

PLUM POINT ENERGY STATION COAL COMBUSTION RESIDUAL LANDFILL

EPA CCR RULE SITING CRITERIA §257.64, UNSTABLE AREAS

PREPARED IN COMPLIANCE WITH THE EPA FINAL RULE FOR THE DISPOSAL OF COAL COMBUSTION RESIDUALS TITLE 40 CODE OF FEDERAL REGULATIONS PART 257

OCTOBER 17, 2018

PLUM POINT ENERGY STATION COAL COMBUSTION RESIDUAL LANDFILL

EPA CCR RULE SITING CRITERIA §257.64, UNSTABLE AREAS

PREPARED IN COMPLIANCE WITH THE EPA FINAL RULE FOR THE DISPOSAL OF COAL COMBUSTION RESIDUALS TITLE 40 CODE OF FEDERAL REGULATIONS PART 257

Prepared for

Plum Point Services Company, LLC Plum Point Energy Station 2732 South County Road 623 Osceola, AR 72370

Prepared by

FTN Associates, Ltd. 3 Innwood Circle, Suite 220 Little Rock, AR 72211

FTN No. R14590-1960-001

October 17, 2018

PROFESSIONAL ENGINEER'S CERTIFICATION

With this certification, I certify that I, as a Professional Engineer in the State of Arkansas, am a qualified professional engineer as defined in §257.53 of Title 40 Code of Federal Regulations (40 CFR) Part 257, that this report has been prepared under my direction in accordance with generally accepted good engineering practices, that the findings are accurate to the best of my knowledge, and that the CCR unit that is subject to this certification meets the location requirements under §257.64 of 40 CFR Part 257.



Dana L. Derrington, Arkansas PE #16372

10/17/2018 Date

TABLE OF CONTENTS

PROFI	ESSION	JAL ENGINEER'S CERTIFICATION	i				
1.0	INTRODUCTION1						
2.0	BACK	GROUND	3				
	2.1	Plant Operational History	3				
	2.2	Landfill History	3				
	2.3	Review of Landfill Permit Documentation	4				
3.0	UNSTABLE AREA EVALUATION						
	3.1	Review of Onsite or Local Soil Conditions that May Result in Significant Differential Settling	6				
	3.2	Review of Onsite or Local Geologic or Geomorphologic Features	7				
	3.3	Review of Onsite or Local Human-Made Features or Events (Both Surface and Subsurface)	7				
4.0	CONC	LUSIONS1	0				
5.0	REFE	RENCES1	1				

LIST OF APPENDICES

APPENDIX A: Well Construction Details, Soil Boring Logs, and Geotechnical Data

LIST OF FIGURES

Figure 1	Location map	2
Figure 2	Landfill site map	5
Figure 3	Geologic map	3
Figure 4	Topography of surrounding area based on USGS topographic quadrangle Osceola, AR)

1.0 INTRODUCTION

Plum Point Services Company, LLC (PPSC) operates a landfill for the disposal of coal combustion residuals (CCRs) generated at the Plum Point Energy Station (PPES) located in Mississippi County, Arkansas. PPES and the landfill are located approximately 2 miles south of the city of Osceola, as shown on Figure 1.

The landfill is permitted by the Arkansas Department of Environmental Quality (ADEQ) under permit no. 0303-S3N-R1 and operates in accordance with the permit and Arkansas Pollution Control and Ecology Commission (APCEC) Regulation No. 22 requirements. The landfill also operates in accordance with the Environmental Protection Agency (EPA) Coal Combustion Residuals Rule (CCR rule), promulgated at Title 40 Code of Federal Regulations (40 CFR) Part 257.

Pursuant to §257.64 of Title 40 Code of Federal Regulations (40 CFR), new and existing CCR landfills must not be located in an unstable area. An unstable area is defined by §257.53 as a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR unit that are responsible for preventing releases from such unit. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains. This report presents the findings of an evaluation of the landfill in support of the location restriction requirements of §257.64.



Figure 1. Location map.

2.0 BACKGROUND

This section provides a brief description of the operational history of the plant and landfill. Landfill permit documents that were reviewed as part of this evaluation are also identified.

2.1 Plant Operational History

PPES became active during March 2010 and generates electricity through the combustion of low-sulfur subbituminous coal, which is sourced primarily from the Powder River Basin in Wyoming and Montana. The combustion process produces CCR materials that are captured through the plant's air emission control systems comprised of electrostatic precipitators and flue-gas desulfurization (FGD) technologies. The CCRs produced by the plant include bottom ash/boiler slag, fly ash, and FGD materials. These CCR materials are comingled and disposed of in a moist/dry state in the landfill.

2.2 Landfill History

In October 2002, ADEQ issued solid waste permit no. 0303-S3N for construction and operation of the CCR landfill. The permit was revised in April 2016 to permit no. 0303-S3N-R1 in response to a minor permit modification application submitted by FTN Associates, Ltd. (FTN).

The permitted area is approximately 173 acres and is designed to have 12 waste disposal cells, as shown on Figure 2. Cells 1 through 10 are each approximately 15 acres in size, Cell 11 is 9.6 acres, and Cell 12 is approximately 10.8 acres. The total permitted disposal capacity for all 12 cells is 22,400,000 cubic yards. Of this area, only Cells 1 and 3 have been developed, as shown on Figure 2 and as described below.

Cell 1 and the western stormwater pond were constructed in 2008. The landfill began operation in March 2010, concurrent with the initiation of plant operation. Construction of Cell 3 began in 2014, was completed in 2015, and began receiving CCRs in December 2015. The leachate storage pond located to the west of Cell 1 was constructed in 2016.

3

The landfill has been designed to meet APCEC Regulation No. 22 standards. The bottom liner systems for Cell 1 and Cell 3 were constructed in accordance with the permit and include a 12-inch minimum thickness compacted clay liner with a maximum hydraulic conductivity of 1×10^{-7} cm/sec, a 60-mil high-density polyethylene (HDPE) liner, and a leachate collection system.

2.3 Review of Landfill Permit Documentation

The original permit application for the landfill was submitted by Genesis Environmental Consulting, Inc. (GEC) in 2001. The following three reports were submitted with the application and were reviewed as part of this evaluation:

- Geotechnical and hydrogeological investigation (GHI) report: this document was prepared by GEC in fulfillment of Regulation No. 22, Chapter 11, requirements. The report includes a review of the regional geological and hydrogeological setting of the landfill, a description of surface and subsurface exploration activities performed at the landfill site, a characterization of observed onsite lithology and hydrogeological conditions, and geotechnical testing results of onsite soils.
- Design report: this report was prepared by GEC in fulfillment of Regulation No. 22, Chapter 5, design criteria for class 3N landfills. The report is certified by an Arkansas-registered professional engineer and details the stability evaluation of the landfill.
- Site selection limitations and location restrictions report: this report was prepared by GEC in fulfillment of Regulation No. 22, Chapter 5, landfill location criteria for class 3N landfills. This report includes a determination that the landfill is not located in an unstable area.



Figure 2. Landfill site map.

3.0 UNSTABLE AREA EVALUATION

Pursuant to §257.64(b), the owner or operator must consider all of the following factors, at a minimum, when determining whether an area is unstable:

- 1. Onsite or local soil conditions that may result in significant differential settling;
- 2. Onsite or local geologic or geomorphologic features; and
- 3. Onsite or local human-made features or events (both surface and subsurface).

FTN reviewed the reports identified in Section 2.3 along with publicly available documents published by the US Geological Survey (USGS). Findings from this review are discussed below within the context of the factors listed in §257.64(b).

3.1 Review of Onsite or Local Soil Conditions that May Result in Significant Differential Settling

Boring logs and associated geotechnical data from the GHI report (GEC 2001) are included in Appendix A. These documents and the GHI report indicate the landfill is underlain by cohesive soils comprised of low- to high-plasticity clays and low-plasticity silts that extend to an average depth of 15 ft below ground surface (bgs), but can be as much as 30 ft thick in some areas and absent in others. The cohesive soils are underlain by fine- to coarse-grained sands and fine- to coarse-grained gravel encountered at depth. Based on one deep boring, completed to a depth of 200 ft bgs, the coarse-grained materials reach a depth of 190 ft bgs in the vicinity of the landfill.

A review of the subsurface data included in Appendix A shows that no organic soils, which are prone to settlement due to their high compressibility, were encountered in any of the borings. There are also no apparent lateral changes in the underlying lithology that would indicate a notable change in the compressibility of foundation soils, as can be seen from the soil boring logs. These factors, coupled with a review of the landfill design report and the site selection limitations and location restrictions report (GEC 2001) indicate that significant differential settling is unlikely.

3.2 Review of Onsite or Local Geologic or Geomorphologic Features

Surficial deposits in the vicinity of the landfill are Quaternary alluvial deposits, as shown on Figure 3. Regionally, the alluvium reaches depths of 100 to 200 ft bgs (Ryling 1960; Cushing, Boswell, and Hosman 1964) and is characterized by unconsolidated alluvial and terrace deposits of sands and gravels grading upward to clays interbedded with silt and fine-grained sand (Stephenson and Crider 1916; Cushing, Boswell, and Hosman 1964; Petersen, Broom, and Bush 1985). At the landfill, these deposits extend to a total depth of 190 ft bgs, as discussed in Section 3.1. These sediments are not susceptible to dissolution and as such, are not typically associated with karst topography. A review of the topographical map included as Figure 4 shows no evidence of karst features or evidence of areas susceptible to mass movement (i.e., landslides) in the vicinity of the landfill.

According to the 2001 GHI report, GEC performed a review of aerial photography to identify sedimentary, depositional, structural, and geomorphic features within and surrounding the site. This review did not identify any lineaments or surficial indication of faulting at the site.

3.3 Review of Onsite or Local Human-Made Features or Events (Both Surface and Subsurface)

Presently, there are no visible onsite or local human-made features or events that would cause the area in the immediate vicinity of the landfill to be unstable. A stability evaluation of the landfill was performed as part of the landfill design report (GEC 2001). The evaluation was certified by an Arkansas-registered professional engineer and determined that the landfill was designed to be stable under both static and seismic conditions.

According to USGS (Kresse et al. 2014), the underlying alluvial aquifer is used primarily as an irrigation source. A review of seasonal water levels collected at the landfill (FTN 2018) indicates that recharge to the aquifer is sufficient to balance seasonal withdrawals. As such, land subsidence due to groundwater removal from the alluvial aquifer is considered unlikely.



