kg = milligrams per kilograms

TABLE 7.
HYDRAULIC PROPERTIES OF COPPER MOUNTAIN LEACHED CAP

Sample ID	Rock Fragments[a] (Vol. %)	Saturated Hydraulic Conductivity (cm/s)		Volumetric Water Content[b] (cm^3/cm^3)								van Genuchen Coefficients	
				Θ_r		Θ_s		$\Theta_{1/3}$		Θ_{15}		α	N
		<2mm	Whole Soil	<2mm	Whole Soil	<2mm	Whole Soil	<2mm	Whole Soil	<2mm	Whole Soil	*1/cm*	*Dimensionless*
CMLC-1	61	7.40E-03	2.90E-03	0	0	0.47	0.18	0.20	0.08	0.07	0.03	0.0785	1.2493
CMLC-2	61	8.40E-03	3.20E-03	0.0014	0.0005	0.45	0.17	0.19	0.07	0.06	0.02	0.0704	1.2697
CMLC-3	55	8.90E-03	4.20E-03	0.0162	0.0074	0.47	0.21	0.18	0.08	0.07	0.03	0.0874	1.2914

a Total rock fragments includes field estimate of materials >3"

b Θ_r = residual moisture content

Θ_s = saturated moisture content

$\Theta_{1/3}$ = 1/3 bar moisture content

Θ_{15} = 15 bar moisture content

TABLE 8
BORROW SOURCE VOLUMETRICS MINE/STOCKPILE UNIT

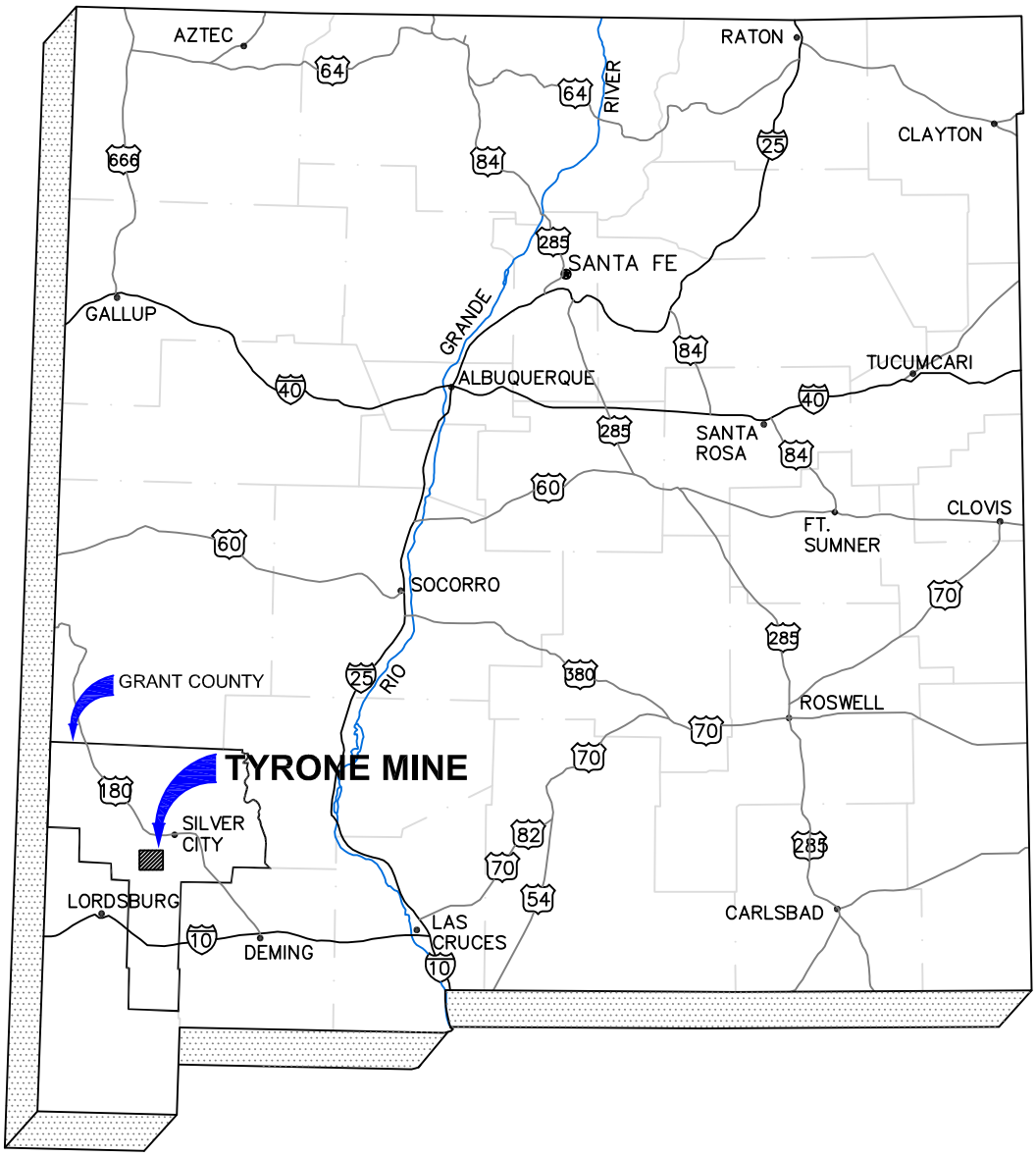
Borrow Source[a]	Area (acres)	Volume (yd^3)
A	127	6,141,720
B	56	2,708,160
C	4	193,440
D	64	5,158,400
E	57	2,516,800
Copper Mountain	NA	3,600,000
Total		**20,318,520**

a) Gila Conglomerate Borrow Sources are identified on Plate 2

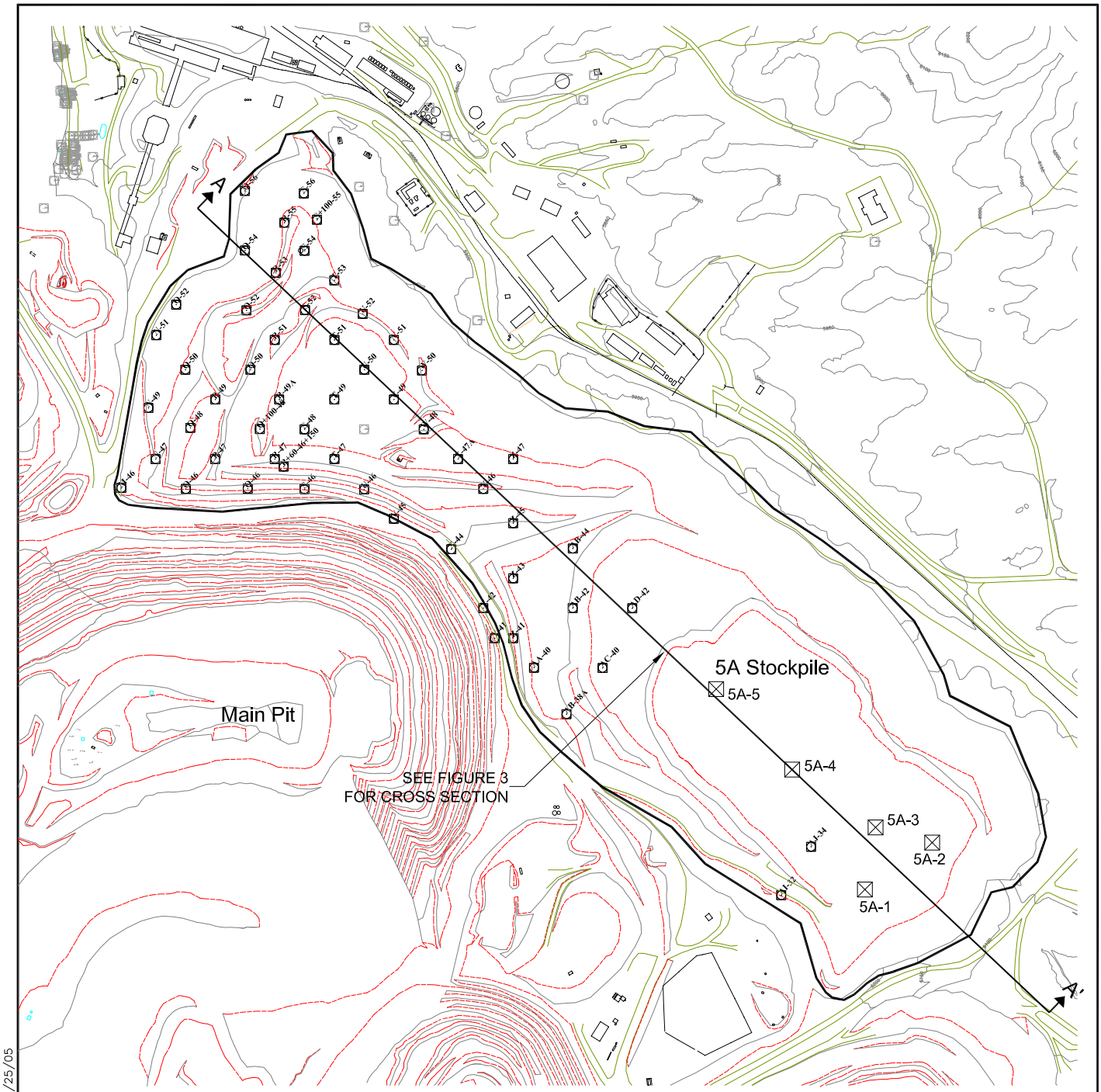
FIGURES

STATE OF NEW MEXICO

NOT TO SCALE



PROJECT	PHELPS DODGE TYRONE INC. GRANT COUNTY, NEW MEXICO				
TITLE	GENERAL LOCATION OF TYRONE MINE IN NEW MEXICO				
Golder Associates ALBUQUERQUE/NEW MEXICO	PROJECT No.	053-2016		FILE No.	FIGURE01
	DESIGN	LM	10/25/05	SCALE	SCALE / REV. REV
	CADD	CM	10/25/05		
	CHECK	LM	10/25/05		1
	REVIEW	REVIEW	RVW_DATE		



PROPOSED DRILL LOCATIONS (11/05)

DRILL HOLE

500 0 500 1000
SCALE: 1" = 1000' FEET

PROJECT

PHELPS DODGE TYRONE INC.
GRANT COUNTY, NEW MEXICO

TITLE

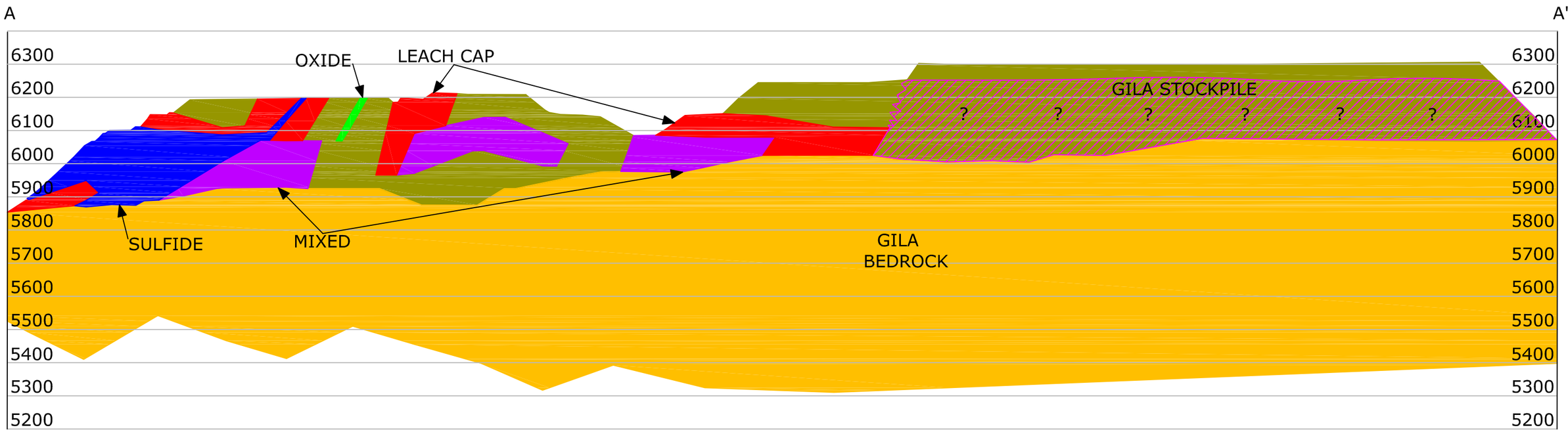
EXPLORATION DRILLING LOCATIONS
5A (1D) STOCKPILE

Golder Associates
ALBUQUERQUE/NEW MEXICO

PROJECT No.		053-2016	FILE No.	DRILL PITS-1D_5A	
DESIGN	LM	10/25/05	SCALE	SCALE	REV. REV
CADD	CM	10/25/05			
CHECK	LM	10/25/05			
REVIEW	REVIEW	RVW_DATE			

2

K:\2005 Projects\053-2016\DRILL PITS-1D_5A.dwg CM 10/25/05



GILA BEDROCK

SULFIDE

LEACH CAP

? DRILLING NEEDED TO CONFIRM COMPOSITION

GILA STOCKPILE

OXIDE

MIXED (SULFIDE/LEACHED CAP/GILA)

SCALE: 1" = 300'

PROJECT

PHELPS DODGE TYRONE INC.
GRANT COUNTY, NEW MEXICO

TITLE

5A STOCKPILE
MATERIAL CROSS-SECTION

Golder Associates
ALBUQUERQUE/NEW MEXICO

PROJECT No.		053-2016	FILE No.		5A-SECTION
DESIGN	RJW	10/25/05	SCALE	SCALE	REV. REV
CADD	CM	10/25/05	3		
CHECK	LM	10/25/05			
REVIEW	REVIEW	RVW_DATE			

CROSS-SECTION PREPARED BY PHELPS DODGE TYRONE GEOLOGY STAFF: R. WAIDLER

Figure 4. Vegetation growing on low pH leached cap stockpile materials. Sample location C79LC-7 on the Savanna Stockpile.

PLATES

No.1X Tailing

No. 1A Tailing

No. 3 Stockpile

Main Mine Facilities Area

LITTLE ROCK PERMIT BOUNDARY

Deadman Canyon

SX/EW Plant

No. 2A Stockpile

West Main

Main Pit

5A Stockpile

Savanna Stockpile

No. 1 Stockpile

Valencia Area

No. 1B Stockpile

TYRONE PERMIT BOUNDARY

Gettysburg Pit

No. 1A Stockpile

Copper Mountain Pit

No. 1C Stockpile

San Salvador Hill Pit

7A Stockpile

900 0 900 1800

SCALE: 1" = 900' FEET

LEGEND

GILA CONGLOMERATE SAMPLES

- STOCKPILE SAMPLE (DBSA, 1997A)
- NO.1 STOCKPILE BORROW (THIS REPORT)
- 5A STOCKPILE (THIS REPORT)
- CONCENTRATOR/MILL BER (GOLDER, 2005)
- SOIL SURVEY (DBSA, 1997A)

LEACH CAP SAMPLES

- COPPER MOUNTAIN (PDTI, 2005; GOLDER, 2005)
- LITTLE ROCK (PDTI, 2000; GOLDER, 2005)
- OTHER LEACH CAP SAMPLES (THIS REPORT)

PROJECT

phelps dodge TYRONE Inc.

PHELPS DODGE TYRONE INC.
GRANT COUNTY, NEW MEXICO

TITLE

MATERIALS CHARACTERIZATION SAMPLE LOCATIONS MINE/STOCKPILE UNIT

Golder Associates
ALBUQUERQUE/NEW MEXICO

PROJECT No.		053-2016	FILE No.	PLATE1
DESIGN	DR	10/19/05	SCALE SCALE	REV. A
CADD	CM	10/19/05	PLATE 1	
CHECK	LM	10/28/05		
REVIEW	REVIEW	RVW_DATE		

K:\2005 Projects\053-2016\Samp Locs.dwg

No. 1X Tailing

No. 1A Tailing

A

No. 3 Stockpile

B

Main Mine Facilities Area

C

SX/EW Plant

No. 2A Stockpile

West Main

Main Pit

5A Stockpile

D

Savanna Stockpile

No. 1 Stockpile

E

Valencia Area

No. 1B Stockpile

No. 1A Stockpile

Copper Mountain Pit

No. 1C Stockpile

San Salvador Hill Pit

7A Stockpile

SOIL SURVEY LIMIT

900 0 900 1800
SCALE: 1" = 900' FEET

LEGEND

- MINE FACILITIES AND DISTURBED AREAS
- ALLUVIAL SOILS
- GILA CONGLOMERATE AND ASSOCIATED SOILS
- SHALLOW SOILS OVERLYING HARD BEDROCK
- POTENTIAL BORROW AREAS
- SOIL SURVEY LIMIT (DBSA, 1997)

POTENTIAL GILA CONGLOMERATE BORROW SOURCES

BORROW AREA	ACRES	ASSUMED THICKNESS (FT)	VOLUME (CY)
A	127	30	6,141,720
B	56	30	2,708,160
C	4	30	193,440
D	64	50	5,158,400
E	52	30	2,516,800
TOTAL			16,718,520

PROJECT

phelps dodge TYRONE Inc.

PHELPS DODGE TYRONE INC.
GRANT COUNTY, NEW MEXICO

TITLE

POTENTIAL GILA CONGLOMERATE BORROW SOURCES TYRONE MINE/STOCKPILE UNIT

Golder Associates
ALBUQUERQUE/NEW MEXICO

PROJECT No.		053-2016	FILE No.	PLATE02
DESIGN	DR	10/19/05	SCALE	REV. REV
CADD	CM	10/19/05		
CHECK	LM	10/24/05		
REVIEW	REVIEW	RVW_DATE		

PLATE 2

K:\2005 Projects\053-2016\PLATE02.dwg

APPENDIX A

FIELD LOGS - 5A AND NO. 1 STOCKPILE BORROW INVESTIGATIONS

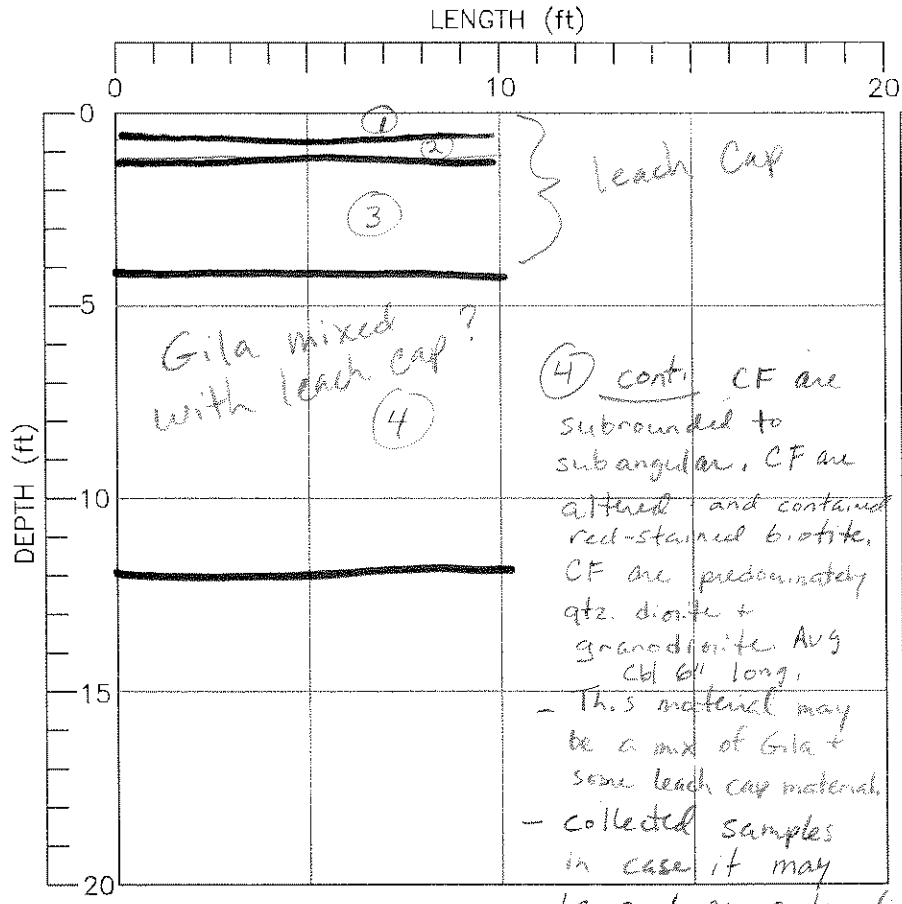
APPENDIX A-1

5A STOCKPILE FIELD LOG SHEETS

FIELD TEST PIT LOG

TEST PIT TP 5A1

TEMP 50 °F WEATHER Sunny ENGINEER D. Blecher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR M3/PD DATE 1/19/05
ELEVATION DATUM JOB
LOCATION 12S-0748265 / 3614946E NAD 27 , 5A Stockpile



(4) cont: CF are subrounded to subangular, CF are altered and contained red-stained biotite, CF are predominately qtz. diorite + granodiorite. Avg Cbl 6" long.
- This material may be a mix of Gila + some leach cap material.
- collected samples in case it may be good as reclamation material - no sulfides.

LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-0.5', yellowish-red scL, 60% gravel, 3% Cobbles, CF are altered with red and black staining. Not Gila,
(2) 0.5'-1', reddish-yellow scL; 60% grl, 5% cobbles,
(3) 1'-4', red scL, 55% grl, 3% cobbles; CF are red iron stained with oxidized biotite + possibly pyrite, some copper staining. CF are mainly qtz. diorite,

0-4' non-Gila, possibly leach cap

(4) 4-12', light yellowish brown scL; 50% grl, 15% cobbles, 1% stones

SAMPLES	
NO.	DESCRIPTION
-	- TPSA1 0-4'
-	- TPSA1 4-12'

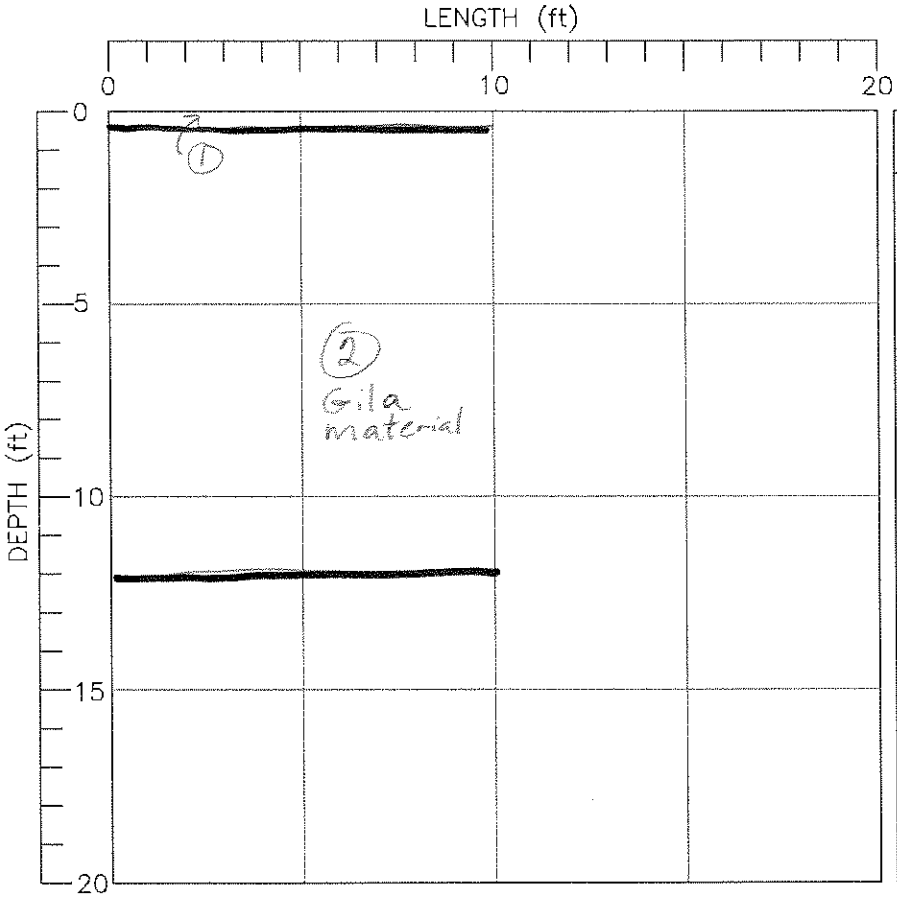
SPECIAL NOTES:

- photos 1-2 showing leach cap material over

FIELD TEST PIT LOG

TEST PIT TP 5A 2

TEMP 50 °F WEATHER Sunny ENGINEER D. Buscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD / M3 DATE 1/19/05
ELEVATION DATUM JOB
LOCATION 125 0748348 / 3615038 NAD 27 , 5A Stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

① 0-3", yellowish-red SL; 55% gravel, 2% cobbles of quartz diorite,

② 3"-12", Gila material, dk yellowish brown COLS, 50-60% gravel, 5-10% cobbles, 1% stones CF are subrounded qtz. diorite & granodiorite, some CF are highly altered with red and orange Fe staining

SAMPLES	
NO.	DESCRIPTION
–	– TP5A2 0.25-6'
–	– TP5A2 6-12'
geo-tech	TP5A2 0.25-12'
Soil hydraul	TP5A2 0.25-12'

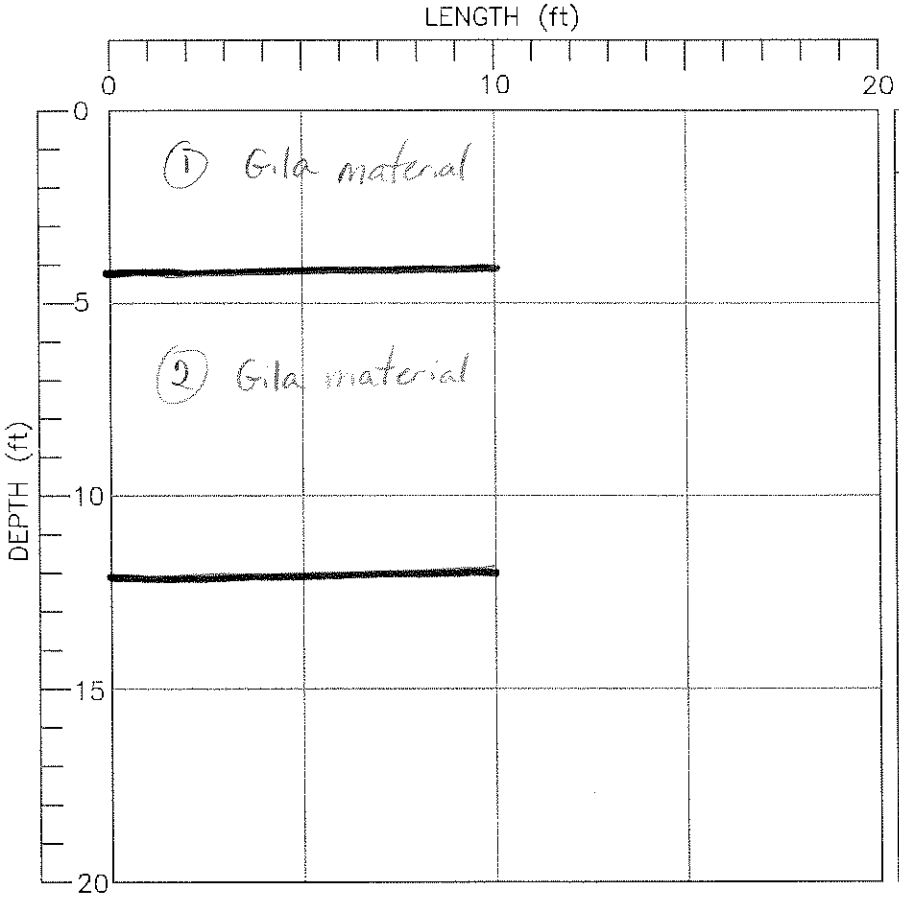
SPECIAL NOTES:

- photo 3 of pit
- photo 4 of site with old truck bed.

FIELD TEST PIT LOG

TEST PIT TP 5A3

TEMP ___ °F WEATHER 50°F Sunny ENGINEER D Buscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD / M3 DATE 1/19/05
ELEVATION ___ DATUM ___ JOB ___
LOCATION 12S 0748372 / 3615159 NAD 27 , 5A stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

① 0-4', yellowish-brown CoLS, 50-55% gravel, (60% of grl of fine), 5% cobbles, <1% stones, CF are subrounded qtz. diorite, granite and some altered rocks.

② 4-12', yellowish-brown CoLS, 60-65% gravel, (40% of gravel is fine), 5% cobbles, <1% stones, CF are subrounded qtz. diorite, granite and some altered rocks (Fe stained) - most cbls 3-5" long

SAMPLES	
NO.	DESCRIPTION
–	– TP5A3 0-6'
–	– TP5A3 6-12'
Soil hydrau	TP5A3 0-12'

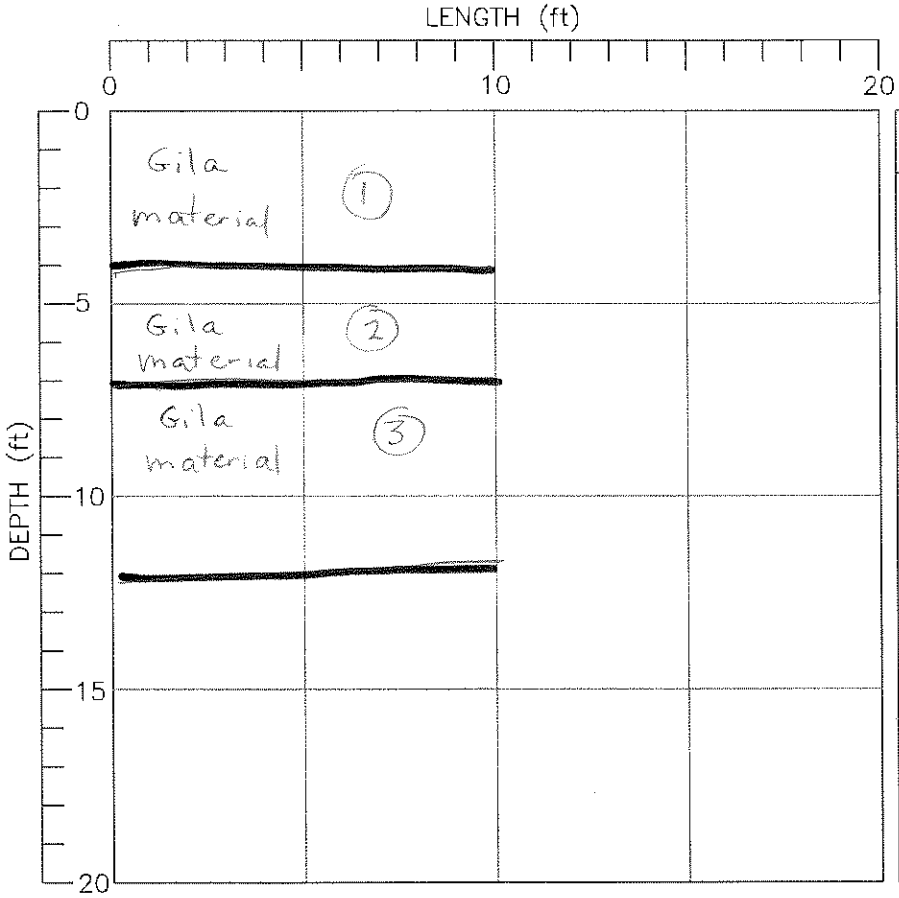
SPECIAL NOTES:

- photos 5, 6 of pit
- photo 7 of site with black pipes in background

FIELD TEST PIT LOG

TEST PIT TP 5A4

TEMP 50 °F WEATHER Sunny ENGINEER D. Buscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 1/19/05
ELEVATION ____ DATUM ____ JOB ____
LOCATION 12 S 0748483/3615126 NAD 27 , 5A Stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-4', Gila material, yellowish-brown cobs; 55% grl, 7% cobbles, 1% stones

(2) 4-7', Gila material; yellowish-brown cobs; 60% grl, 7% cbls, 1% stones

(3) 7-12' Gila material, yellowish-brown cobs, 60% gravel, 12% cbls, 1% stones

CF - Subrounded diorite, granodiorite, granite and few altered rocks cbls mixed sizes

SAMPLES	
NO.	DESCRIPTION
–	– TP 5A4 – 0-6'
–	– TP 5A4 – 6-12'
Soil hydraulics	TP 5A4 – 0-12'

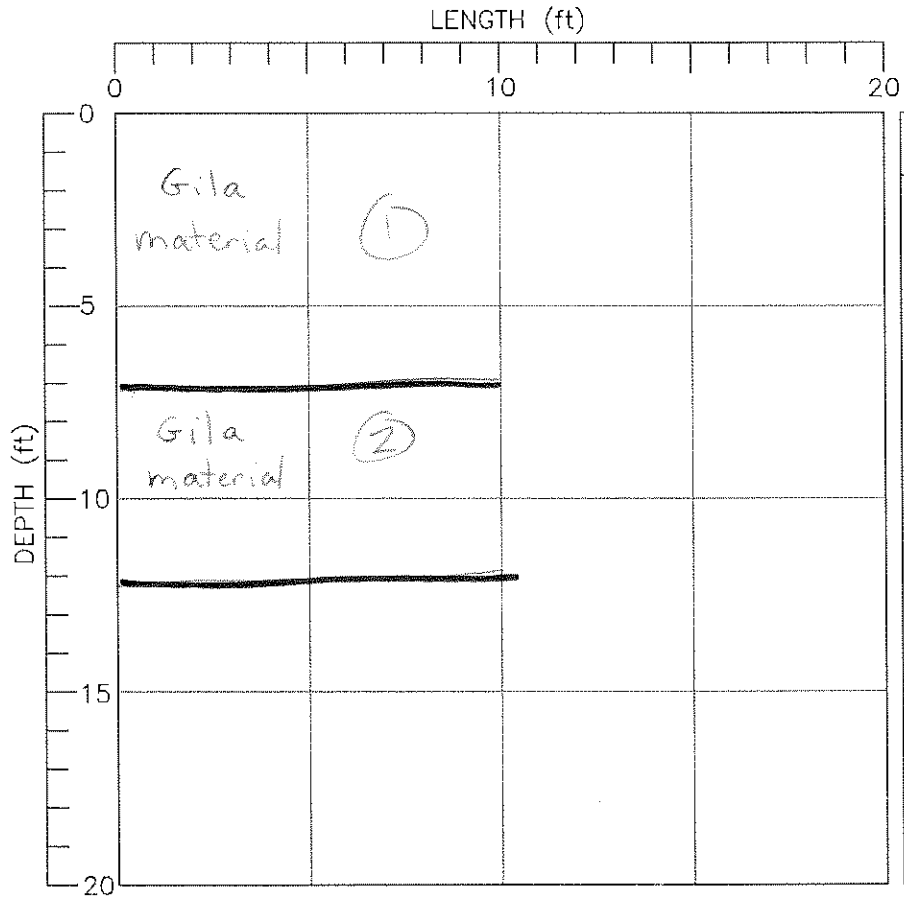
SPECIAL NOTES:

– Photo 8 of pit
Photo 9 of site with backhoe

FIELD TEST PIT LOG

TEST PIT TP TP 5A S

TEMP 50 °F WEATHER Sunny ENGINEER D. Busscher OPERATOR Lloyd Bussey
EQUIPMENT 466 Cat backhoe CONTRACTOR M3/PD DATE 1/19/05
ELEVATION DATUM JOB
LOCATION 12 S 0748171 / 3615140 NAD 27 - 5A Stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-7', Gila material, yellowish-brown CoLS, 60% grl, 7% cbls, 1% stones

(2) 7-12', Gila material, yellowish-brown CoLS, 65% grl, 7% cobbles, 1% stones.

CF - subrounded qtz. diorite & some mafic igneous rocks. Cbls mixed sizes.

SAMPLES	
NO.	DESCRIPTION
-	- TP5A5 0-6'
-	- TP5A5 6-12'
geotech	TP5A5 0-12'
Soil hydraul.	TP5A5 0-12'

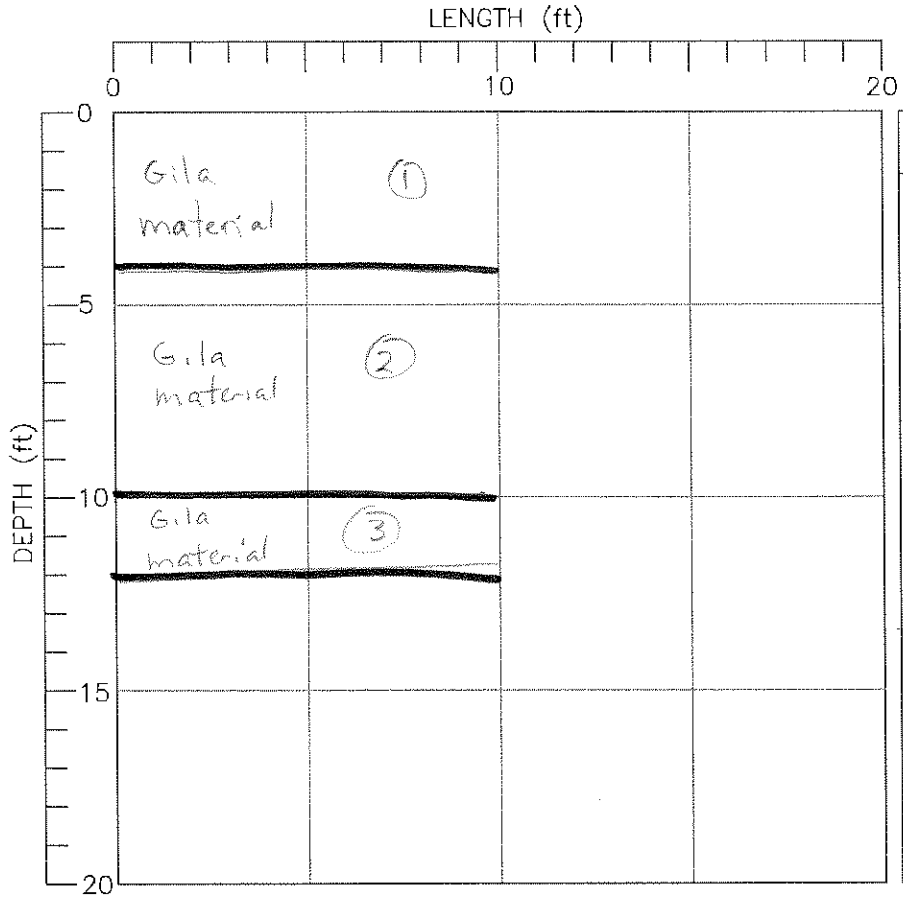
SPECIAL NOTES: Proctor TP5A5 0-12'

- photo 10 of site with pond of water
- photo 11 of pit

FIELD TEST PIT LOG

TEST PIT TP 5A6

TEMP ___ °F WEATHER 50°F Sunny ENGINEER D. Busscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/MB DATE 1/19/05
ELEVATION ___ DATUM ___ JOB ___
LOCATION 12S 0748105 / 3615856 - 5A stockpile
NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-4', Gila material, yellowish-brown, CoLS; 50% grl, 8-10% cbs, 1% stones

(2) 4-10', Gila material, yellowish-brown coLS; 55% grl, 8% cbs, 1% stones,

(3) 10-12', Gila material, yellowish-brown coLS, 55% grl, 12% cbls, 1% stones.