Figure 3. Geologic map, adapted from Haley (1969) and Ausbrooks and Prior (2006).



Figure 4. Topography of surrounding area based on USGS topographic quadrangle Osceola, AR (USGS 1972).

4.0 CONCLUSIONS

Based on a review of the available documentation referenced in this report, the following conclusions can be made:

- 1. No onsite or local soil conditions were identified that would result in significant differential settling;
- 2. No onsite or local geologic or geomorphologic features, such as karst areas or areas susceptible to mass movement, were identified; and
- 3. No onsite or local human-made features or events, either surface or subsurface, were identified that would cause the area in the immediate vicinity of the landfill to be unstable.

In consideration of these findings, the landfill meets the location restriction requirements of §257.64.

5.0 REFERENCES

- Ausbrooks, S.M., and W.L. Prior. 2006. Geologic Worksheet of the Arkansas Portion of the Osceola Quadrangle, Mississippi County, Arkansas [1:24,000 scale digital geologic worksheet]. Updated from Haley, B.R., 1969. Little Rock, AR: Arkansas Geological Commission.
- Cushing, E.M., E.H. Boswell, and R.L. Hosman. 1964. *Water Resources of the Mississippi Embayment: General Geology of the Mississippi Embayment* [USGS Professional Paper 448-B]. Washington, DC: US Government Printing Office. Available online at <u>https://pubs.usgs.gov/pp/0448b/report.pdf</u>.
- FTN (FTN Associates, Ltd.). 2018. Plum Point Energy Station, Groundwater Monitoring and Corrective Action 2017 Annual Report. Little Rock, AR: FTN Associates, Ltd.
- GEC (Genesis Environmental Consulting, Inc.). 2001. Permit Application for Class 3N Solid Waste Facility, Plum Point Energy Associates, LLC. Little Rock, AR: Genesis Environmental Consulting, Inc.
- Haley, B.R. 1969. Geologic Worksheet of the Osceola Quadrangle, Arkansas [Open-File Report, Scale 1:62,500]. Little Rock, AR: Arkansas Geological Commission. Revised by Ausbrooks, S.M., and W.L. Prior, 2006.
- Kresse, T.M., P.D. Hays, K.R. Merriman, J.A. Gillip, D.T. Fugitt, J.L. Spellman,
 A.M. Nottmeier, D.A. Westerman, J.M. Blackstock, and J.L. Battreal. 2014. Aquifers of Arkansas—Protection, Management, and Hydrologic and Geochemical Characteristics of Groundwater Resources in Arkansas [USGS Scientific Investigations Report 2014-5149]. Prepared in cooperation with the Arkansas Natural Resources Commission. Reston, VA: US Geological Survey. <u>http://dx.doi.org/10.3133/sir20145149</u>.
- Petersen, J.C., M.E. Broom, and W.V. Bush. 1985. Geohydrologic Units of the Gulf Coastal Plain in Arkansas [USGS Water-Resources Investigations Report 85-4116]. Prepared in cooperation with the Arkansas Department of Pollution Control and Ecology and the Arkansas Geological Survey. Denver, CO: US Geological Survey, Western Distribution Branch, Open-File Services Collection. 24 pp.
- Ryling, R.W. 1960. Ground-Water Potential of Mississippi County, Arkansas [Water Resources Circular No. 7]. Little Rock, AR: Arkansas Geological and Conservation Commission. 87 pp.
- Stephenson, L.W., and A.F. Crider. 1916. Geology and Ground Waters of Northeastern Arkansas [USGS Water-Supply Paper 399]. Washington, DC: US Government Printing Office. Available online at <u>https://pubs.usgs.gov/wsp/0399/report.pdf</u>.
- USGS (US Geological Survey). 1972 (rev 1983). "USGS 1:24000-Scale Quadrangle for Osceola, AR 1972." US Geological Survey. Available online at https://www.sciencebase.gov/catalog/item/4f5543b2e4b018de15819c9d.

APPENDIX A

Well Construction Details, Soil Boring Logs, and Geotechnical Data

			- Andrew Andrew State			
	ESIS ENVIRONMENTAL CO	NSULT	ING, INC.	FIELD BOREHOLE N	BOREHOI	LE LOG
11400	West Baseline Road Little Road	ck, AR 7	2209	COORDINATE	ES: 489496.27N 19	15916.93E
	e. (301) 435-2199 Pax (3	01) 400-4	1341	ELEVATION:	TOC ELEV	ATION: 242.75 ft
PROJEC	CT INFORMATION			DRILLIN	NG INFORMATIO	ON
PROJECT: Plum	Point Energy Station		DRILLI	NG CO.: A	nderson Engineeri	ng
SITE LOCATION:	Osceola, AR		DRILLI	ER: Pa	aul Harris	
JOB NO.:	01008		RIG TY	(PE: Si	imco 2400 SKL	
LOGGED BY:	ME		METH	OD OF DRILL	ING: 6.25" diam.	Solid flight auger
DATE DRILLED:	4/09/01		SAMP	LING METHO	DDS: Split Spoon	
GRAVEL PACK: 10-20	Sand SEAL: Bentonite pellets	3	GROUT: B	entonite chips		Page 1 of 1
CASING/SCREEN TYPE:	PVC DIAMETER: 2-inch	CASIN	G LENGTH:	23.63	STATIC WATER LEVE	L:21.53' BELOW TOC
SCREEN LENGTH:10'	SLOT SIZE: 0.010	T.D. O	F WELL 33.63	BELOW TOC	DATE OF WATER LEV	EL: 5/02/01
DEPTH SYMBOL	SOIL DESCRIPTION	E C	BLOW OUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	Brown silty clay, slightly moist. Brown silty clay, slightly moist.	2,	Pi ti 5'	ished shelby ibe from 3'- '.		3' of stick-up Bentonite chips from surface to 15 7'
-151520 -	Dark tan silt with clay moist. Brown clayey silt, very moist.	, 3, , 1,	3,4 1,2 H	it H20 @ 20'		Bentonite pellets from 15.7' to 17.6'. 10-20 sand
-25 -	Tan fine to coarse sand wet.	1, 6,	U. s f 10,13 d s T 3	sed Hollow tem augers rom 25'-30' onstruct wel ue to heavin ands. otal depth @ 0'.	to 1 g	from 17.6' to 30.63'.

	ESIS ENVIRONMENTAL C	ONSULT	ING, INC.	FIELD		
// 11400 Phone) West Baseline Road Little F e: (501) 455-2199 Fax	Rock, AR 7 (501) 455-4	2209 1547	COORDINATE	ES: 489523.55N 19 TOC ELEV	17416.25E ATION: 243.99 ft
PROJE	CT INFORMATION			DRILLIN	NG INFORMATIO	ON
PROJECT: Plum	Point Energy Station		DRILLI	NG CO.: A	nderson Engineeri	ng
SITE LOCATION:	Osceola, AR	· .	DRILLE	R: P	aul Harris	
IOB NO.:	01008		RIG TY	PE: Si	mco 2400 SKL	
OGGED BY:	ME		METHO	DD OF DRILL	ING: 6.25"diam.	solid flight auger
DATE DRILLED:	4/09/01		SAMPL	ING METHO	DS: Split Spoon	
GRAVEL PACK: 10-20	Sand SEAL: Bentonite pelle	ets	GROUT: Be	entonite chips		Page 1 of 1
CASING/SCREEN TYPE:	PVC DIAMETER: 2-inch	CASIN	G LENGTH:	20.23'	STATIC WATER LEVE	L: 22.13' BELOW TOC
SCREEN LENGTH:10'	SLOT SIZE: 0.010	T.D. OF	- WELL 30.23	BELOW TOC	DATE OF WATER LEV	EL: 5/02/01
DEPTH SYMBOL	SOIL DESCRIPTION	B	LOW OUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
0 -5 -10 -15 -20 -25 -25 -25 -25 -25 -25 -25 -25	Brown and gray silty clay, slightly moist, medium plasticity. Brown and gray silty clay, slightly moist, medium plasticity. Dark brown to gray sil clay, moist. Dark brown to gray sil clay, with fine to med grained sand, wet. Dark brown to gray sil clay, with increasing fine to medium sand, w	1, 1 3, 3 ty 2, 2 ty 3, 4 .ty .ty .et.	Pu: tul 5' 2,3 4,6 Hi Ho au co du sa 30	shed shelby be from 3'- t H2O @ 20'.		<pre>3' of stick-up Bentonite chips from surface to 12'. Bentonite pellets from 12' to 14'. 10-20 sand from 14' to 27'.</pre>

EDWARDS ENGINEERING, P.A.		FIELD BORING LOG						
The second se	BORING NO.	MW-1	103	PAGE: 1 of 1				
	TOTAL DEPT	TH: 30' FEET BELOW GROUND SURFACE (BGS)						
CLIENT: Dynegy Services Plum Point, LLC	•	PROJECT: Plum Point Well Installation						
JOB NO.: LSP-AR-PPES-07-02		DRILL	ING CO.: A	Anderson Engineering				
LOGGED BY: Lance Powell		DRILL	ER: Dennis	Young				
DATE DRILLED: 9-26-07		RIG T	YPE: Simco	2800 HS (HT)				
DRILLING METHOD: Hollow Stem Auger		-						
SAMPLING METHOD: Split Spoon								
Depth Sample 488350.05N 1915934.03E BGS Interval DESCRIPTIO	TOC: 243.25 ft	Litho. Symbol	Blow Counts	Comments				
	•							
0 Topsoil 0' - 0.5' Dark Brown Silty Cla	1							
Gray to Brown Silty Clay,			4.0.0					
			1,2,2					
Gray Clay, Medium to High Plasticity								
10 - Some Silt, Moist			1,2,4					
Gray Clay, Medium to High Plasticity								
15 Some Silt, Moist			2,5,4					
				Contact with medium to coarse sand at 16				
- Gray Medium to Coarse Sand Som	e Clav							
Wet, Grading into Silty Sand	o olay,	·····	1,1,2	Hit water at 20' ∇				
Gray , Sandy Silt, Wet				Split Spoon samples not taken at 25' and 30'				
				due to heaving sands				
Gray , Silty, Coarse Sand, Some Cla	Ι,							