CF - Subrounded qtz. diorite & granodiorite, few altered rocks with red iron staining. Most cbls 3-6" long.

SAMPLES	
NO.	DESCRIPTION
-	- TP5A6 0-6'
-	- TP5A6 6-12'
soil hydraul	TP5A6 0-12'

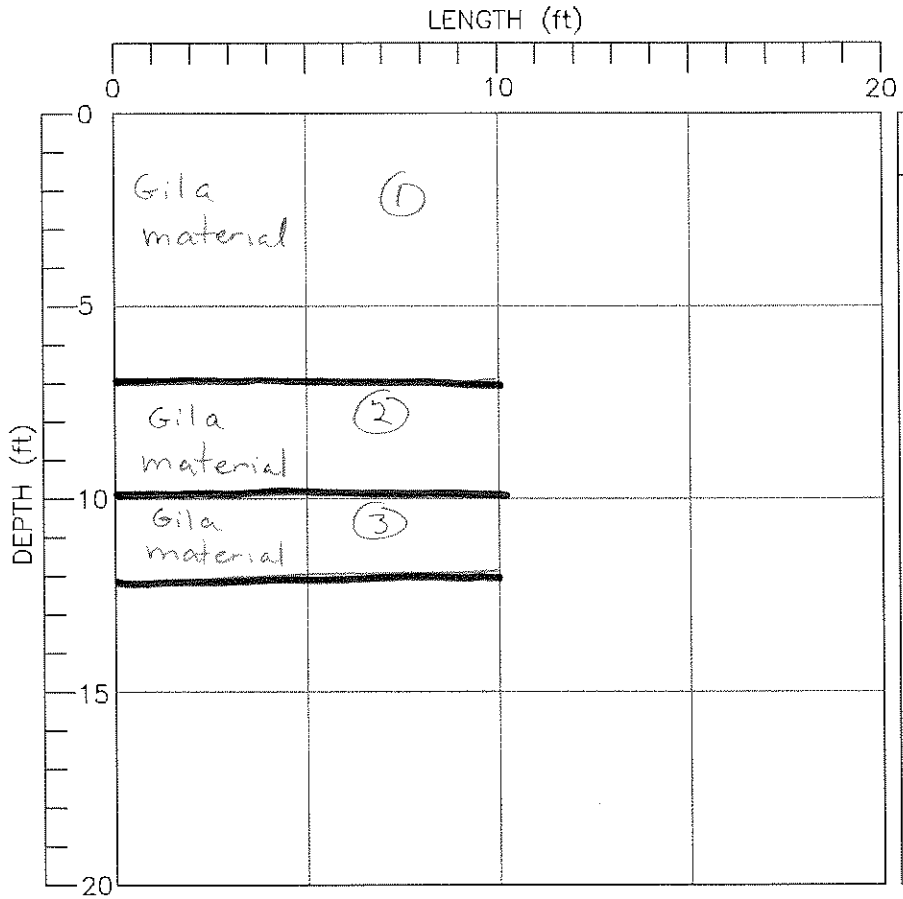
SPECIAL NOTES:

- Photo 12 of site
- Photo 13 of pit

FIELD TEST PIT LOG

TEST PIT TP 5A7

TEMP ___ °F WEATHER Cool, cloudy ENGINEER D. Buscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/MB DATE 1/20/05
ELEVATION ___ DATUM ___ JOB ___
LOCATION 5A Stockpile, 12S 0747949/3615382 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-7' Gila material, yellowish brown CoLS, 50% gravel, 7-10% cbls, 1% stones.

(2) 7-10' Gila material, yellowish-brown CoLS, 55% grl, 10% cbls, 1% stones

(3) 10-12' Gila material, yellowish-brown CoLS, 60% grl, 7% cbls, 1% stones.

CF - subrounded qtz diorite, granodiorite, porphyry and few red stained igneous rocks. Most cbls 3-5" long.

SAMPLES	
NO.	DESCRIPTION
–	– TP5A7 0-6'
–	– TP5A7 6-12'
soil hydrad	TP5A7 0-12' (1 of 2)
	TP5A7 0-12' (2 of 2)

SPECIAL NOTES: TP5A7 0-12' geotech

– Photo 14 - Site showing cables on ground

Photo 15 + 16 - of pit.

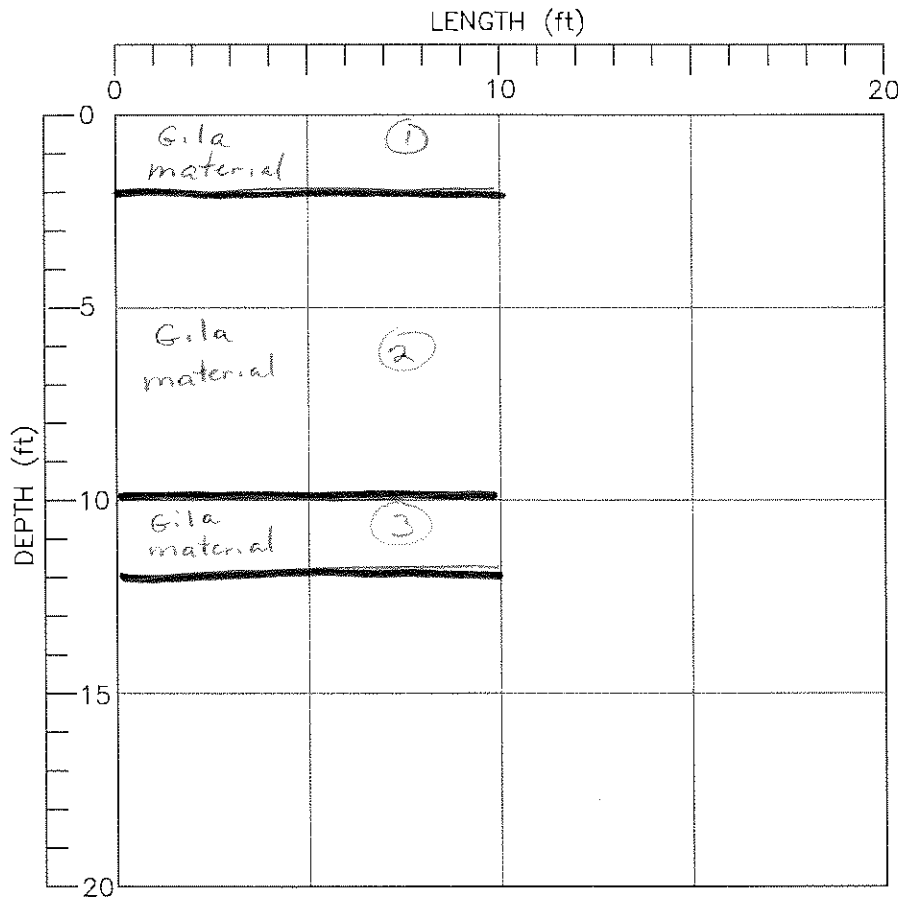
2 5 gal buckets

2160 lbs

FIELD TEST PIT LOG

TEST PIT TP 5AB

TEMP ___ °F WEATHER cool, cloudy ENGINEER D. Buscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 1/20/05
ELEVATION ___ DATUM ___ JOB ___
LOCATION 5A stockpile, 12S 0748117/3615469



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-2', Gila material, Yellowish-brown CoLS, 50% gravel, 3% cobbles

(2) 2-10' Gila material, Yellowish-brown CoLS, 55-60% gravel, 5-7% cbls,

(3) 10-12', Gila material, Yellowish-brown CoLS, 50% gravel, 5% cbls

CF - Subrounded qtz diorite, granodiorite, porphyry, + few red stained igneous rocks. < 1% stones Most cbls 3-6"

SAMPLES	
NO.	DESCRIPTION
–	– TP5AB 0-6'
–	– TP5AB 6-12'
Soil hydrad	TP5AB 0-12' (1 gal)
Soil hydrad	TP5AB 0-12' (2 gal)

2 gal buckets

SPECIAL NOTES:

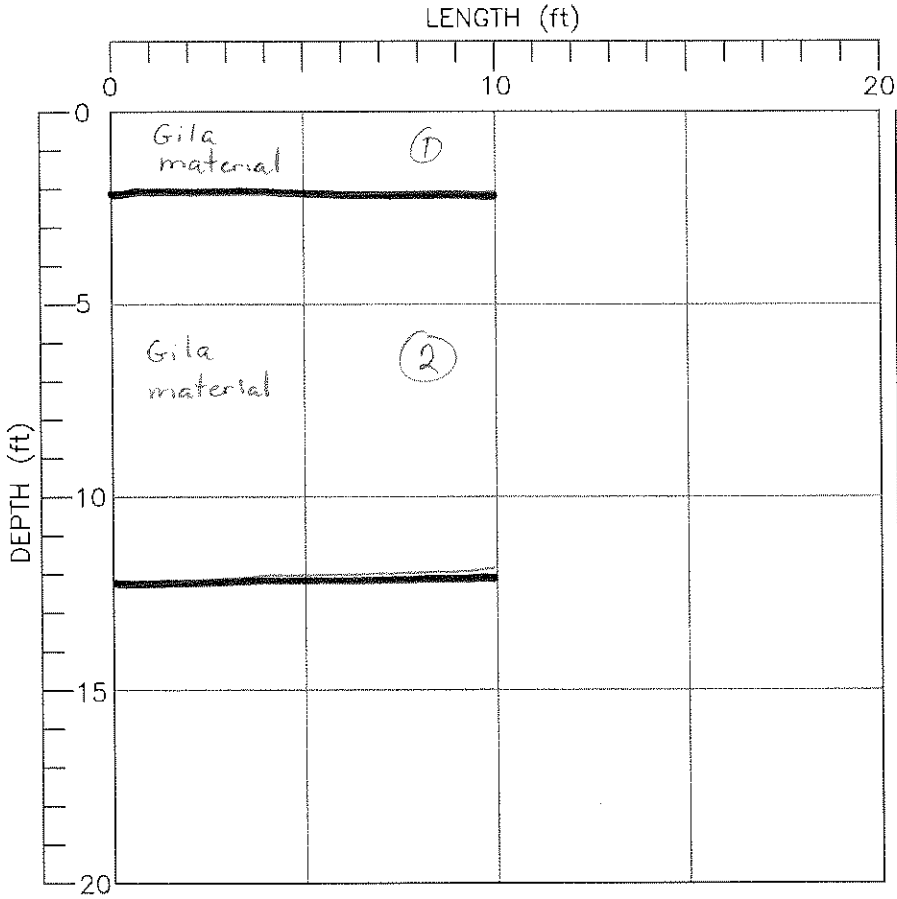
– Photo 17 of site with pond in background.

Photo 18 - pit.

FIELD TEST PIT LOG

TEST PIT TP 5A9

TEMP 45 °F WEATHER partly cloudy ENGINEER D. Buscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 1/20/05
ELEVATION ____ DATUM ____ JOB ____
LOCATION 5A stockpile, 12S 0748240/3615321 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

① 0-2', Gila material, dark yellowish-brown CoLS, 50% grl, 7% cbls,

② 2-12' Gila material, yellowish-brown CoLS, 55-60% grl, 5-7% cbls.

CF- Subrounded granodiorite, qtz diorite, porphyry, few granite, and few red + orange stained igneous rocks. <1% stones. Most Cobbles 3-6" long.

SAMPLES	
NO.	DESCRIPTION
–	– TP5A9 0-6'
–	– TP5A9 6-12'
geotech	TP5A9 0-12'
soil hydraul	TP5A9 0-12'

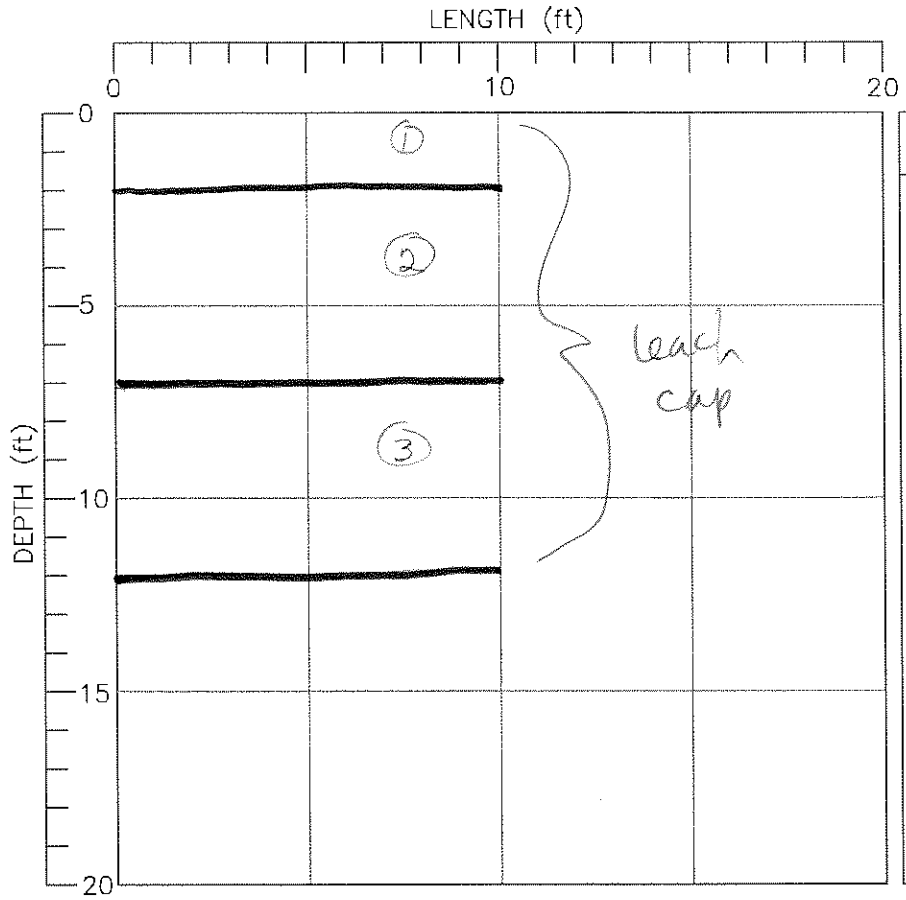
SPECIAL NOTES:

– Photo 19 - vicinity
Photo 20 - pit
(did not get very close to pit - caving in)

FIELD TEST PIT LOG

TEST PIT TP 5A 10

TEMP 45 °F WEATHER Sunny ENGINEER D. Buscher OPERATOR L. Russey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD / M3 DATE 1/20/05
ELEVATION ____ DATUM ____ JOB ____
LOCATION 5A stock pile, 125 0748321 / 3615253



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-2' reddish brown LS, 60% gravel, 7% cobbles.

(2) 2'-7' reddish brown SL, 60% gravel, 7% cbls.

(3) 7'-12' reddish brown SL, 50% grl, 7-10% cbls.

CF - Subrounded qtz, diorite, granodiorite & porphyry many of which are highly altered with deep red, orange & yellow staining; <1% stones, Few CF have white salt on surfaces.

SAMPLES	
NO.	DESCRIPTION
–	– no samples
–	–

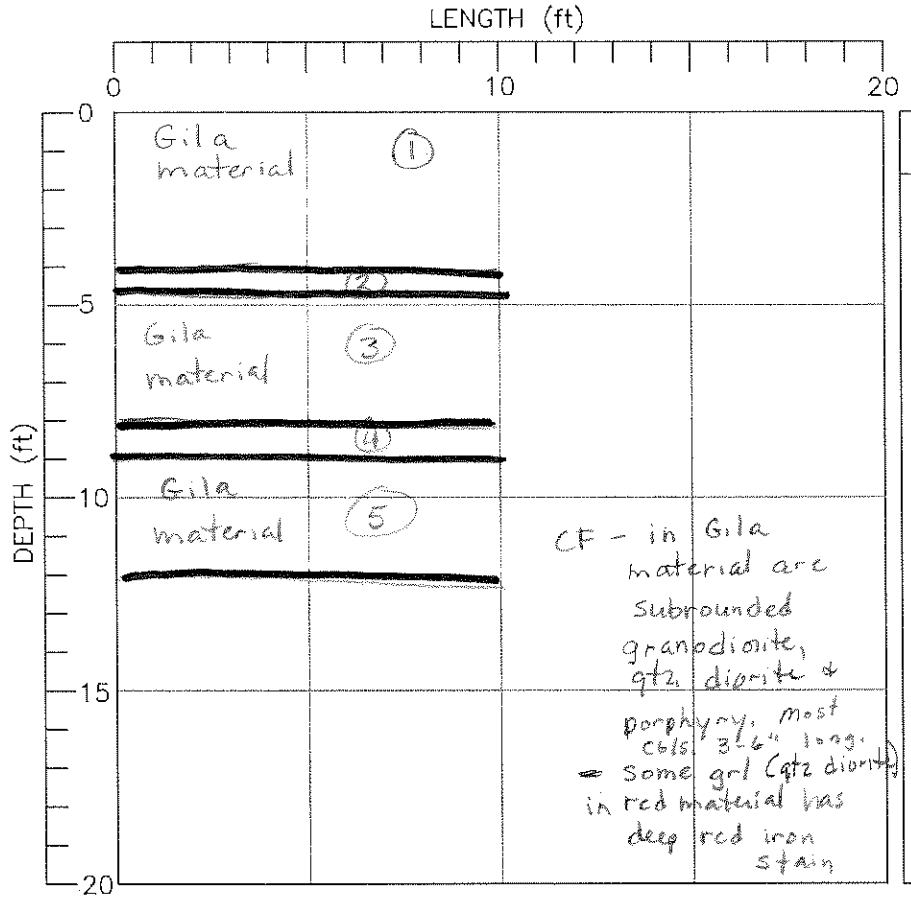
SPECIAL NOTES:

- Photo 21 - of site
Photo 22 - of pit

FIELD TEST PIT LOG

TEST PIT TP 5A11

TEMP 45 °F WEATHER Partly cloudy ENGINEER D. Buscher OPERATOR L. Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 1/20/05
ELEVATION _____ DATUM _____ JOB _____
LOCATION 5A Stockpile, 12S 0748295 / 3615231



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-4' Gila material dark yellowish-brown CoLS; 50-55% gravel 5-7% cobbles, <1% stones

(2) 4'-4.75' reddish-brown CoLS, 50% gravel

(3) 4.75-8', Gila material, yellowish-brown CoLS 55% grl, 5% cbls, <1% stones

(4) 8-9', reddish-brown CoLS, 50% gravel

(5) 9-12' Gila material, yellowish-brown CoLS 55% grl, 5% cbls, <1% stones.

SAMPLES	
NO.	DESCRIPTION
–	– TP5A11 0-6'
–	– TP5A11 6-12'
	TP5A11 0-12' (1 of 2)
	TP5A11 0-12' (2 of 2)

SPECIAL NOTES:

– Photo 23 of site with truck beds & poles in the distance.

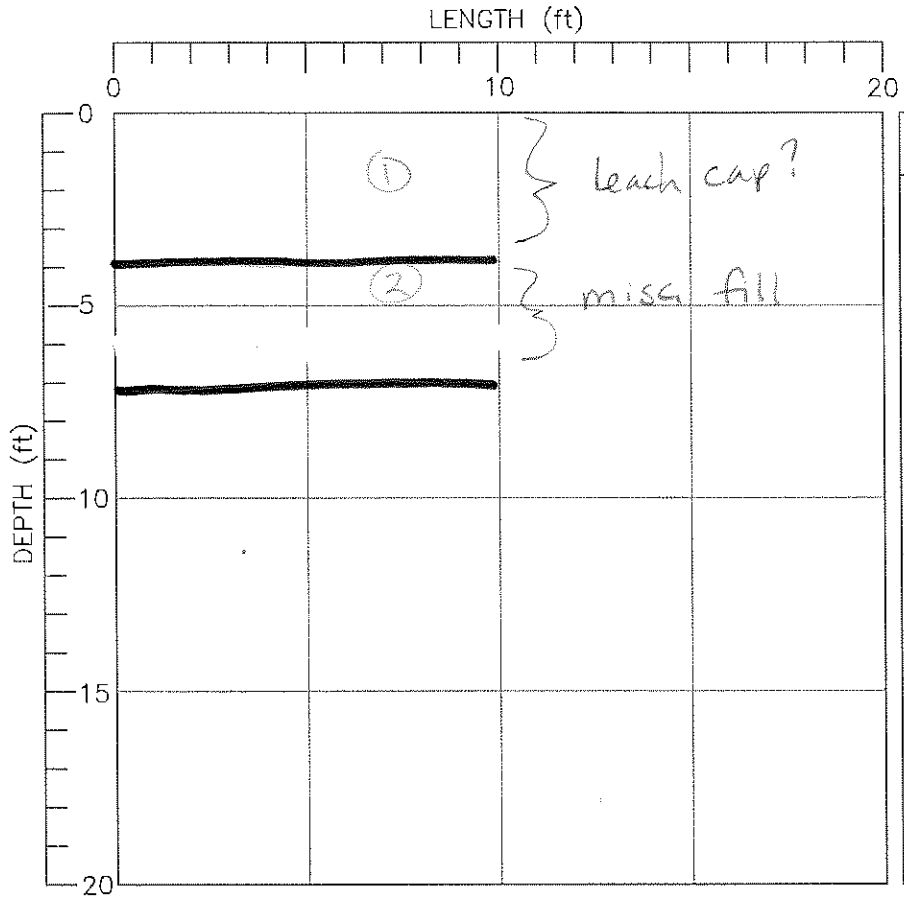
– Photo 24 of pit

2 Sol buckets

FIELD TEST PIT LOG

TEST PIT TP 5A12

TEMP 45 °F WEATHER Cloudy ENGINEER D. Buscher OPERATOR L. Bussey
EQUIPMENT 466 Cat backhoe CONTRACTOR PD/MB DATE 1/20/05
ELEVATION ____ DATUM ____ JOB ____
LOCATION 5A stockpile, 12S 0748377 / 3615267 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-4' reddish-brown SL, 50% grl, 5% cbls,

(2) 4-7' misc. fill, dark yellowish-brown SL, 55% grl, 7% cbls, 1% stones; contains some bricks, wire, lumber & tar paper.

CF - (in both 1 + 2) granodiorite, conglomerate (or cement?) & altered igneous rocks that are red and orange stained.

SAMPLES	
NO.	DESCRIPTION
–	– no samples
–	–

SPECIAL NOTES:

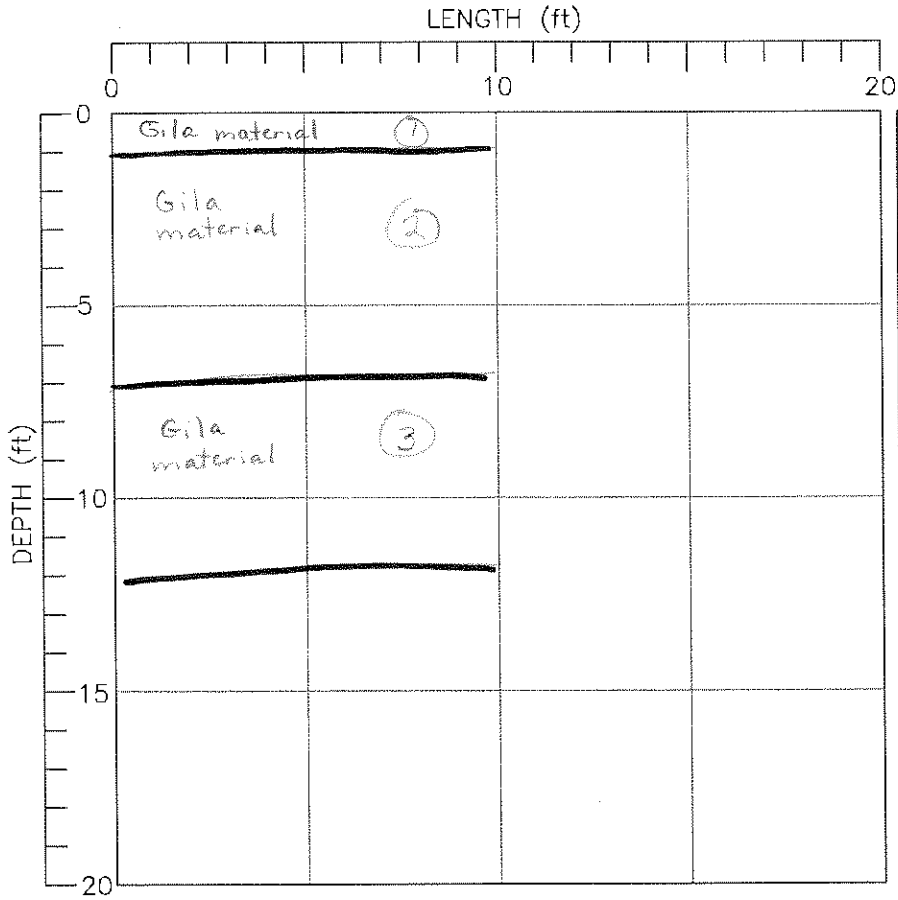
- Photo 25 of pit note brick on top and bottom in pit.

13 0748310 / 3615280

FIELD TEST PIT LOG

TEST PIT TP 5A13

TEMP 45 °F WEATHER Cloudy ENGINEER D. Buscher OPERATOR Lloyd Bussey
EQUIPMENT 466 Cat backhoe CONTRACTOR PD / M3 DATE 1/20/05
ELEVATION DATUM JOB
LOCATION 5A Stockpile, 125 0748316 / 3615280 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-1', Gila material, dark yellowish-brown SL 50% grl, 5% cobbles

(2) 1-7' Gila material, yellowish-brown CoLS 55-60% gravel, 5% cbls, 1% stones

(3) 7-12' Gila material, yellowish brown CoLS, 50% gravel, 5% cbls, 1% stones

CF - subrounded qtz, diorite, granodiorite porphyry, some with deep red iron staining, most cbls 3-6" long.

SAMPLES	
NO.	DESCRIPTION
-	- No Samples
-	-

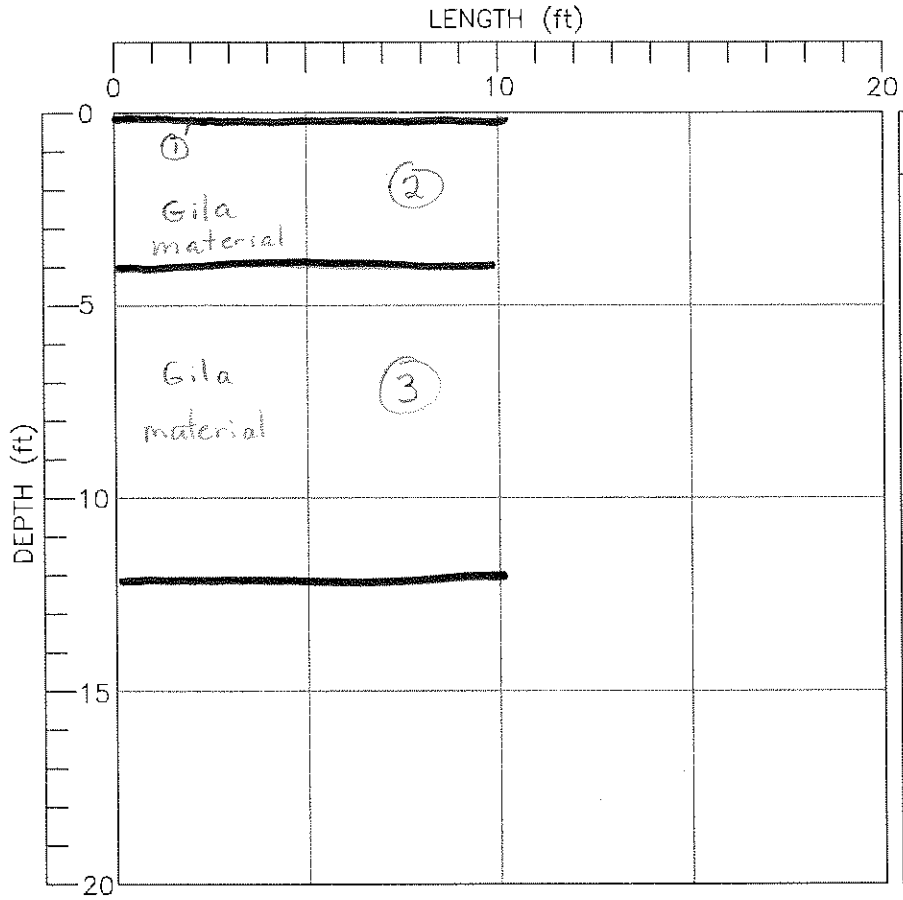
SPECIAL NOTES:

- Photo 26 - pit

FIELD TEST PIT LOG

TEST PIT TP 5A14

TEMP ____ °F WEATHER ____ ENGINEER ____ OPERATOR ____
EQUIPMENT ____ CONTRACTOR ____ DATE 11/20/05
ELEVATION ____ DATUM ____ JOB ____
LOCATION 5A Stockpile, 125 0748288/3615010E



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-2", Strong brown SL, 45% gravel,

(2) 2"-4' Gila material yellowish-brown CoLS, 50-55% gravel, 50% cbls

(3) 4'-12' Gila material dark yellowish-brown CoLS, 60% gravel, 5% cbls,

CF - Subrounded qtz, diorite, granodiorite, few mafic igneous rocks, some altered red and yellow iron stained igneous rocks, <1% stones, most cbls 3-6" long,

SAMPLES	
NO.	DESCRIPTION
-	- no Samples
-	-

SPECIAL NOTES:

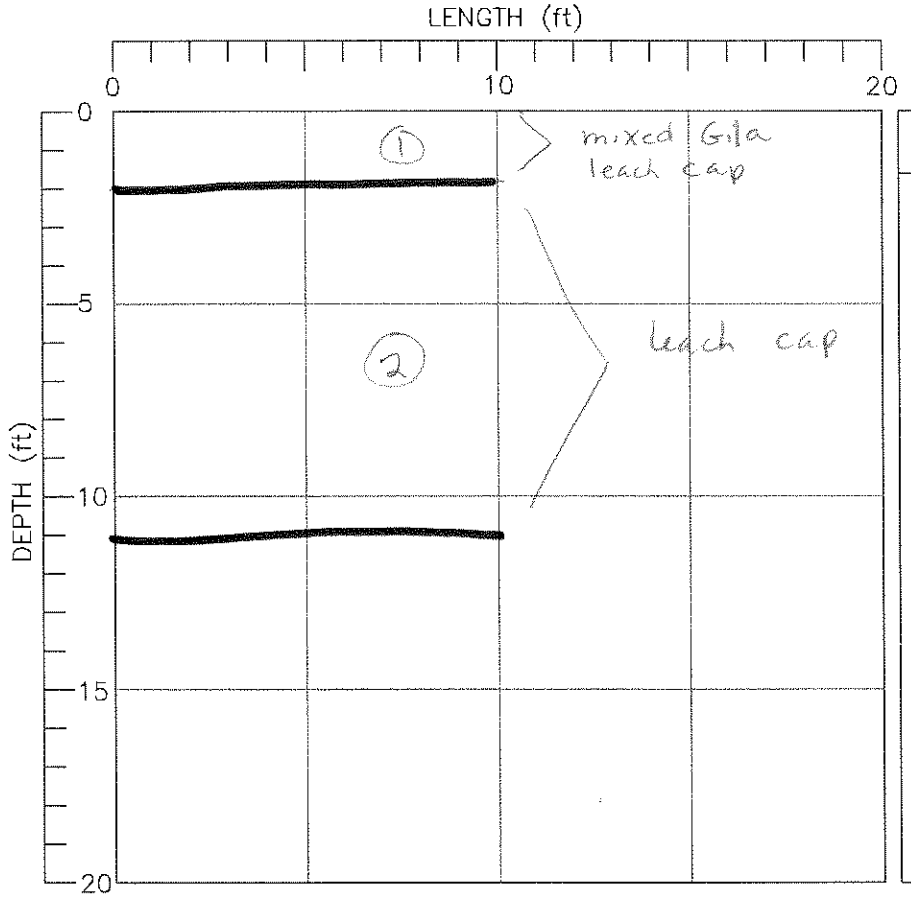
- Photo 27 of site with rock berms in background.

- Photo 28 of pit, note 2" red layer on top.

FIELD TEST PIT LOG

TEST PIT TP 5A15

TEMP 45 °F WEATHER cloudy ENGINEER D. Buscher OPERATOR L. Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PB / M3 DATE 1/20/05
ELEVATION DATUM JOB
LOCATION 5A Stockpile, 12 S 0748300 / 3614912 E NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-2' reddish yellow SL, 50% grl, 15% cbls many CF are highly altered.

(2) 2-11' reddish brown SCL mixed with brownish yellow SCL, 45% grl, 20% cbls, 2% stones, 1% boulders, the CF are subangular to angular & most are highly altered with deep red, light green, & orange staining - leach cap.

SAMPLES	
NO.	DESCRIPTION
-	- no samples
-	-

SPECIAL NOTES:

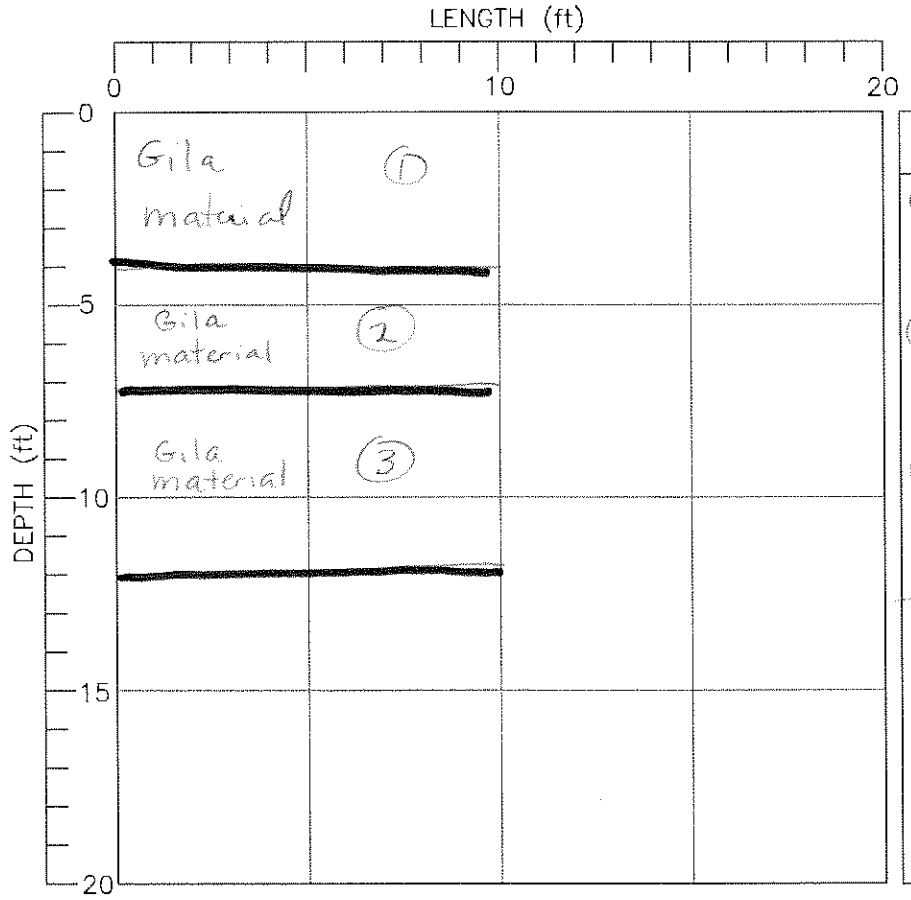
- Photo 29 of sink and excavated material

Photo 30 of pit

FIELD TEST PIT LOG

TEST PIT TP 5A16

TEMP 45 °F WEATHER Cloudy ENGINEER D. Buscher OPERATOR L. Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 11/20/05
ELEVATION ____ DATUM ____ JOB ____
LOCATION 5A Stockpile, 12S 0748402 / 3614970



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-4' Gila material, Yellowish-brown CoLS, 45-50% grl, 7% cbls

(2) 4-7' Gila material Yellowish-brown coLS, 60% grl, 7% cbls

(3) 7-12' Gila material, Yellowish-brown CoLS, 60% grl, 3% cbls.

CF - subrounded granodiorite, some porphyry, very few heavily iron stained granodiorite. Most cobbles 3-5" long.

SAMPLES	
NO.	DESCRIPTION
–	– TP5A16 0-6'
–	– TP5A16 6-12'
Soil hyd.	TP5A16 0-12'

SPECIAL NOTES:

– Photo 31 of site

Photo 32 of pit

FIELD TEST PIT LOG

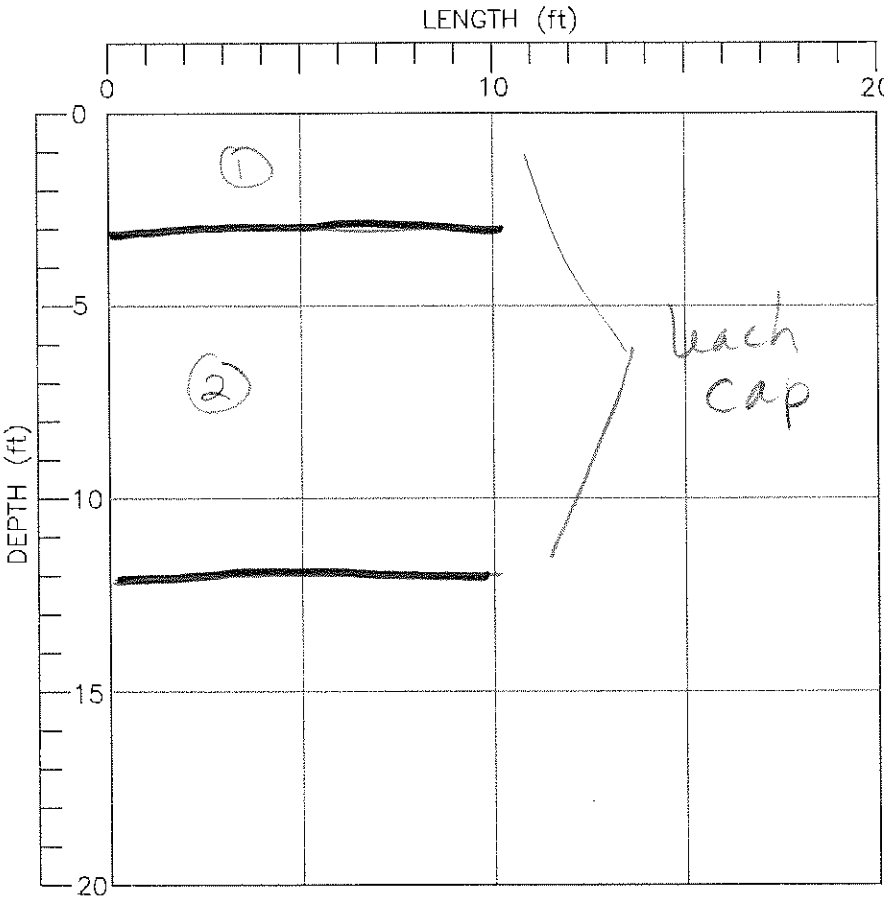
TEST PIT TP 5A 17

TEMP ____°F WEATHER cold, windy ENGINEER D Buscher OPERATOR Lloyd Bussey

EQUIPMENT 446 Cat backhoe CONTRACTOR PM / M3 DATE 2/4/05

ELEVATION ________ DATUM ________ JOB 5A stockpile

LOCATION 0747185/3616089 (NAD 27) 5A Stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

① 1-3', reddish brown and some very pale brown coarse sandy loam; 35% grl, 10% cbls – leach cap

② 3-12' reddish brown + some very pale brown coarse sandy loam, 50% grl, 15 cbls, <1% stones leach cap.

CF are highly altered with deep red & orange staining, some yellowish green staining probably oxidize sulfides,

SAMPLES	
NO.	DESCRIPTION
–	– no Samples
–	–

SPECIAL NOTES:

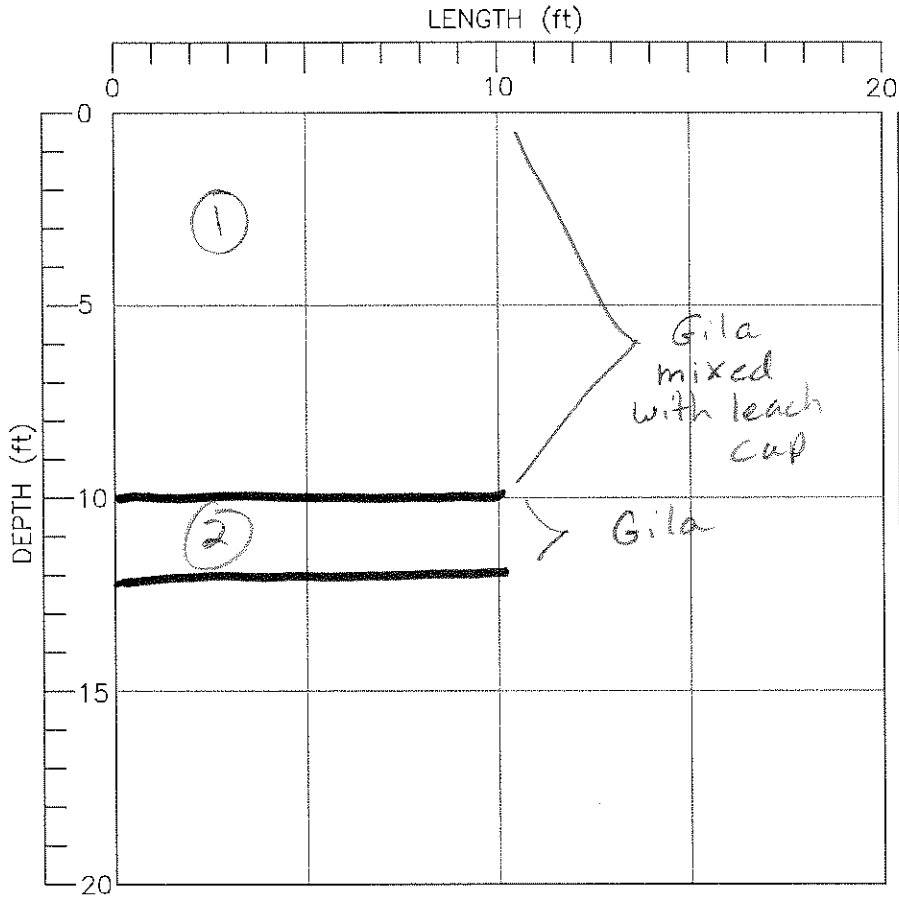
- Photo 68 of pit

Photo 69 of pile

FIELD TEST PIT LOG

TEST PIT TP 5A 1B

TEMP ___ °F WEATHER cold, windy ENGINEER D. Buscher OPERATOR Lloyd Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PM / M3 DATE 9/4/05
ELEVATION ___ DATUM ___ JOB 5A stockpile
LOCATION 0747271 / 3616017 (NAD 27) 5A Stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-10' brown coarse sandy loam, 55-60% gravel, 5-7% cbls most are 3-7" long — Gila material. This material is mixed with 10% reddish brown coarse sandy loam. The reddish brown material contains highly altered rocks with deep red & orange staining.

(2) Gila material: yellowish-brown coarse sandy loam, 60% grl, 7% cbls, <1% stones

SAMPLES	
NO.	DESCRIPTION
–	– TP5A1B 0-6"
–	– TP5A1B 6-12"
soil hyd.	TP5A1B 0-12"

SPECIAL NOTES:

– Photo 70 showing mixed material.

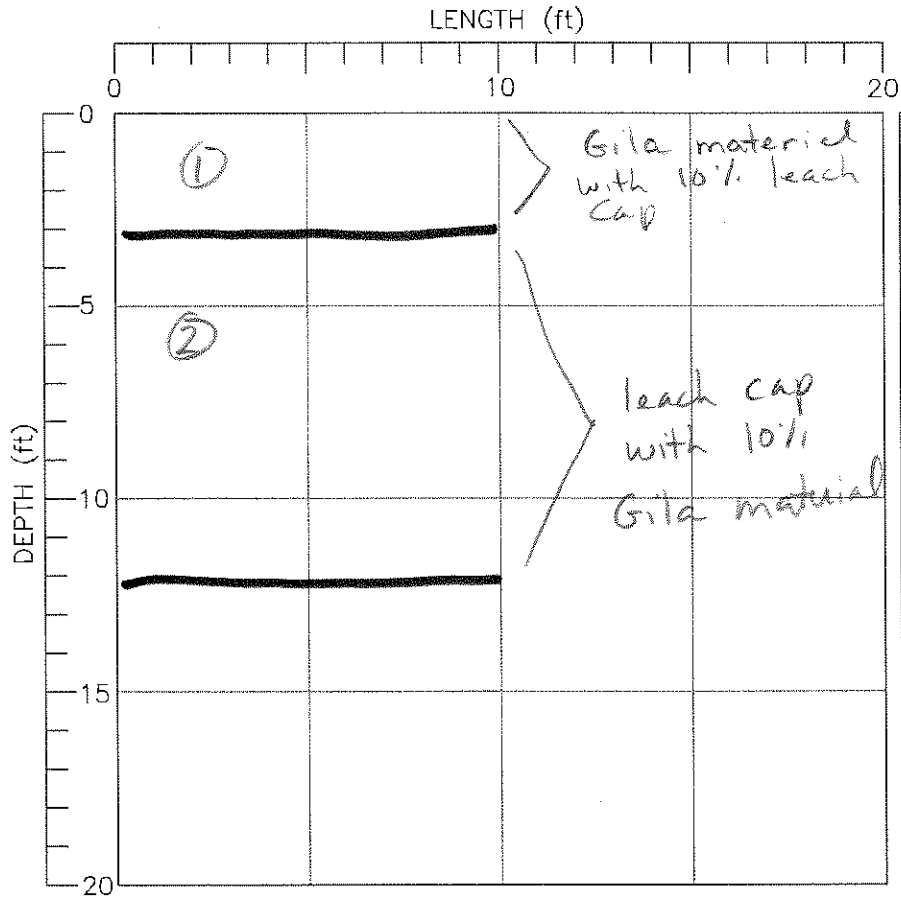
FIELD TEST PIT LOG

TEST PIT TP 5A19

TEMP ___ °F WEATHER
EQUIPMENT 446 Cat backhoe
ELEVATION
LOCATION 0747329 / 3615949 (NAD 27)

ENGINEER D. Bussey
CONTRACTOR PD/M3
DATUM

OPERATOR L. Bussey
DATE 2/4/05
JOB 5A stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-3' Gila mixed with leach cap. Yellowish brown coarse loamy sand, 65% grl, 5% cbls mixed with 10% reddish brown coarse sandy loam, 65% grl + 15% cbls that are highly altered with deep red, orange + yellow staining.

(2) 3-12' leach cap - reddish brown coarse sandy loam, 65% grl + 15% cbls that are high altered with deep red, orange + yellow staining, few rocks contain pyrite, this material is mixed with 10% Gila material.

SAMPLES	
NO.	DESCRIPTION
–	– No samples
–	–

SPECIAL NOTES:

- Photo 71 of pit
Photo 72 showing altered rocks in piles.

FIELD TEST PIT LOG

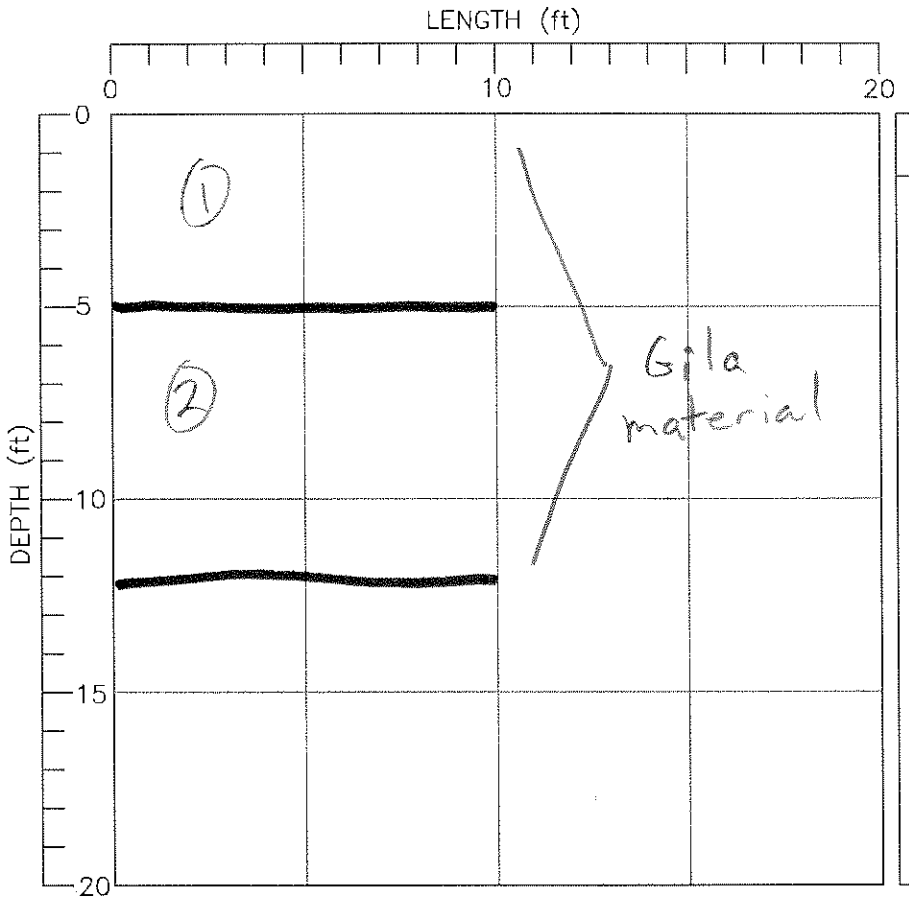
TEST PIT TP SA20

TEMP ___ °F WEATHER ___ ENGINEER D. Buscher OPERATOR L. Bussey

EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 2/14/05

ELEVATION ___ DATUM ___ JOB SA Stockpile

LOCATION 0747436/3615896 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) Gila material 0-5', yellowish brown coarse sandy loam, 50% grl, 3% cbls,

(2) 5-12' Gila material, yellowish brown coarse sandy loam, 60% grl, 3% cbls,

CE are generally subrounded granodiorite, most cobbles are 3-5" long. A couple yellow-orange stained cobbles.

SAMPLES	
NO.	DESCRIPTION
–	– TPSA20 0-6'
–	– TPSA20 6-12'
Soil hyd.	TPSA20 0-12'
geotech	TPSA20 0-12'

SPECIAL NOTES:

– Photo 73 of pit

Photo 74 of pile

FIELD TEST PIT LOG

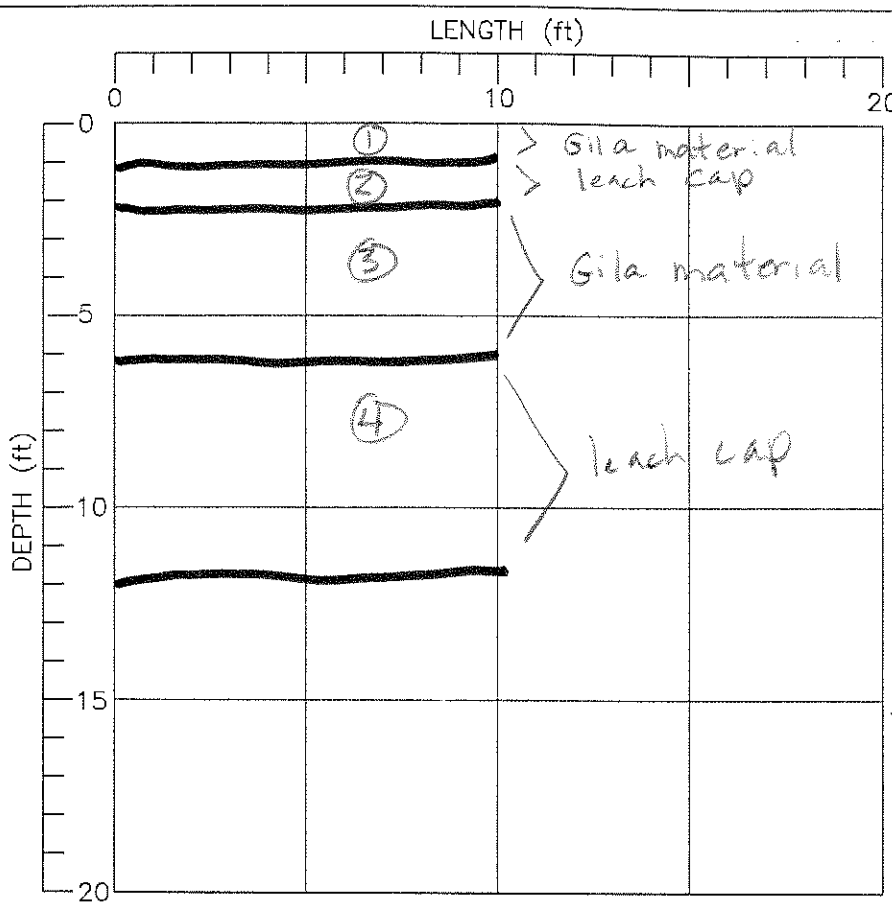
TEST PIT TP 5A21

TEMP ___ °F WEATHER _____ ENGINEER D. Buscher OPERATOR L. Bussey

EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 2/4/05

ELEVATION _____ DATUM _____ JOB 5A Stockpile

LOCATION 0747551 / 3615885 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-1', Gila material, yellowish brown coarse sandy loam 65% fine + medium gravel + 3% cbls

(2) 1-2' leach cap, reddish brown coarse loamy sand, 75% grl and 5% cbls that are highly altered

(3) 2-6' same as 0-1' - Gila material

(4) 6-12' leach cap, reddish brown coarse sandy loam, 65% grl 10% cobbles, <1% stones CF are highly altered with deep red + some orange + yellow staining

SAMPLES	
NO.	DESCRIPTION
–	– TP5A21 0-1'
–	– TP5A21 6-12'
soil hyd.	TP5A21 0-12'

SPECIAL NOTES:

– Photo 75 of pit, note red material

Photo 76 of Gila pile + red altered pile

FIELD TEST PIT LOG

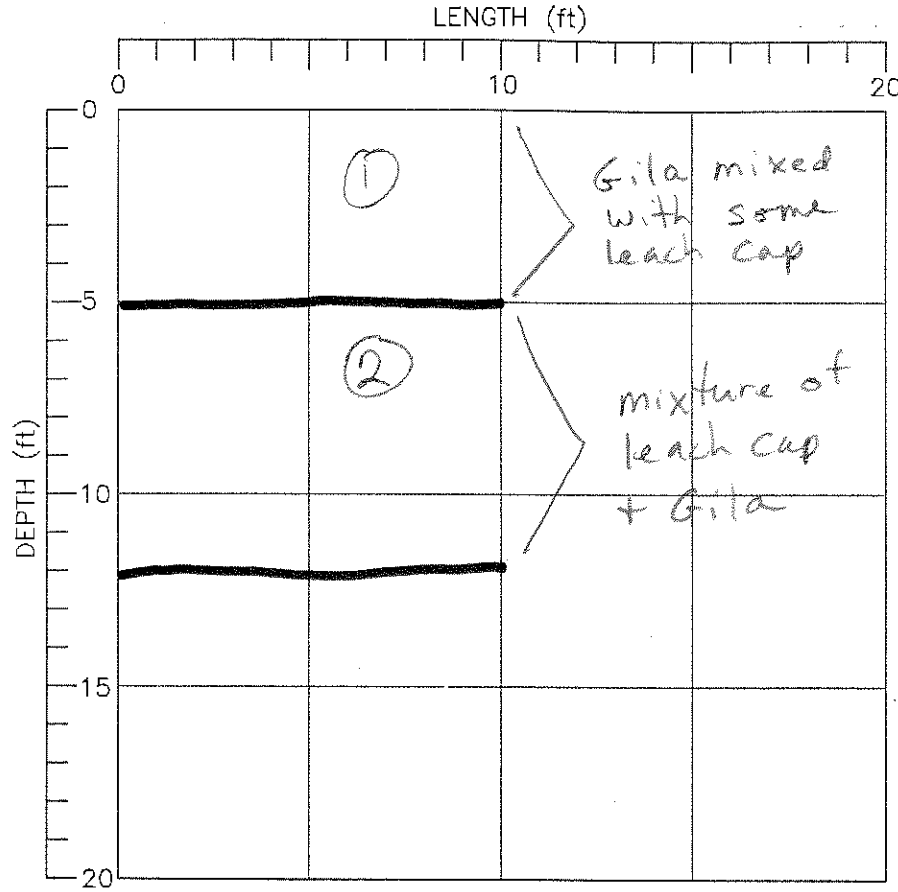
TEST PIT TP 5A22

TEMP ___ °F WEATHER ___ ENGINEER D. Buscher OPERATOR L. Bussey

EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 2/4/05

ELEVATION ___ DATUM ___ JOB 5A stockpile

LOCATION 0747729/3615851 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-5' Predominately Gila material - brown coarse sandy loam, 45% grl, 3% cbls mixed with some reddish-brown coarse sand loam, 65% grl + some yellow + red stained rocks,

(2) 5-12' Mixture of Gila and leach cap. Leach cap reddish brown coarse sandy loam, 75% grl, 15-20% broken rocks up to 12" long that are deep red, orange + yellow staining.

SAMPLES	
NO.	DESCRIPTION
–	– no samples
–	–

SPECIAL NOTES:

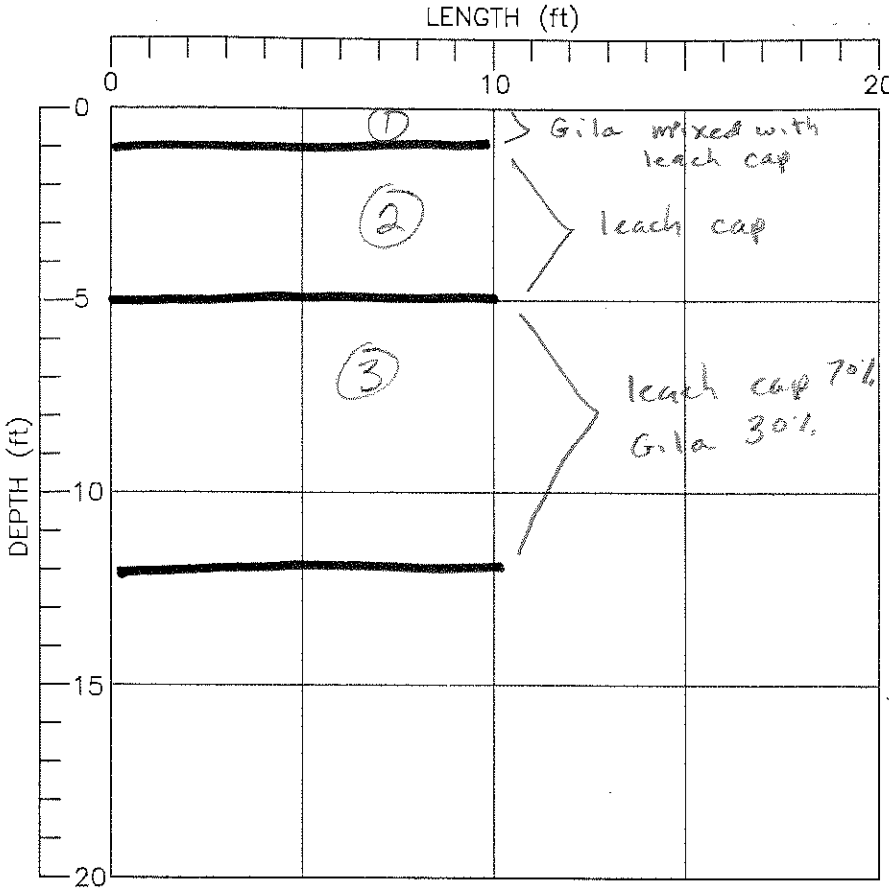
– Photo 77 pit
Photo 78 pile of upper couple feet - Gila material mixed with red altered material

FIELD TEST PIT LOG

TEMP ___ °F WEATHER ___
EQUIPMENT 446 Cat backhoe
ELEVATION ___
LOCATION 0747708 / 3615598

TEST PIT TP 5A 23
ENGINEER D. Buscher
CONTRACTOR PD / M3
DATUM NAD 27

OPERATOR L. Busey
DATE 2/4/05
JOB 5A stockpile



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-1' Gila material brown coarse sandy loam, 60% grl, 5% cbls most are 3-6" luna mixed with 5mm reddish brown sandy loam.

(2) 1-5' reddish brown sandy loam leach cap, 40-65% red stained grl, 5-7% cobbles that are stained deep red and yellow,

(3) 5-12' Leach cap 70% mixed with Gila 30%. Leach cap - reddish brown CoSL 40% grl, 7% red cbls, Gila - brown CoSL, 65% grl, 5% cbls.

SAMPLES	
NO.	DESCRIPTION
–	– no samples
–	–

SPECIAL NOTES:

– Photo 79 - pit
Photo 80 - piles of red altered material

FIELD TEST PIT LOG

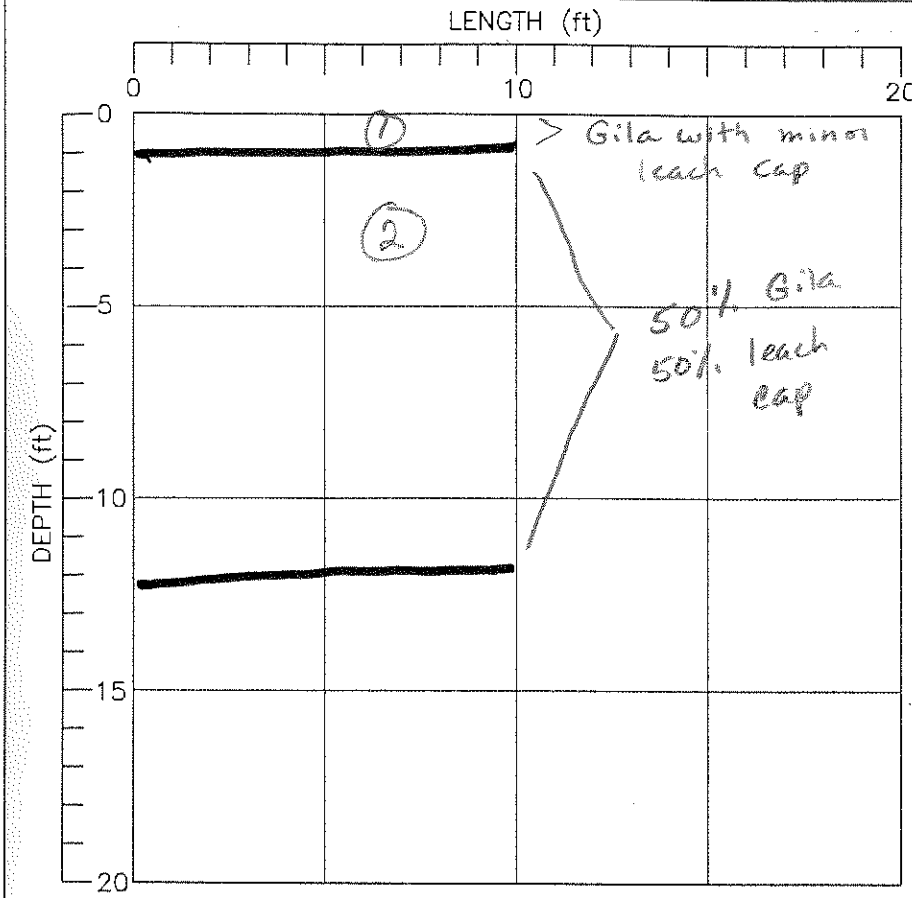
TEST PIT TP SA24

TEMP ___ °F WEATHER _____ ENGINEER D. Buscher OPERATOR F. Bussey

EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 2/4/05

ELEVATION _____ DATUM _____ JOB SA Stockpile

LOCATION No GPS coord. but accurately located on map.



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-1' Gila material brown coarse sandy loam, 60% grl of mixed sizes, 5% cbls. mixed with minor leach cap - reddish brown CoSL.

(2) 1-12' 50% Gila material like (1). 50% leach cap - reddish brown CoSL, 65% grl, 5% altered cbls with deep red & yellowish-orange staining cbls 3-6" long on avg.

SAMPLES	
NO.	DESCRIPTION
–	– TPSA24 0-6'
–	– TPSA24 6-12'
soil hyd.	TPSA24 0-12'
geotech	TPSA24 0-12'

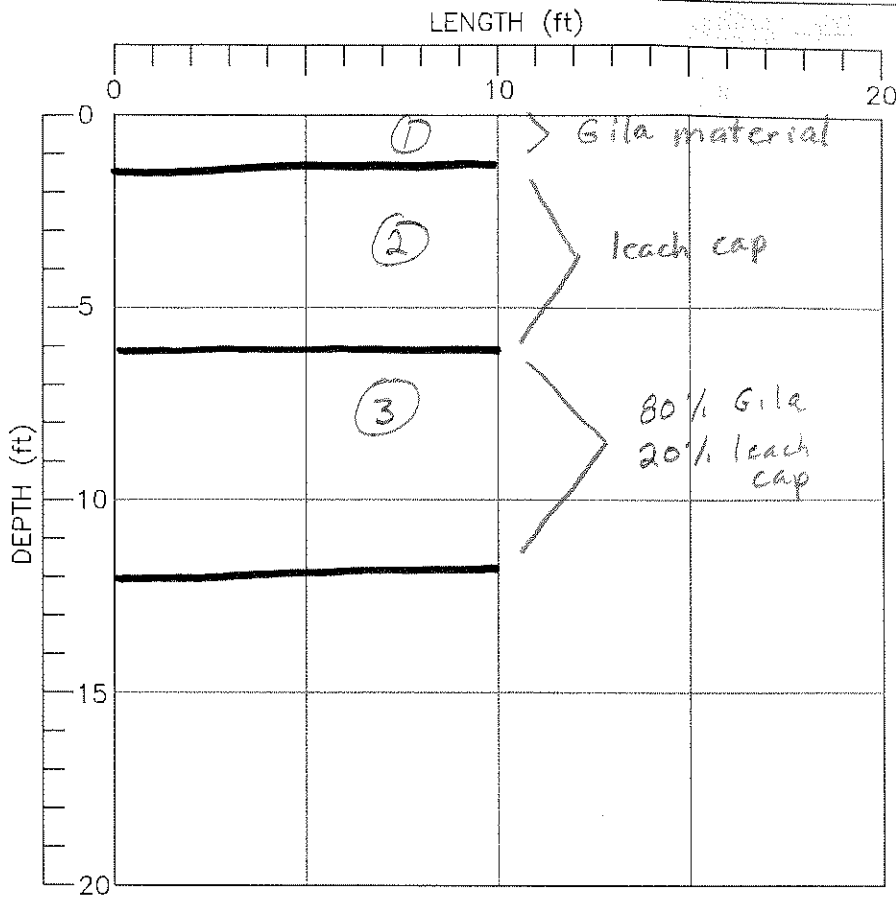
SPECIAL NOTES:

– Photo 81 pit

FIELD TEST PIT LOG

TEST PIT TP 5A 25

TEMP ___ °F WEATHER Cold, windy ENGINEER D. Buscher OPERATOR L. Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD / M3 DATE 2/4/05
ELEVATION ___ DATUM ___ JOB 5A stockpile
LOCATION 0747501 / 3615890 (NAD 27)



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-1.5' Gila material, brown coarse SL, 65% grl most are fine + medium, 3% cbls,

(2) 1.5-6' leach cap - reddish brown CoSL 50% red stained grl of mixed sizes, 5% cbls that are stained deep red + orange,

(3) 6-12', 80% of (1) but 5% cbls, and 20% of (2)

SAMPLES	
NO.	DESCRIPTION
–	– no samples
–	–

SPECIAL NOTES:

– Photo #1 pit

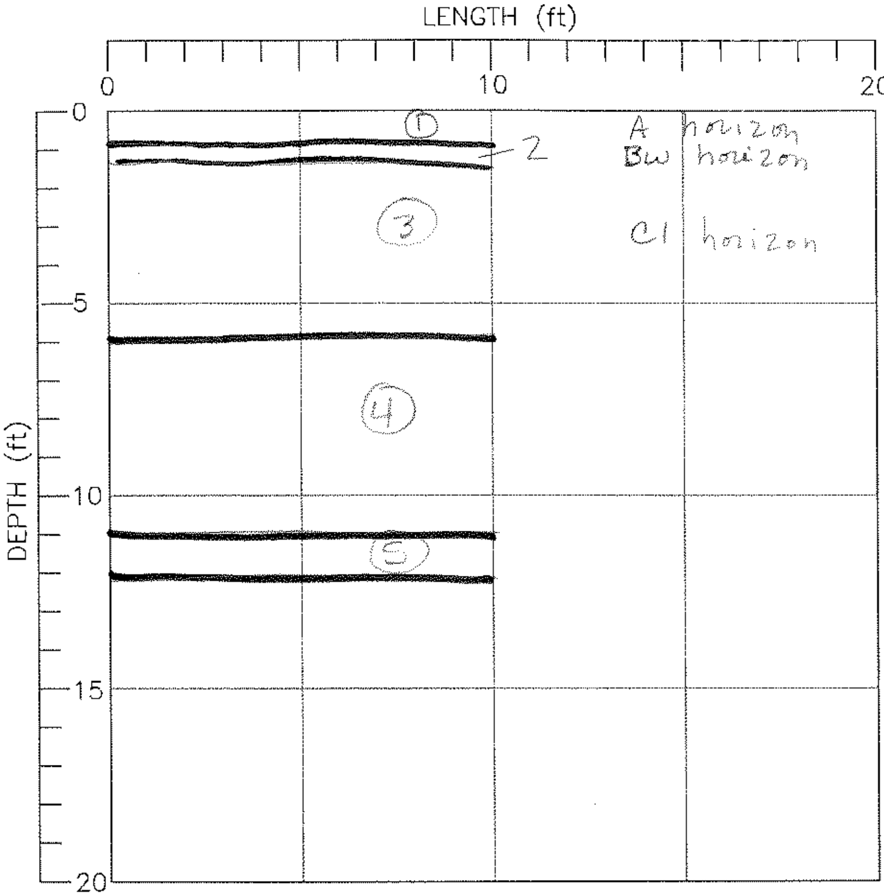
APPENDIX A-2

NO. 1 STOCKPILE BORROW FIELD LOG SHEETS

FIELD TEST PIT LOG

TEST PIT TP 1B1

TEMP 45 °F WEATHER raining ENGINEER D. Buscher OPERATOR L. Bussey
EQUIPMENT 446 Cat backhoe CONTRACTOR PD/M3 DATE 1/2?/05
ELEVATION DATUM JOB
LOCATION 1 borrow - 12S 0750363 / 3615184 NAD 27



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-9" very dk. grayish-brown SL; 40% grl, 3% cbls.

(2) 9"-14" dark yellowish brown Co SL; 45% gravel, 3% cobbles,

(3) 14"-6' yellowish-brown SL; 50% grl, 5% cbls,

(4) 6'-11' dK. yellowish-brown LS; 50% grl, 15% cbls, 1% stones, weakly cemented

(5) 11-12" yellowish-brown CoLS; 55% grl, 10% cbls, weakly cemented.

CF - subrounded porphyry, granite, granodiorite few are highly altered with red, black, orange staining.

SAMPLES	
NO.	DESCRIPTION
-	- TP1B1 0-9"
-	- TP1B1 9"-6'
	TP1B1 6'-11'
	TP1B1 11'-12'

SPECIAL NOTES:

- Photo 33 of partially filled pit.
- Photo 34 piles of upper 6'
- Photo 35 - piles of lower 6'
- Photo 36 of site.

FIELD TEST PIT LOG

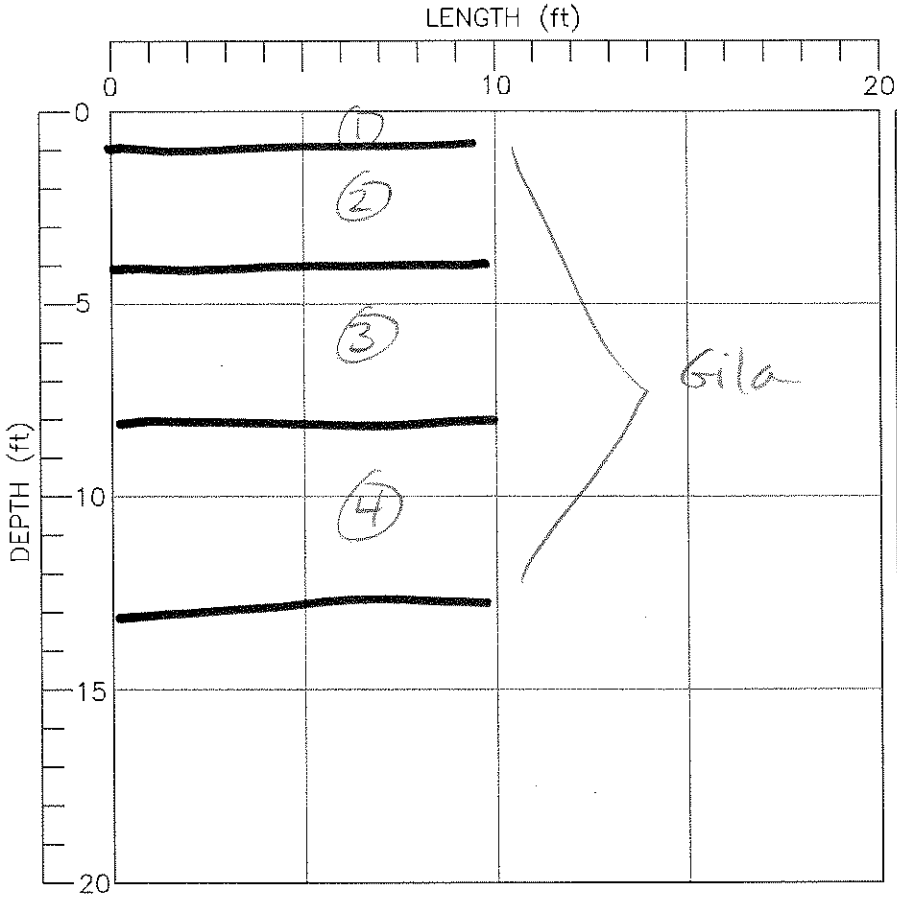
TEST PIT TP TB-2

TEMP ___ °F WEATHER Sunny, cold ENGINEER D. Buscher OPERATOR Lloyd Busch

EQUIPMENT 325 B Cat CONTRACTOR PD/M3 DATE 2/3/05

ELEVATION ___ DATUM ___ JOB Borrow area

LOCATION 0750533/3614430 (NAD 27)



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-1' very dark brown Co. sandy loam, 7% grl <1% cobbles.