MONITORING WELL IN	STALLATION RECORD
Job Name Plum Point Energy Well Station	Well Number MW-103
Job Number LSP-AR-PPES-07-02 Installation Date Septe	mber 26, 2007 Location PPES Class 3N Landfill
Datum Elevation 243.25 ft	Surface Elevation240.5 ft
Datum for Water Level Measurement <u>Top of PVC Stickup</u>	0.040
Screen Diameter & Material	Slot Size7.25"
Riser Diameter & Material Sand	Borehole Diameter2
Drilling Method Hollow Stem Auger	rilling Contractor Anderson Engineering
vented cap	
Lockable Aluminum	
wen casing	
Pipe Bollard	Stickup: <u>2.8</u>
Concrete Pad	
Ground Surface	
Calid Diagr	
Solia Riser	
Flush Joint	Length of Solid
	riser: 20'
	Total Depth of
Depth to Top of	Monitoring
Bentonite Seal16'	Well: <u>32.0</u>
Depth to Top of Lower	
Granular Material ^{18'}	
	Length of Screen
Screen —	and Bottom Cap.
Bottom Can	
Bentonite Pellets	
Bentonite Plug (Not	to Scale) Stabilized water level <u>22.15</u> feet
Granular Backfill	below datum.
EDWARDS ENGINEERING PA	MONITORING WELL INSTALLATION RECORD
Civil and Environmental Engineering, Planning, and Consulting	PROJECT NUMBER: LSP-AR-PPES-07-02
1-1	

GEC					FIELD	B	DREHO	LE LOG
	GEN	ESIS ENVIRONMENTAL (CONSUL	ING, INC.	BOREHOLE	NO.:	WW-108 TOT	AL DEPTH: 30'
	11400) West Baseline Road Little e: (501) 455-2199 Fa	Rock, AR 7 x (501) 455-	72209 -4547	COORDINAT	TES: 4	89573.87N 19	20414.52E
. Toma					ELEVATION:		TOC ELEV	ATION: 245.11 ft
	PROJEC	CT INFORMATION			DRILLI	ING II	NFORMATIC	DN
PROJEC	T: Plum	Point Energy Station		DRILL	ING CO.: A	Anders	son Engineeri	ng
SITE LO	CATION:	Osceola, AR		DRILL	ER: I	Paul H	arris	
JOB NO	.:	01008		RIG T	YPE: S	Simco	2400 SKL	- -
LOGGE	O BY:	ME		METH	od of Dril	LING	6.25"diam. s	solid flight auger
DATE DI	RILLED:	4/11/01		SAMP	LING METH	ODS:	Split Spoon	
GRAVEL P	ACK: 10-20 \$	Sand SEAL: Bentonite pe	llets	GROUT: E	Bentonite chips			Page 1 of 1
CASING/SC	REEN TYPE:	PVC DIAMETER: 2-inch	CASIN	NG LENGTH:	22.40'	STAT	IC WATER LEVE	L:22.54' BELOW TOC
SCREEN LI	ENGTH:10'	SLOT SIZE: 0.010	T.D. C	F WELL 32.4	0' BELOW TOC	DATE	OF WATER LEV	EL: 5/02/01
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION		BLOW COUNTS	COMMENTS	s c	BORING COMPLETION	WELL DESCRIPTION
							[]	
-								
0 -11								3' of stick-up
	I.I.I							
and the second sec	=: = : =	Brown, silty clay, slightly moist, low			ushed shelby ube from 3'-	-		
-5 -		plasticity.		5	•			Bentonite
]	Т:Т:Э							surface to
-								14'.
-10-		Light brown, clayey s	silt, 2,	4,4				
	LTTT	Signery morse.						
-								
								Bentonite
-15 -		Brownish gray, silty clay, moist.	2,	4,6				pellets from 14' to 16'.
	77777							
-		Consulation action bit	Th					10-20 sand
		plasticity (19'-19.5	'). 1,	2,5				from 16' to
-20 -	E: I: I:	Gray, silty clay, ver	ry	н	it H2O @ 22	••		29.4 .
		moist (19.5'-20').						
				н	eaving sands	s @		
-25 -		Tan, fine to coarse grained sand, subange	ular 2,	,5,5 2 t	o hollow ste	em I		
-		to subrounded, wet.		a	ugers to construct we	11.		
				T	otal depth (0'.	G		
-30 -	H	ll ·	to rofloot t		latura usad far			lt

FIELD BORING LOG								
				BORING NO .:	MW-1	113 PAGE: 1 of 1		
				TOTAL DEPT	H: 33	FEET BELOW GROUND SURFACE (BGS)		
CLIE	ΞN	T: Dy	negy Services Plum Point, LLC		PROJ	ECT: Plum Point MW-13 Replacement		
JOB	N	O.: [DY-09-02		DRILL	ING CO .: Tri-State Testing Services, Inc.		
LOG	G	ED E	SY: Lance Powell		DRILL	ER: Mike Woolfolk		
DAT	Έ	DRII	_LED: 4/7/09		RIG T	YPE: CME 55		
DRII		ING	METHOD: Hollow Stem Auger					
SAM	1PI	LING	METHOD: Continuous					
Depth	Sa	ample	488463.15N 1919936.06E T	DC: 244.63 ft	Litho.	Comments		
BGS	Int	terval	DESCRIPTION		Symbol			
0-			Tanaail 0' 0.5' Dark Brown Silby Clay					
-			Topson 0 - 0.5 Dark Brown Siny Chay					
-	11		Gray to Brown Silty Clay, Moist, Trace	Organics				
	Π							
5 -	╢							
-			Tan to Brown Silty Sand, Fine to Mediur	n arain				
-	11		Moist	n grain,				
	Π							
10 -	\square							
-	$\left \right $		Tan, Medium to Coarse Grain Sand					
-			Subangular to Subrounded, Damp					
	Π							
15 —	$\left \right $							
-			Tan. Medium to Coarse Grain Sand.					
-	11		Subangular to Subrounded, Damp			Hit water at 18'		
	Π					-		
20	$\left \right $							
-			Tan, Fine to Medium Grain Sand with Tu	ace Brown				
			Clay, Subangular to Subrounded, Wet					
	Π							
25 —	$\left \cdot \right $							
-			Tan, Fine to Coarse Grain Sand					
	1		Subangular to Subrounded, Wet					
-	Π							
30 -	╢							
-			Tan, Fine to Coarse Grain Sand,			Over 15' of wet sand. Auger started to lock up. Sample		
	1		Subangular to Subrounded, Wet			not taken at 33.		
	ĮŢ							

MONITORING WELL INSTALLATION RECORD							
Job Name Plum Point Energy Station MW-13 Replacement	Well Number MW-113						
Job Number DY-09-02 Installation Date 4/7/0	9 Location PPES Class 3N Landfill						
Datum Elevation 244.63 ft	Surface Elevation241.5 ft						
Datum for Water Level Measurement Top of PVC Stickup							
Screen Diameter & Material 2" PVC	Slot Size0.010"						
Riser Diameter & Material2" PVC	Borehole Diameter 7 1/4"						
Granular Backfill Material <u>Sand</u>	Representative Lance Powell						
Drilling Method <u>Hollow Stem Auger</u> Dr	illing Contractor <u>Tri-State Testing Services, Inc.</u>						
Vented Cap							
Lockable Aluminum							
Well Casing							
Pine Pollard	Stickup: 2.93'						
Concrete Pad							
Ground Surface							
. Stern external state and the state of the	an iti kana ana ana ana ana ana ana ana ana an						
Solid Pieer							
Flush Joint	Langth of Solid						
	Length of Solid						
	Total Depth of						
	Monitoring						
Depth to Top of 14'	Well: <u>35.93'</u>						
	from TOC						
Doubte to Tax of Lower							
Crapular Material 16'							
	Length of Screen						
Screen — 🦉	and Bottom Cap.						
33' BOREHOLE	15'						
는 전에 가지 않는 것이 있는 것이 있 같은 것이 있는 것 같은 것이 있는 것이 없는 것이 없는 것이 없는 것이 없는 것이 있는 것이 없는 것이 있는 것이 없는							
Bottom Can							
Bottom Cop-							
Bentonite Pellets							
Bentonite Plug (Not t	o Scale) Stabilized water level <u>18.07</u> feet						
Granular Backfill	below datum.						
	Measured on <u>4-09-09</u>						
	MONITORING WELL INSTALLATION RECORD						
	WELL NUMBER: MW-13R						
	DRAWING NUMBER: 1 CHECKED BY: LP						

EDWA	RDS ENGINEERING, P.A.	FIELD BORING LOG							
Civil and Env	ronmental Engineering, Planning, and Consulting	BORING NO .:	ORING NO.: MW-115 PAGE: 1 of 1						
		TOTAL DEPT	TH: 30' FEET BELOW GROUND SURFACE (BGS)						
CLIENT: Dynegy Se	ervices Plum Point, LLC		PROJECT: Plum Point Well Installation						
JOB NO.: LSP-AR-	PPES-07-02		DRILL	ING CO.: A	nderson Engineering				
LOGGED BY: Phi	lip Fields		DRILL	ER: Dennis `	Young				
DATE DRILLED:	9-25-07		RIG T	YPE: Simco	2800 HS (HT)				
DRILLING METH	OD: Hollow Stem Auger								
SAMPLING MET	HOD: Split Spoon								
Depth Sample 4873	26.36N 1920085.78E 1	TOC: 243.55 ft	Litho.	Blow	Comments				
BGS Interval	DESCRIPTION		Symbol	Counts					
	Topsoil 0' - 0.5' Dark Brown Silty Clay								
- - Gray to	Gray to Brown Silty Clay, Moist			3,5,5					
- Tan to	Brown Silty Sand, Fine to Mediu	ım grain,		3.3.4					
10 - - - - - - - - - - - - - - - - - - -	ine to Medium grain Sand, Organics, subangular to subrour	ided, Damp		2,3,3					
- - - Tan, F subang	ine to Medium grain Sand, gular to subrounded, Damp			5,5,5					
20	ine to Medium grain Sand, gular to subrounded, Wet			2,1,3	Hit water at 24'				
25	ine to Medium grain Sand, gular to subrounded, Wet				Split Spoon samples not taken at 25' and 30' due to heaving sands				