(2) 1-4' brown coarse sandy loam, 60% grl, 7% cbls most are 3-5" long

(3) 4-8' strong brown coarse sandy loam 50% grl of mixed sizes, 15% cbls most are 3-6" long. <1% stones

(4) 8-13' strong brown coarse loamy sand, 45% grl of mixed sizes, 15% cbls most are 3-5" long.

CF - Subrounded granodiorite & porphyry

SAMPLES	
NO.	DESCRIPTION
–	– TPTB2 0-1'
–	– 1-4'
	4-8'
	8-13'

SPECIAL NOTES:

- Photo 56 - pit
Photo 57 - piles 0-4'
Photo 58 - piles 4-13'

FIELD TEST PIT LOG

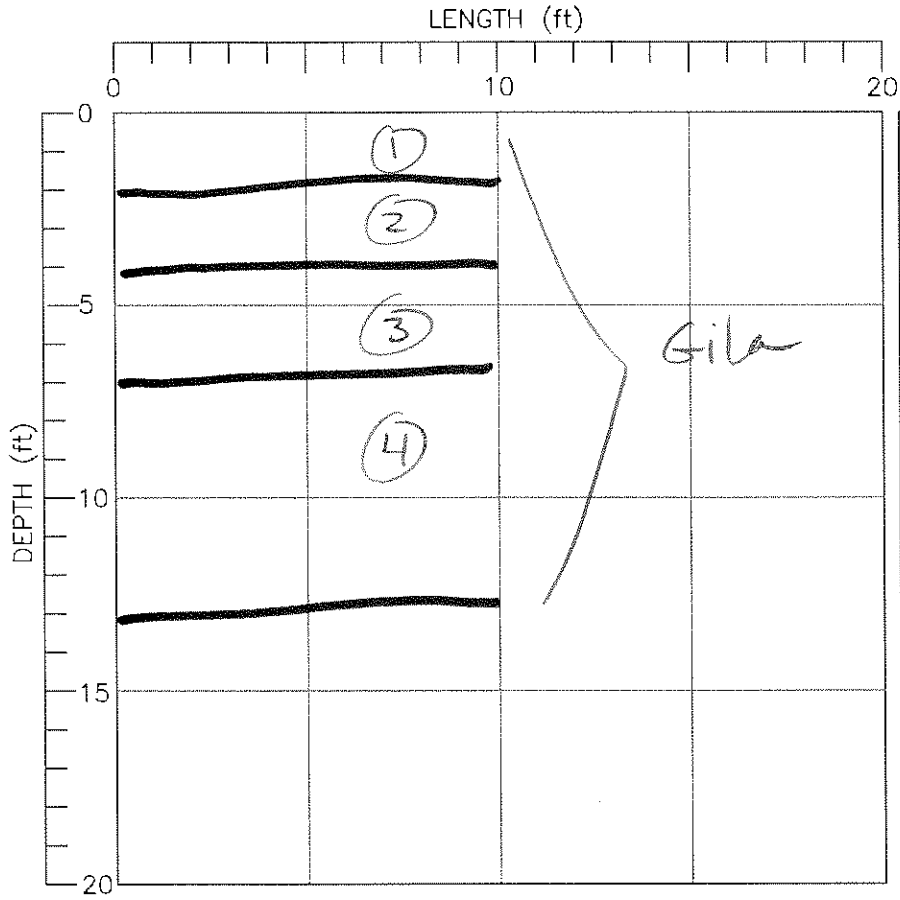
TEST PIT ID TP 1B-3

TEMP ___ °F WEATHER Sunny, Cold | ENGINEER D Buscher | OPERATOR L. Bussey

EQUIPMENT 325 B Ext | CONTRACTOR PB/M3 | DATE 2/3/05

ELEVATION ___ | DATUM ___ | JOB 1 borrow area

LOCATION 6750497 / 3614291 (NAD 27)



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-2' Very dark brown sandy clay over, 7% grl, 2% cbls over dark brown clay (1.5-2')

(2) 2-4' brown sandy clay loam, 40% grl of mixed sizes, 5% cbls most are 4-7" long

(3) 4-7' brown coarse sandy loam, 45% grl of mixed sizes, 5% cbls, most are 3-6"

(4) 7-13' brown sandy loam, 55-60% grl of mixed sizes, 4% grl most are 3-6" long - contains lenses of sandy clay loam.

SAMPLES	
NO.	DESCRIPTION
–	– TP 1B 3 0-2'
–	– 2-4'
	4-7'
	7-13'

SPECIAL NOTES:

– Photo 59 pit

Photo 60 pit

Photo 61 piles 2-4'

Photo 62 piles 4-13'

FIELD TEST PIT LOG

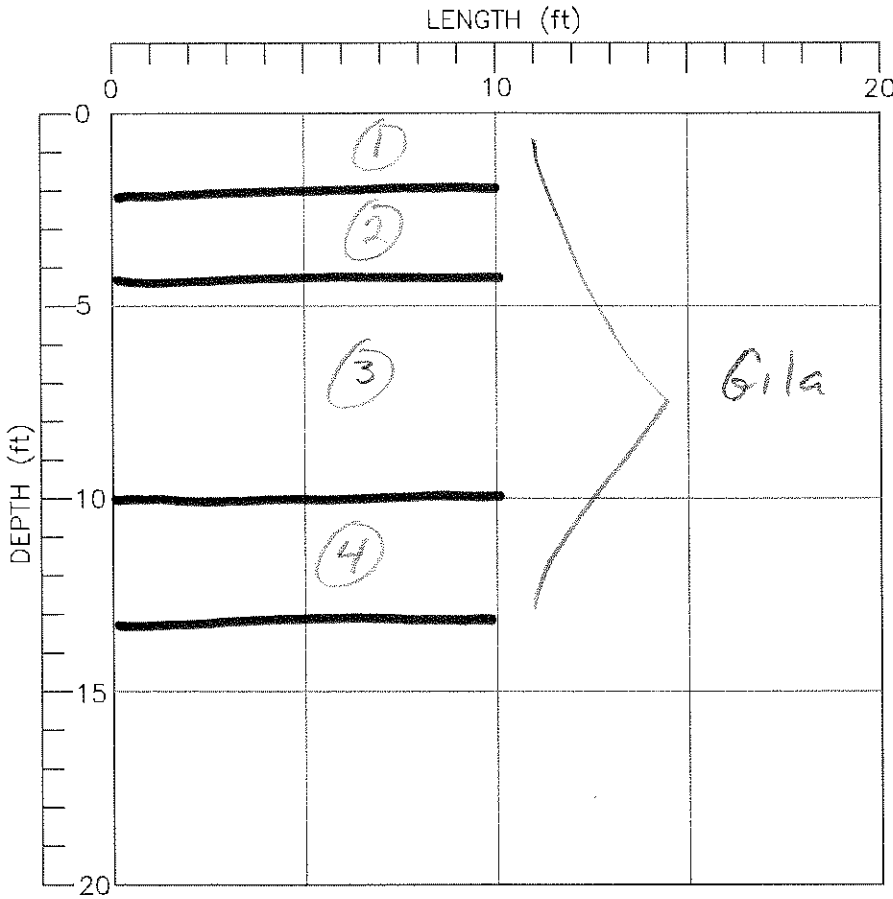
TEST PIT TP1B-4

TEMP ___ °F WEATHER Sunny cold | ENGINEER D Buscher | OPERATOR L. Bussey

EQUIPMENT 325 B cat | CONTRACTOR PD/M3 | DATE 2/3/05

ELEVATION ___ | DATUM ___ | JOB 1 borrow area

LOCATION 0750651 / 3614683 (NAD 27)



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-2' very dark brown coarse sandy loam, 18% fine + med. gravel, 3% cobbles.

(2) 2-4' brown Sandy clay loam, 15% grl of mixed sizes, 3% cobbles most are 3-5" long.

(3) 4-10' brown loamy sand + sandy loam, 60-65% gravel of mixed sizes, 10% cbls most are 3-7", <1-1% stones

(4) 10-13' brown loamy sand, 50% grl of mixed sizes, 10% cbls most are 3-7" long, <1% stones.

SAMPLES	
NO.	DESCRIPTION
–	– TPIB4 0-2'
–	– 2-4'
	4-10'
	10-13'

SPECIAL NOTES:

- Photo 63 pit
Photo 64

FIELD TEST PIT LOG

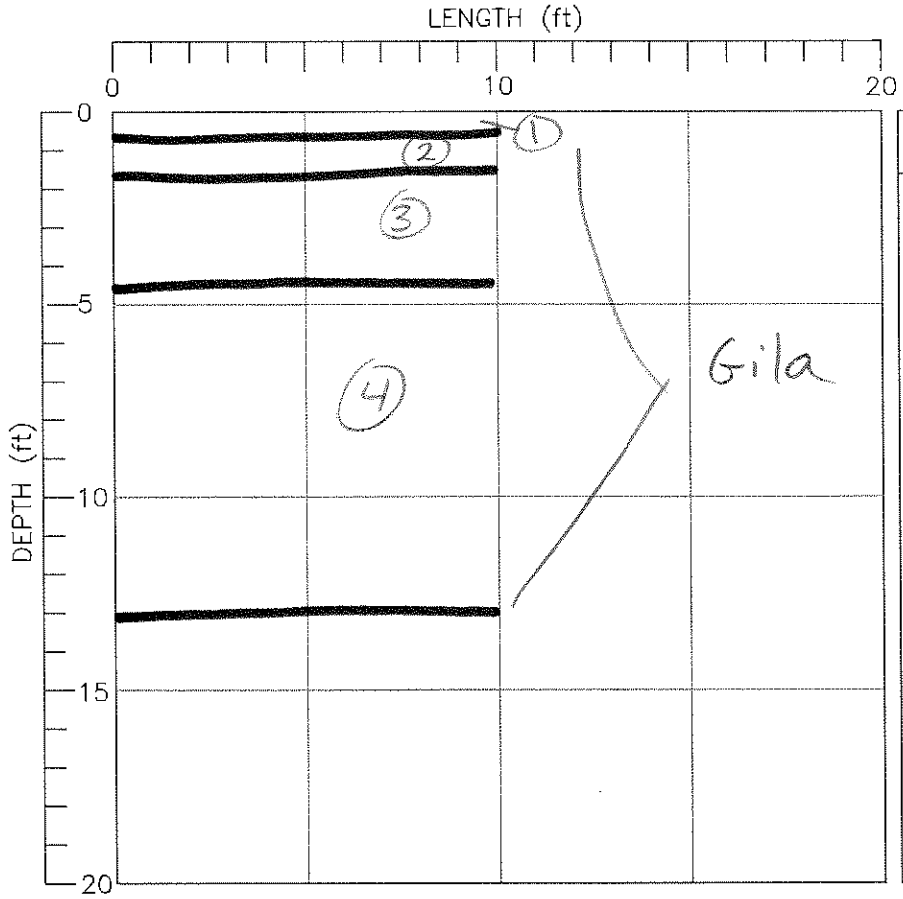
TEST PIT TP 1B-5

TEMP ___ °F WEATHER ___ ENGINEER D Buscher OPERATOR L. Bussey

EQUIPMENT 325 B Cat CONTRACTOR PD/MT DATE 2/3/05

ELEVATION ___ DATUM ___ JOB 1 borrow area

LOCATION 0750552 / 3614970 (NAD 27)



LITHOLOGIC DESCRIPTIONS AND EXCAVATION NOTES

(1) 0-7" very dark brown sandy clay loam, 7% grl of mixed sizes.

(2) 7"-1.5' reddish brown sandy clay, 10% grl most are fine & medium, 2% cbls,

(3) 1.5-4.5' brown coarse sandy loam, 40% grl of mixed sizes, 5% cbls most are 3-7" long, 1% stones up to 16",

(4) 4.5-13' brown coarse sandy loam, 55-65% grl of mixed sizes, 15% cobbles most are 3-6" long, 1% stones, <1% boulders up to 26"

SAMPLES	
NO.	DESCRIPTION
–	–
–	–

SPECIAL NOTES:

–

APPENDIX B

LABORATORY REPORTS

APPENDIX B-1

5A STOCKPILE LABORATORY REPORT

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
Toll Free 800.735.4489 * 406.252.6325 * FAX 406.252.6069 * eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-001
Client Sample ID: TP5A2, 0.25-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	76	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	15	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	3	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.23	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:03 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 15:00 / srm
Organic Matter	0.47	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 10:19 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 10:19 / car
Copper	1.4	mg/kg		0.1		SW6020	02/24/05 10:19 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 10:19 / car
Manganese	0.6	mg/kg		0.1		SW6020	02/24/05 10:19 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 10:19 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 10:19 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 10:19 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
Toll Free 800.735.4489 * 406.252.6325 * FAX 406.252.6069 * eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-002
Client Sample ID: TP5A2, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	79	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	12	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	5	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.90	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.18	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.2	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:04 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:47 / srm
Organic Matter	0.62	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 11:17 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 11:17 / car
Copper	1.9	mg/kg		0.1		SW6020	02/24/05 11:17 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 11:17 / car
Manganese	0.7	mg/kg		0.1		SW6020	02/24/05 11:17 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 11:17 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 11:17 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 11:17 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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Toll Free 800.735.4489 * 406.252.6325 * FAX 406.252.6069 * eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-003
Client Sample ID: TP5A3, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	75	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	15	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	10	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	5	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.60	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.31	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	02/23/05 10:06 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:47 / srm
Organic Matter	0.26	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.04	mg/kg		0.02		SW6020	02/24/05 11:24 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 11:24 / car
Copper	2.0	mg/kg		0.1		SW6020	02/24/05 11:24 / car
Lead	0.4	mg/kg		0.1		SW6020	02/24/05 11:24 / car
Manganese	0.8	mg/kg		0.1		SW6020	02/24/05 11:24 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 11:24 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 11:24 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 11:24 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-004
Client Sample ID: TP5A3, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	79	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	11	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	10	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	5	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.25	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.1	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	02/23/05 10:07 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:48 / srm
Organic Matter	0.29	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.04	mg/kg		0.02		SW6020	02/24/05 11:31 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 11:31 / car
Copper	1.4	mg/kg		0.1		SW6020	02/24/05 11:31 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 11:31 / car
Manganese	0.5	mg/kg		0.1		SW6020	02/24/05 11:31 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 11:31 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 11:31 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 11:31 / car

Report Definitions:
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QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-005
Client Sample ID: TP5A4, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	79	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	13	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	8	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	5	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	LS					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.43	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	4	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:09 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:49 / srm
Organic Matter	0.40	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 11:38 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 11:38 / car
Copper	1.2	mg/kg		0.1		SW6020	02/24/05 11:38 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 11:38 / car
Manganese	0.6	mg/kg		0.1		SW6020	02/24/05 11:38 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 11:38 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 11:38 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 11:38 / car

Report Definitions:
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ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-006
Client Sample ID: TP5A4, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	79	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	13	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	8	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	6	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	LS					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.33	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	6	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.6	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 10:10 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:49 / srm
Organic Matter	0.31	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 11:46 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 11:46 / car
Copper	1.5	mg/kg		0.1		SW6020	02/24/05 11:46 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 11:46 / car
Manganese	0.7	mg/kg		0.1		SW6020	02/24/05 11:46 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 11:46 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 11:46 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 11:46 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-007
Client Sample ID: TP5A5, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	74	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	15	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	11	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	5	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.72	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.5	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	3	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.04	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:11 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:50 / srm
Organic Matter	0.41	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 11:53 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 11:53 / car
Copper	7.8	mg/kg		0.1		SW6020	02/24/05 11:53 / car
Lead	0.4	mg/kg		0.1		SW6020	02/24/05 11:53 / car
Manganese	4.1	mg/kg		0.1		SW6020	02/24/05 11:53 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 11:53 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 11:53 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 11:53 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-008
Client Sample ID: TP5A5, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	79	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	13	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	8	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	LS					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.49	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.3	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	4	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:13 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:52 / srm
Organic Matter	0.21	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.04	mg/kg		0.02		SW6020	02/24/05 12:00 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 12:00 / car
Copper	2.2	mg/kg		0.1		SW6020	02/24/05 12:00 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 12:00 / car
Manganese	1.0	mg/kg		0.1		SW6020	02/24/05 12:00 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 12:00 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 12:00 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 12:00 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-009
Client Sample ID: TP5A6, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	76	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	15	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	5	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.29	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.9	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:14 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:53 / srm
Organic Matter	0.24	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.04	mg/kg		0.02		SW6020	02/24/05 12:36 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 12:36 / car
Copper	4.6	mg/kg		0.1		SW6020	02/24/05 12:36 / car
Lead	0.6	mg/kg		0.1		SW6020	02/24/05 12:36 / car
Manganese	1.1	mg/kg		0.1		SW6020	02/24/05 12:36 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 12:36 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 12:36 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 12:36 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-010
Client Sample ID: TP5A6, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	55	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	83	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	10	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	7	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	6	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	LS					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.70	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.47	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.3	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 10:16 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:54 / srm
Organic Matter	0.28	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.05	mg/kg		0.02		SW6020	02/24/05 12:43 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 12:43 / car
Copper	1.1	mg/kg		0.1		SW6020	02/24/05 12:43 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 12:43 / car
Manganese	0.6	mg/kg		0.1		SW6020	02/24/05 12:43 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 12:43 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 12:43 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 12:43 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-011
Client Sample ID: TP5A18, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	73	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	17	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	10	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	2	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.64	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	21.3	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	3	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.06	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	13	mg/kg		1		ASA24-5	02/23/05 10:23 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:56 / srm
Organic Matter	0.52	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.05	mg/kg		0.02		SW6020	02/24/05 12:58 / car
Cadmium	0.1	mg/kg		0.1		SW6020	02/24/05 12:58 / car
Copper	99.4	mg/kg		0.1		SW6010B	02/25/05 11:52 / rlh
Lead	0.5	mg/kg		0.1		SW6020	02/24/05 12:58 / car
Manganese	9.5	mg/kg		0.1		SW6020	02/24/05 12:58 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 12:58 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 12:58 / car
Nickel	0.1	mg/kg		0.1		SW6020	02/24/05 12:58 / car

Report Definitions:
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-012
Client Sample ID: TP5A18, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	73	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	15	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	12	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.40	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.93	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	21.3	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	3	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	3	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	0	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.14	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.04	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.08	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.3	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	17	mg/kg		1		ASA24-5	02/23/05 10:24 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:56 / srm
Organic Matter	0.16	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.04	mg/kg		0.02		SW6020	02/24/05 13:26 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 13:26 / car
Copper	187	mg/kg		0.1		SW6010B	02/25/05 11:56 / rlh
Lead	0.4	mg/kg		0.1		SW6020	02/24/05 13:26 / car
Manganese	3.0	mg/kg		0.1		SW6020	02/24/05 13:26 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 13:26 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 13:26 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 13:26 / car

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ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-013
Client Sample ID: TP5A20, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	73	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	16	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	11	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	0	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.70	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.15	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	17.7	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	6	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.6	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	13	mg/kg		1		ASA24-5	02/23/05 10:25 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:57 / srm
Organic Matter	0.22	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.02	mg/kg		0.02		SW6020	02/24/05 14:55 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 14:55 / car
Copper	15.3	mg/kg		0.1		SW6020	02/24/05 14:55 / car
Lead	0.4	mg/kg		0.1		SW6020	02/24/05 14:55 / car
Manganese	6.1	mg/kg		0.1		SW6020	02/24/05 14:55 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 14:55 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 14:55 / car
Nickel	0.1	mg/kg		0.1		SW6020	02/24/05 14:55 / car

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-014
Client Sample ID: TP5A20, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	75	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	16	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	1	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.50	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.16	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	17.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	02/23/05 10:27 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:58 / srm
Organic Matter	0.26	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		0.02		SW6020	02/24/05 15:03 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 15:03 / car
Copper	3.8	mg/kg		0.1		SW6020	02/24/05 15:03 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 15:03 / car
Manganese	0.9	mg/kg		0.1		SW6020	02/24/05 15:03 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 15:03 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 15:03 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 15:03 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-015
Client Sample ID: TP5A21, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	48	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	67	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	20	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	13	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	2	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.20	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.24	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	6	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.06	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.6	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	16	mg/kg		1		ASA24-5	02/23/05 10:28 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:59 / srm
Organic Matter	0.24	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		0.02		SW6020	02/24/05 15:10 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 15:10 / car
Copper	20.4	mg/kg		0.1		SW6020	02/24/05 15:10 / car
Lead	0.7	mg/kg		0.1		SW6020	02/24/05 15:10 / car
Manganese	3.5	mg/kg		0.1		SW6020	02/24/05 15:10 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 15:10 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 15:10 / car
Nickel	0.1	mg/kg		0.1		SW6020	02/24/05 15:10 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-016
Client Sample ID: TP5A21, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	44	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	64	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	21	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	15	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	2	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.00	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.36	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	24.1	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	0	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.19	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.07	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.12	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	02/23/05 10:30 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 13:59 / srm
Organic Matter	0.24	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		0.02		SW6020	02/24/05 15:17 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 15:17 / car
Copper	23.3	mg/kg		0.1		SW6020	02/24/05 15:17 / car
Lead	0.7	mg/kg		0.1		SW6020	02/24/05 15:17 / car
Manganese	4.8	mg/kg		0.1		SW6020	02/24/05 15:17 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 15:17 / car
Molybdenum	0.2	mg/kg		0.1		SW6020	02/24/05 15:17 / car
Nickel	0.1	mg/kg		0.1		SW6020	02/24/05 15:17 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-017
Client Sample ID: TP5A24, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	44	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	69	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	16	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	15	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.40	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.38	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	22.9	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	3	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	1	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.13	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.05	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.05	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	18	mg/kg		1		ASA24-5	02/23/05 10:31 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:00 / srm
Organic Matter	0.40	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		0.02		SW6020	02/24/05 15:24 / car
Cadmium	0.2	mg/kg		0.1		SW6020	02/24/05 15:24 / car
Copper	46.9	mg/kg		0.1		SW6010B	02/25/05 12:00 / rlh
Lead	1.3	mg/kg		0.1		SW6020	02/24/05 15:24 / car
Manganese	17.9	mg/kg		0.1		SW6020	02/24/05 15:24 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 15:24 / car
Molybdenum	0.2	mg/kg		0.1		SW6020	02/24/05 15:24 / car
Nickel	0.2	mg/kg		0.1		SW6020	02/24/05 15:24 / car

Report Definitions:
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ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-018
Client Sample ID: TP5A24, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	75	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	14	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	11	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.70	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.62	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	21.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	4	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.07	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.04	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	11	mg/kg		1		ASA24-5	02/23/05 10:32 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:02 / srm
Organic Matter	0.29	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.02	mg/kg		0.02		SW6020	02/24/05 15:31 / car
Cadmium	0.2	mg/kg		0.1		SW6020	02/24/05 15:31 / car
Copper	34.2	mg/kg		0.1		SW6020	02/24/05 15:31 / car
Lead	0.9	mg/kg		0.1		SW6020	02/24/05 15:31 / car
Manganese	9.6	mg/kg		0.1		SW6020	02/24/05 15:31 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 15:31 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 15:31 / car
Nickel	0.2	mg/kg		0.1		SW6020	02/24/05 15:31 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-019
Client Sample ID: TP5A7, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	73	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	18	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.12	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.3	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	4	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	02/23/05 10:34 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:03 / srm
Organic Matter	0.22	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 16:00 / car
Cadmium	0.1	mg/kg		0.1		SW6020	02/24/05 16:00 / car
Copper	10.8	mg/kg		0.1		SW6020	02/24/05 16:00 / car
Lead	0.5	mg/kg		0.1		SW6020	02/24/05 16:00 / car
Manganese	1.1	mg/kg		0.1		SW6020	02/24/05 16:00 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 16:00 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 16:00 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 16:00 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-020
Client Sample ID: TP5A7, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	75	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	16	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	2	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.60	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.21	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.1	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	4	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.05	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.05	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	02/23/05 10:35 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:03 / srm
Organic Matter	0.31	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/25/05 11:43 / car
Cadmium	0.1	mg/kg		0.1		SW6020	02/24/05 18:42 / car
Copper	18.6	mg/kg		0.1		SW6020	02/25/05 11:43 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 18:42 / car
Manganese	0.7	mg/kg		0.1		SW6020	02/25/05 11:43 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 18:42 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 18:42 / car
Nickel	ND	mg/kg		0.1		SW6020	02/25/05 11:43 / car

Report Definitions:
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QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-021
Client Sample ID: TP5A8, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	51	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	78	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	13	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.38	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	20.7	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:42 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:06 / srm
Organic Matter	0.26	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 18:56 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 18:56 / car
Copper	3.2	mg/kg		0.1		SW6020	02/24/05 18:56 / car
Lead	0.5	mg/kg		0.1		SW6020	02/24/05 18:56 / car
Manganese	1.2	mg/kg		0.1		SW6020	02/24/05 18:56 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 18:56 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 18:56 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 18:56 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-022
Client Sample ID: TP5A8, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	75	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	14	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	11	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	3	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.40	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.45	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	21.1	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	6	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	6	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.6	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:44 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:06 / srm
Organic Matter	0.28	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/25/05 11:34 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 19:25 / car
Copper	2.7	mg/kg		0.1		SW6020	02/25/05 11:34 / car
Lead	0.5	mg/kg		0.1		SW6020	02/24/05 19:25 / car
Manganese	1.0	mg/kg		0.1		SW6020	02/25/05 11:34 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 19:25 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 19:25 / car
Nickel	ND	mg/kg		0.1		SW6020	02/25/05 11:34 / car

Report Definitions:
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ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-023
Client Sample ID: TP5A9, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	80	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	13	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	7	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	3	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	LS					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.14	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 10:45 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:07 / srm
Organic Matter	0.59	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 20:01 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 20:01 / car
Copper	1.9	mg/kg		0.1		SW6020	02/24/05 20:01 / car
Lead	0.4	mg/kg		0.1		SW6020	02/24/05 20:01 / car
Manganese	0.7	mg/kg		0.1		SW6020	02/24/05 20:01 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 20:01 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 20:01 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 20:01 / car

Report Definitions:
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QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-024
Client Sample ID: TP5A9, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	76	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	16	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	8	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	3	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.50	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.28	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	19.1	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	02/23/05 10:46 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:08 / srm
Organic Matter	0.24	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.04	mg/kg		0.02		SW6020	02/24/05 20:08 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 20:08 / car
Copper	3.3	mg/kg		0.1		SW6020	02/24/05 20:08 / car
Lead	0.4	mg/kg		0.1		SW6020	02/24/05 20:08 / car
Manganese	1.4	mg/kg		0.1		SW6020	02/24/05 20:08 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 20:08 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 20:08 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 20:08 / car

Report Definitions:
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ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-025
Client Sample ID: TP5A11, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	54	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	73	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	16	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	11	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.50	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	1.85	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	20.9	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	6	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.07	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.6	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	13	mg/kg		1		ASA24-5	02/23/05 10:48 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:08 / srm
Organic Matter	0.29	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 20:16 / car
Cadmium	0.1	mg/kg		0.1		SW6020	02/24/05 20:16 / car
Copper	28.1	mg/kg		0.1		SW6020	02/24/05 20:16 / car
Lead	0.6	mg/kg		0.1		SW6020	02/24/05 20:16 / car
Manganese	9.9	mg/kg		0.1		SW6020	02/24/05 20:16 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 20:16 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 20:16 / car
Nickel	0.1	mg/kg		0.1		SW6020	02/24/05 20:16 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-026
Client Sample ID: TP5A11, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	73	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	16	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	11	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	2.29	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	22.6	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	1	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	4	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.06	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	0.01	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	15	mg/kg		1		ASA24-5	02/23/05 10:49 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA38-3	02/23/05 14:09 / srm
Organic Matter	0.53	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 20:23 / car
Cadmium	0.1	mg/kg		0.1		SW6020	02/24/05 20:23 / car
Copper	27.3	mg/kg		0.1		SW6020	02/24/05 20:23 / car
Lead	0.6	mg/kg		0.1		SW6020	02/24/05 20:23 / car
Manganese	8.8	mg/kg		0.1		SW6020	02/24/05 20:23 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 20:23 / car
Molybdenum	ND	mg/kg		0.1		SW6020	02/24/05 20:23 / car
Nickel	0.1	mg/kg		0.1		SW6020	02/24/05 20:23 / car

Report Definitions:
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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-027
Client Sample ID: TP5A16, 0-6 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	56	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	77	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	14	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	9	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	SL					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.70	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.12	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.0	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	4	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	4	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	02/23/05 10:51 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:10 / srm
Organic Matter	0.36	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 20:30 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 20:30 / car
Copper	1.7	mg/kg		0.1		SW6020	02/24/05 20:30 / car
Lead	0.4	mg/kg		0.1		SW6020	02/24/05 20:30 / car
Manganese	0.6	mg/kg		0.1		SW6020	02/24/05 20:30 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 20:30 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 20:30 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 20:30 / car

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 5A Stockpile
Lab ID: B05020544-028
Client Sample ID: TP5A16, 6-12 ft

Report Date: 03/03/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	56	wt%		2		ASA15-5	02/24/05 10:07 / srm
Sand	79	%		1		ASA15-5	02/24/05 10:07 / srm
Silt	13	%		1		ASA15-5	02/24/05 10:07 / srm
Clay	8	%		1		ASA15-5	02/24/05 10:07 / srm
Very Fine Sand	4	wt%				ASA15-5	02/24/05 10:07 / srm
Texture	LS					ASA15-5	02/24/05 10:07 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:07 / srm
Conductivity, sat. paste	0.15	mmhos/cm		0.01		ASA10-3	02/24/05 10:07 / srm
Saturation	18.2	%		0.1		USDA27a	02/24/05 10:07 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	5	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid Potential	0	t/kt		1		Sobek Modified	03/02/05 08:31 / srm
Acid/Base Potential	5	t/kt				Sobek Modified	03/02/05 08:31 / srm
Sulfur, Total	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Hot Water Extractable	0.03	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, HNO3 Extractable	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	03/02/05 08:31 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/24/05 10:07 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 10:52 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:12 / srm
Organic Matter	0.28	%		0.02		ASA29-3	02/25/05 13:15 / srm
METALS, ABDTPA EXTRACTABLE							
Arsenic	0.03	mg/kg		0.02		SW6020	02/24/05 20:37 / car
Cadmium	ND	mg/kg		0.1		SW6020	02/24/05 20:37 / car
Copper	2.1	mg/kg		0.1		SW6020	02/24/05 20:37 / car
Lead	0.3	mg/kg		0.1		SW6020	02/24/05 20:37 / car
Manganese	0.8	mg/kg		0.1		SW6020	02/24/05 20:37 / car
Mercury	ND	mg/kg		0.1		SW6020	02/24/05 20:37 / car
Molybdenum	0.1	mg/kg		0.1		SW6020	02/24/05 20:37 / car
Nickel	ND	mg/kg		0.1		SW6020	02/24/05 20:37 / car

Report Definitions:
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QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

APPENDIX B-2

NO. 1 STOCKPILE BORROW LABORATORY REPORT

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-001
Client Sample ID: TP1B1, 0-9 in

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	25	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	63	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	24	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	13	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	1	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.20	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.18	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	18.6	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.3	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	14	mg/kg		1		ASA24-5	02/23/05 10:53 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:13 / srm
Organic Matter	1.14	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-002
Client Sample ID: TP1B1, 9 in-6 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	77	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	10	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	13	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	3	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.47	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	21.8	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	02/23/05 10:55 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:13 / srm
Organic Matter	0.34	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-003
Client Sample ID: TP1B1, 6-11 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	49	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	77	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	12	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	11	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	5	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.90	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.58	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	21.1	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.4	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	02/23/05 11:02 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:15 / srm
Organic Matter	0.22	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-004
Client Sample ID: TP1B1, 11-12 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	73	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	14	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	13	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	3	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.92	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	21.1	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.5	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	02/23/05 11:03 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:16 / srm
Organic Matter	0.45	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-005
Client Sample ID: TP1B2, 0-1 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	30	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	63	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	24	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	13	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.38	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	21.4	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.7	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	14	mg/kg		1		ASA24-5	02/23/05 11:05 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA38-3	02/23/05 14:17 / srm
Organic Matter	1.76	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-006
Client Sample ID: TP1B2, 1-4 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	37	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	73	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	14	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	13	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.49	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	22.8	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	1.0	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	02/23/05 11:06 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:18 / srm
Organic Matter	0.41	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-007
Client Sample ID: TP1B2, 4-8 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	40	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	78	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	15	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	7	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	2	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	LS					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.50	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.57	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	22.2	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	1.5	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	1	mg/kg		1		ASA24-5	02/23/05 11:08 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:18 / srm
Organic Matter	0.38	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-008
Client Sample ID: TP1B2, 8-13 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	40	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	83	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	10	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	7	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	3	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	LS					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.74	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	23.3	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	1.0	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 11:09 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:19 / srm
Organic Matter	0.38	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-009
Client Sample ID: TP1B3, 0-2 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	23	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	49	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	22	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	29	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SCL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.26	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	41.3	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.8	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 11:10 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA38-3	02/23/05 14:20 / srm
Organic Matter	2.00	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-010
Client Sample ID: TP1B3, 2-4 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	37	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	61	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	19	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	20	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	1	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SCL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.30	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.51	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	31.5	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	1.8	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	ND	mg/kg		1		ASA24-5	02/23/05 11:12 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:22 / srm
Organic Matter	0.67	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-011
Client Sample ID: TP1B3, 4-7 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	42	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	72	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	18	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	10	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	6	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.80	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.64	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	28.4	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	3.6	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	1	mg/kg		1		ASA24-5	02/23/05 11:13 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:23 / srm
Organic Matter	0.16	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-012
Client Sample ID: TP1B3, 7-13 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	52	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	59	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	18	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	23	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SCL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.00	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	2.82	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	37.2	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	2.0	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	02/23/05 11:15 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:23 / srm
Organic Matter	0.12	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-013
Client Sample ID: TP1B4, 0-2 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	21	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	67	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	22	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	11	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.60	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.41	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	19.8	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.6	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	02/23/05 11:22 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA38-3	02/23/05 14:25 / srm
Organic Matter	1.12	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-014
Client Sample ID: TP1B4, 2-4 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	40	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	71	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	11	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	18	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.10	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.57	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	28.5	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.9	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	1	mg/kg		1		ASA24-5	02/23/05 11:23 / srm
Nitrate as N, KCL Extract	1	mg/kg		1		ASA38-3	02/23/05 14:26 / srm
Organic Matter	0.40	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-015
Client Sample ID: TP1B4, 4-10 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	79	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	9	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	12	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	1	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.20	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	1.26	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	22.1	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	1.0	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 11:24 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:27 / srm
Organic Matter	0.21	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-016
Client Sample ID: TP1B4, 10-13 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	39	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	82	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	8	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	10	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	2	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	LS					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.90	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.27	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	19.8	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.7	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	02/23/05 11:26 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:27 / srm
Organic Matter	0.43	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-017
Client Sample ID: TP1B5, 0-7 in

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	21	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	58	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	23	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	19	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	2	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.60	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.37	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	25.3	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.8	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 11:27 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:28 / srm
Organic Matter	2.72	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-018
Client Sample ID: TP1B5, 7 in-1.5 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	33	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	50	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	16	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	34	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SCL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.10	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.19	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	42.1	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.7	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	02/23/05 11:29 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:29 / srm
Organic Matter	1.71	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-019
Client Sample ID: TP1B5, 1.5-4.5 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	41	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	67	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	16	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	17	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	6.40	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	0.31	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	24.3	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	0.8	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	ND	mg/kg		1		ASA24-5	02/23/05 11:30 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:30 / srm
Organic Matter	0.57	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: 1 borrow, Tyrone
Lab ID: B05020549-020
Client Sample ID: TP1B5, 4.5-13 ft

Report Date: 03/01/05
Collection Date: 02/04/05
Date Received: 02/09/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	47	wt%		2		ASA15-5	02/24/05 10:14 / srm
Sand	75	%		1		ASA15-5	02/25/05 13:13 / srm
Silt	12	%		1		ASA15-5	02/25/05 13:13 / srm
Clay	13	%		1		ASA15-5	02/25/05 13:13 / srm
Very Fine Sand	0	wt%				ASA15-5	02/25/05 13:13 / srm
Texture	SL					ASA15-5	02/25/05 13:13 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.60	s.u.		0.10		ASAM10-3.2	02/24/05 10:14 / srm
Conductivity, sat. paste	1.41	mmhos/cm		0.01		ASA10-3	02/24/05 10:14 / srm
Saturation	24.3	%		0.1		USDA27a	02/24/05 10:14 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	1.0	%		0.1		USDA23c	02/25/05 13:13 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	02/23/05 11:31 / srm
Nitrate as N, KCL Extract	ND	mg/kg		1		ASA38-3	02/23/05 14:32 / srm
Organic Matter	0.26	%		0.02		ASA29-3	02/25/05 13:13 / srm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

APPENDIX B-3

LEACHED CAP LABORATORY REPORT

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Project #0131595002 Condition 79 Leached Cap
Lab ID: B05071377-001
Client Sample ID: C79LC-1

Report Date: 08/02/05
Collection Date: 07/07/05
Date Received: 07/20/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	50	wt%		2		ASA15-5	07/27/05 11:11 / srm
Sand	47	%		1		ASA15-5	07/27/05 11:01 / srm
Silt	28	%		1		ASA15-5	07/27/05 11:01 / srm
Clay	25	%		1		ASA15-5	07/27/05 11:01 / srm
Texture	L					ASA15-5	07/27/05 11:01 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.00	s.u.		0.10		ASAM10-3.2	07/27/05 11:01 / srm
Conductivity, sat. paste	0.29	mmhos/cm		0.01		ASA10-3	07/27/05 11:01 / srm
Saturation	36.8	%		0.1		USDA27a	07/27/05 11:01 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	1.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid Potential	2.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid/Base Potential	0	t/kt				Sobek Modified	07/27/05 13:36 / srm
Sulfur, Total	0.07	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HNO3 Extractable	0.03	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Residual	0.01	%		0.01		Sobek Modified	07/27/05 13:36 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
METALS, WATER EXTRACTABLE (2:1)							
Selenium	ND	mg/kg		0.05		SW6020	07/28/05 01:30 / rlh
Boron	ND	mg/kg	D	0.02		SW6010B	07/28/05 08:56 / jjw
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		1		SW6020	07/28/05 22:57 / rlh
Arsenic	ND	mg/kg		1		SW6010B	07/29/05 13:23 / jjw
Cadmium	0.54	mg/kg		0.01		SW6020	07/28/05 04:54 / rlh
Cadmium	0.60	mg/kg		0.01		SW6020	07/28/05 22:57 / rlh
Cadmium	0.60	mg/kg		0.01		SW6010B	07/29/05 13:23 / jjw
Copper	270	mg/kg		1		SW6010B	07/29/05 13:23 / jjw
Lead	0.20	mg/kg		0.01		SW6020	07/28/05 04:54 / rlh
Lead	0.21	mg/kg		0.01		SW6020	07/28/05 22:57 / rlh
Manganese	36.4	mg/kg		0.01		SW6010B	07/29/05 13:23 / jjw
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 04:54 / rlh
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 22:57 / rlh
Molybdenum	0.22	mg/kg	D	0.02		SW6020	07/28/05 04:54 / rlh
Molybdenum	ND	mg/kg		0.01		SW6010B	07/29/05 13:23 / jjw
Nickel	0.25	mg/kg	D	0.02		SW6010B	07/29/05 13:23 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Project #0131595002 Condition 79 Leached Cap
Lab ID: B05071377-002
Client Sample ID: C79LC-2

Report Date: 08/02/05
Collection Date: 07/07/05
Date Received: 07/20/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	53	wt%		2		ASA15-5	07/27/05 11:11 / srm
Sand	60	%		1		ASA15-5	07/27/05 11:01 / srm
Silt	19	%		1		ASA15-5	07/27/05 11:01 / srm
Clay	21	%		1		ASA15-5	07/27/05 11:01 / srm
Texture	SCL					ASA15-5	07/27/05 11:01 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.60	s.u.		0.10		ASAM10-3.2	07/27/05 11:01 / srm
Conductivity, sat. paste	0.37	mmhos/cm		0.01		ASA10-3	07/27/05 11:01 / srm
Saturation	32.3	%		0.1		USDA27a	07/27/05 11:01 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	2.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid Potential	2.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid/Base Potential	1	t/kt				Sobek Modified	07/27/05 13:36 / srm
Sulfur, Total	0.10	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Hot Water Extractable	0.04	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HNO3 Extractable	0.05	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Residual	ND	%		0.01		Sobek Modified	07/27/05 13:36 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
METALS, WATER EXTRACTABLE (2:1)							
Selenium	ND	mg/kg		0.05		SW6020	07/28/05 01:37 / rlh
Boron	ND	mg/kg	D	0.02		SW6010B	07/28/05 09:00 / jjw
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		1		SW6020	07/28/05 23:04 / rlh
Arsenic	ND	mg/kg		1		SW6010B	07/29/05 13:27 / jjw
Cadmium	0.27	mg/kg		0.01		SW6020	07/28/05 05:01 / rlh
Cadmium	0.30	mg/kg		0.01		SW6020	07/28/05 23:04 / rlh
Cadmium	0.30	mg/kg		0.01		SW6010B	07/29/05 13:27 / jjw
Copper	110	mg/kg		1		SW6010B	07/29/05 13:27 / jjw
Lead	0.34	mg/kg		0.01		SW6020	07/28/05 05:01 / rlh
Lead	0.36	mg/kg		0.01		SW6020	07/28/05 23:04 / rlh
Manganese	23.5	mg/kg		0.01		SW6010B	07/29/05 13:27 / jjw
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 05:01 / rlh
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 23:04 / rlh
Molybdenum	0.37	mg/kg	D	0.02		SW6020	07/28/05 05:01 / rlh
Molybdenum	ND	mg/kg		0.01		SW6010B	07/29/05 13:27 / jjw
Nickel	0.09	mg/kg	D	0.02		SW6010B	07/29/05 13:27 / jjw

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MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Project #0131595002 Condition 79 Leached Cap
Lab ID: B05071377-003
Client Sample ID: C79LC-3

Report Date: 08/02/05
Collection Date: 07/07/05
Date Received: 07/20/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	28	wt%		2		ASA15-5	07/27/05 11:11 / srm
Sand	56	%		1		ASA15-5	07/27/05 11:01 / srm
Silt	21	%		1		ASA15-5	07/27/05 11:01 / srm
Clay	23	%		1		ASA15-5	07/27/05 11:01 / srm
Texture	SCL					ASA15-5	07/27/05 11:01 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.80	s.u.		0.10		ASAM10-3.2	07/27/05 11:01 / srm
Conductivity, sat. paste	0.39	mmhos/cm		0.01		ASA10-3	07/27/05 11:01 / srm
Saturation	29.3	%		0.1		USDA27a	07/27/05 11:01 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	1.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid Potential	2.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid/Base Potential	0	t/kt				Sobek Modified	07/27/05 13:36 / srm
Sulfur, Total	0.06	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Hot Water Extractable	ND	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HCl Extractable	0.01	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HNO3 Extractable	0.04	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Residual	0.01	%		0.01		Sobek Modified	07/27/05 13:36 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
METALS, WATER EXTRACTABLE (2:1)							
Selenium	ND	mg/kg		0.05		SW6020	07/28/05 01:44 / rlh
Boron	ND	mg/kg	D	0.02		SW6010B	07/28/05 09:04 / jjw
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		1		SW6020	07/28/05 23:11 / rlh
Arsenic	ND	mg/kg		1		SW6010B	07/29/05 13:31 / jjw
Cadmium	0.06	mg/kg		0.01		SW6020	07/28/05 05:08 / rlh
Cadmium	0.07	mg/kg		0.01		SW6020	07/28/05 23:11 / rlh
Cadmium	0.07	mg/kg		0.01		SW6010B	07/29/05 13:31 / jjw
Copper	145	mg/kg		1		SW6010B	07/29/05 13:31 / jjw
Lead	0.09	mg/kg		0.01		SW6020	07/28/05 05:08 / rlh
Lead	0.09	mg/kg		0.01		SW6020	07/28/05 23:11 / rlh
Manganese	1.24	mg/kg		0.01		SW6010B	07/29/05 13:31 / jjw
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 05:08 / rlh
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 23:11 / rlh
Molybdenum	0.45	mg/kg	D	0.02		SW6020	07/28/05 05:08 / rlh
Molybdenum	ND	mg/kg		0.01		SW6010B	07/29/05 13:31 / jjw
Nickel	0.02	mg/kg	D	0.02		SW6010B	07/29/05 13:31 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Project #0131595002 Condition 79 Leached Cap
Lab ID: B05071377-004
Client Sample ID: C79LC-4

Report Date: 08/02/05
Collection Date: 07/07/05
Date Received: 07/20/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	35	wt%		2		ASA15-5	07/27/05 11:11 / srm
Sand	56	%		1		ASA15-5	07/27/05 11:01 / srm
Silt	21	%		1		ASA15-5	07/27/05 11:01 / srm
Clay	23	%		1		ASA15-5	07/27/05 11:01 / srm
Texture	SCL					ASA15-5	07/27/05 11:01 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.80	s.u.		0.10		ASAM10-3.2	07/27/05 11:01 / srm
Conductivity, sat. paste	1.68	mmhos/cm		0.01		ASA10-3	07/27/05 11:01 / srm
Saturation	30.1	%		0.1		USDA27a	07/27/05 11:01 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid Potential	25	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid/Base Potential	-25	t/kt				Sobek Modified	07/27/05 13:36 / srm
Sulfur, Total	0.83	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Hot Water Extractable	0.02	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HNO3 Extractable	0.40	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Residual	0.41	%		0.01		Sobek Modified	07/27/05 13:36 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
METALS, WATER EXTRACTABLE (2:1)							
Selenium	ND	mg/kg		0.05		SW6020	07/28/05 01:50 / rlh
Boron	ND	mg/kg	D	0.02		SW6010B	07/28/05 09:09 / jjw
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		1		SW6020	07/28/05 23:18 / rlh
Arsenic	ND	mg/kg		1		SW6010B	07/29/05 13:34 / jjw
Cadmium	0.03	mg/kg		0.01		SW6020	07/28/05 23:18 / rlh
Cadmium	0.04	mg/kg		0.01		SW6010B	07/29/05 13:34 / jjw
Copper	102	mg/kg		1		SW6010B	07/29/05 13:34 / jjw
Lead	0.58	mg/kg		0.01		SW6020	07/28/05 23:18 / rlh
Manganese	12.2	mg/kg		0.01		SW6010B	07/29/05 13:34 / jjw
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 23:18 / rlh
Molybdenum	0.21	mg/kg		0.01		SW6010B	07/29/05 13:34 / jjw
Nickel	0.06	mg/kg	D	0.02		SW6010B	07/29/05 13:34 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Project #0131595002 Condition 79 Leached Cap
Lab ID: B05071377-005
Client Sample ID: C79LC-5

Report Date: 08/02/05
Collection Date: 07/07/05
Date Received: 07/20/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	61	wt%		2		ASA15-5	07/27/05 11:11 / srm
Sand	50	%		1		ASA15-5	07/27/05 11:01 / srm
Silt	26	%		1		ASA15-5	07/27/05 11:01 / srm
Clay	24	%		1		ASA15-5	07/27/05 11:01 / srm
Texture	SCL					ASA15-5	07/27/05 11:01 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.50	s.u.		0.10		ASAM10-3.2	07/27/05 11:01 / srm
Conductivity, sat. paste	1.14	mmhos/cm		0.01		ASA10-3	07/27/05 11:01 / srm
Saturation	27.0	%		0.1		USDA27a	07/27/05 11:01 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	2.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid Potential	19	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid/Base Potential	-17	t/kt				Sobek Modified	07/27/05 13:36 / srm
Sulfur, Total	0.66	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Hot Water Extractable	0.05	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HNO3 Extractable	0.49	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Residual	0.12	%		0.01		Sobek Modified	07/27/05 13:36 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
METALS, WATER EXTRACTABLE (2:1)							
Selenium	ND	mg/kg		0.05		SW6020	07/28/05 01:57 / rlh
Boron	ND	mg/kg	D	0.02		SW6010B	07/28/05 09:13 / jjw
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		1		SW6020	07/28/05 23:25 / rlh
Arsenic	ND	mg/kg		1		SW6010B	07/29/05 13:38 / jjw
Cadmium	0.40	mg/kg		0.01		SW6020	07/28/05 23:25 / rlh
Cadmium	0.41	mg/kg		0.01		SW6010B	07/29/05 13:38 / jjw
Copper	170	mg/kg		1		SW6010B	07/29/05 13:38 / jjw
Lead	2.34	mg/kg		0.01		SW6020	07/28/05 23:25 / rlh
Manganese	38.7	mg/kg		0.01		SW6010B	07/29/05 13:38 / jjw
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 23:25 / rlh
Molybdenum	1.29	mg/kg		0.01		SW6010B	07/29/05 13:38 / jjw
Nickel	0.15	mg/kg	D	0.02		SW6010B	07/29/05 13:38 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Project #0131595002 Condition 79 Leached Cap
Lab ID: B05071377-006
Client Sample ID: C79LC-6

Report Date: 08/02/05
Collection Date: 07/07/05
Date Received: 07/20/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	42	wt%		2		ASA15-5	07/27/05 11:11 / srm
Sand	36	%		1		ASA15-5	07/27/05 11:01 / srm
Silt	34	%		1		ASA15-5	07/27/05 11:01 / srm
Clay	30	%		1		ASA15-5	07/27/05 11:01 / srm
Texture	CL					ASA15-5	07/27/05 11:01 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	5.40	s.u.		0.10		ASAM10-3.2	07/27/05 11:01 / srm
Conductivity, sat. paste	0.54	mmhos/cm		0.01		ASA10-3	07/27/05 11:01 / srm
Saturation	26.5	%		0.1		USDA27a	07/27/05 11:01 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	1.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid Potential	9.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid/Base Potential	-7	t/kt				Sobek Modified	07/27/05 13:36 / srm
Sulfur, Total	0.28	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Hot Water Extractable	ND	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HNO3 Extractable	0.09	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Residual	0.19	%		0.01		Sobek Modified	07/27/05 13:36 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
METALS, WATER EXTRACTABLE (2:1)							
Selenium	ND	mg/kg		0.05		SW6020	07/28/05 02:04 / rlh
Boron	ND	mg/kg	D	0.02		SW6010B	07/28/05 09:17 / jjw
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		1		SW6020	07/28/05 23:31 / rlh
Arsenic	ND	mg/kg		1		SW6010B	07/29/05 13:41 / jjw
Cadmium	0.28	mg/kg		0.01		SW6020	07/28/05 23:31 / rlh
Cadmium	0.26	mg/kg		0.01		SW6010B	07/29/05 13:41 / jjw
Copper	99	mg/kg		1		SW6010B	07/29/05 13:41 / jjw
Lead	3.30	mg/kg		0.01		SW6020	07/28/05 23:31 / rlh
Manganese	11.0	mg/kg		0.01		SW6010B	07/29/05 13:41 / jjw
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 23:31 / rlh
Molybdenum	0.24	mg/kg		0.01		SW6010B	07/29/05 13:41 / jjw
Nickel	0.09	mg/kg	D	0.02		SW6010B	07/29/05 13:41 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
Toll Free 800.735.4489 * 406.252.6325 * FAX 406.252.6069 * eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Golder Associates Inc
Project: Project #0131595002 Condition 79 Leached Cap
Lab ID: B05071377-007
Client Sample ID: C79LC-7

Report Date: 08/02/05
Collection Date: 07/07/05
Date Received: 07/20/05
Matrix: Soil

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	40	wt%		2		ASA15-5	07/27/05 11:11 / srm
Sand	46	%		1		ASA15-5	07/27/05 11:01 / srm
Silt	31	%		1		ASA15-5	07/27/05 11:01 / srm
Clay	23	%		1		ASA15-5	07/27/05 11:01 / srm
Texture	L					ASA15-5	07/27/05 11:01 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	4.90	s.u.		0.10		ASAM10-3.2	07/27/05 11:01 / srm
Conductivity, sat. paste	0.49	mmhos/cm		0.01		ASA10-3	07/27/05 11:01 / srm
Saturation	21.7	%		0.1		USDA27a	07/27/05 11:01 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	1.0	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid Potential	15	t/kt		1.0		Sobek Modified	07/27/05 13:36 / srm
Acid/Base Potential	-14	t/kt				Sobek Modified	07/27/05 13:36 / srm
Sulfur, Total	0.50	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Hot Water Extractable	0.03	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HCl Extractable	ND	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, HNO3 Extractable	0.16	%		0.01		Sobek Modified	07/27/05 13:36 / srm
Sulfur, Residual	0.31	%		0.01		Sobek Modified	07/27/05 13:36 / srm
- The acid base potential was calculated from non-sulfate sulfur.							
METALS, WATER EXTRACTABLE (2:1)							
Selenium	ND	mg/kg		0.05		SW6020	07/28/05 02:52 / rlh
Boron	ND	mg/kg	D	0.02		SW6010B	07/28/05 09:21 / jjw
METALS, ABDTPA EXTRACTABLE							
Arsenic	ND	mg/kg		1		SW6020	07/28/05 23:52 / rlh
Arsenic	ND	mg/kg		1		SW6010B	07/29/05 13:52 / jjw
Arsenic	ND	mg/kg		1		SW6010B	08/01/05 17:23 / jjw
Cadmium	0.22	mg/kg		0.01		SW6020	07/28/05 23:52 / rlh
Cadmium	0.21	mg/kg		0.01		SW6010B	07/29/05 13:52 / jjw
Cadmium	0.21	mg/kg		0.01		SW6010B	08/01/05 17:23 / jjw
Copper	68	mg/kg		1		SW6010B	07/29/05 13:52 / jjw
Copper	64	mg/kg		1		SW6010B	08/01/05 17:23 / jjw
Lead	1.43	mg/kg		0.01		SW6020	07/28/05 23:52 / rlh
Manganese	16.8	mg/kg		0.01		SW6010B	07/29/05 13:52 / jjw
Manganese	16.4	mg/kg		0.01		SW6010B	08/01/05 17:23 / jjw
Mercury	ND	mg/kg		0.05		SW6020	07/28/05 23:52 / rlh
Molybdenum	0.16	mg/kg		0.01		SW6010B	08/01/05 17:23 / jjw
Nickel	0.08	mg/kg	D	0.02		SW6010B	07/29/05 13:52 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

APPENDIX B-4

DBS&A LABORATORY REPORT

Laboratory Report for
Golder Associates, Inc.

(013-1595, Tyrone SBM1)

October 24, 2005

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

October 24, 2005

Todd Stein
Lewis Munk
Golder Associates, Inc.
4910 Alameda Blvd. NE, Suite A
Albuquerque, NM 87113
(505)-821-3043

Re: Laboratory Report for Golder Associates, Inc. (013-1595, Tyrone SBM1)

Dear Mr. Stein and Mr. Munk:

Enclosed is the final report for the Golder Associates, Inc. samples (013-1595, Tyrone SBM1). Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed final report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the final report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to Golder Associates, Inc. and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
LABORATORY / TESTING FACILITY

Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

Summaries

Summary of Sample Preparation

	Target Remold Density (Provided by Client) (1.35 g/cm^3-1.55 g/cm^3)	Actual Remold Values		
Sample Number	Dry Bulk Density (g/cm^3)	Moisture Content Gravimetric (%, g/g)	Dry Bulk Density (g/cm^3)	Percent of Target (%)
CMLC-1	1.4	10.1	1.39	99%
CMLC-2	1.4	10.3	1.40	100%
CMLC-3	1.4	9.8	1.40	100%

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Initial Moisture Content		Dry Bulk Density	Wet Bulk Density	Calculated Porosity
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	(g/cm^3)	(g/cm^3)	(%)
CMLC-1	10.1	14.1	1.39	1.53	42.5
CMLC-2	10.3	14.5	1.40	1.55	44.4
CMLC-3	9.8	13.6	1.40	1.54	43.4

NA = Not analyzed

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Method of Analysis	
		Constant Head	Falling Head
CMLC-1	7.4E-03	X	
CMLC-2	8.4E-03	X	
CMLC-3	8.9E-03	X	

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
CMLC-1	0	45.6
	11	44.2
	40	32.0
	80	27.3
	510	20.4
	8770	8.9
	851293	2.9
CMLC-2	0	43.5
	12	42.4
	39	30.6
	76	25.8
	510	19.6
	6833	7.7
	851293	2.4
CMLC-3	0	46.0
	11	44.1
	40	29.4
	78	25.6
	510	19.6
	7037	7.9
	851293	3.1

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r	θ_s
CMLC-1	0.0785	1.2493	0.0000	0.4665
CMLC-2	0.0704	1.2697	0.0014	0.4459
CMLC-3	0.0874	1.2914	0.0162	0.4711

Summary of Calculated Unsaturated Hydraulic Properties with Gravel Corrections

Sample Number	Ksat	θ_i	θ_r	θ_s
CMLC-1	2.9E-03	0.0552	0.0000	0.1827
CMLC-2	3.2E-03	0.0560	0.0005	0.1721
CMLC-3	4.2E-03	0.0618	0.0074	0.2139

Summary of Particle Density Tests

Sample Number	Particle Density (g/cm^3)
CMLC-1	2.42
CMLC-2	2.52
CMLC-3	2.47

Laboratory Data and Graphical Plots

Initial Properties

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Initial Moisture Content		Dry Bulk Density	Wet Bulk Density	Calculated Porosity
	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	(g/cm^3)	(g/cm^3)	(%)
CMLC-1	10.1	14.1	1.39	1.53	42.5
CMLC-2	10.3	14.5	1.40	1.55	44.4
CMLC-3	9.8	13.6	1.40	1.54	43.4

NA = Not analyzed

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-1
Date Sampled: 7/15/05
Depth: N/A
Test Date: 31-Aug-05

Field weight of sample* (g): 153.86
Tare weight, ring (g): 43.63
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 100.11
Sample volume (cm^3): 72.00
Measured particle density: 2.42

Initial Volumetric Moisture Content (% vol):	14.1
Initial Gravimetric Moisture Content (% g/g):	10.1
Dry bulk density (g/cm^3):	1.39
Wet bulk density (g/cm^3):	1.53
Calculated Porosity (% vol):	42.5
Percent Saturation:	33.0

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-2
Date Sampled: 7/15/05
Depth: N/A
Test Date: 31-Aug-05

Field weight of sample* (g): 165.83
Tare weight, ring (g): 46.40
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 108.27
Sample volume (cm^3): 77.10
Measured particle density: 2.52

Initial Volumetric Moisture Content (% vol): 14.5
Initial Gravimetric Moisture Content (% g/g): 10.3
Dry bulk density (g/cm^3): 1.40
Wet bulk density (g/cm^3): 1.55
Calculated Porosity (% vol): 44.4
Percent Saturation: 32.6

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-3
Date Sampled: 7/15/05
Depth: N/A
Test Date: 31-Aug-05

Field weight of sample* (g): 160.04
Tare weight, ring (g): 45.19
Tare weight, cap/plate/epoxy (g): 0.00

Dry weight of sample (g): 104.64
Sample volume (cm^3): 74.80
Measured particle density: 2.47

Initial Volumetric Moisture Content (% vol):	13.6
Initial Gravimetric Moisture Content (% g/g):	9.8
Dry bulk density (g/cm^3):	1.40
Wet bulk density (g/cm^3):	1.54
Calculated Porosity (% vol):	43.4
Percent Saturation:	31.5

Comments:

* Weight including tares
NA = Not analyzed

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Method of Analysis	
		Constant Head	Falling Head
CMLC-1	7.4E-03	X	
CMLC-2	8.4E-03	X	
CMLC-3	8.9E-03	X	

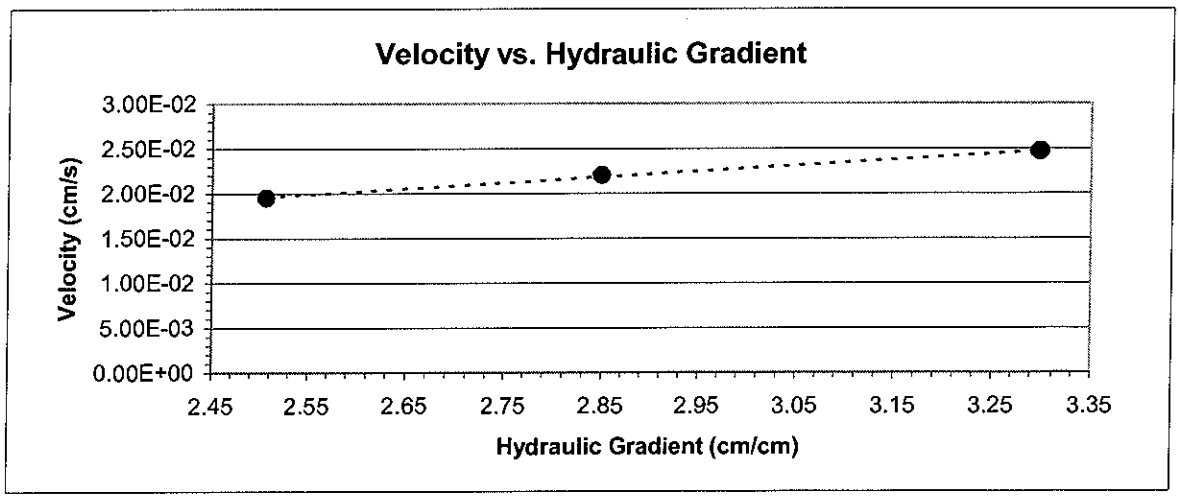
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB05.0177.00
Sample number: CMLC-1
Date Sampled: 7/15/05
Depth: N/A

Type of water used: TAP
Collection vessel tare (g): 10.73
Sample length (cm): 3.79
Sample diameter (cm): 4.92
Sample x-sectional area (cm^2): 19.00

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
08-Sep-05	14:32:56	22.0	12.5	37.0	26.2	56	7.5E-03	7.1E-03
08-Sep-05	14:33:52							
Test # 2:								
11-Sep-05	10:24:17	21.5	10.8	32.9	22.2	53	7.7E-03	7.5E-03
11-Sep-05	10:25:10							
Test # 3:								
11-Sep-05	12:24:28	21.5	9.5	32.9	22.2	60	7.8E-03	7.5E-03
11-Sep-05	12:25:28							

***Average Ksat* (cm/sec):** **7.4E-03**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

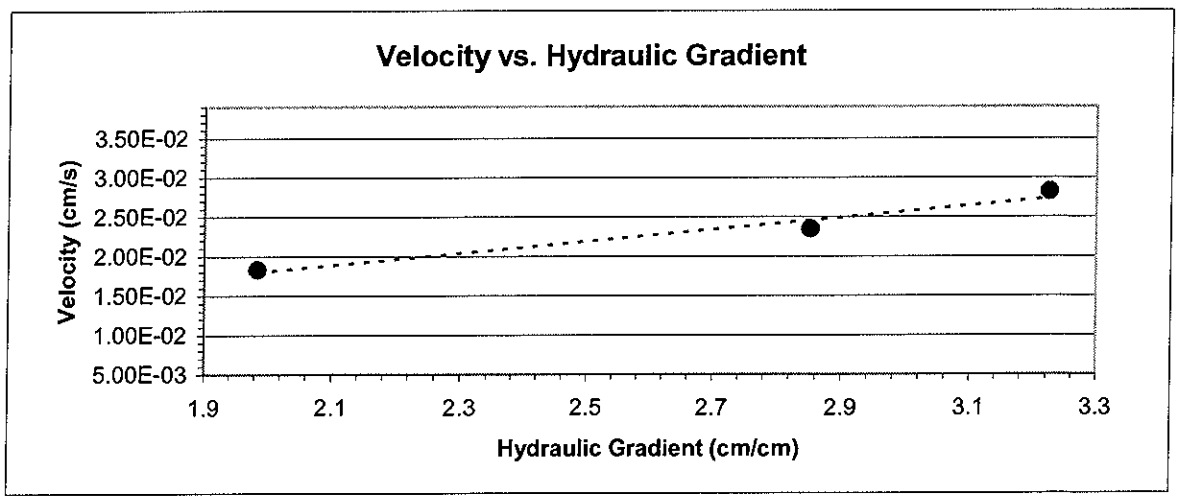
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB05.0177.00
Sample number: CMLC-2
Date Sampled: 7/15/05
Depth: N/A

Type of water used: TAP
Collection vessel tare (g): 6.36
Sample length (cm): 4.03
Sample diameter (cm): 4.94
Sample x-sectional area (cm^2): 19.13

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
08-Sep-05	12:01:42	22.0	13.0	27.9	21.6	40	8.7E-03	8.4E-03
08-Sep-05	12:02:22							
Test # 2:								
08-Sep-05	14:37:17	22.0	11.5	22.1	15.7	35	8.2E-03	7.9E-03
08-Sep-05	14:37:52							
Test # 3:								
11-Sep-05	10:20:55	21.5	8.0	23.9	17.6	50	9.2E-03	8.9E-03
11-Sep-05	10:21:45							

***Average Ksat* (cm/sec):** **8.4E-03**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

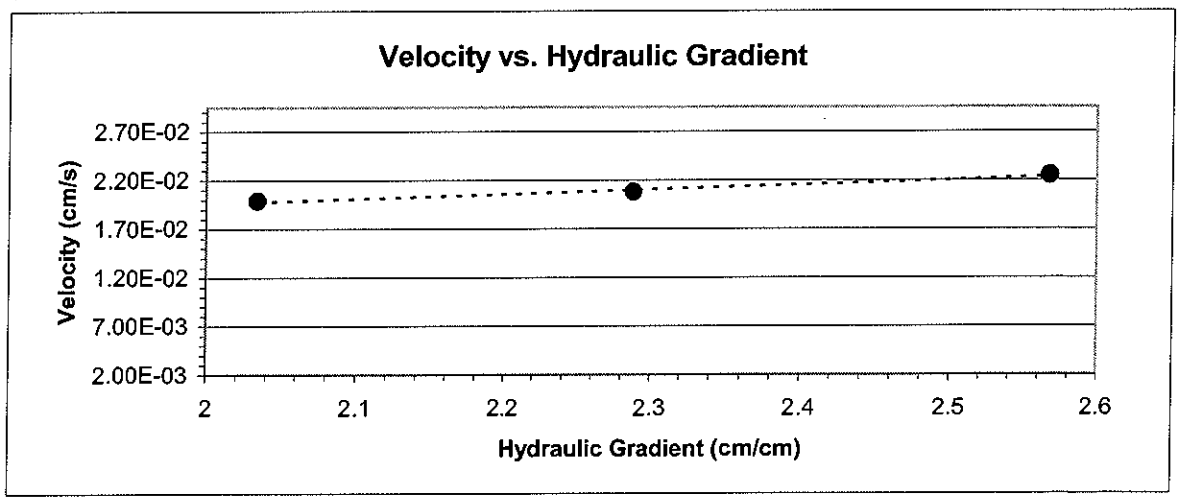
Saturated Hydraulic Conductivity
Constant Head Method

Job name: Golder Associates, Inc.
Job number: LB05.0177.00
Sample number: CMLC-3
Date Sampled: 7/15/05
Depth: N/A

Type of water used: TAP
Collection vessel tare (g): 6.62
Sample length (cm): 3.93
Sample diameter (cm): 4.92
Sample x-sectional area (cm^2): 19.02

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
11-Sep-05	10:18:34	21.5	10.1	26.3	19.7	46	8.8E-03	8.5E-03
11-Sep-05	10:19:20							
Test # 2:								
11-Sep-05	12:20:55	21.5	9.0	18.5	11.9	30	9.1E-03	8.8E-03
11-Sep-05	12:21:25							
Test # 3:								
12-Sep-05	08:26:15	22.0	8.0	19.9	13.2	35	9.8E-03	9.3E-03
12-Sep-05	08:26:50							

***Average Ksat* (cm/sec):** **8.9E-03**



Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Unsaturated Hydraulic Conductivity

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
CMLC-1	0	45.6
	11	44.2
	40	32.0
	80	27.3
	510	20.4
	8770	8.9
	851293	2.9
CMLC-2	0	43.5
	12	42.4
	39	30.6
	76	25.8
	510	19.6
	6833	7.7
	851293	2.4
CMLC-3	0	46.0
	11	44.1
	40	29.4
	78	25.6
	510	19.6
	7037	7.9
	851293	3.1

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	**N** (dimensionless)	θ_r	θ_s
CMLC-1	0.0785	1.2493	0.0000	0.4665
CMLC-2	0.0704	1.2697	0.0014	0.4459
CMLC-3	0.0874	1.2914	0.0162	0.4711

Summary of Calculated Unsaturated Hydraulic Properties with Gravel Corrections

Sample Number	**Ksat**	θ_i	θ_r	θ_s
CMLC-1	2.9E-03	0.0552	0.0000	0.1827
CMLC-2	3.2E-03	0.0560	0.0005	0.1721
CMLC-3	4.2E-03	0.0618	0.0074	0.2139

Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder Associates, Inc.	*Dry wt. of sample* (g):	100.11
Job Number:	LB05.0177.00	*Tare wt., screen & clamp* (g):	25.70
Sample Number:	CMLC-1	*Tare wt., ring* (g):	43.63
Date Sampled:	7/15/05	*Tare wt., epoxy* (g):	0.00
Depth:	N/A	*Sample volume* (cm^3):	72.00

Saturated weight at 0 cm tension* (g): 202.24
Volume of water† in saturated sample (cm^3): 32.80
Saturated moisture content (% vol): 45.56
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	12-Sep-05 / 14:55	202.24	0.00	45.56
	19-Sep-05 / 15:30	201.27	11.00	44.21
	26-Sep-05 / 10:05	192.49	39.50	32.02
	03-Oct-05 / 11:00	189.13	80.00	27.35
Pressure plate:	09-Oct-05 / 08:30	184.12	509.90	20.39

Comments:

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-1
Date Sampled: 7/15/05
Depth: N/A

Dry weight of water activity meter sample* (g): 138.15
Tare weight, jar (g): 113.03
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	04-Oct-05 / 14:10	139.75	8770.3	8.86

Dry weight of relative humidity box sample* (g): 94.11
Tare weight (g): 41.86
Sample bulk density (g/cm^3): 1.39

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	12-Oct-05 / 16:30	95.20	851293	2.92

Comments:

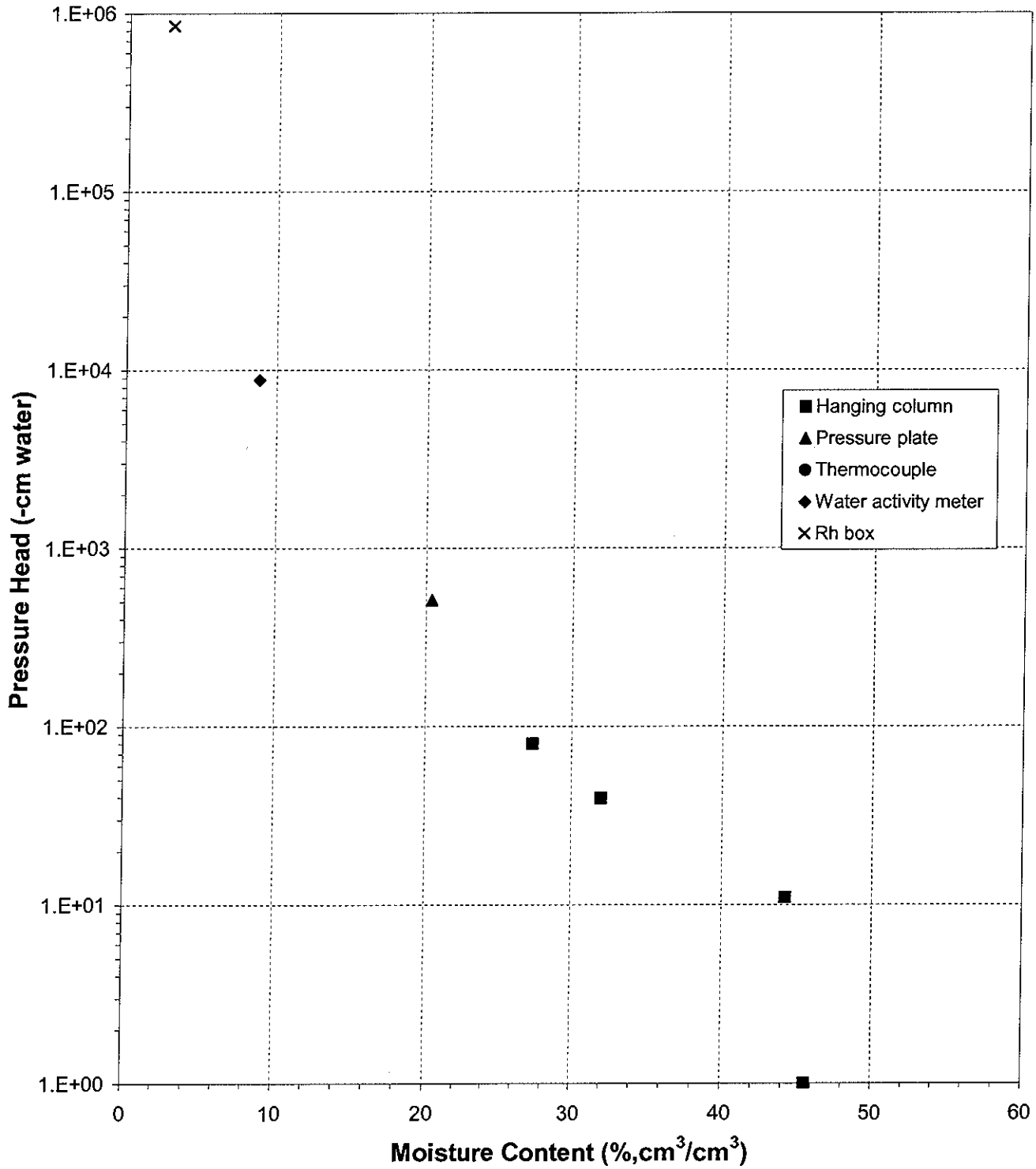
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