MONITORING WELL IN	STALLATION RECORD
Job Name Plum Point Energy Well Station	Well Number MW-115
Job Number LSP-AR-PPES-07-02 Installation Date Septe	mber 25, 2007 Location PPES Class 3N Landfill
Datum Elevation 243.55 ft	Surface Elevation240.4 ft
Datum for Water Level Measurement <u>Top of PVC Stickup</u>	0.040
Screen Diameter & Material	Slot Size 7.25"
Riser Diameter & Material Sand	Borehole Diameter2
Drilling Mathed Hollow Stem Auger	rilling Contractor Anderson Engineering
Vented Cap	
Lockable Aluminum	
wen casing	
Pipe Bollard	Stickup: <u>3.0</u>
Concrete Pad	
Ground Surface	
Calid Diagr	
Solia Riser	
Flush Joint	longth of Solid
	riser: 20'
	Total Depth of
Death to Ten of	Monitoring
Bentonite Seal16'	Well: 33
	from IUC
Depth to Top of Lower	
Granular Material18'	Ar (10.00)
	Longth of Coroon
Screen	and Bottom Cap.
	10'
Datters Car	
Bottom Cap-	
Bentonite Pellets	
Bentonite Plug (Not	to Scale) Stabilized water level <u> 27.01 </u> feet
Granular Backfill	below datum.
	Measured on <u>September 27, 2007</u>
	MONITORING WELL INSTALLATION RECORD
EDWARDS ENGINEERING, P.A. Civil and Environmental Engineering, Planning, and Consulting	PROJECT NUMBER: LSP-AR-PPES-07-02
Ter	WELL NUMBER: MW-15
	DRAWING NUMBER: 5 CHECKED BY: LP

			PROJE		BOF	RING ID:		
			Plui	n Point Energy Station Landfill	M	W-116		
3	Ê_		LOCAT	ION:	WEL	LID:		
			Osc			VV-116		
	e 1	6		rav Drilling Inc		20511 71		EASTING:
			DRILLI	NG EQUIPMENT:	GRC	UND SURFACE	ELEV.:	TOC ELEVATION:
	Asso	ociates	Ltd. CMI	E 750X	23	89.3 ft		243.97 ft
water resou	rces / environ	mental consu	Itants DRILLI	NG METHOD:	тот	AL DEPTH:		DEPTH TO WATER:
			8.5"	H.S.A.	31	.9 ft below	/ TOC	17 ft bgs
LOGGE	D BY:		SAMPL	ING METHOD:	DAT	E STARTED:		DATE COMPLETED:
)		<u>5-ft</u>	split barrel	6/	23/2015		6/23/2015
Depth (feet	% REC	nscs	Graphic Log	Description			W Constr	ell ⁻ uction
0	0 70 100 100 60 n/a	CH		LEAN CLAY, silty, with very fine-grained sand, olive of grey with orange mottles, medium stiff to soft, moist.	grey to stiff, light			 4.7 ft of stick up 21.5 ft of 2 in dia., Sch. 40 PVC Solid Riser to 16.8 ft bgs (including stickup) Cement/bentonite grout from 0 to 13 ft bgs Bentonite pellet seal from 13 to 15 ft bgs Silica size 10/20 filter pack from 15 to 27 ft bgs 10 ft of 2 in dia., 0.010 in slot, ScH 40 PVC screen from 16.8 to 26.8 ft bgs 0.35 ft, 2 in dia., Sch. 40 PVC end cap 27 ft BOH
NOTES	were North	updated Coordii	based on sunates and NA	urvey report dated July 29, 2015. Horizontal and vel VD88.	rtical co	pordinates are b	based on A	rkansas State Plane NAD83

			PROJE	ECT:	BOR	RING ID:		
			Plu	Plum Point Energy Station Landfill		WW-117 WELL ID:		
<u> </u>			LOCA					
_	<u> </u>			eola, AR	MV	V-117		
_			DRILL	ING CONTRACTOR:	NOF	RTHING:	EASTING:	
			MCC	Sray Drilling Inc	488	8672.25	1917608.53	
					GRC		TOC ELEVATION:	
water resou	rces / environ	mental consul	tants		239	9.4 ft	242.53 ft	
							DEPTH TO WATER:	
			C.0		34.		> 17 ft bgs	
	D BY:		SAMP	enlit barrol		E STARTED: 1/2015	GI24/2015	
)		<u> </u>		0/2		0/24/2013	
(fee	REC	SS	ohic	Description			Well	
epth	% F	n Si	Grag	Description		Con	struction	
ă								
0 -				LEAN CLAY, silty, brown, medium stiff to stiff, moist.		xxx xxx	3.2 ft of stick up	
-	100	CI		@ 1.5.ft. clavey ailt land brown acft			- 24.0 ft of 2 in dia Sab 40	
2 –	100	UL		W 1.5 II, Clayey silliens, brown, solt.			PVC Solid Riser to 20.8 ft bgs	
-			i i i i i i i i i i i i i i i i i i i	FAT CLAY, brown, medium stiff to soft, moist.			_ (including stickup)	
4 -				∞ 6.7 ft with fine-grained sand Sand content increa	505		Cement/bentonite grout from 0	
-	60	СН		with depth.	000			
6 -				8			 Bentonite pellet seal from 5 to 7 4 ft bas 	
-				POORLY GRADED SAND, very fine- to fine-grained, brown with carbonaceous material				
8 –							—	
-				@ 8 ft, no carbonaceous material.			Natural sand from 7.4 to 15 ft	
10 -	50						bgs.	
							-	
12 -		SP					—	
							_	
14				@ 16.7, sand becomes laminated with carbonaceous	6			
16 -	50			material.				
				@ 17 ft, wet.				
18 —							from 15 to 31 ft bgs	
· ·				SILIY SAND, TINE-GRAINED, DROWN, SATURATED.			-	
20 —		SM						
-	50			POORLY GRADED SAND fine argined subangular	to		-	
22 –				subrounded, brown, saturated.	.0			
-				@23 ft, hit heaving sands. Plugged augers to 31 ft.			10 ft of 2 in dia 0.040 in al-4	
24 —							ScH 40 PVC screen from 20.8	
							_ to 30.8 ft bgs	
26 —		SP						
-	n/a							
28 –							0.18 ft. 2 in dia Sch 40 PVC	
-							end cap	
30 —								
32				·			– 31 ft BOH	
NOTES	. Bore	hole and	d/or well ID	s were updated to reflect the nomenclature used for	the EP	A CCR Rule network.	Vertical and horizontal coordinates	
were updated based on survey report dated July 29, 2015. Horizontal and vertical coordinates are based on Arkansas State Plane NAD83								
North Coordinates and NAVD88.								

			PROJ Plu	ECT: m Point Energy Station Landfill	BOF M	RING ID: N-118		
- tn				LOCATION: Osceola, AR DRILLING CONTRACTOR: McCray Drilling Inc DRILLING EQUIPMENT:		WELL ID: MW/_118		
			DRILI				EASTING:	
						8283.34 DUND SURFACE ELEV.:	1916953.52 TOC ELEVATION:	
water resour	ASS(ces / environ	DCICITES mental consul	Ltd. CM	E 750X	23	8.0 ft	241.23 ft	
			DRILI 8.5	ING METHOD: ' H.S.A.	тот 31	AL DEPTH: .4 ft below TOC	17 ft bgs	
	D BY:		SAMF 5-ft	PLING METHOD: split barrel	DAT 6/2	e started: 2 4/2015	DATE COMPLETED: 6/24/2015	
Depth (feet)	% REC	nscs	Graphic Log	Description	Description W		/ell truction	
0	100 100 50 n/a	CL CH CL/CH SM		LEAN CLAY, silty with very fine-grained sand, the moist. FAT CLAY, brown and dark grey, stiff, moist. SANDY LEAN to FAT CLAY, silty, brown, very stiff, moist. SILTY SAND, poorly graded, fine-grained, brown POORLY GRADED SAND, fine-grained, subroubrown, moist to dry. @ 17 ft, saturated. @ 17.5 ft, laminated with carbonaceous material @ 20 ft, hit heaving sands. Plugged augers to a	orown, stiff, soft, moist. <u>vn, moist.</u> unded, al. 28 ft.		 3.3 ft ft stick up. 21.0 ft of 2 in dia. Sch. 40 PVC solid riser to 17.7 ft bgs Cement/bentonite grout from 0 to 3.2 ft bgs Bentonite pellet seal from 3.2 to 7.6 ft bgs Natural sand from 7.6 to 12.5 ft bgs Bentonite pellet seal from 12.5 to 14.5 ft bgs Silica size 10/20 filter pack from 14.5 to 28 ft bgs 10 ft of 2 in dia. 0.010 in slot Sch. 40 PVC screen 17.7 to 27.7 ft bgs 0.35 ft 2 in dia., Sch 40 PVC end cap Drilling terminated at 28 ft bgs 	
28 -								
NOTES	Bore	hole and	d/or well IE)s were updated to reflect the nomenclature use	ed for the EF	PA CCR Rule network. Ve	rtical and horizontal coordinates	
North Coordinates and NAVD88.								

			PROJI Plui	ECT: m Point Energy Station Landfill	BOR MV	RING ID: V-119		
<u>à</u>						WELL ID: MW/_119		
						RTHING: 9014.22	EASTING: 1915902.58	
	Associates Ltd.			DRILLING EQUIPMENT:		OUND SURFACE ELEV.: 3.6 ft	TOC ELEVATION: 246.53	
water resou	urces / environi	nental consu	tants DRILL		тот. 35	AL WELL DEPTH: 4 ft has	DEPTH TO WATER (10/17/2016): 23 35 ft below TOC	
LOGGE	ED BY:		SAMP	8.5" H.S.A. SAMPLING METHOD:		E STARTED:	DATE COMPLETED: 10/6/2016	
<u>DLD</u>)/EWS ບ	5	ں – <mark>ار</mark>		10/	\\		
Depth (fe	% RE	nscs	Graphi Log	Description		Const	ruction	
							Above ground completion including 2x2 ft concrete pad, four pipe bollards, and locking outer steel casing	
0 -	100		//////	Road Base			2.9 ft stick up	
2 –	100	CL		LEAN CLAY, olive gray, sitff, moist		🗮 🗮 –		
4 -	100	СН		FAT CLAY, dark gray, stiff, moist, with bits of organi	c matter		solid riser (including stick up)	
6 -		CL		LEAN CLAY, silty, brownish gray, medium stiff to sc	ft, moist		Cement/bentonite grout from 0 ft to 15 ft bgs	
10 – 12 –	100	СН		FAT CLAY, dark gray, stiff, moist				
14 — 16 —	80	CL		LEAN CLAY, brownish gray, medium stiff, moist			Bentonite pellet seal from 15 ft to 20 ft bgs	
- 18 — -	-	ML		CLAYEY SILT, with fine grained sand, brownish gra	y, soft,			
20 – - 22 –	80			POORLY GRADED SAND, medium to fine-grained, medium dense saturated			 Silica size 10/20 filter pack from 20 ft to 33 ft bgs 	
24 —	-						10 ft of 2 in dia. 0.010 in slot Sch. 40 PVC screen	
26 -	40	SP		@ 28 ft some carbonaceous material			0.35 ft 2 in dia., Sch. 40 PVC end cap	
28 -							Drilling terminated at 33 ft bgs	
- 32 —	40						Ĵ	
34	, Rore	hole ar		s were undated to reflect the nomenclature used for	or the F		ertical and horizontal coordinates	
NOTES	were updated based on survey report dated November 18, 2016. Horizontal and vertical coordinates are based on Arkansas State Plane							
	NAD83 North Coordinates and NAVD88.							

SECTION 22 GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

PERMIT APPLICATION CLASS 3N SOLID WASTE FACILITY PLUM POINT ENERGY ASSOCIATES, LLC JULY 2001

22.0 GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

Section 22.533 of Arkansas Regulation 22 states that:

(a) Applicants, permittees, owners and operators shall also refer to applicable provisions of Chapters 11, Geotechnical Investigations, Chapter 12, Ground Water Monitoring and Corrective Action, Chapter 13, Closure and Post Closure Care, and Chapter 14, Financial Assurance Criteria, for additional requirements.

Arkansas Regulation 22.1102 (April 1995) details the requirements for geotechnical and hydrogeological investigations associated with Class 1 and Class 3 solid waste facilities. The regulations require that sufficient data be gathered to develop a conceptual hydrogeologic model of the site. The hydrogeologic model can then be utilized to determine the suitability of a given site for solid waste disposal.

This section of the permit application is intended to document compliance with Arkansas Regulation 22, Chapter 11. Extensive research, field investigations, data acquisition, compilation, and analysis were conducted in order to accurately characterize the subsurface characteristics of the Class 3N Facility and to prepare an overall site hydrogeologic model. The investigation included detailed surface mapping of the site and surrounding area, a surface geophysical study, a subsurface exploration program consisting of boreholes and piezometers, downhole geophysical analysis, collection of representative samples for geotechnical analysis, and aquifer analysis.

Based on information outlined in the Hydrogeological and Geotechnical Investigation, the site of the Class 3N Facility is suitable for development as a Class 3N Facility. The Hydrogeological and Geotechnical Investigation is presented as **APPENDIX 22-A**.

APPENDIX 22-A GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

Hydrogeologic and Geotechnical Report Plum Point Energy Station Class 3N Solid Waste Facility Osceola, Arkansas

Prepared for

PLUM POINT ENERGY ASSOCIATES, LLC

For Submittal to

Arkansas Department of Environmental Quality Solid Waste Division

Certification:

I certify that I am a qualified groundwater scientist who has received a baccalaureate or postgraduate degree in the natural sciences. I have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgements regarding groundwater monitoring and contaminant fate and transport. I further certify that this report was prepared by myself or by a subordinate working under my direction.

Merrick Rotenberry, P.G. Project Geologist

7-12-01

Date

GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

CLASS 3N SOLID WASTE FACILITY

PLUM POINT ENERGY STATION OSCEOLA, ARKANSAS

Prepared For:

Plum Point Energy Associates, LLC

Prepared By:

Genesis Environmental Consulting, Inc. 11400 West Baseline Road Little Rock, Arkansas 72209 GEC Project # 01008

July 2001

 $\overline{\mathbb{C}}$

TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 SITE LOCATION AND BACKGROUND	1
1.2 PROPOSED CLASS 3N FACILITY AREA	1
2.0 REGIONAL CHARACTERIZATION	3
2.1 REGIONAL CLIMATE	3
2.2 REGIONAL SURFACE DRAINAGE	3
2.3 REGIONAL GEOLOGY	3
2.3.1 REGIONAL SOILS	4
2.3.2 REGIONAL STRATIGRAPHY	5
2.3.3 REGIONAL STRUCTURAL GEOLOGY	7
2.3.4 REGIONAL GEOMORPHOLOGY	8
2.4 REGIONAL HYDROGEOLOGY	9
2.5 REGIONAL GROUNDWATER QUALITY	9
2.6 WATER WELL INVENTORY	10
3.0 SITE HYDROGEOLOGIC INVESTIGATION (22.1101 AND 22.1102)	12
3.1 PREVIOUS INVESTIGATIONS	12
3.2 AERIAL PHOTOGRAPH ANALYSIS (22.1102 (C)(1))	12
3.3 GEOLOGIC MAPPING AND STRUCTURE (22.1102 (C)(2))	12
3.4 SURFACE GEOPHYSICAL INVESTIGATION (22.1102 (C)(3))	13
3.4.1 SURFACE GEOPHYSICAL STUDY	13
3.4.2 SURFACE GEOPHYSICAL RESULTS	14
3.5 SUBSURFACE EXPLORATION PROGRAM (22.1102 (C)(4))	15
3.5.1 SOIL BORING PROGRAM	16
3.5.2 SITE GEOLOGY	16
3.5.3 SUBSURFACE GEOPHYSICAL LOGS	17
3.6 HYDROGEOLOGIC INVESTIGATION (22.1102 (C)(5))	19
3.6.1 INSTALLATION OF PIEZOMETERS	19
3.6.4 RESULTS OF AQUIFER TESTING.	24
3.6.5 SITE GROUNDWATER CHEMISTRY	26
4.0 GEOTECHNICAL TESTING (22.1102 (C)(6))	27
4.1 SIEVE ANALYSIS SUMMARY	27
4.3 STANDARD PROCTOR DENSITY (TEST PIT SAMPLES)	31
4.4 HYDRAULIC CONDUCTIVITY SUMMARY	32
4.5 SHEAR STRENGTH EVALUATION SUMMARY	32
5.0 CONCEPTUAL HYDROGEOLOGIC MODEL (22.1102(D))	34
6.0 CONCLUSIONS	36
7.0 REFERENCES	39

TABLE OF CONTENTS, CONT.

LIST OF TABLES

TABLE 1	Regional Stratigraphic Column	7
TABLE 2	Regional Groundwater Chemical Analysis	. 10
TABLE 3	Exploration Depths of EM34-3XL at Different Intercoil Spacings	. 14
TABLE 4	Piezometer Construction Details	. 21
TABLE 5	Fluid Level Measurements	. 22
TABLE 6	Slug Test Results	. 25
TABLE 7	Geotechnical Analysis Results	. 28
TABLE 8	Shear Strength Analysis Results	. 33
TABLE 9	Hydrogeologic Model Units	. 34

LIST OF FIGURES

FIGURE 1	Geographic	Location Map
----------	------------	--------------

- FIGURE 2 Topographic Site Location Map
- FIGURE 3 Soil Boring and Piezometer Location Map
- FIGURE 4 Geologic Worksheet
- FIGURE 5-1 Surface Conductivity Map (10M HD)
- FIGURE 5-2 Surface Conductivity Map (10M VD)
- FIGURE 5-3 Surface Conductivity Map (20M VD)
- FIGURE 5-4 Surface Conductivity Map (40M VD)
- FIGURE 6 Cross Section Location Map
- FIGURE 7-1 Cross Section A-A'
- FIGURE 7-2 Cross Section B-B'
- FIGURE 7-3 Cross Section C-C'
- FIGURE 7-4 Cross Sections D-D', E-E', F-F'
- FIGURE 8 Groundwater Flow Map

APPENDICES

- APPENDIX A Water Well Logs and Well Location Map
- APPENDIX B Aerial Photograph
- APPENDIX C Surface Conductivity Data
- APPENDIX D Boring Logs
- APPENDIX E Borehole Subsurface Geophysical Logs
- APPENDIX F Pump Test Data
- APPENDIX G Slug Test and Pump Test Data
- APPENDIX H Geotechnical Laboratory Report
1.0 INTRODUCTION

The following document presents the findings and conclusions of the hydrogeologic and geotechnical investigation associated with a proposed Class 3 Non-Commercial (3N) Facility (Class 3N Facility) to be located in Osceola, Mississippi County, Arkansas. The Class 3N Facility is being developed in conjunction with and to serve the Plum Point Energy Station (PPES), a proposed coal-fired generating plant.

The hydrogeologic investigation, conducted by Genesis Environmental Consulting, Inc. (GEC), was designed to meet the requirements of Chapter 11 of Arkansas Department of Environmental Quality (ADEQ) Solid Waste Management Division Regulation 22 (Regulation 22).

The data and information presented in the following report is intended to thoroughly characterize the hydrogeologic aspects of the Class 3N Facility, which may directly or indirectly affect the design, construction, operation and/or monitoring of the Class 3N Facility containment structure as authorized in the above specified regulations.

Section 2.0 of this report presents the regional characterization for the area surrounding the Class 3N Facility. Section 3.0 of this report presents the site-specific characterization, which includes results from the surface and subsurface geophysical investigations, soil boring program, hydrogeologic characteristics, and site specific groundwater studies. The results of the geotechnical analysis associated with samples collected during the investigation are presented in Section 4.0. Section 5.0 includes the interpreted conceptual hydrogeologic model. Section 6.0 presents the conclusions of the entire investigation. The data and information presented in this report is intended to characterize the overall hydrogeologic setting of the property and surrounding areas.

1.1 SITE LOCATION AND BACKGROUND

A site location map showing the general location of the Class 3N Facility is presented in **FIGURE 1**. More specifically, the site is located within Section 13 of Township 12 North, Range 10 East, and Section 18 of Township 12 North, Range 11 East. A site location map presenting the location of the site on a 7.5 minute USGS topographic map is included as **FIGURE 2**.