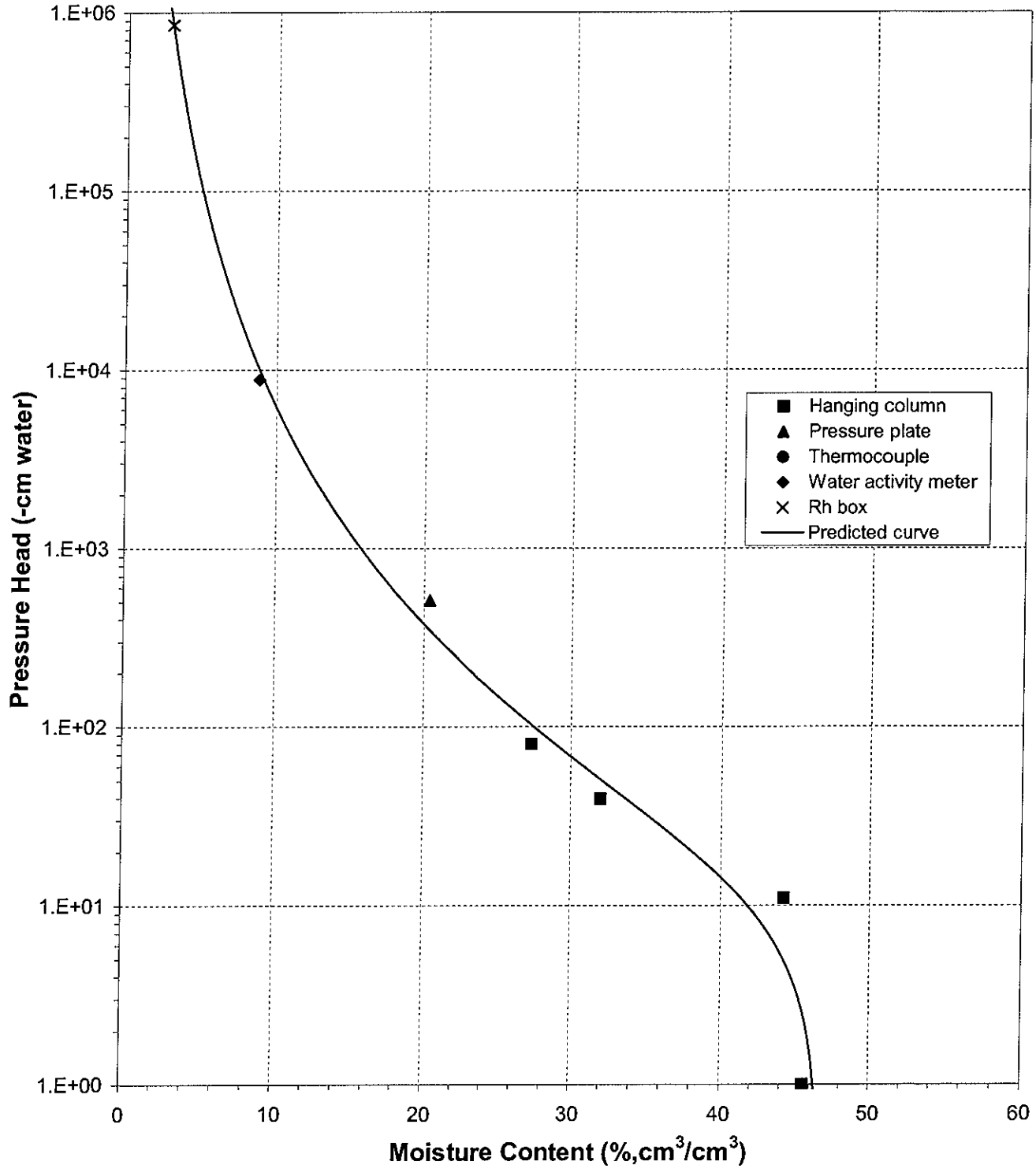
Water Retention Data Points

Sample Number: CMLC-1



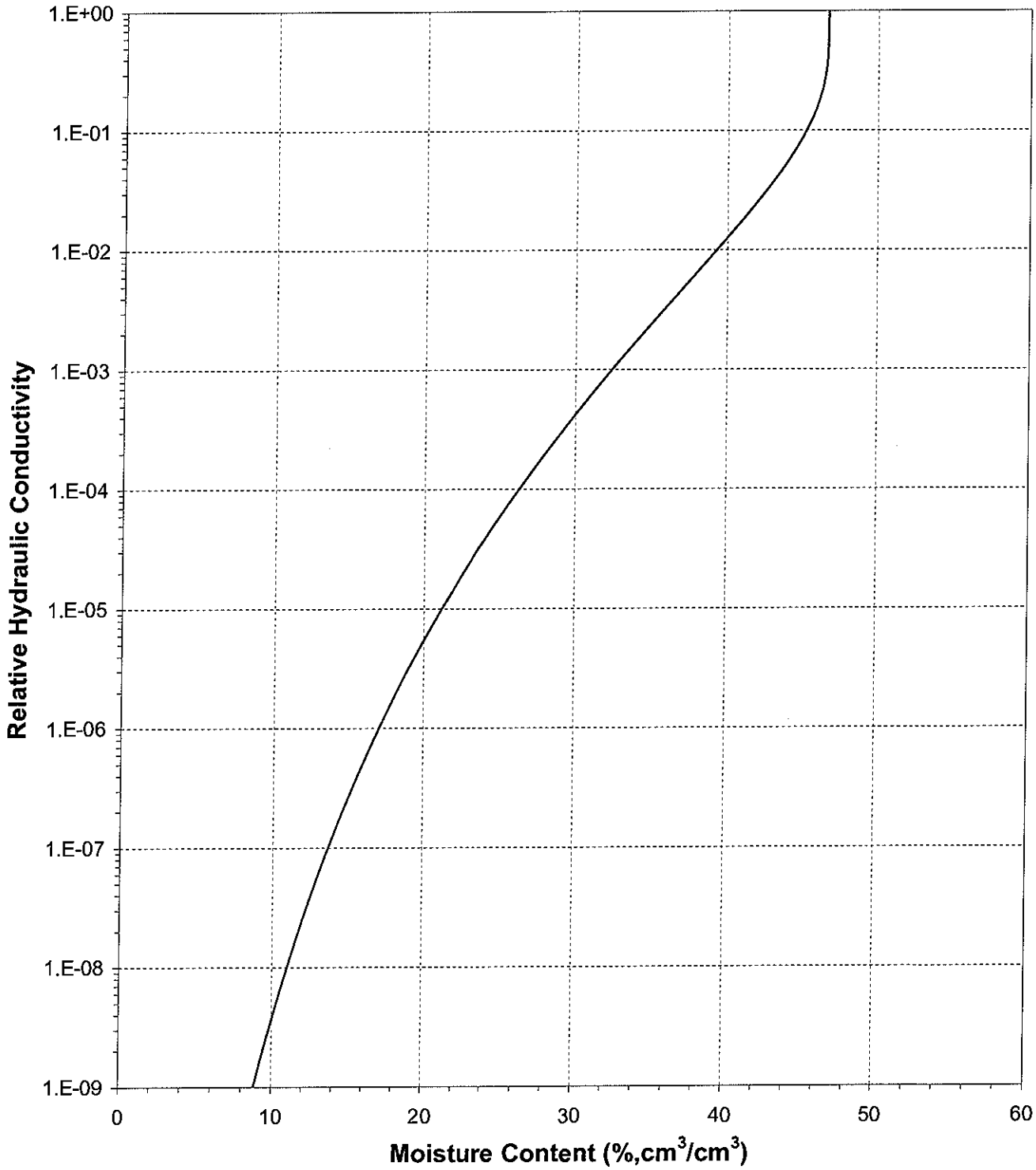
Predicted Water Retention Curve and Data Points

Sample Number: CMLC-1



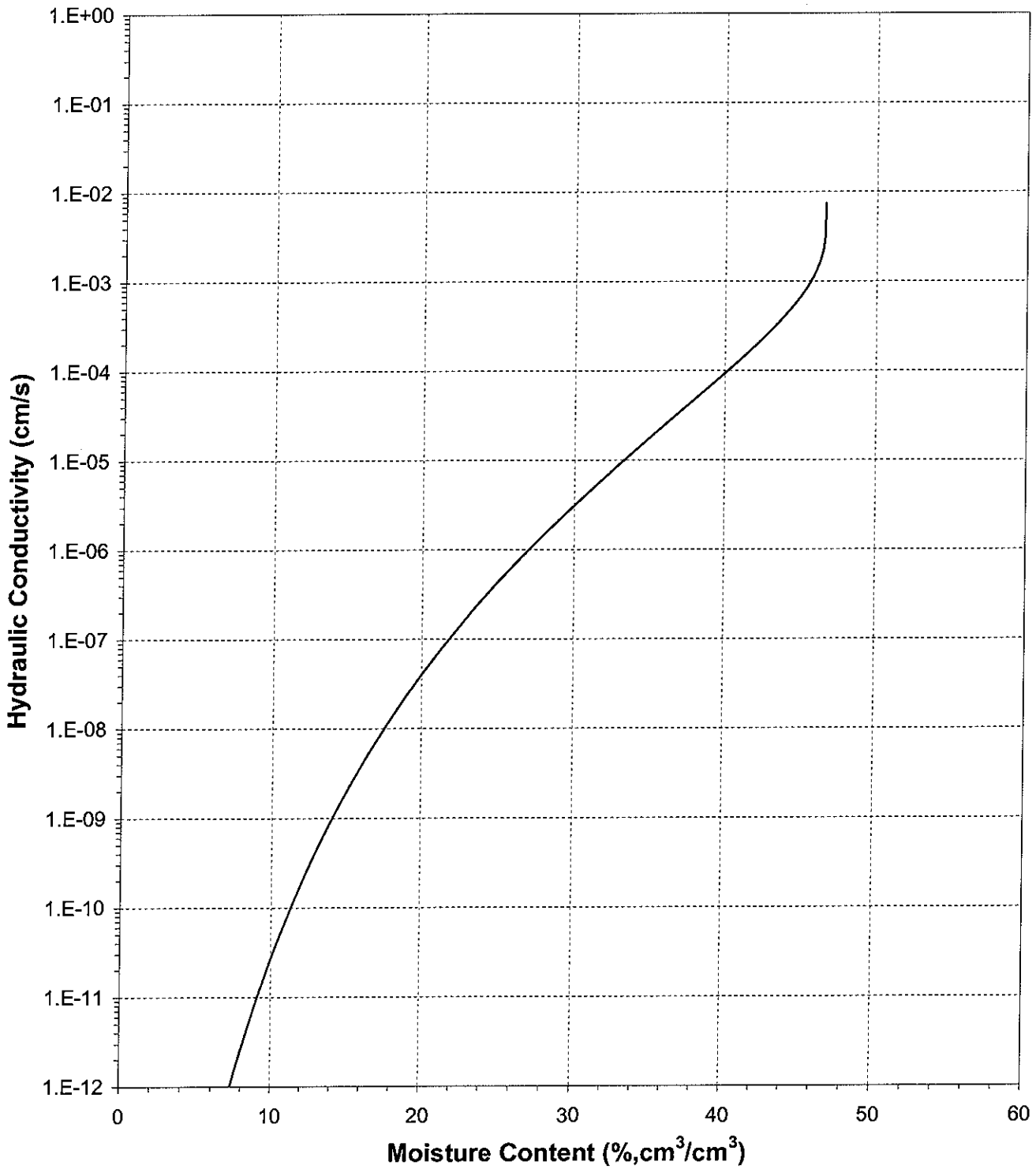
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: CMLC-1



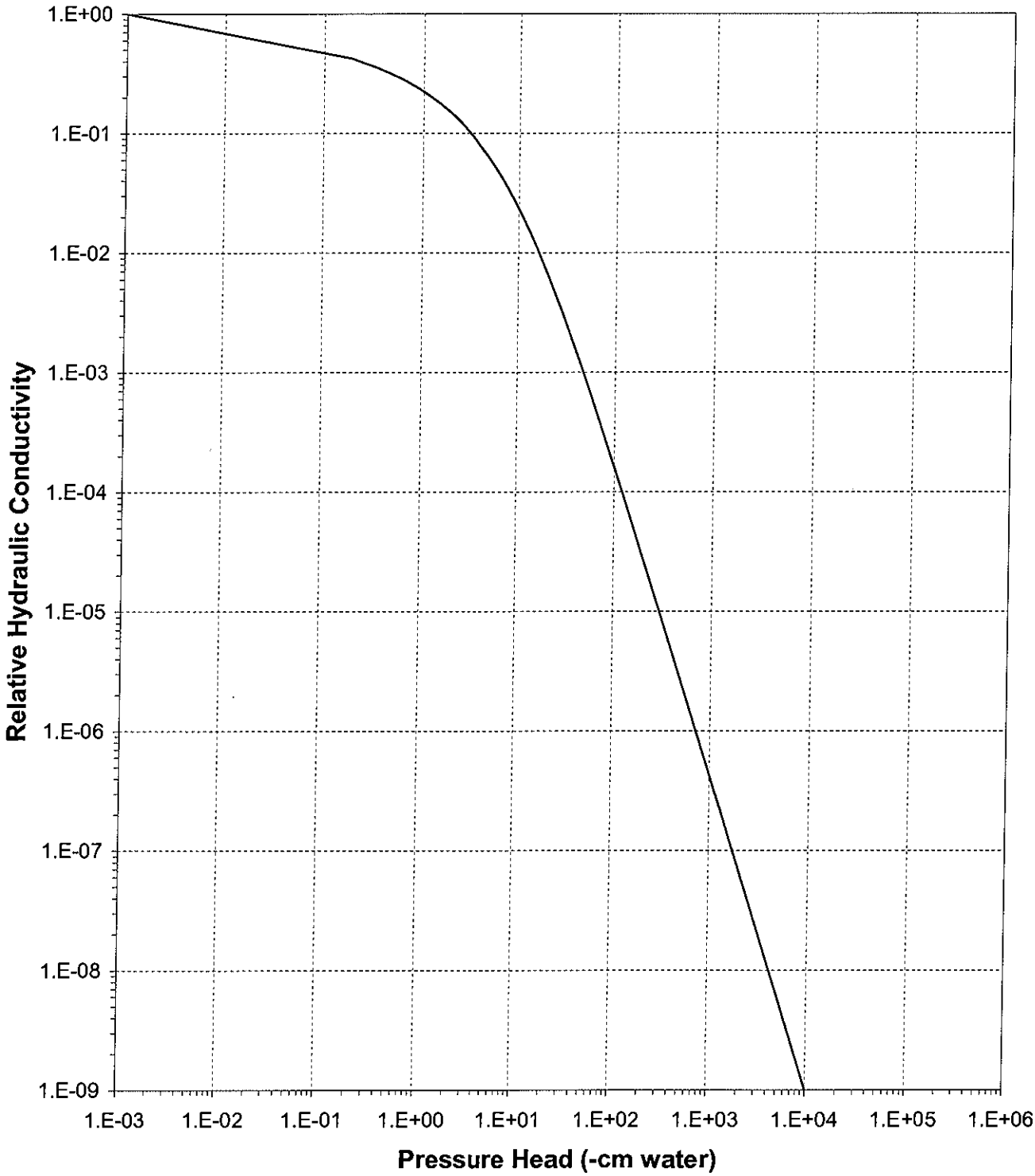
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: CMLC-1



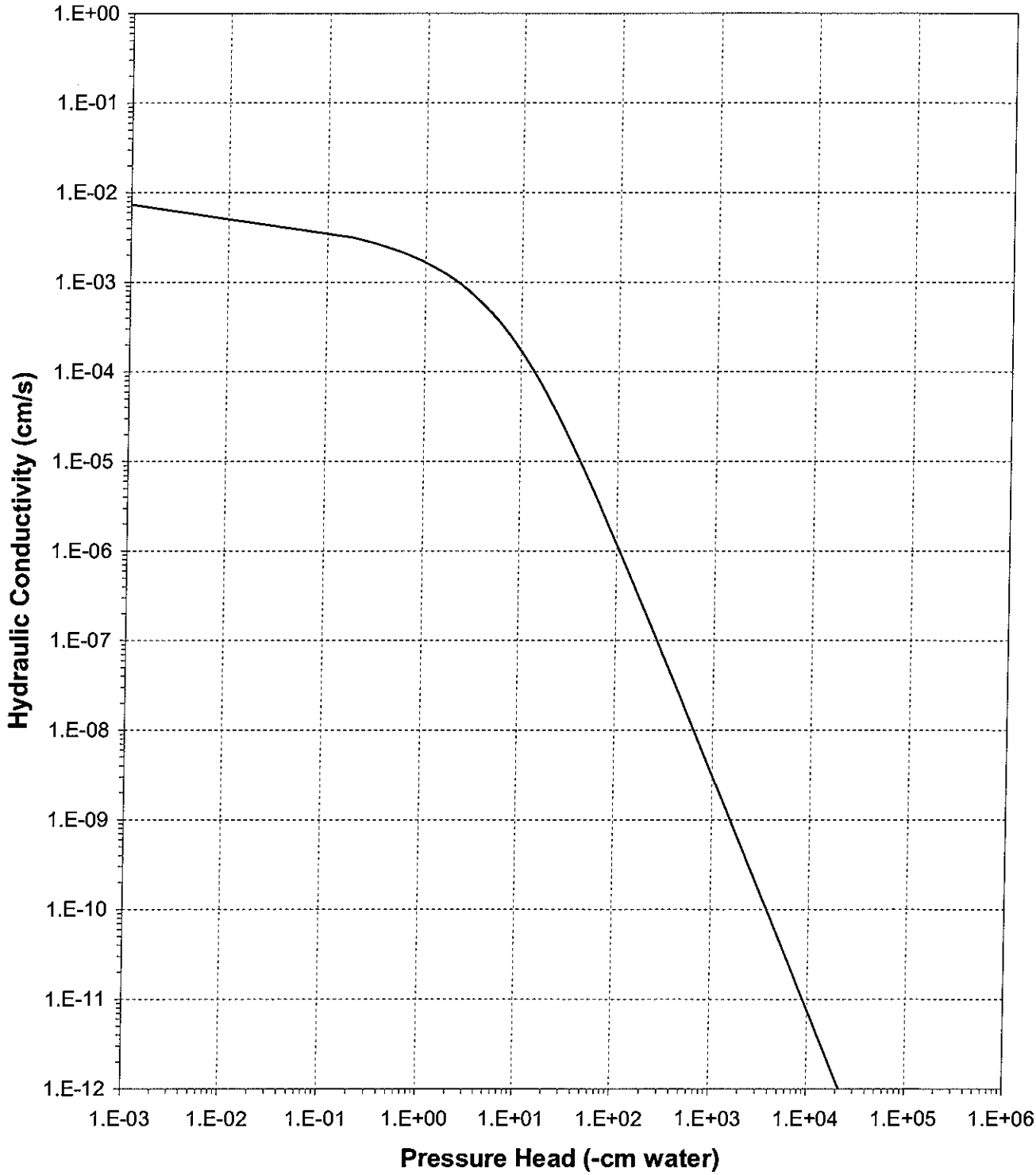
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: CMLC-1



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: CMLC-1



Gravel Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-1
Date Sampled: 7/15/05
Depth: N/A
Split: # 10 Sieve

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	7579		
Mass (fines)(g):	2560		
Dry bulk density (fines)(g/cm^3):	1.39	Density (composite)(g/cm^3):	2.16
+Density (coarse)(g/cm^3):	2.65		
Ksat value (fines)(cm/sec):	7.4E-03	Ksat composite(cm/sec):	2.9E-03
Theta initial (fines):	0.1410	Theta initial composite:	0.0552
Theta saturated (fines):	0.4665	Theta saturated composite:	0.1827
Theta residual (fines):	0.0000	Theta residual composite:	0.0000
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

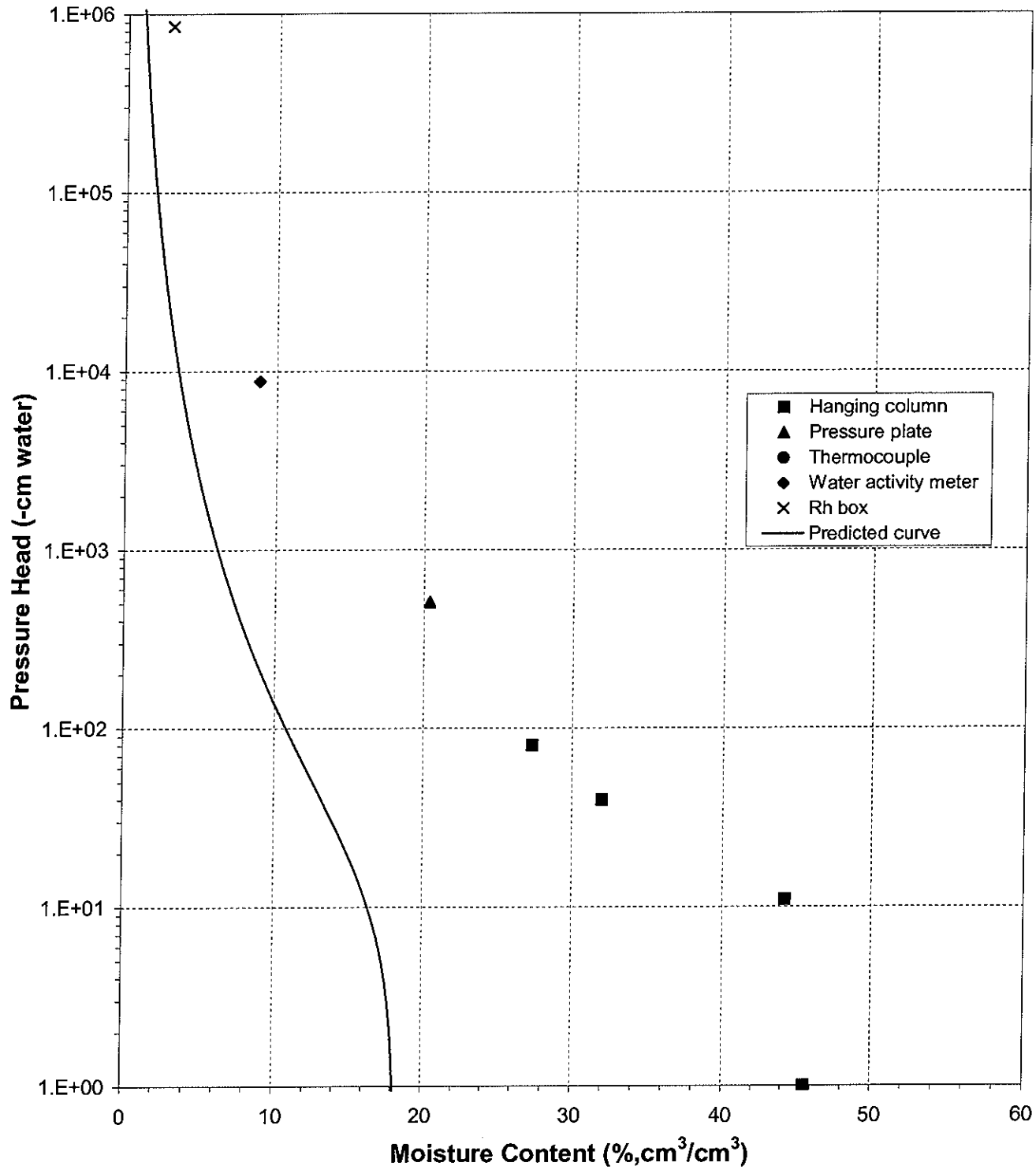
Volumetric fraction of fines in composite: 0.392
Volumetric fraction of coarse in composite: 0.608
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 1841.73
Volume (coarse)(cm^3): 2860.00
Volume (composite)(cm^3): 4701.73

Comments:
+Assumed to be 2.65, unless measured
*Values will be zero if the coarse fraction is assumed to hold no water in pores.

Date: 24-Oct-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Predicted Water Retention Curve and Data Points

Sample Number: CMLC-1 (Gravel Corrected)



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name:	Golder Associates, Inc.	*Dry wt. of sample* (g):	108.27
Job Number:	LB05.0177.00	*Tare wt., screen & clamp* (g):	25.75
Sample Number:	CMLC-2	*Tare wt., ring* (g):	46.40
Date Sampled:	7/15/05	*Tare wt., epoxy* (g):	0.00
Depth:	N/A	*Sample volume* (cm^3):	77.10

Saturated weight at 0 cm tension* (g): 213.94
Volume of water† in saturated sample (cm^3): 33.52
Saturated moisture content (% vol): 43.47
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	11-Sep-05 / 11:30	213.94	0.00	43.47
	19-Sep-05 / 15:35	213.11	11.50	42.40
	27-Sep-05 / 10:15	204.03	39.00	30.62
	03-Oct-05 / 11:00	200.34	76.00	25.84
Pressure plate:	09-Oct-05 / 08:30	195.52	509.90	19.58

Comments:

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-2
Date Sampled: 7/15/05
Depth: N/A

Dry weight of water activity meter sample* (g): 135.13
Tare weight, jar (g): 112.41
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Water Activity Meter:	04-Oct-05 / 17:01	136.37	6832.7	7.66

Dry weight of relative humidity box sample* (g): 104.61
Tare weight (g): 44.94
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	12-Oct-05 / 16:30	105.62	851293	2.37

Comments:

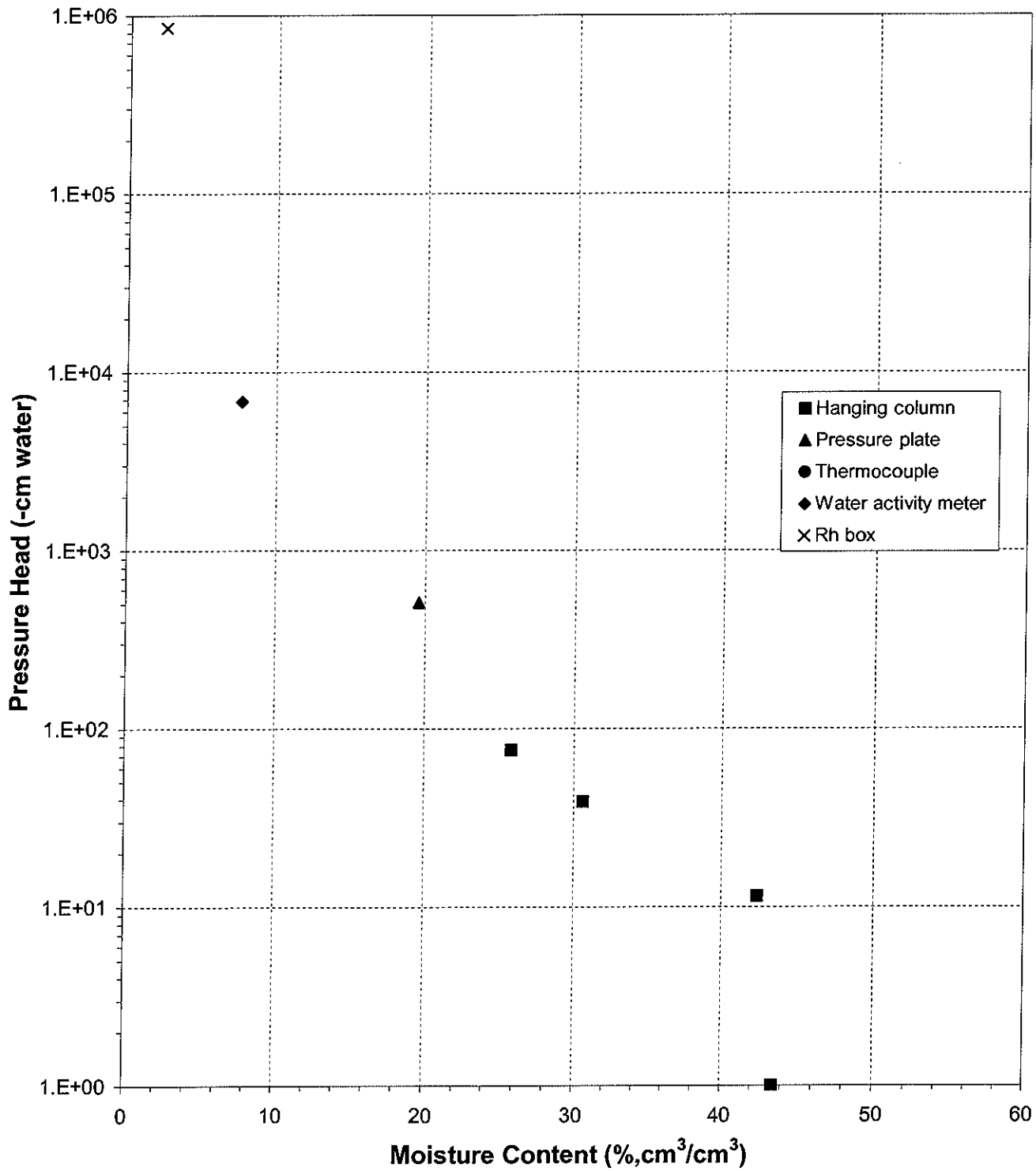
* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

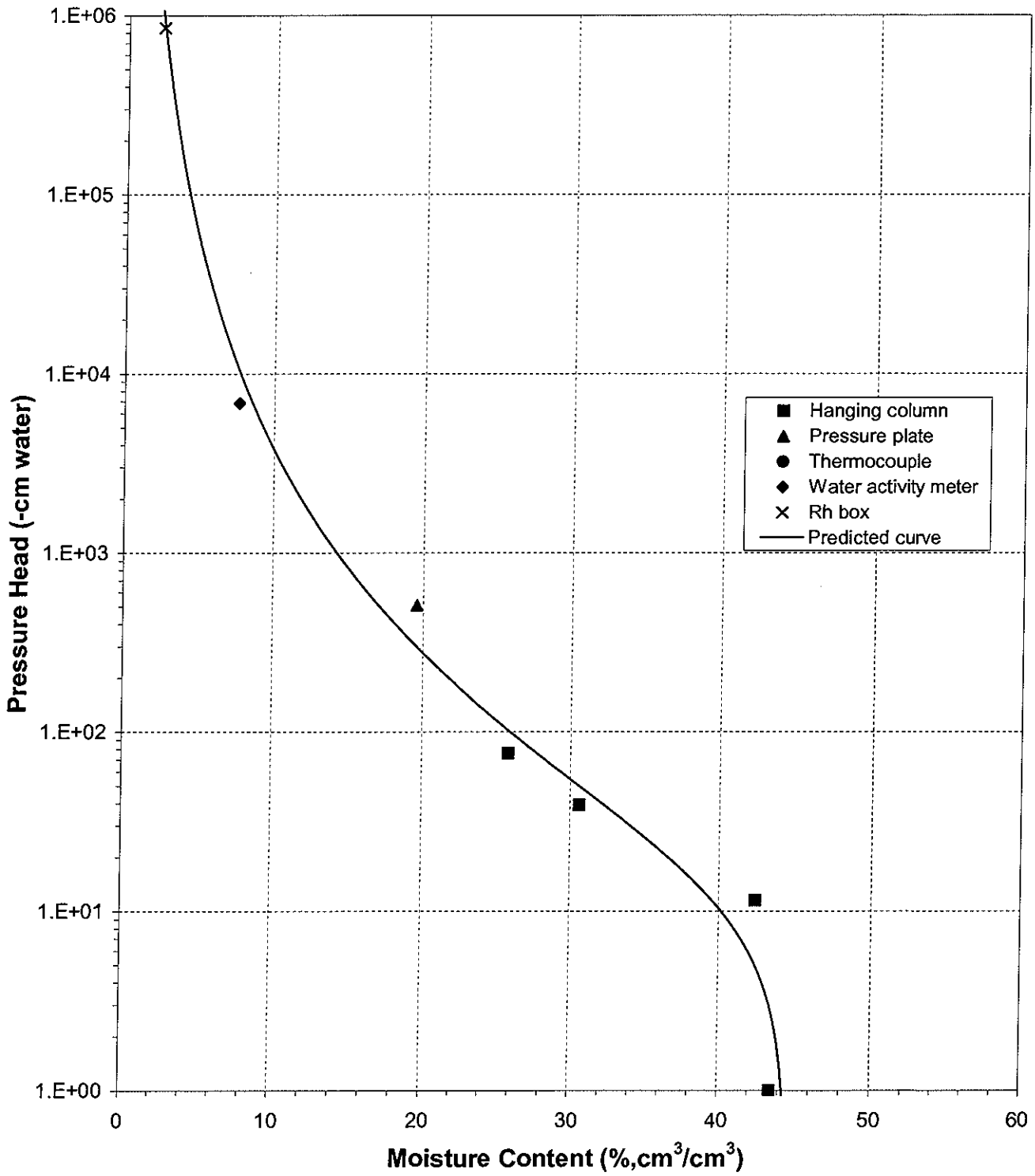
Water Retention Data Points

Sample Number: CMLC-2



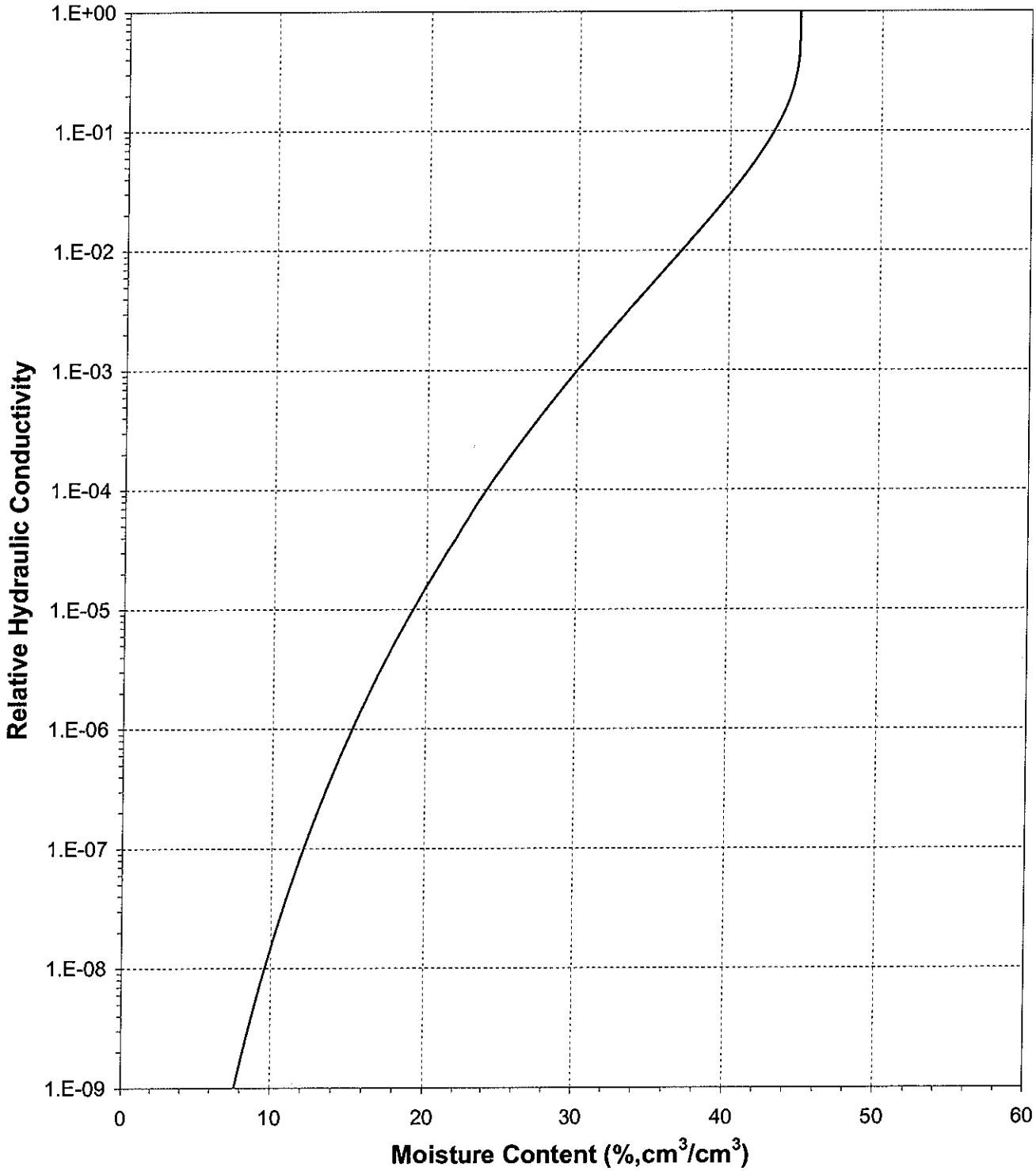
Predicted Water Retention Curve and Data Points

Sample Number: CMLC-2



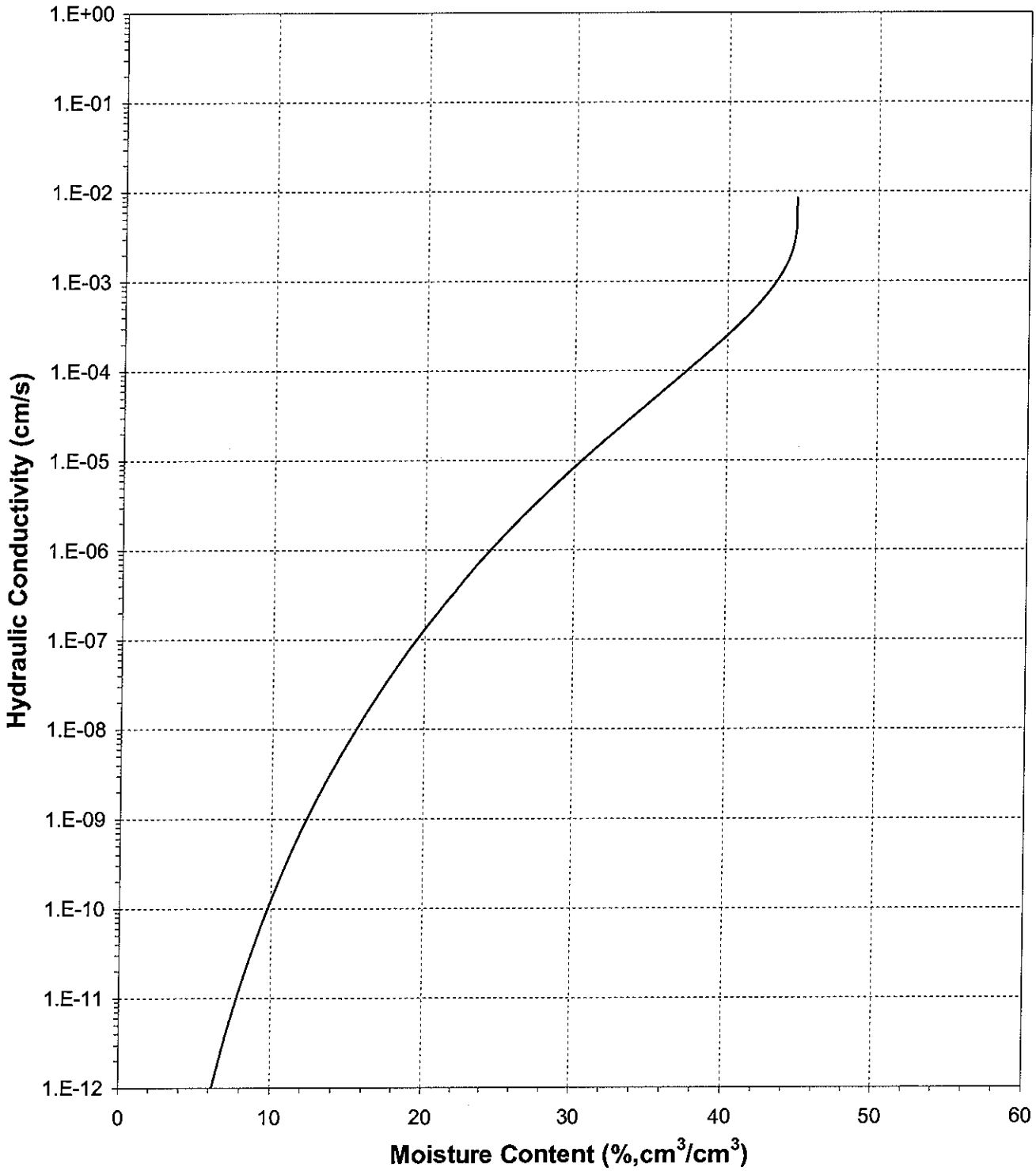
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: CMLC-2