The PPES will produce up to approximately 1600 Megawatts (MW) of electrical power and will incorporate pulverized coal boiler technology utilizing primarily Powder River Basin coal for its fuel supply. Plum Point Energy Associates, LLC (PPEA), the permit applicant, will own and operate the PPES. PPEA intends to permit, design and operate the proposed Class 3N Facility to accept waste materials with the construction and operation of the PPES.

1.2 PROPOSED CLASS 3N FACILITY AREA

The Class 3N Facility will be used for disposal of combustion wastes, coal wastes and other wastes associated with the construction and operation of the PPES. The proposed waste

materials are non-hazardous, inert, and non-putrescible. The property to be utilized for the Class 3N Facility encompasses roughly 245 acres, however, the actual limits of the waste disposal area comprise roughly 190 acres.

The property on which the Class 3N Facility will be located is currently used for agricultural purposes. Current land use on adjacent properties is also for agricultural purposes. FIGURE 3 illustrates the general layout and orientation of the Class 3N Facility in relation to surrounding properties.

2.0 REGIONAL CHARACTERIZATION

This section discusses the regional features of the area surrounding the Class 3N Facility including climate, hydrology, geology, soils, hydrogeology, and groundwater quality. Information contained in this section was gathered during the literature review that was conducted as part of the investigation conducted by GEC. The information presented in this section was collected from various State and Federal government documents. References for the various reports are provided following the text of the report.

2.1 REGIONAL CLIMATE

The Class 3N Facility is located near Osceola, Arkansas in Mississippi County. Mississippi County is located in northeast Arkansas and is separated by the Mississippi River from the State of Tennessee to the east. Mississippi County is characterized by hot summers and mild winters. The average maximum temperature in summer (June through August) is 91° Fahrenheit (F). The average minimum temperature in winter (December through February) is 32° F. Annual average precipitation is 47.5 inches. Fall is the driest season and winter is the wettest. In January, the wettest month, the average monthly precipitation is 5.45 inches, nearly twice the 2.8 inches normally received in October. The average seasonal snowfall is less than 5 inches. The sun is intense from mid-May through mid-September, which keeps the humidity and loss of soil moisture through evaporation high (USDA-June 1971).

2.2 REGIONAL SURFACE DRAINAGE

Mississippi County is part of an extensive deltaic flood plain that extends from Cairo, Illinois to the Gulf of Mexico. The topography is generally level and ranges from broad flats to gently sloping ridges and swales. Elevation ranges from 150 to 300 feet above sea level. Slopes are generally less than 1 percent, but slopes on some stream banks are as much as 15 percent.

The drainage of Mississippi County is generally southward. The major natural drainageways in the county are the Mississippi River, Pemiscot Bayou, Left Hand Chute of the Little River, Right Hand Chute of the Little River, Buffalo Creek, and the Tyronza River. Areas protected by the levee of the Mississippi River drain into the St. Francis River, which, in turn, empties into the Mississippi River (USDA-June 1971). The regional and site specific drainage pathways are identified on the topographic map presented in **FIGURE 2** and the site map presented in **FIGURE 3**.

2.3 REGIONAL GEOLOGY

This section describes the geologic setting of the region. This description includes the soils located on the site, regional stratigraphy, structural geology, and geomorphology. A geologic worksheet obtained from the Arkansas Geological Commission (AGC) which illustrates the regional geology is presented in **FIGURE 4**. The following information was gathered from various State and Federal geologic publications.

.

2.3.1 Regional Soils

According to the USDA Soil Survey of Mississippi County - 1971, there are several soil series underlying the site. The soil series have been classified as the Commerce Series, Convent Series, Crevasse Series, Jeanerette Series, Morganfield Series, Sharkey Series, Steele Series, and the Tunica Series.

The *Commerce Series* consists of soils that are dark grayish-brown silt loam over dark grayishbrown, grayish-brown, and gray silt loam and silty clay loam. They formed in beds of loamy alluvium. These soils are somewhat poorly drained. They generally occur on the lower part of natural levees bordering stream channels.

The *Convent Series* consist of soils of brown fine sandy loam over loam, very fine sandy loam, and silt loam mottled with yellowish brown, dark brown, light gray, and dark yellowish brown. These soils are somewhat poorly drained. These soils are generally on the lower part of natural levees bordering stream channels. They formed in stratified beds of sandy and silty alluvium.

The *Crevasse Series* consist of soils of very dark grayish-brown loamy sand over pale-brown and dark grayish-brown loamy sand and sand. These soils are excessively drained. These soils formed in sandy alluvium and are located on natural levees bordering stream channels.

The *Jeanerette Series* consist of soils that are very dark grayish-brown silt loam overlying very dark gray and gray silty clay loam or loam mottled with dark yellowish brown and yellowish brown. These soils are somewhat poorly drained. These soils are on level parts of low natural levees where they formed in loamy sediments.

The *Morganfield Series* consist of soils that are dark grayish-brown or brown fine sandy loam over very dark grayish-brown, brown, and very pale brown silt loam and very fine sandy loam. These soils are well drained. These soils formed in loamy alluvium and are located on natural levees bordering stream channels.

The *Sharkey Series* contains the Sharkey silty clay, which is a poorly drained soil that has a very dark grayish-brown silty clay surface layer 4-8 inches thick. The subsoil is dark-gray or gray clay mottled with dark brown and dark yellowish brown clay. These soils are on broad flats, where they developed in thick beds of clayey sediments deposited by slack water.

The *Steele Series* consists of the Steele silty clay loam. This soil is moderately well drained and is dark grayish-brown to brown silty clay loam surface layer over a grayish-brown loamy sand. Below this is dark-gray clay mottled with yellowish brown. Steele soils are on broad flats, where they developed in sandy, loamy, and clayey sediments.

The *Tunica Series* consists of soils that are very dark grayish-brown, dark brown or dark grayishbrown silty clay surface layer 5-9 inches thick. The subsoil is dark gray and gray clay or silty clay and silty clay loam that extends to a depth of about 45 inches. These soils formed in moderately thick beds of sediments deposited by slack water and underlain by loamy sediments.

2.3.2 Regional Stratigraphy

The surface of the Class 3N Facility property is covered by Quaternary Age Alluvium deposits. These sedimentary deposits include gravels, sands, silts, clays and mixtures of any and all of these. Underlying the Quaternary alluvial deposits is the Claiborne Group of the Tertiary Period. The Claiborne Group consists of the Cockfield Formation, the Cook Mountain Formation and the Memphis Sand. Beneath the Claiborne lies the Wilcox Group, which is also of Tertiary age.

The alluvial deposits of the Quaternary Period cover most of the East Arkansas Basin of the Mississippi Embayment. The alluvium is the result of recent stream deposition in the form of point bar sequences and flood plain deposits. The alluvium consists of an upper stratum of silt and clay, and a lower stratum of sand and gravel. The gravel deposits often make up over 50 percent of the thickness of the alluvium. The approximate thickness of the alluvium of the area of the site is estimated to be 120 feet. In some areas, the alluvium can reach a thickness of 150 feet (Pugh, et. al.-1997). The bottom of the Quaternary deposits rest on the erosional surface of older Cretaceous and Tertiary formations. This erosional surface determines the dip of the overlying alluvium, which is broad and gently southward (ASWCC-1988).

Beneath the Quaternary Alluvial is the unconformable contact of the Claiborne Group of the Tertiary Period. In some areas of the Mississippi Embayment, mostly in Southeast Arkansas, the Jackson Group of the Tertiary overlies the Claiborne. In the vicinity of the Class 3N Facility property, it is not present. The Claiborne is chiefly non-marine and composed of medium to very-fine sands, silts, and silty clays. The sands tend to be light- to dark-gray, white, brown, or red depending on the degree of weathering. The silts and clays are light to dark gray and sometimes variegated. Intervals enriched with carbonaceous material are dark brown to black. The silts are usually clayey and the clays are normally silty or sandy. Lignite beds are found in this interval and seem to be controlled environmentally rather than stratigraphically.

The Claiborne Group is composed of the Cockfield Formation, Cook Mountain Formation and the Memphis Sand (McFarland -1998). The thickness of the Claiborne ranges from a thin edge to as much as 1,500 feet, but in the area of the Class 3N Facility property, the Claiborne is estimated to be approximately 920 feet thick (Peterson, et. al. - 1981). Together, the Cockfield and Cook Mountain formations of the Claiborne Group are roughly 320 feet thick. Underlying these formations is the Memphis Sand, which is also subdivided into the Sparta Sand, Cane River Formation, and the Carrizo Sand. North of the 35-degree latitude (including the site), the Sparta Sand combines with the underlying Cane River Formation and Carrizo Sand to form the Memphis Sand (ASWCC-1988). The Memphis Sand is predominantly massive unconsolidatedbedded sands with the upper portion being an alternating layer of sand and clay beds. This unit is about 600 feet thick in the Class 3N Facility site area and dips to the axis of the Mississippi Embayment at about 10 to 20 feet per mile (Petersen, et. al.-1981). The Memphis Sand outcrops on Crowley's Ridge in Poinsett and Cross Counties of Arkansas. The Memphis Sand aquifer is confined in some places by the overlying Cook Mountain formation and by the underlying sand and clay sequences of the Wilcox group.

Lying unconformably beneath the Claiborne Group is the Wilcox Group. The Wilcox is a thick series of non-marine sands, silty sands, clays, and gravels with some thick deposits of lignite.

The sands are generally fine to very-fine grained and light gray in color. The clays are light gray or brown in color and often sandy or silty. The lignites occur throughout the sequence and are controlled by depositional environment rather than stratigraphic location (McFarland-1998). The Wilcox dips to the southeast at approximately 40 feet per mile. The upper unit of the Wilcox is composed primarily of clay, while the lower unit is primarily a massively bedded fine to very fine-grained sand. This lower unit is known as the "lower Wilcox aquifer". The average thickness of the Wilcox is 850 feet and can be as thick as 1,025 feet in some areas. In the area of the Class 3N Facility site the thickness is estimated to be approximately 800 feet (Petersen, et. al.-1981).

Below the Wilcox lies the Midway Group, which represents a marginal marine depositional environment. This unit is approximately 600 feet thick and composed of calcareous shale, arenaceous limestone, calcareous glauconitic sandstone, conglomerate and light to very dark bluish-gray clay shale (McFarland-1998). TABLE 1 illustrates the stratigraphic relationship of the geologic units found in this area.