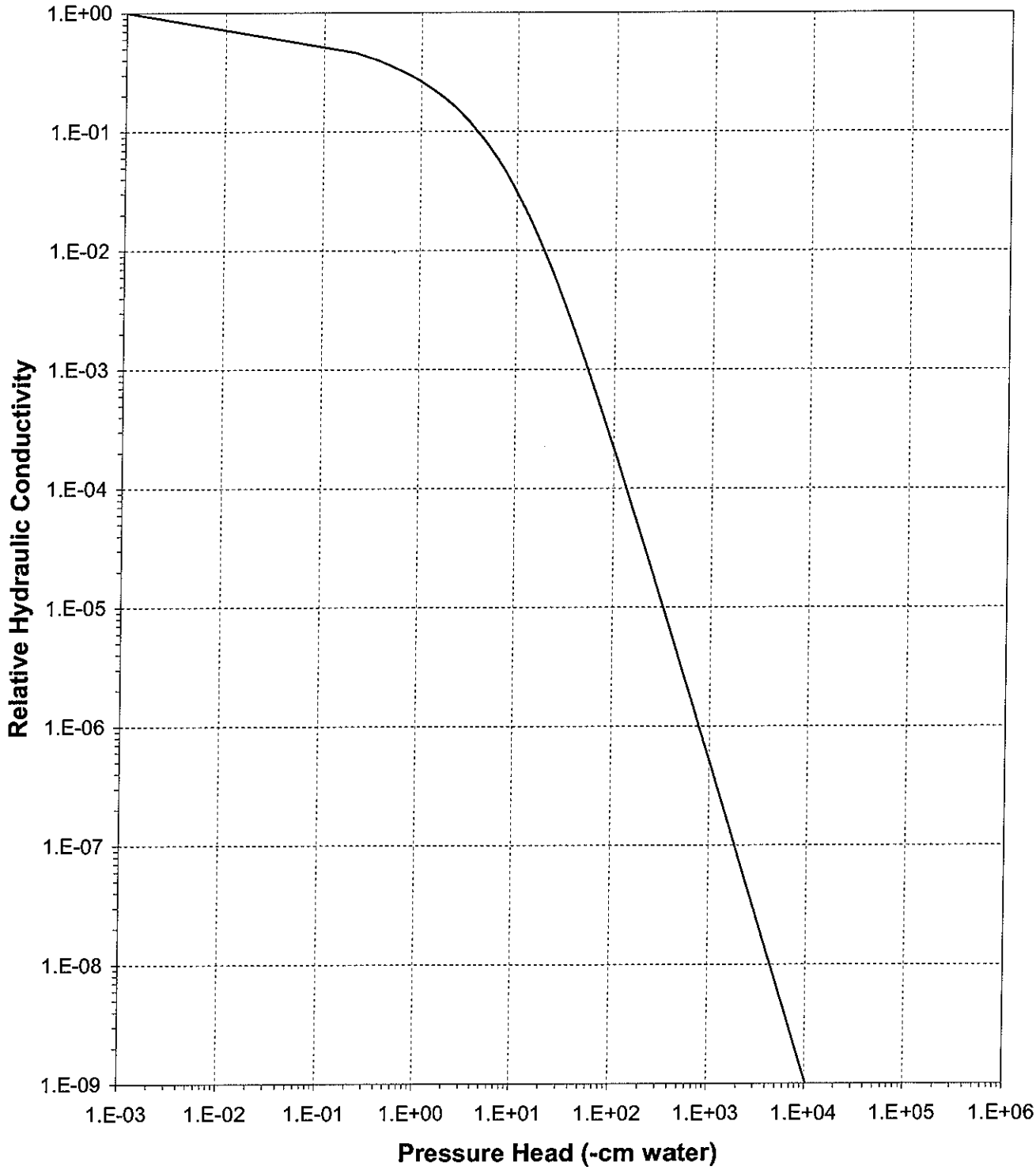
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: CMLC-2



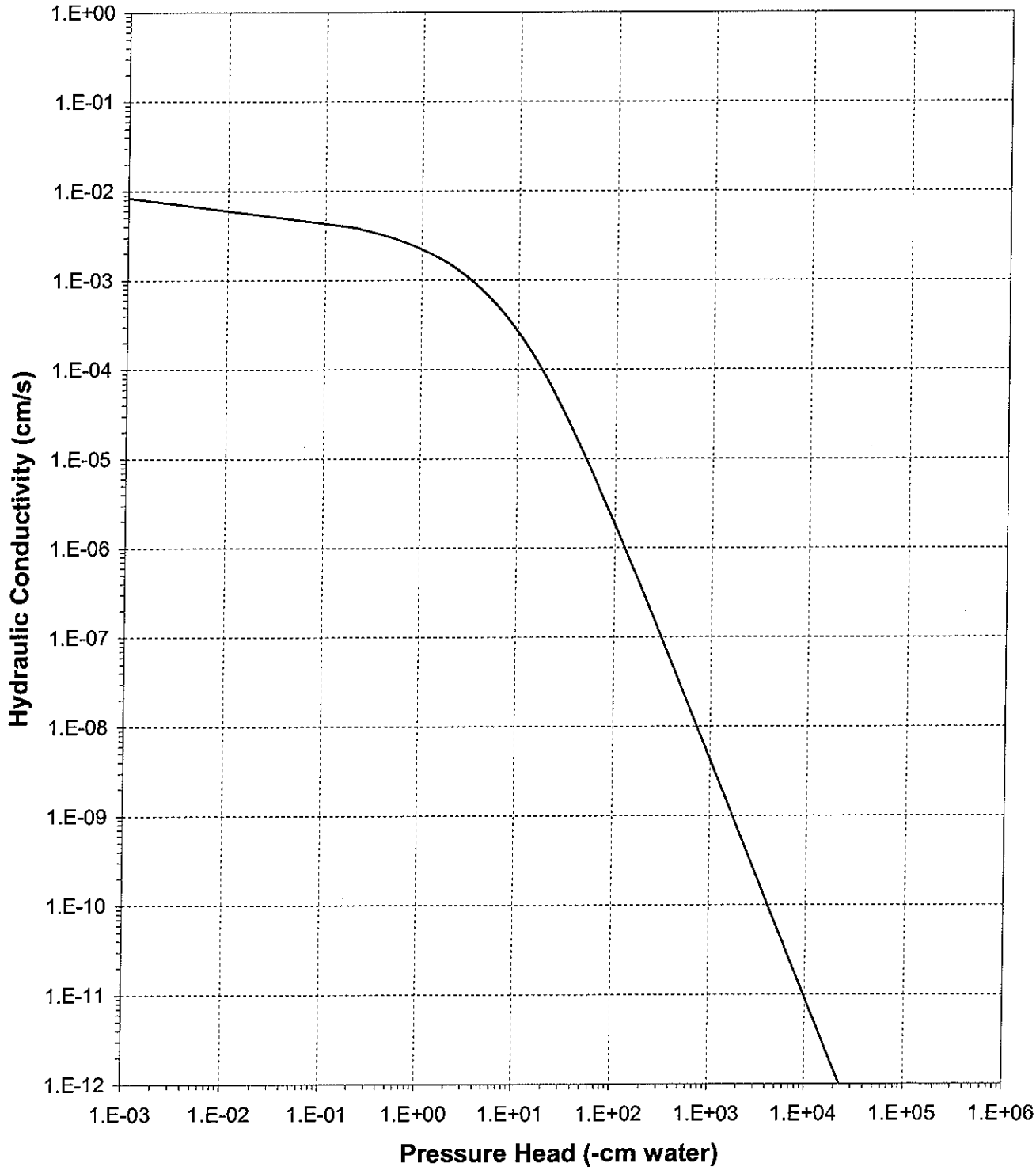
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: CMLC-2



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: CMLC-2



Gravel Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-2
Date Sampled: 7/15/05
Depth: N/A
Split: # 10 Sieve

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	3487		
Mass (fines)(g):	1158		
Dry bulk density (fines)(g/cm^3):	1.4	Density (composite)(g/cm^3):	2.17
+Density (coarse)(g/cm^3):	2.65		
Ksat value (fines)(cm/sec):	8.4E-03	Ksat composite(cm/sec):	3.2E-03
Theta initial (fines):	0.1450	Theta initial composite:	0.0560
Theta saturated (fines):	0.4459	Theta saturated composite:	0.1721
Theta residual (fines):	0.0014	Theta residual composite:	0.0005
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

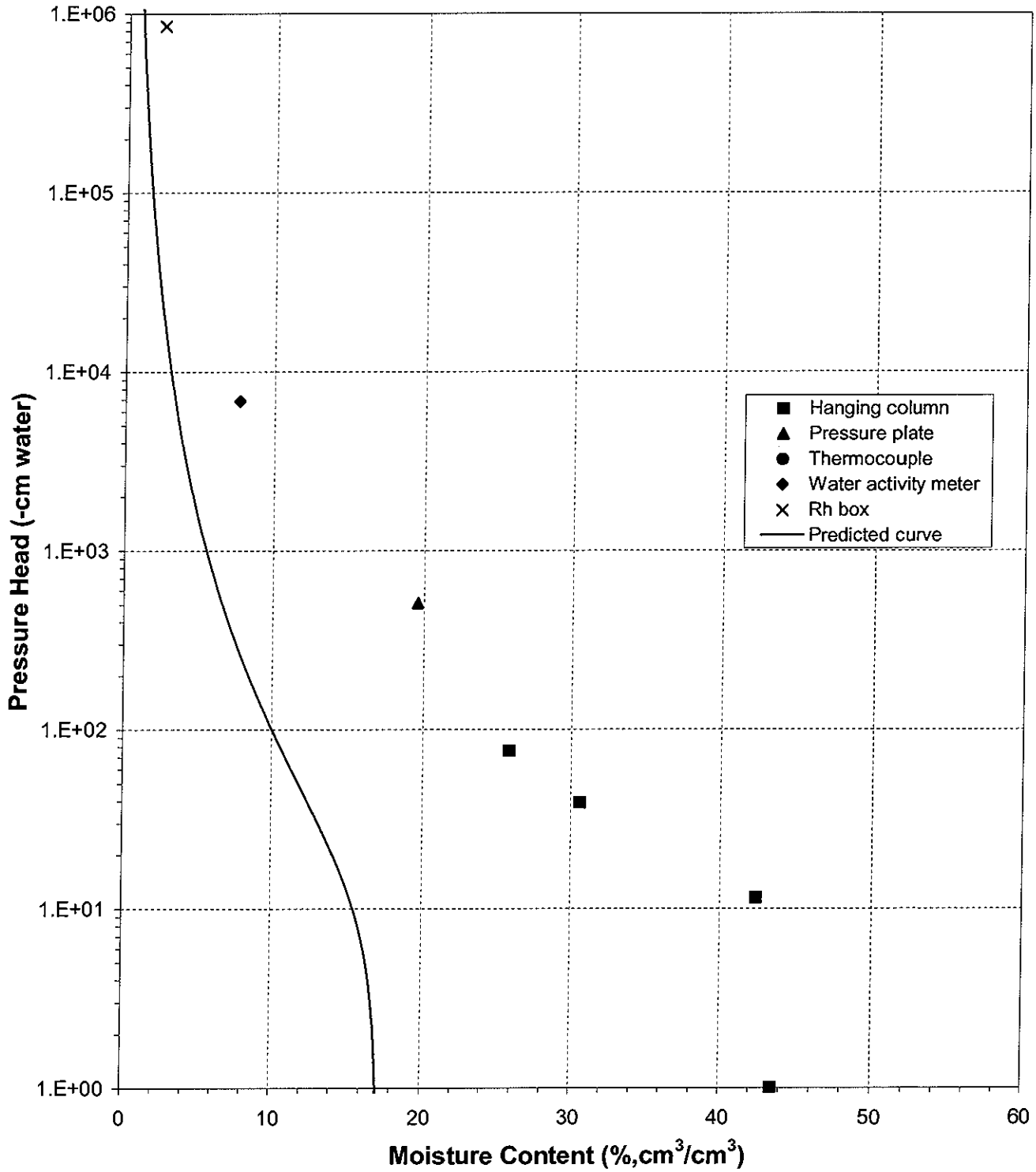
Volumetric fraction of fines in composite: 0.386
Volumetric fraction of coarse in composite: 0.614
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 827.14
Volume (coarse)(cm^3): 1315.85
Volume (composite)(cm^3): 2142.99

Comments:
+Assumed to be 2.65, unless measured
*Values will be zero if the coarse fraction is assumed to hold no water in pores.

Date: 24-Oct-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Predicted Water Retention Curve and Data Points

Sample Number: CMLC-2 (Gravel Corrected)



Moisture Retention Data

Hanging Column/Pressure Plate/Thermocouple

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-3
Date Sampled: 7/15/05
Depth: N/A

Dry wt. of sample (g): 104.64
Tare wt., screen & clamp (g): 25.60
Tare wt., ring (g): 45.19
Tare wt., epoxy (g): 0.00
Sample volume (cm^3): 74.80

Saturated weight at 0 cm tension* (g): 209.82
Volume of water† in saturated sample (cm^3): 34.39
Saturated moisture content (% vol): 45.97
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	12-Sep-05 / 15:05	209.82	0.00	45.97
	19-Sep-05 / 16:00	208.44	11.00	44.13
	27-Sep-05 / 10:20	197.39	40.00	29.36
	03-Oct-05 / 10:55	194.56	78.20	25.57
Pressure plate:	09-Oct-05 / 08:30	190.07	509.90	19.57

Comments:

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

Moisture Retention Data

Water Activity Meter/Relative Humidity Box

(Main Drainage Curve)

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-3
Date Sampled: 7/15/05
Depth: N/A

Dry weight of water activity meter sample* (g): 156.15
Tare weight, jar (g): 112.86
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Water Activity Meter:	12-Oct-05 / 14:30	158.59	7036.6	7.88

Dry weight of relative humidity box sample* (g): 98.97
Tare weight (g): 44.10
Sample bulk density (g/cm^3): 1.40

	Date/Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content^T (% vol)
Relative humidity box:	12-Oct-05 / 16:30	100.17	851293	3.08

Comments:

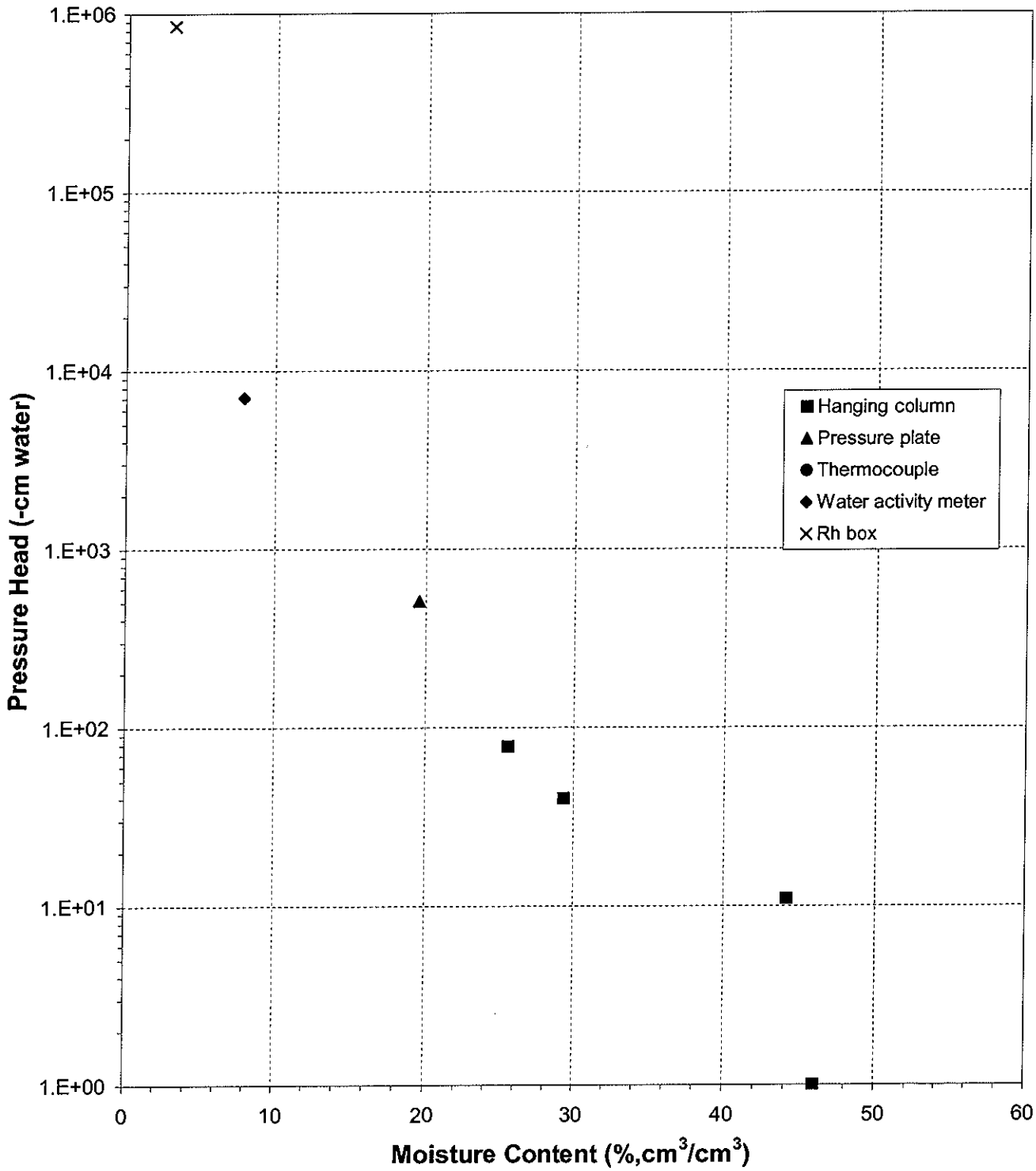
* Weight including tares

^{T} Assumed density of water is 1.0 g/cm^3

Laboratory analysis by: M. Carrillo
Data entered by: D. O'Dowd
Checked by: J. Hines

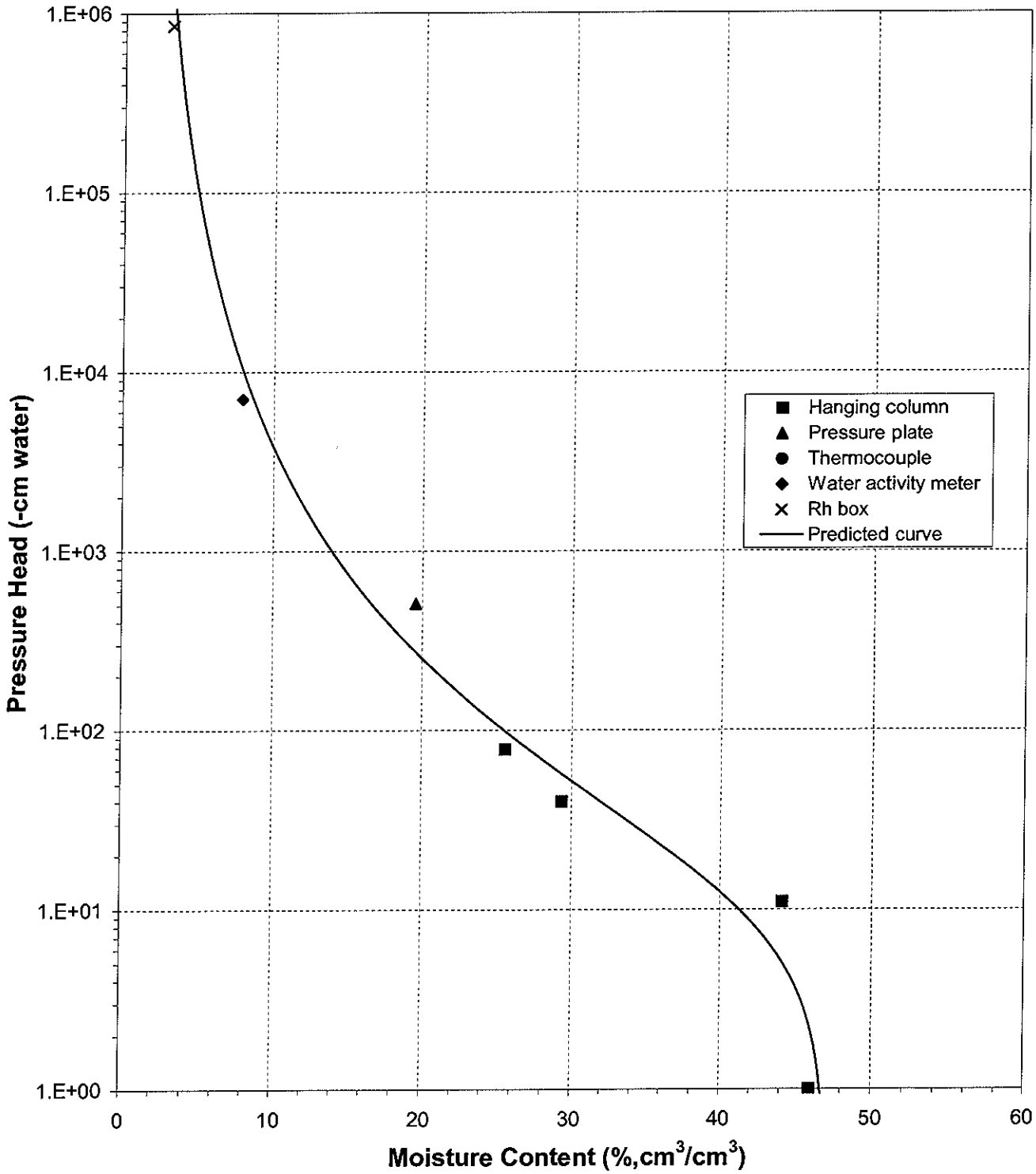
Water Retention Data Points

Sample Number: CMLC-3



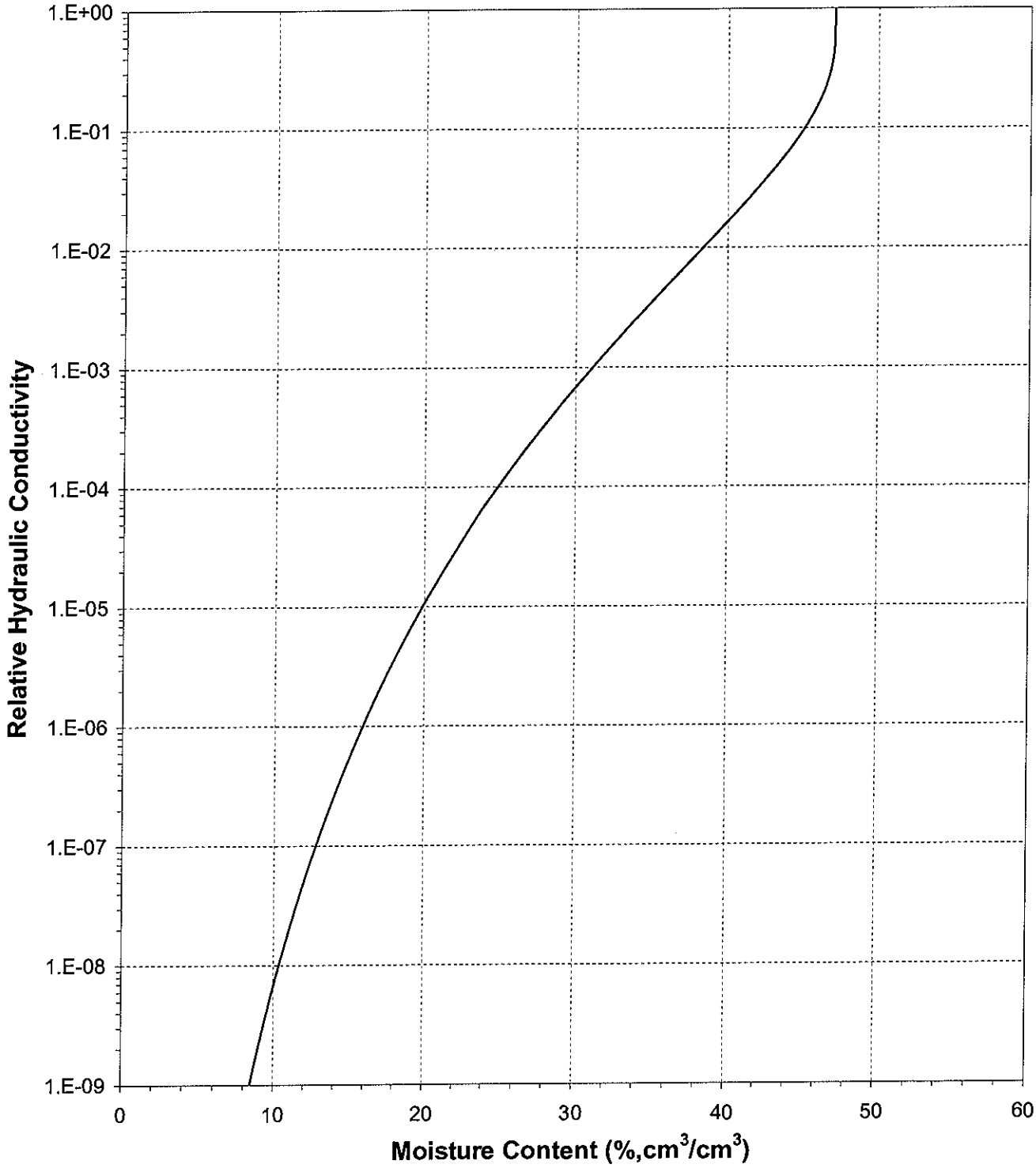
Predicted Water Retention Curve and Data Points

Sample Number: CMLC-3



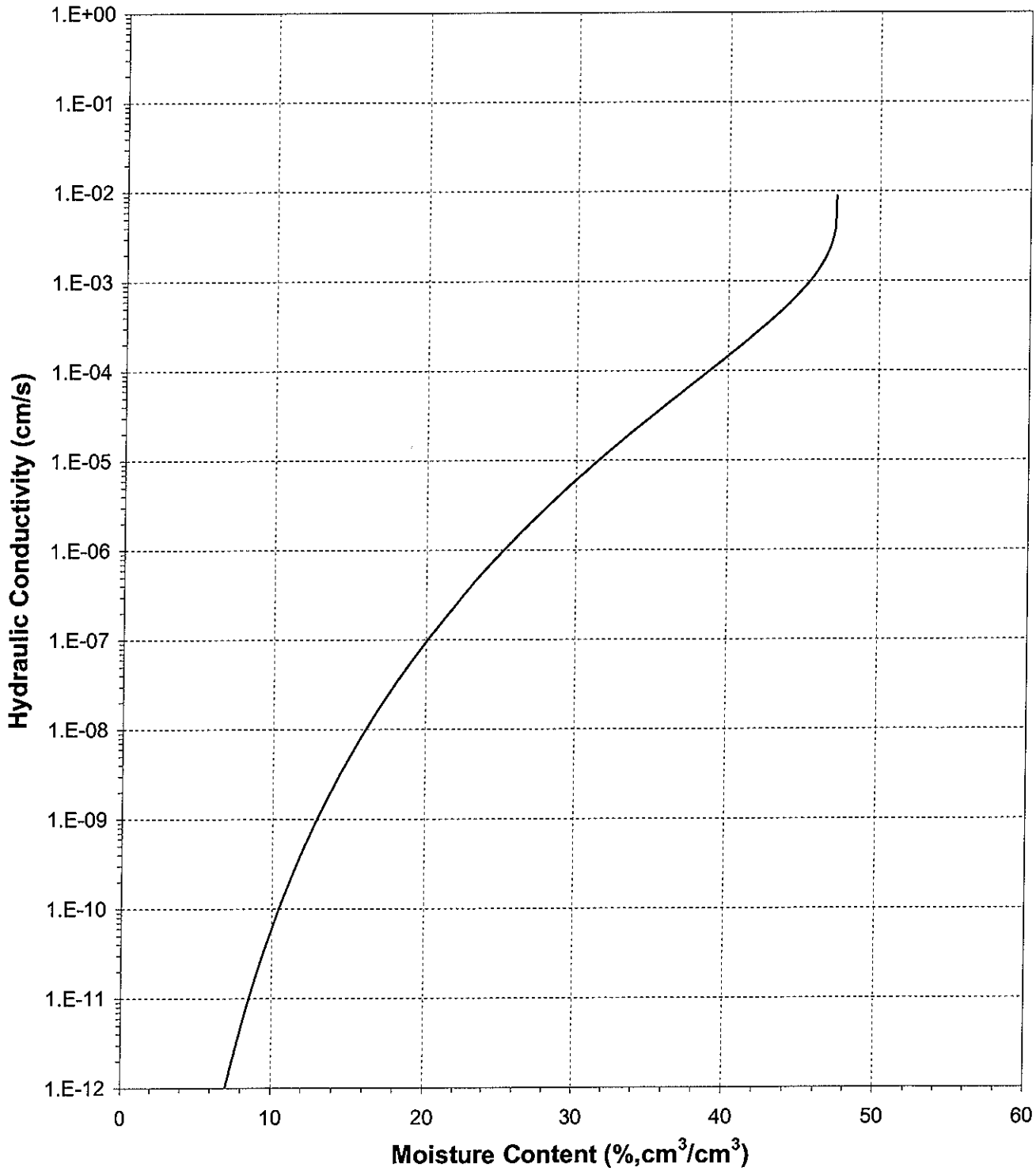
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: CMLC-3



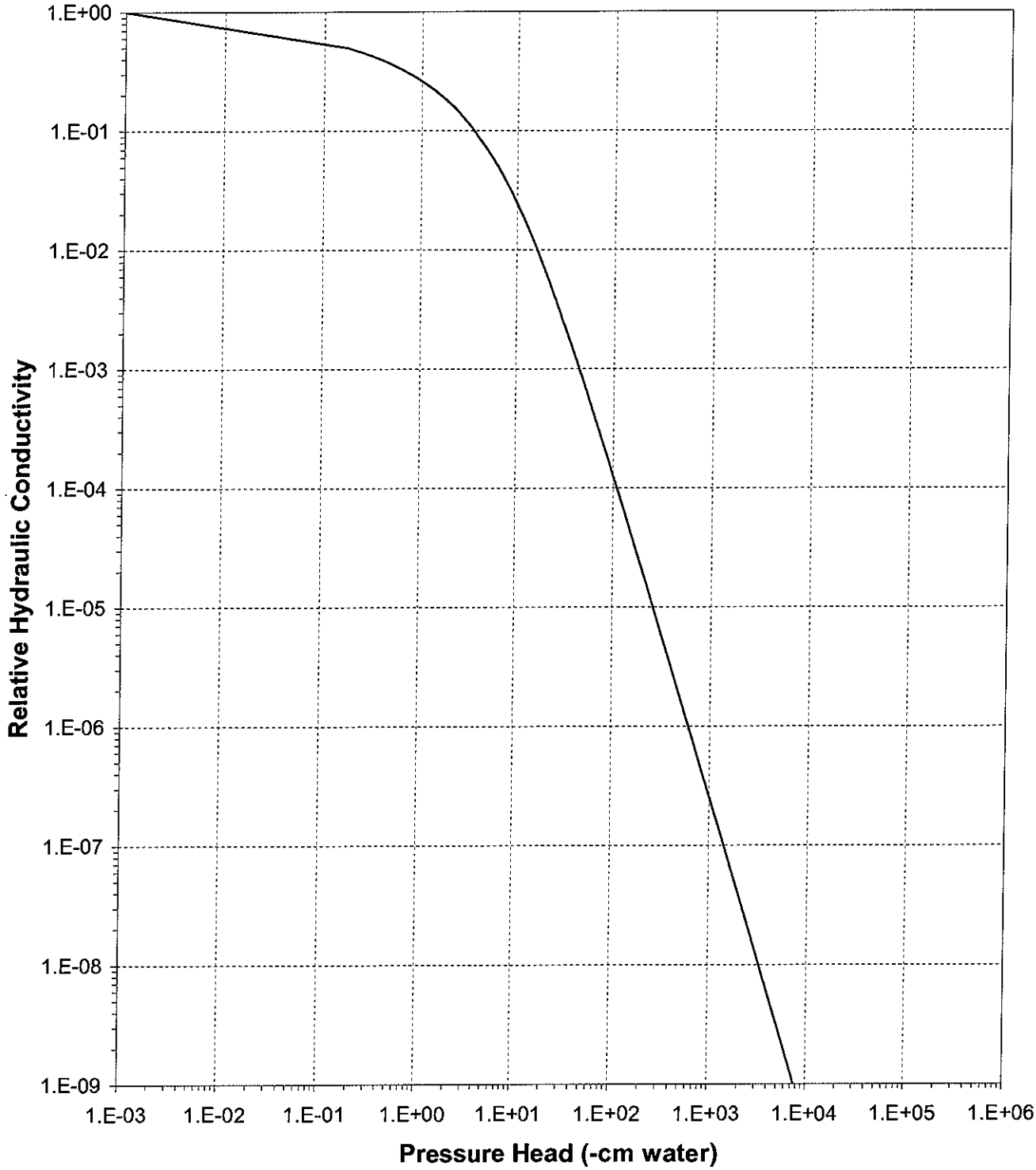
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: CMLC-3



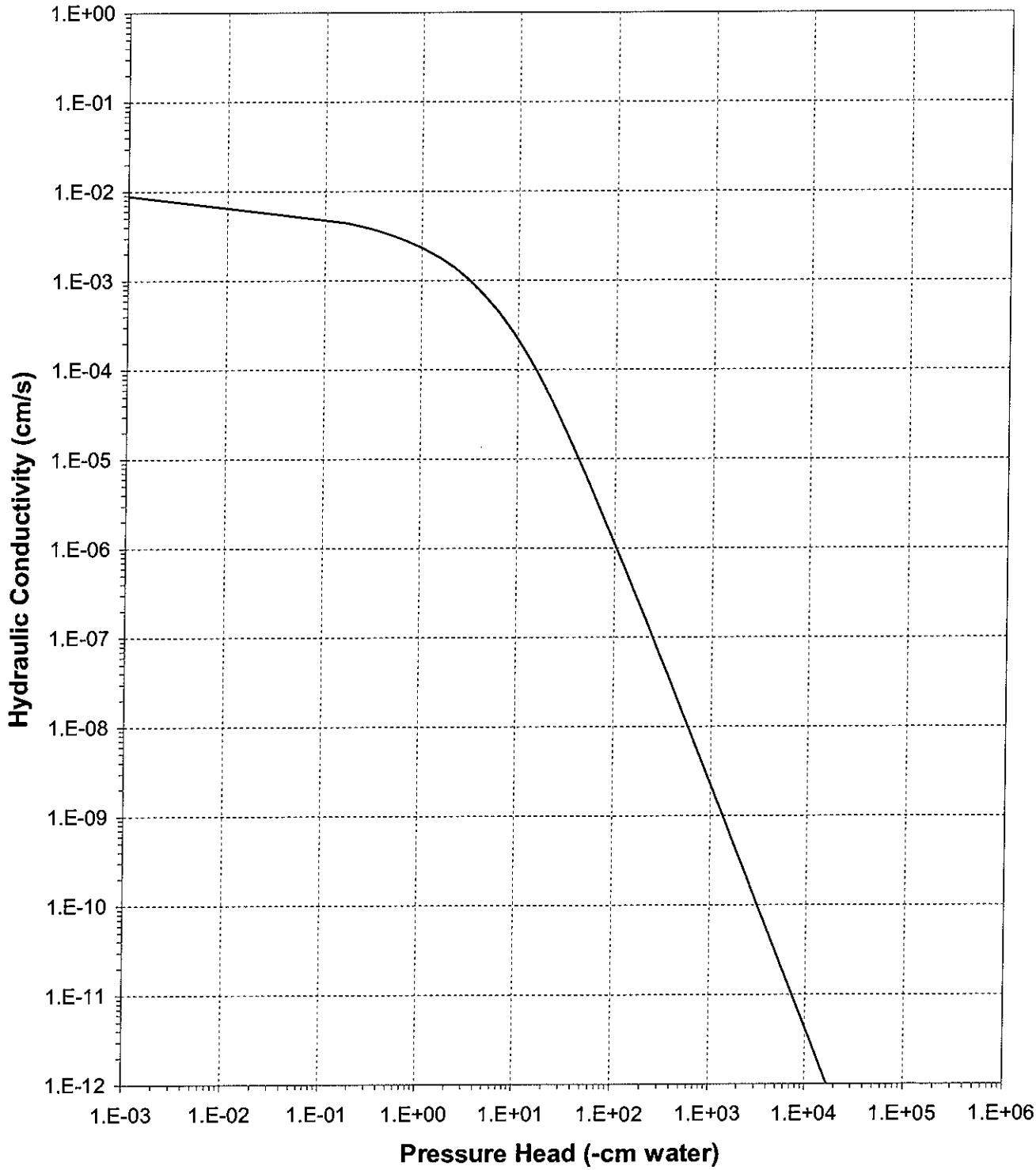
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: CMLC-3



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: CMLC-3



Daniel B. Stephens & Associates, Inc.