Class 3N Solid Waste Facility Plum Point Energy Associates, LLC

TABLE 1Regional Stratigraphic ColumnClass 3N FacilityOsceola, Arkansas

Period	Group	Formation	Estimated Thickness	Description	Hydrologic Characteristics
			(ft)		
Quaternary	Alluvium		120 to 150	Gravel, sand, silt and clay.	Average yield from 1000 to 2000 gpm. Major source of water for irrigation and public use.
Tertiary	Jackson		0	Light gray, thinly laminated silts, silty clays, and silty sands. Minor lignite beds and plant remains.	Formation does yield water to wells. (Formation not present in area of site)
	Claiborne Group	Cockfield Cook-Mountain	320	Medium to very-fine sands, silts, and silty clays. Environmentally	Clays of the Cook- Mountain formation act as an upper confining unit to the Memphis sand aquifer.
₽ ⁸		Memphis Sand (Sparta Sand, Cane River Formation, Carrizo Sand)	600	controlled lignite beds and trace fossils.	Yields up to 1000 gpm. High levels of iron and manganese.
	Wilcox	Undifferentiated	800	Series of non-marine sands, silty sands, clays, and gravels with lignite deposits.	Yields up to 1000 gpm. Source for municipal and industrial supply.
	Midway	Porters Creek Clay Clayton Group	600	Calcareous shales, limestone, gluaconitic sandstone and gray clay shale.	Low yield; acts as a lower confining unit for the lower Wilcox aquifer.

2.3.3 Regional Structural Geology

The Class 3N Facility site is located within the East Arkansas Basin of the Mississippi Embayment physiographic region of Arkansas. The surface of this region is of alluvial depositional origin from a non-marine environment deposited during the Quaternary Period. The Mississippi Embayment is a southward plunging syncline, which has an axis that is roughly parallel to the Mississippi River. Geologic units from the Paleozoic Era, Cretaceous Period, and Tertiary Period are present in the subsurface. The Paleozoic strata consists of sandstone and shale which outcrop in the extreme western part of the basin and dip to the southeast where they are covered by unconsolidated strata of the Tertiary and Quaternary Periods. The Paleozoic strata forms an impermeable base that dips towards the axis of the embayment, where it reaches a depth of approximately 4600 feet below sea level.

Strata above the Paleozoic strata are composed of clay, silt, lignite, sand, and gravel deposits. These sediments originate from both marine and continental environments. Succeeding transgressions and regressions of shallow seas during the late Mesozoic to the early Tertiary formed alternating layers of sand, silt and clay. The continental deposits consist of coarser grained sediments that have a high permeability and make up the aquifers of the basin. The marine deposits are composed mostly of marl and clay layers that form confining beds that greatly limit groundwater flow into and out of aquifers.

The uppermost layer of the basin is an alluvial deposit of the Quaternary Period. This alluvium consists of clay, silt, sand, and gravel deposited by stream activity, and wind-blown deposits of silt and loess. Alluvial terraces were deposited during the Pleistocene Epoch of the Quaternary Period where glacial runoff from the north (near Cairo, Illinois) reached the Gulf Coastal Plain, and sediment aggradation occurred. Fluvial activities of erosion, transportation, and deposition further shaped the alluvium and continue to do so today. The Geologic Map of Arkansas and the Geologic Worksheet (FIGURE 4) illustrates the defining boundaries of each geologic unit and its correlating description.

2.3.4 Regional Geomorphology

The Eastern Arkansas Basin lies within the Mississippi Embayment. The Mississippi Embayment is a basically flat, uniformly sloping floodplain formed by deposition and erosion from the Mississippi River and its tributaries during the Quaternary and Tertiary Periods. The surface of this region is of alluvial depositional origin and is dotted with prominent topographic features such as terraces, oxbow lakes, abandoned stream channels, natural levees and backswamp areas. General land surface altitudes range from 150 feet to 300 feet above sea level. The greatest relief of the embayment is Crowley's ridge, which stands as much as 300 feet above the adjacent plain. The ridge extends 198 miles from Helena, Arkansas to Thebes, Illinois, and is never more than 11 miles wide. The ridge consists of unconsolidated Eocene clay, silt, sand, and lignite, capped by Pliocene sand and gravel and middle to late Pleistocene loess. The ridge is thought to be a divide formed as ancestors of the Mississippi River to the west and the Ohio River to the east of Crowley's Ridge eroded coastal plain sediments. Recent seismic studies indicate that the geomorphology of the Ridge may have been influenced by tectonic uplift. A decrease in the Mississippi River gradient and/or tectonic activity may have caused the eastward shifting of the Mississippi River to its present day channel.

The alluvial plain east of Crowley's Ridge is drained by the St. Francis River and its tributaries. Part of the plain west of the ridge drains to the St. Francis River by way of the L'Anguille River through an opening in Crowley's Ridge. The rest of the alluvial plain west of Crowley's Ridge is drained by the White River and its tributaries including the Cache River, Bayou DeView, Big Creek, and LaGrue Bayou, and by Bayou Meto. The topography of the Class 3N Facility site is illustrated by the contour elevations shown in **FIGURE 3**.

2.4 REGIONAL HYDROGEOLOGY

The three principle sources of groundwater in the region of the Class 3N Facility are the Quaternary Alluvium, the Memphis Sand of the Claiborne Group, and the Wilcox Group.

The Wilcox Group contains the lowermost groundwater supply of the Tertiary Period. The "lower Wilcox aquifer" yields large quantities of water to wells in eastern Arkansas. East of Crowley's Ridge, the aquifer yields over 1,000 gallons per minute to wells. The Wilcox is confined by the overlying prominent sands of the Carrizo Sand (the lower unit of the Memphis Sand) and the underlying clays of the Midway Group. Recharge occurs from precipitation entering the outcrop areas or by percolating through overlying alluvium. Groundwater flow is to the southeast towards the axis of the Mississippi Embayment. Water withdrawals from the lower Wilcox aquifer occur primarily in areas east of Crowley's Ridge where yields to water wells are greater. Water pumped from the aquifer is used primarily for municipal and industrial supply (ASWC-1988).

The Memphis Sand of the Claiborne Group is a massive sand unit of the Tertiary Period. The Memphis Sand aquifer commonly yields up to 1,000 gallons per minute of water to wells. The formation dips to the southeast at about 10 to 20 feet per mile. The Memphis Sand aquifer is confined between the overlying Cook Mountain formation and the underlying Wilcox Group. The aquifer is recharged in its outcrop areas near Crowley's Ridge and at subcrop areas (places where the top confining unit is missing) from percolation through the overlying alluvium. Groundwater flows down-dip from it's recharge areas to the southeast (ASWCC-1988). The Memphis Sand aquifer is the principal source of water for Memphis, Tennessee and other areas in the northern part of the Embayment. Most wells tap only the upper part of the aquifer.

The Quaternary alluvium contains the uppermost aquifer. The Alluvial aquifer is the principal source of water for irrigation in eastern Arkansas. The Alluvial aquifer commonly yields 1,000 to 2,000 gallons per minute of water to wells with occasional occurrences of up to 5,000 gallons per minute (ASWCC-1988). Transmissivity of the aquifer ranges from 10,000 to more than 40,000 square feet per day. Recharge to the alluvial aquifer occurs essentially from precipitation percolating into the formation. This recharge is limited in areas where the upper stratum of clay is thick enough to function as a confining bed. Recharge also occurs in areas of heavy withdrawals from the aquifer, which causes underflow from the Memphis Sand to enter the alluvium. Groundwater flow within the aquifer is in the direction of general land slope and towards streams which receive water from the aquifer. Locally, flow is from areas of recharge to areas of discharge. The streams of the area are hydraulically connected to the alluvial aquifer. Therefore, during the low flow season, groundwater flow is towards streams, which are sustained by the aquifer. This stream-aquifer interflow is reversed in the spring when water levels in the streams are higher than water levels in the aquifer (ASWCC-1988).

2.5 REGIONAL GROUNDWATER QUALITY

The majority of the data presented in this section was taken from the <u>Arkansas State Water Plan</u> <u>– East Arkansas Basin</u> prepared in 1988 by the Arkansas Soil and Water Conservation Commission (ASWCC).

Class 3N Solid Waste Facility	Permit Application
Plum Point Energy Associates, LLC	Geotechnical and Hydrogeological Investigation

Groundwater quality of the Alluvial aquifer in this region is generally hard and contains high levels of iron and manganese. Most constituent concentrations are within drinking water standards; however, local excesses of nitrate, chloride, and total dissolved solids exist in several areas. Median values for iron and manganese are above drinking water standards. This condition is a natural occurrence that is uniformly dispersed throughout the Alluvial aquifer. **TABLE 2** summarizes the average groundwater chemical analysis performed on samples collected from the various Tertiary and Quaternary geologic units located in northeast Arkansas.

Geologic Unit	Alluvial Aquifer	Memphis Sand	Wilcox Group
Temperature (°C)	17.0	18.5	23.5
pH	7.5	7.4	7.5
Specific Conductance			
(MicroSiemen/cm)	588	N/A	N/A
Carbonate Hardness (CaCO ₃)	250	120	15
Dissolved Calcium (Ca)	71	30	4.2
Dissolved Magnesium (Mg)	19	12	1.1
Dissolved Iron (Fe)	230	1.1	.07
Dissolved Manganese (Mn)	300	30	.02
Dissolved Sodium (Na)	21	21	35
Dissolved Potassium (K)	2.0	2.4	2.5
Dissolved Chloride (Cl)	20	3.3	2.2
Dissolved Sulfate (SO ₄)	9.4	4.4	4.8
Dissolved Fluoride (F)	0.2	0.10	.10
Dissolved Silica (SiO ₂)	31	16	9.9
Total Dissolved Solids (TDS)	320	154	116
Dissolved Nitrate (N)	0.11	.20	.09

TABLE 2

Regional Groundwater Chemical Analysis Class 3N Facility Osceola, Arkansas

Note: All concentrations are in milligrams per liter (mg/l) unless otherwise stated.

2.6 WATER WELL INVENTORY

A water well inventory was conducted on wells within a one and two mile radius of the property. The well inventory was conducted by utilizing State of Arkansas Report of Water Well Construction reports on file at the Arkansas Geological Commission, and also during site reconnaissance activities.