Gravel Correction Data Sheet

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-3
Date Sampled: 7/15/05
Depth: N/A
Split: # 10 Sieve

Uncorrected input values		Corrected Values	
Mass (coarse)(g):	8621		
Mass (fines)(g):	3788		
Dry bulk density (fines)(g/cm^3):	1.4	Density (composite)(g/cm^3):	2.08
+Density (coarse)(g/cm^3):	2.65		
Ksat value (fines)(cm/sec):	8.9E-03	Ksat composite(cm/sec):	4.0E-03
Theta initial (fines):	0.1360	Theta initial composite:	0.0618
Theta saturated (fines):	0.4711	Theta saturated composite:	0.2139
Theta residual (fines):	0.0162	Theta residual composite:	0.0074
*Theta initial (coarse):	0		
*Theta saturated (coarse):	0		
*Theta residual (coarse):	0		
*Volume (coarse voids)(cm^3):	0		

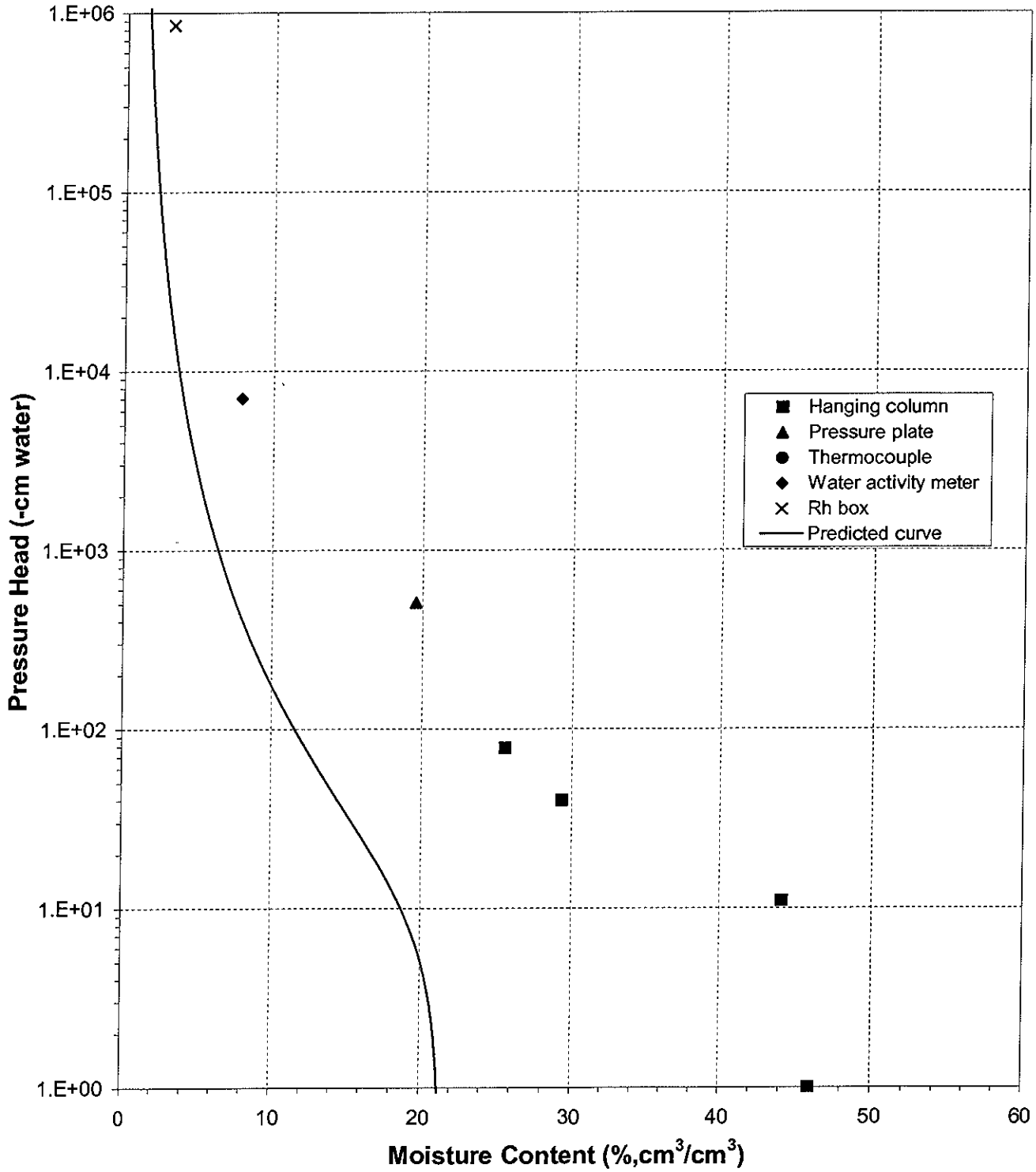
Volumetric fraction of fines in composite: 0.454
Volumetric fraction of coarse in composite: 0.546
Volumetric fraction of voids in composite: 0.000
Volume (fines)(cm^3): 2705.71
Volume (coarse)(cm^3): 3253.21
Volume (composite)(cm^3): 5958.92

Comments:
+Assumed to be 2.65, unless measured
*Values will be zero if the coarse fraction is assumed to hold no water in pores.

Date: 24-Oct-05
Data entered by: D. O'Dowd
Checked by: J. Hines

Predicted Water Retention Curve and Data Points

Sample Number: CMLC-3 (Gravel Corrected)



Specific Gravity

Summary of Particle Density Tests

Sample Number	Particle Density (g/cm^3)
CMLC-1	2.42
CMLC-2	2.52
CMLC-3	2.47

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-1
Date Sampled: 7/15/05
Depth: N/A
Test Date: 19-Aug-05

Trial 1

Weight of pycnometer filled w/air (g):	91.24
Weight of pycnometer filled w/soil (g):	141.26
Weight of pycnometer filled w/soil & water (g):	369.77
Weight of pycnometer filled w/water (g):	340.29
Observed temperature (°C):	21.60
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.43
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.43

Trial 2

Weight of pycnometer filled w/air (g):	91.44
Weight of pycnometer filled w/soil (g):	139.64
Weight of pycnometer filled w/soil & water (g):	368.66
Weight of pycnometer filled w/water (g):	340.44
Observed temperature (°C):	21.70
Density of water at observed temperature (g/cm^3):	0.9978
Particle Density (g/cm^3):	2.41
Correction factor, K:	0.9996
Particle Density at 20°C (g/cm^3):	2.41

Average Particle Density **(g/cm^3):** **2.42**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-2
Date Sampled: 7/15/05
Depth: N/A
Test Date: 19-Aug-05

Trial 1

Weight of pycnometer filled w/air (g):	100.59
Weight of pycnometer filled w/soil (g):	149.52
Weight of pycnometer filled w/soil & water (g):	379.32
Weight of pycnometer filled w/water (g):	349.78
Observed temperature (°C):	21.60
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.52
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.52

Trial 2

Weight of pycnometer filled w/air (g):	91.76
Weight of pycnometer filled w/soil (g):	140.91
Weight of pycnometer filled w/soil & water (g):	370.68
Weight of pycnometer filled w/water (g):	340.91
Observed temperature (°C):	21.60
Density of water at observed temperature (g/cm^3):	0.9979
Particle Density (g/cm^3):	2.53
Correction factor, K:	0.9997
Particle Density at 20°C (g/cm^3):	2.53

Average Particle Density **(g/cm^3):** **2.52**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Particle Density

Job Name: Golder Associates, Inc.
Job Number: LB05.0177.00
Sample Number: CMLC-3
Date Sampled: 7/15/05
Depth: N/A
Test Date: 19-Aug-05

Trial 1

Weight of pycnometer filled w/air (g):	91.52
Weight of pycnometer filled w/soil (g):	141.49
Weight of pycnometer filled w/soil & water (g):	370.40
Weight of pycnometer filled w/water (g):	340.69
Observed temperature (°C):	20.60
Density of water at observed temperature (g/cm^3):	0.9981
Particle Density (g/cm^3):	2.46
Correction factor, K:	0.9999
Particle Density at 20°C (g/cm^3):	2.46

Trial 2

Weight of pycnometer filled w/air (g):	100.50
Weight of pycnometer filled w/soil (g):	149.34
Weight of pycnometer filled w/soil & water (g):	378.92
Weight of pycnometer filled w/water (g):	349.74
Observed temperature (°C):	20.60
Density of water at observed temperature (g/cm^3):	0.9981
Particle Density (g/cm^3):	2.48
Correction factor, K:	0.9999
Particle Density at 20°C (g/cm^3):	2.48

Average Particle Density **(g/cm^3):** **2.47**

Comments:

Laboratory analysis by: M. Carrillo
Data entered by: M. Carrillo
Checked by: J. Hines

Laboratory Tests and Methods

Tests and Methods

Dry Bulk Density:	ASTM D4531; ASTM D6836
Moisture Content:	ASTM D2216; ASTM D6836
Calculated Porosity:	Klute, A. 1986. Porosity. Chp.18-2.1, pp. 444-445, in A. Klute (ed.), Methods of Soil Analysis, American Society of Agronomy, Madison, WI
Saturated K: Constant Head:	ASTM D 2434 (modified apparatus)
Hanging Column Method:	ASTM D6836; Klute, A. 1986. Porosity. Chp.26, in A. Klute (ed.), Methods of Soil Analysis, American Society of Agronomy, Madison, WI
Pressure Plate Method:	ASTM D6836; ASTM D2325
Water Potential Method:	ASTM D6836; Rawlins, S.L. and G.S. Campbell, 1986. Water Potential: Thermocouple Psychrometry. Chp. 24, pp. 597-619, in A. Klute (ed.), Methods of Soil Analysis, Part 1. American Society of Agronomy, Madison, WI.
Relative Humidity Box:	Karathanasis & Hajek. 1982. Quantitative Evaluation of Water Adsorption on Soil Clays.SSA Journal 46:1321-1325
Calc. Kunsat:	ASTM D6836; Soil Sci. Soc. Am. J. 1980 44:892-898
Particle Density	ASTM D854
Course Fraction (Gravel) Correction (calc):	ASTM D4718; Bouwer, H. and Rice, R.C. 1984. Hydraulic Properties of Stony Vadose Zones. Groundwater Vol. 22, No. 6

APPENDIX C

COMPILATION OF GILA CONGLOMERATE AND LEACHED CAP DATA

TABLE C-1
CHEMICAL AND PHYSICAL PROPERTIES OF SOIL SAMPLES FROM THE TYRONE MINE

Horizon Designation/ Layer	Depth[a] (in or ft)	Saturated Paste Extract						Hot Water Soluble		$CaCO_3$ Equivalent (%)	Saturation Percentage (% water)	Particles Size Distribution (%)				Texture[b]
		pH	EC (dS/m)	Calcium (meq/L)	Magnesium (meq/L)	Sodium (meq/L)	SAR	Selenium (mg/kg)	Boron (mg/kg)			Sand	Silt	Clay	Rock Fragments (vol %)	
Test Pit 1, Map Unit 10																
BW1	2-15"	7.1	0.33	2.56	0.47	0.20	0.16	<0.01	0.12	1.6	48.6	24	51	25	5	SiL
BW2	15-52"	7.6	1.66	18.00	2.22	1.02	0.32	<0.01	0.12	2.4	46.1	28	56	16	7	SiL
C	52-62"	7.7	0.99	8.99	1.21	0.96	0.43	<0.01	0.08	2.5	25.9	66	27	7	55	SL
Alluvium	9-11'	7.8	0.59	4.03	0.72	0.89	0.58	<0.01	0.03	2.4	18.0	88	9	3	5	S
Alluvium	11-14'	7.5	1.26	9.51	1.47	1.23	0.52	<0.01	0.04	2.3	22.2	78	15	7	1	LS
Test Pit 2, Map Unit 10																
BW1	2-18"	7.5	0.46	3.61	0.77	0.56	0.38	<0.01	0.09	1.3	56.8	22	40	38	0	CL
BW2	18-34"	7.8	0.73	4.56	1.42	1.96	1.13	<0.01	0.10	3.9	32.0	60	28	12	20	SL
C	34-57"	7.8	1.56	11.40	3.23	4.40	1.63	<0.01	0.13	2.5	21.7	88	9	3	45	S
Alluvium	4-13'	7.7	1.45	11.20	1.84	1.86	0.73	0.02	0.04	2.2	22.8	71	22	7	5	SL
Test Pit 3, Map Unit 10																
A	0-11"	6.3	0.24	1.32	0.64	0.14	0.14	<0.01	0.06	1.0	21.3	72	25	3	30	SL
BW	11-18"	6.7	0.33	1.90	0.95	0.30	0.25	<0.01	0.07	1.0	24.2	60	27	13	20	SL
BC	18-31"	6.9	0.31	1.67	0.84	0.37	0.33	<0.01	0.05	0.8	20.3	80	14	6	30	LS
C	31-58"	7.2	0.26	1.28	0.65	0.30	0.31	<0.01	0.06	1.1	15.6	84	11	5	45	LS
Alluvium	9-13'	7.6	1.08	5.26	1.57	3.50	1.89	0.02	0.07	1.4	33.8	49	39	12	1	L
Test Pit 4, Map Unit 10																
A2	2-13"	7.6	0.50	4.26	0.66	0.22	0.14	<0.01	0.09	3.5	36.8	48	45	7	5	L
BW	13-30"	7.7	0.47	3.73	0.65	0.61	0.41	<0.01	0.11	3.9	29.7	58	37	5	5	SL
C	30-58"	7.9	0.39	2.53	0.49	0.68	0.55	<0.01	0.14	2.8	19.7	84	13	3	40	LS
Alluvium	2.5-14'	7.9	0.58	3.71	0.83	1.20	0.80	<0.01	0.10	3.3	20.2	82	14	4	5	LS
Test Pit 5, Map Unit 20																
A2	2-14"	7.1	0.40	3.57	0.52	0.24	0.17	<0.01	0.05	1.1	38.0	51	35	14	5	L
BW	14-26"	7.6	0.39	3.21	0.46	0.29	0.21	<0.01	0.06	6.0	29.4	64	29	7	22	SL
C	26-56"	7.8	0.35	2.65	0.51	0.44	0.35	<0.01	0.04	5.1	23.2	78	17	5	50	LS
Alluvium	5-7'	7.8	0.34	2.04	0.55	0.93	0.82	<0.01	0.05	4.2	21.7	80	15	5	10	LS
Alluvium	8-12'	7.8	0.84	4.68	1.01	3.33	1.97	<0.01	0.05	3.3	18.3	90	4	6	10	S
Test Pit 6, Map Unit 30																
Bt 1, Bt 2	2-20"	6.7	0.44	2.69	1.14	0.59	0.43	0.01	0.13	0.9	40.0	60	15	25	55	SCL
Bt 3	20-31"	7.5	0.49	2.50	1.08	1.65	1.23	<0.01	0.16	2.4	33.4	72	9	19	63	SL
Bt 4	31-61"	7.7	0.86	2.67	1.10	5.21	3.79	<0.01	0.15	1.7	40.9	68	16	16	75	SL
Bt 6	61-71"	7.4	3.10	11.40	3.43	14.90	5.47	<0.01	0.04	1.1	43.7	59	19	22	10	SCL
Gila C	6-8'	7.4	3.74	14.80	3.94	17.80	5.82	<0.01	0.02	1.7	44.1	48	47	5	0	SL
Gila C	8-10'	7.6	2.62	9.92	2.22	11.90	4.83	0.01	0.02	2.9	27.4	75	19	6	5	SL
Gila C	10-14'	7.7	2.00	7.81	1.61	8.54	3.94	<0.01	0.01	2.1	18.8	85	11	4	55	LS
Gila C	14-20'	7.6	0.98	6.13	0.88	2.52	1.35	<0.01	0.02	3.4	21.1	82	13	5	15	LS

TABLE C-1
CHEMICAL AND PHYSICAL PROPERTIES OF SOIL SAMPLES FROM THE TYRONE MINE

Horizon Designation/ Layer	Depth[a] (in or ft)	Saturated Paste Extract						Hot Water Soluble		$CaCO_3$ Equivalent (%)	Saturation Percentage (% water)	Particles Size Distribution (%)				Texture[b]
		pH	EC (dS/m)	Calcium (meq/L)	Magnesium (meq/L)	Sodium (meq/L)	SAR	Selenium (mg/kg)	Boron (mg/kg)			Sand	Silt	Clay	Rock Fragments (vol %)	
Test Pit 8, Map Unit 30																
Btk 1	2-17"	7.4	0.56	2.37	0.80	3.02	2.40	<0.01	0.13	1.2	75.2	27	20	53	15	C
Btk 2	17-34"	7.5	3.66	18.60	6.12	16.60	4.72	0.02	0.16	2.8	62.3	28	39	33	15	CL
Btk 3	34-58"	7.6	3.14	12.10	3.61	16.60	5.92	<0.01	0.06	6.5	33.5	56	40	4	22	SL
Btk 4	58-73"	7.7	2.28	8.77	2.00	12.10	5.21	<0.01	0.02	9.2	23.3	78	18	4	45	LS
Gila C	4-12'	7.6	1.92	9.87	1.72	7.00	2.90	<0.01	0.01	4.1	24.5	72	21	7	65	SL
Gila C	12-14'	7.6	1.20	7.10	1.21	2.53	1.24	<0.01	0.01	1.7	32.6	60	29	11	15	SL
Gila C	14-20'	7.6	1.00	6.11	1.16	1.68	0.88	<0.01	0.01	1.5	25.4	70	17	13	50	SL
Test Pit 9, Map Unit 45																
A	0-6"	5.0	0.92	4.97	2.55	0.44	0.23	<0.01	0.09	0.9	27.6	58	30	12	35	SL
Bt 1	6-34"	6.5	0.26	0.94	0.63	0.64	0.72	<0.01	0.17	0.6	71.7	24	17	59	35	C
Bt 2	34-70"	7.6	2.65	8.57	6.08	14.50	5.36	<0.01	0.15	6.0	47.2	60	15	25	65	SCL
Test Pit 10, Map Unit 45																
A, AB	0-16"	6.6	0.30	1.48	0.69	0.33	0.32	<0.01	0.07	0.8	18.1	70	23	7	20	SL
Bt 1, Bt 2	16-49"	7.4	0.65	3.04	1.44	1.94	1.30	<0.01	0.08	0.9	30.3	60	20	20	30	SCL
Bt 3	49-63"	7.8	1.01	2.47	1.68	5.98	4.15	<0.01	0.08	1.9	34.4	48	35	17	7	L
Gila C	8-18'	7.2	1.06	1.56	0.78	7.87	7.28	<0.01	0.02	0.7	23.7	52	35	13	1	L
Gila C	18-20'	6.8	0.70	0.91	0.48	5.14	6.17	<0.01	0.01	0.7	16.4	84	8	8	10	LS
Test Pit 11, Map Unit 30																
A	0-5"	6.3	0.38	2.25	1.05	0.24	0.19	<0.01	0.06	0.7	18.6	74	21	5	30	SL
Bt 1	1-18"	6.7	0.69	1.39	0.56	5.09	5.15	<0.01	0.02	1.4	38.8	57	20	23	10	SCL
Bt 2	18-60"	6.8	0.92	1.78	0.73	6.21	5.54	<0.01	0.01	1.7	35.5	62	23	15	25	SL
Gila C	16-20'	6.6	0.70	2.33	0.99	3.17	2.46	<0.01	0.02	1.1	37.8	54	25	21	5	SCL
Test Pit 12, Map Unit 20																
C	2-54"	7.5	0.36	2.81	0.57	0.23	0.18	<0.01	0.02	0.7	17.0	82	12	6	50	LS
Alluvium	7-10'	7.2	1.64	15.40	3.10	1.15	0.38	<0.01	0.09	0.6	22.0	70	23	7	<5	SL
Alluvium	10-15'	7.4	0.59	4.08	1.04	0.53	0.33	<0.01	0.03	0.5	18.4	88	6	6	<5	LS
Test Pit 13, Map Unit 20																
A, C1	0-39"	6.4	0.22	1.14	0.50	0.26	0.29	<0.01	0.06	0.6	18.9	90	6	4	30	S
C2	39-62"	6.3	0.18	0.98	0.40	0.30	0.36	<0.01	0.04	0.7	17.2	87	9	4	30	LS
Alluvium	6-14'	6.8	0.23	1.37	0.84	0.47	0.45	<0.01	0.04	0.4	20.2	94	3	3	20	S
Test Pit 14, Map Unit 40																
C1	0-46"	6.9	0.43	0.50	0.24	3.80	6.25	<0.01	<0.01	0.9	22.9	76	13	11	46	SL
C2	46-55"	7.2	0.38	0.17	0.11	3.41	9.11	<0.01	<0.01	0.8	39.4	54	23	23	25	SCL
Test Pit 15, Map Unit 40																
A	0-9"	5.5	0.52	3.53	1.38	0.34	0.22	0.01	0.10	0.6	20.9	75	18	7	15	SL
Bt 1	9-15"	5.6	0.35	1.14	0.63	0.86	0.91	<0.01	0.08	1.1	35.7	64	13	23	45	SCL
Bt 2	15-46"	7.4	0.71	1.71	0.72	4.54	4.12	<0.01	0.08	1.1	22.6	72	20	8	50	SL
C2	46-60"	7.6	2.07	6.74	2.26	13.70	6.46	<0.01	0.03	1.5	23.3	80	13	7	65	LS
Gila C	9-12.5"	7.5	2.07	8.27	2.15	9.54	4.18	<0.01	0.02	4.2	19.3	78	15	7	15	LS

TABLE C-1
CHEMICAL AND PHYSICAL PROPERTIES OF SOIL SAMPLES FROM THE TYRONE MINE

Horizon Designation/ Layer	Depth[a] (in or ft)	Saturated Paste Extract						Hot Water Soluble		$CaCO_3$ Equivalent (%)	Saturation Percentage (% water)	Particles Size Distribution (%)				Texture[b]
		pH	EC (dS/m)	Calcium (meq/L)	Magnesium (meq/L)	Sodium (meq/L)	SAR	Selenium (mg/kg)	Boron (mg/kg)			Sand	Silt	Clay	Rock Fragments (vol %)	
Test Pit 17, Map Unit 40																
A	0-11"	5.2	0.42	1.97	0.90	0.24	0.20	<0.01	0.09	0.7	18.5	66	28	6	17	SL
Bt 1, Bt 2	11-29"	5.8	0.28	1.36	0.64	0.63	0.63	<0.01	0.11	1.2	24.4	71	15	14	50	SL
BC	29-60"	7.5	0.42	2.17	0.90	1.32	1.07	<0.01	0.01	0.7	22.4	80	10	10	65	SL
Test Pit 18, Map Unit 40																
A	0-8"	6.4	0.34	1.79	0.85	0.29	0.25	<0.01	0.06	1.5	20.0	65	23	12	20	SL
Bt 1	8-14"	6.5	0.32	1.59	0.83	0.70	0.64	<0.01	0.09	0.9	27.5	60	22	18	50	SL
Bt 2	14-24"	6.5	0.56	0.95	0.45	1.75	2.09	<0.01	0.20	0.4	51.1	42	14	44	40	C
BC	24-60"	7.7	0.53	0.76	0.47	4.16	5.30	<0.01	0.05	3.0	25.5	72	7	21	60	SCL
Test Pit 19, Map Unit 20																
A	0-7"	7.5	0.44	3.44	0.96	0.26	0.18	<0.01	0.09	1.3	28.2	58	24	18	7	SL
C1	7-43"	7.5	0.24	1.51	0.54	0.33	0.33	<0.01	0.04	1.1	20.8	88	5	7	32	LS
C2	43-62"	7.3	0.34	1.42	0.53	1.30	1.32	<0.01	0.04	1.3	24.8	66	22	12	5	SL
Test Pit 21, Map Unit 10																
A, C1, C2	0-35"	7.6	0.37	2.94	0.44	0.26	0.20	<0.01	0.09	3.1	22.9	90	5	5	70	S
C3	35-55"	7.7	0.51	3.90	0.67	0.40	0.26	0.01	0.14	4.0	30.5	52	42	6	5	SL
Pit Wall Gila Conglomerate																
1D-4	Grab	6.1	1.27	7.56	4.39	2.38	0.97	<0.01	0.03	0.9	17.8	87	10	3	60	S
1D-5	Grab	6.2	0.94	6.43	2.36	1.47	0.70	<0.01	0.04	0.9	19.4	84	11	5	40	LS
1D-6	Grab	6.7	1.96	15.00	6.06	4.43	1.37	<0.01	0.03	1.2	19.5	84	12	4	15	LS
1D (5A) Stockpile																
1D-1	--	5.7	0.63	2.52	1.31	1.23	0.89	<0.01	0.05	0.8	20.8	79	13	8	ND	LS
1D-2	--	5.1	0.75	4.67	2.29	0.51	0.27	<0.01	0.03	0.8	20.5	85	10	5	ND	LS
1D-3	--	5.9	0.56	2.88	1.33	1.44	0.99	<0.01	0.03	1	21.3	84	11	5	ND	LS
SP1D-02	--	5.7	1.17	7.61	3.97	1.86	0.77	<0.01	0.02	ND	21.8	80	11	9	ND	LS
SP1D-03	--	6.5	0.16	2.39	1.24	1.07	0.79	<0.01	0.02	0.4	23.2	80	12	8	ND	LS
SP1D-09	--	6.2	0.53	2.96	1.42	0.69	0.47	<0.01	0.03	BA	18.5	86	7	7	ND	LS
SP1D-15	--	6.3	0.41	2.24	0.9	0.68	0.54	<0.04	0.02	NA	19.1	82	10	8	ND	LS

Notes:

Table adapted from DBS&A, 1997a

[a] Depths for soil horizons are in inches; depths for the underlying geologic layers are in feet.

[b] texture = USDA texture class according to Soil Survey Division Staff (1993)

in = inches

ft = feet

dS/m = deciSiemens per meter

meq/L = milliequivalents per liter

mg/kg = milligrams per kilogram

TABLE C-2
SUMMARY OF SOIL HYDRAULIC PROPERTIES FOR TYRONE BORROW MATERIALS

Sample ID	Type[a]	Particle Size Distribution (%)				Texture[c]	K_{sat} (cm/s)		Volumetric Water Content[d] (cm^3/cm^3)							
									Θ_r		Θ_s		$\Theta_{1/3}$		Θ_{15}	
		Sand	Silt	Clay	Rock Fragments[b] (Vol %)		<2mm	Whole Soil	<2mm	Whole Soil	<2mm	Whole Soil	<2mm	Whole Soil	<2mm	Whole Soil
1D-1	GC	87	10	3	67	S	7.30E-03	1.80E-03	0.03	0.010	0.43	0.142	0.17	0.056	0.07	0.023
1D-5	GC	84	11	5	67	LS	5.90E-02	1.46E-02	0	0	0.53	0.175	0.16	0.053	0.07	0.023
TP-1 0-2.5	Alluv	26	54	20	10	SiL	3.30E-05	2.83E-05	0	0	0.45	0.405	0.34	0.306	0.17	0.153
TP-2 4-13	Alluv	71	22	7	10	SL	5.50E-04	4.71E-04	0.03	0.027	0.41	0.369	0.22	0.198	0.10	0.090
TP-3 1-9	Alluv	77	16	7	10	LS	6.90E-03	5.91E-03	0.05	0.045	0.45	0.405	0.20	0.180	0.08	0.072
TP-3 9-14	Alluv	49	39	12	50	LS	2.90E-04	1.16E-04	0.03	0.015	0.49	0.245	0.27	0.135	0.11	0.055
TP-4 2.5-5.14	Alluv	48	45	7	55	LS	1.60E-04	5.65E-05	0.03	0.014	0.34	0.153	0.21	0.095	0.08	0.036
TP-8 0.1-4.95	GC	37	33	30	37	CL	1.50E-05	7.97E-06	0	0	0.46	0.290	0.40	0.252	0.22	0.139
TP-8 4-12	GC	72	21	7	65	SL	4.20E-04	1.11E-04	0	0	0.51	0.179	0.29	0.102	0.14	0.049
TP-9 4-8	GC	60	15	25	2	SCL	2.70E-03	2.62E-03	0	0	0.6	0.588	0.25	0.245	0.12	0.118
TP-10 2-8	GC	54	28	18	25	SL	1.00E-03	6.67E-04	0.04	0.030	0.46	0.345	0.19	0.143	0.08	0.060
TP-10 8-18	GC	52	35	13	15	LS	1.30E-05	1.03E-05	0	0	0.39	0.332	0.25	0.213	0.12	0.102
TP-11 4-16	GC	57	20	23	60	SCL	2.50E-05	7.69E-06	0	0	0.43	0.172	0.29	0.116	0.15	0.060
TP-13 2.5-6	Alluv	88	8	4	60	S	5.70E-03	1.75E-03	0	0	0.38	0.152	0.20	0.080	0.07	0.028
TP-13 6-14	Alluv	94	3	3	0	S	4.00E-03	4.00E-03	0	0	0.37	0.370	0.09	0.090	0.03	0.030
TP-14 0-20	GC	65	18	17	30	SL	5.10E-04	3.10E-04	0	0	0.46	0.322	0.24	0.168	0.11	0.077
TP-17 2-20	GC	76	13	11	13	SL	4.70E-04	3.84E-04	0.02	0.017	0.34	0.296	0.15	0.131	0.06	0.052
TP-18 2-5	GC	72	7	21	40	SCL	1.00E-04	5.00E-05	0	0	0.41	0.246	0.27	0.162	0.16	0.096
TP-19 2-11	Alluv	66	22	12	5	SL	4.90E-04	4.54E-04	0	0	0.37	0.352	0.23	0.219	0.10	0.095
TP-21 5-14	Alluv	52	42	6	67	SL	1.70E-03	4.20E-04	0	0	0.39	0.129	0.24	0.079	0.10	0.033

Notes:
Table adapted from DBS&A, 1999
a GC = Gila Conglomerate
Alluv = Alluvium
b Total rock fragments includes field estimate of materials >3"
c Texture = USDA texture class according to Soil Survey Division Staff (1993)
d Θ_r = residual moisture content
Θ_s = saturated moisture content
$\Theta_{1/3}$ = 1/3 bar moisture content
Θ_{15} = 15 bar moisture content

TABLE C-3
ACID-BASE ACCOUNT AND SULFUR FORMS FOR SELECTED GILA CONGLOMERATE AND ASSOCIATED SOILS

Sample ID	Depth *(ft bgs)*	Saturated Paste pH	Acid-Base Account *(t $CaCO_3$/kt)*			Extractable Sulfur Forms *(%)*				
			ANP	AGP	ABA	H_2O	HCl	HNO_3	Residual	Total
TP-13	6-14	7.9	4	<1	4	<0.01	<0.01	<0.01	<0.01	<0.01
TP-15	9-12.5	7.9	42	<1	42	<0.01	<0.01	<0.01	<0.01	<0.01
1D-4	Grab	6.1	9	<1	9	0.01	<0.01	0.01	0.01	0.03
1D-5	Grab	6.2	9	<1	9	0.02	<0.01	0.01	<0.01	0.03
1D-6	Grab	6.7	12	<1	12	0.20	<0.01	<0.01	<0.01	0.02

Notes:

Table adapted from DBS&A, 1997

ft bgs = feet below ground surface

ANP = acid-neutralization potential, in tons $CaCO_3$ per 1,000 tons

AGP = acid-generation potential, in tons $CaCO_3$ per 1,000 tons

ABA = acid-base accounting = ANP - AGP, in tons $CaCO_3$ per 1,000 tons

$CaCO_3$ = calcium carbonate

TABLE C-4
CHEMICAL AND PHYSICAL PROPERTIES OF SELECTED SAMPLES
FROM THE CONCENTRATOR/MILL DEMOLITION BORROW INVESTIGATION

Sample ID	Depth *(ft bgs)*	Particle Size *(%)*				Texture	Saturation Percentage *(% water)*	Saturated Paste		$CaCO_3$ *(%)*	Phosphorus		Nitrate	
		Sand	Silt	Clay	Rock Fragments *(vol %)*			pH	EC *(dS/m)*		*mg/kg*	*lb/ac-ft*	*mg/kg*	*lb/ac-ft*
TP-M1	Bulk	76	11	13	71	SL	20.2	6.3	0.39	0.5	3	12	<1	<4
TP-M2	Bulk	74	11	15	53	SL	20.5	6.4	0.32	0.5	3	12	<1	<4
TP-M3	Bulk	76	11	13	46	SL	19.4	6.6	0.21	0.5	2	8	<1	<4
TP-M4	Bulk	78	11	11	52	SL	18.9	5.8	0.36	0.4	4	16	<1	<4
TP-N1	Bulk	79	10	11	21	SL	16.3	7.2	0.27	0.7	3	12	<1	<4
TP-N2	Bulk	78	7	15	22	SL	18.2	7.1	0.32	0.6	3	12	<1	<4
TP-R1	Bulk	78	11	11	19	SL	17.6	5.1	0.45	0.5	11	44	<1	<4
TP-R2	Bulk	77	10	13	20	SL	19.6	7.3	0.54	0.9	4	16	<1	<4
TP-R3	Bulk	78	7	15	21	SL	19.8	6.0	1.61	0.5	7	28	<1	<4

Notes:
Golder, 2005
ft bgs = feet below ground surface
EC = electrical conductivity
dS/m = deciSiemens per meter
mg/kg = milligrams per kilograms
lb/ac-ft = pounds per acre-feet

TABLE C-5
CHEMICAL AND PHYSICAL PROPERTIES OF LEACHED CAP SAMPLES FROM THE TYRONE AND LITTLE ROCK MINE

Sample ID	Depth (ft bgs)	Particle Size Distribution (%)				Texture	Saturation Percentage (% water)	Saturated Paste		$CaCO_3$ (%)
		Sand	Silt	Clay	Rock Fragments[a] (vol %)			pH	EC (dS/m)	
Tyrone Leach Cap										
TySCMP-1	Bulk	74	12	14	55	SL	25.6	6.7	0.36	<0.1
TySCMP-2	Bulk	68	15	17	60	SL	24.8	6.1	0.29	<0.1
TyNCMP-1	Bulk	66	18	16	65	SL	NA	5.9	0.52	<0.1
TyNCMP-2	Bulk	67	16	24	60	SCL	NA	4.9	0.68	<0.1
TyCMS-R1	Bulk	77	13	10	NA	SL	26.5	6.2	0.33	1.3
TyCMS-R2	Bulk	86	9	5	NA	LS	25.9	6.5	0.23	1.0
TyCMS-R3	Bulk	74	13	13	NA	SL	25.4	7.4	0.46	0.8
TyCMS-D1	Bulk	78	13	9	NA	SL	23.5	5.8	0.28	0.2
TyLC-1	Bulk	56	23	21	67	SCL	NA	NA	NA	NA
TyLC-2	Bulk	70	19	11	69	SL	NA	NA	NA	NA
TyLC-3	Bulk	62	19	19	72	SL	NA	NA	NA	NA
TyLC-4	Bulk	62	21	17	52	SL	NA	NA	NA	NA
TyLC-5	Bulk	68	21	11	54	SL	NA	NA	NA	NA
Little Rock Mine										
LRSP-1	0-0.5	65	19	16	59	SL	NA	5.7	0.12	0.9
LRSP-2	0-0.5	67	19	14	65	SL	NA	5.8	0.14	0.9
LRSP-3	0-0.5	72	16	12	64	SL	NA	7.1	0.25	1.1
LRSP-4	0-0.5	60	24	16	52	SL	NA	5.5	0.14	0.5
LRSP-5	0-0.5	70	16	14	46	SL	NA	5.7	0.12	0.9
LRSP-6	0-0.5	80	10	10	66	SL	NA	5.6	0.15	0.7
LROB-1	4-5	72	15	13	64	SL	NA	6.8	0.65	1.1
LROB-2	4-5	74	13	13	65	SL	NA	6.7	0.21	1.0
LROB-3	4-5	70	13	17	64	SL	NA	6.2	0.22	1.0
LROB-4	4-5	72	13	15	52	SL	NA	6.6	0.27	1.3
LROB-5	4-5	68	21	11	46	SL	NA	6.0	0.87	0.6

Notes:

[a] Total rock fragments includes field estimate of materials >3"

ft bgs = feet below ground surface

dS/m = deciSiemens per meter

TABLE C-6
ACID-BASE ACCOUNT AND SULFUR FORMS FOR TYRONE AND LITTLE ROCK LEACHED CAP

Sample ID	Depth *(ft bgs)*	Saturated Paste pH	Acid-Base Account *(t $CaCO_3$/kt)*			Extractable Sulfur Forms *(%)*				
			ANP	AGP	ABA	Total	H_2O	HCL	HNO_3	Residual
TySCMP-1	Bulk	6.7	22	<0.3	22	<0.01	<0.01	<0.01	<0.01	<0.01
TySCMP-2	Bulk	6.1	18	<0.3	18	<0.01	<0.01	<0.01	<0.01	<0.01
TyCMS-R1	Bulk	6.2	13	<0.3	13	0.02	0.02	<0.01	<0.01	<0.01
TyCMS-R2	Bulk	6.5	10	<0.3	10	<0.01	<0.01	<0.01	<0.01	<0.01
TyCMS-R3	Bulk	7.4	8	<0.3	8	<0.01	<0.01	<0.01	<0.01	<0.01
TyCMS-D1	Bulk	5.8	2	<0.3	1	0.03	0.01	<0.01	0.02	<0.01

Notes:
ft bgs = feet below ground surface
ANP = acid neutralization potential
AGP = acid generation potential
ABA = acid-base accounting
t $CaCO_3$/kt = tons calcium carbonate per kiloton

TABLE C-7
AB-DTPA EXTRACTABLE CONSTITUENTS FROM TYRONE AND LITTLE ROCK LEACHED CAP

Sample ID	Depth (ft bgs)	mg/kg							
		As	Cd	Cu	Pb	Mn	Hg	Mo	Ni
TyCMS-R1	Bulk	<1	<0.01	38	0.25	11.6	<0.05	0.55	0.08
TyCMS-R2	Bulk	<1	0.03	25	0.63	34.0	<0.05	0.24	0.09
TyCMS-R3	Bulk	<1	0.02	35	5.37	31.6	<0.05	0.48	0.08
TyCMS-D1	Bulk	<1	0.04	47	2.48	28.8	<0.05	0.91	0.10
LROB-2	4-5	<1	0.06	141	0.95	16.6	<0.05	0.16	0.29
LROB-3	4-5	<1	0.03	61	1.46	14.1	<0.05	0.17	0.06
LROB-4	4-5	<1	0.03	125	0.89	15.4	<0.05	0.14	0.05
LROB-5	4-5	<1	0.03	44	3.52	13.7	<0.05	0.19	0.09
LRPB-1	0-0.5	<1	0.03	324	1.20	17.3	<0.05	0.09	0.05
LRPB-2	0-0.5	<1	0.02	63	0.73	13.5	<0.05	0.10	0.04
CD-3A	272-275	<1	0.04	68	1.38	27.0	<0.05	0.36	0.06
BX-3	269-272	<1	0.07	14	0.72	51.6	<0.05	0.38	0.07

Notes:
ft bgs = feet below ground surface
mg/kg = milligrams per kilogram