Four (4) wells were identified within a one-mile radius of the site, and nine (9) wells were identified within a two-mile radius of the site. A map illustrating the location of the wells and the associated construction reports (if available) are presented in **APPENDIX A**. According to the construction reports and visual observations, wells No. 1 through No. 13 are used for irrigation or are specified for usage as "other." Wells No. 14 and No. 15 are currently utilized as

1

a source of domestic water supply; however, the wells are greater than 500 feet from the active portion of the Class 3N Facility waste disposal boundary.

It should be noted that construction reports were not on file at the Arkansas Geological Commission for wells No. 10, 11, 12, 13, 14 and 15. It was observed that wells No. 10, 11, 12, and 13 are utilized for irrigation or non-domestic purposes only. Well No. 10 should be properly plugged and abandoned prior to placing waste at the Class 3N Facility.

3.0 SITE HYDROGEOLOGIC INVESTIGATION (CHAPTER 11 OF REGULATION 22, SECTIONS 22.1101 AND 22.1102)

The material presented in this section describes site-specific information that was gathered during the field phase of the hydrogeologic investigation, including methodology and results.

3.1 PREVIOUS INVESTIGATIONS

There have been no previous hydrogeological investigations conducted at the Class 3N Facility property prior to this investigation. On May 2, 2001, the ADEQ Solid Waste Division conducted a preliminary site evaluation associated with the development of the Class 3N Facility. The investigation consisted of excavating five (5) backhoe test pits. The test pits were logged by ADEQ and GEC personnel. Soil samples were collected from the test pits by GEC for geotechnical analysis. The locations of the test pits are shown in **FIGURE 3**.

As indicated by correspondence dated June 21, 2001, the results of the ADEQ preliminary site investigation indicated that the site is suitable for the Class 3N Facility site.

3.2 AERIAL PHOTOGRAPH ANALYSIS (22.1102 (C)(1))

An aerial photograph of the site (taken in February, 2001) and of the surrounding area was reviewed to identify sedimentary, depositional, structural, and geomorphic features within and surrounding the site. A copy of the aerial photograph is included in **APPENDIX B**.

A review of the aerial photograph did not identify any photo lineaments or reveal any surficial indication of faulting within the property boundary or near the Class 3N Facility. The lack of a definitive surface expression is a reasonable but not unequivocal indication that any potential faults near the Class 3N Facility site have not been active during the Holocene age (10,000 years).

Although various irregular shaped areas (indicated by areas light tan in color) are shown on the photograph, the areas appear to represent soils in which vegetation is not present, and not historic sand blows.

A seismic investigation was also conducted as part of the current hydrogeologic investigation in order to determine the shear wave velocities of the subsurface materials at the Class 3N Facility site. The results of the seismic investigation are discussed in **SECTION 17** (Design Report) of this permit application.

3.3 GEOLOGIC MAPPING AND STRUCTURE (22.1102 (C)(2))

GEC conducted a surface geologic mapping exercise of the area within a one-half mile radius of the Class 3N Facility boundary to identify and confirm the following:

• Features identified on the aerial photographs,

- Surface stratigraphy,
- Structural features,
- Springs and seeps, and
- Domestic, agricultural, and municipal water wells.

An aerial photograph analysis and site reconnaissance was conducted by GEC to investigate any identified photo lineaments, drainage features, springs, and any possible water wells. The geomorphology of this region is a basically flat, uniformly sloping floodplain formed by deposition and erosion from the Mississippi River and its tributaries during the Quaternary and Tertiary Periods.

The Class 3N Facility site is flat and does not exhibit any notable structural features. Surface water is drained by several excavated ditches (Ditch No. 11 on the western portion of the property and the Brown Bayou on the eastern boundary) which flow to the south. No springs or seeps were observed during the Class 3N Facility site reconnaissance.

Domestic, agricultural, and municipal water wells identified during the water well search are discussed in SECTION 2.6.

3.4 SURFACE GEOPHYSICAL INVESTIGATION (22.1102 (C)(3))

The following section describes the surface geophysical studies conducted at the site by GEC. The surface geophysical survey was conducted in accordance with the Hydrogeologic and Geotechnical Investigation Workplan submitted to the ADEQ in February, 2001. The Workplan was approved by the ADEQ on April 24, 2001. A surface geophysical program is a valuable tool that enables the relevant changes in soil type, stratigraphic changes, and sedimentary features to be evaluated over an extensive area, while effectively reducing the number of borings required to accurately characterize the area.

Upon completion of the surface geophysical survey, the data was evaluated and a subsurface boring program was developed to investigate any observed anomalies and to correlate the results of the survey with the actual lithology encountered in the borings. The geophysical method chosen to evaluate the Class 3N Facility site was an electromagnetic (EM) inductive technique used to measure subsurface terrain "conductivity." The survey was conducted by utilizing a Geonics EM-34-3XL instrument. A detailed discussion of the investigation's methods and results are discussed below.

3.4.1 Surface Geophysical Study

A detailed surface EM survey of the site was conducted using grid nodes previously established at the Class 3N Facility site. The investigation was performed to gain preliminary information on the subsurface geology at the Class 3N Facility site. The field activities associated with the EM survey were conducted on March 14, 2001 through March 16, 2001.

EM surface geophysical techniques provide information about the terrain conductivity of the subsurface. The electrical resistivity/conductivity of a substance is a measure of the

difficulty/ease with which an electrical current can be made to flow through it (McNeill, 1980). High terrain conductivity readings are the result of subsurface materials such as clay or saturated sediments. Low terrain conductivity readings are the result of subsurface materials such as sands. When combined with additional subsurface data, such as data obtained from test borings, this method provides a possible means for defining vertical and horizontal extent of clay layers. This method also can provide a correlation between different soil and/or rock types and their associated conductivity values. The following field procedures were used to conduct the EM terrain conductivity survey.

The surface conductivity survey was conducted using a Geonics EM34-3XL transmitting and receiving system. The entire Class 3N Facility site was initially gridded on 500-foot centers; however, the conductivity measurements for this investigation were taken on 250-foot centers. Conductivity measurements in both the horizontal dipole position (HD) and the vertical dipole position (VD), with intercoil spacings of 10, 20 and 40 meters, were recorded on 250-foot centers across the entire site.

To measure the terrain conductivity, the transmitter operator stops at the measurement station and the receiver operator moves the receiver coil backwards and forwards until the meter indicates the optimum intercoil spacing. The terrain conductivity is then read from a second meter on the instrument. The instrument is calibrated to read conductivity in millimhos per meter. Utilizing both the HD and VD instrument positions, data was collected at an intercoil spacing of 10, 20 and 40 meters. **TABLE 3** lists the exploration depths for the different intercoil spacing and dipole positions (McNeill, 1980).

Intercoil Spacing	Exploration Depth (feet)			
(meters)	Horizontal Dipoles	Vertical Dipoles		
	(HD)	(VD)		
10	25	50		
20	50	100		
40	100	200		

TABLE 3 Exploration Depths of EM34-3XL at Different Intercoil Spacings Class 3N Facility Osceola, Arkansas

The instrument is most responsive to variations in the near-surface conditions in the HD mode, whereas the VD mode will be relatively insensitive to such changes. The conductivity data obtained during the investigation is included in **APPENDIX** C of this report.

3.4.2 Surface Geophysical Results

The objective of the surface conductivity survey at the Class 3N Facility was in part to determine the thickness of the clay cap overlying the sands of the Alluvial deposits, and to determine the presence of any shallow sand lenses. This was accomplished by contouring the terrain conductivity values. The data that was gathered was interpreted by contouring the terrain conductivity values after the survey had been completed. The contouring was accomplished utilizing the SurferTM computer program from Golden Software, Inc. Four (4) contour maps, **FIGURES 5-1** through **FIGURE 5-4**, were compiled from the data collected at the 10-meter, 20-meter, and 40 meter intercoil spacings. The contour maps were generated by using data from the HD and VD mode at 10-meter spacing, VD mode at 20-meter spacing, and VD mode at 40-meter spacing.

Conductivity readings were taken along the grid system every 250 feet and identified by the identification system shown on the top and left side of **FIGURE 5-1** through **5-4**. For example, a reading was taken at point A1, at A1.5 (250 feet east of A1), at A2, and so on. Other hydrological data such as test borings and published geologic information were then used to assist in the interpretation of the data. These interpretations were verified during the boring program discussed in **SECTION 3.5**.

FIGURE 5-1 shows the 10-meter spacing (horizontal dipole) at an exploration depth of approximately 25 feet below ground surface (bgs). Because of the relatively shallow exploration depth of the 10 meter spacing, this figure best illustrates the variations of clay thickness near the ground surface. High conductivity readings indicate that there is a greater amount (thickness) of clay, while low conductivity readings indicate that more sand is present. The lithology encountered in the soil borings generally correlated well with the surface conductivity results. For example, in the areas shown by high conductivity contours, a greater thickness of clay was encountered in the soil borings in that particular area. As illustrated by FIGURE 5-1 through 5-4, the conductivity results illustrate natural depositional variations associated with the unconsolidated sediments and do not indicate any apparent anomalies.

3.5 SUBSURFACE EXPLORATION PROGRAM (22.1102 (C)(4))

In accordance with Section (22.1102 (c)(4)) of ADEQ Regulation 22, a minimum of one (1) boring for every five acres associated with the site was drilled and sampled during this investigation. Although the property boundary encompasses approximately 245 acres, the actual limits of the waste disposal area will comprise roughly 190 acres.

A total of fifty-seven (57) borings were drilled throughout the Class 3N property. The boring program was performed to thoroughly characterize the hydrogeologic setting of the site. Fourteen (14) of the fifty-seven (57) borings were subsequently converted into groundwater piezometers to further characterize the hydrology of the site, and one (1) of the borings was utilized to perform a seismic investigation at the site.

The information that was gathered and/or confirmed from the boring locations included:

- Stratigraphy;
- Saturated and unsaturated geologic units beneath the site;
- Thickness of the material overlying the uppermost aquifer;
- Depth to the uppermost aquifer;
- Material comprising the uppermost aquifer;

- Geotechnical information;
- Hydraulic conductivity of the aquifer and identification of any confining layers;
- Borehole geophysical logs, including natural gamma and formation conductivity; and
- Confirmation of regional published information.

The information obtained during this investigation was used to develop the conceptual hydrogeologic model of the Class 3N Facility site.

3.5.1 Soil Boring Program

On April 2 through April 24, 2001, fifty-seven (57) soil borings were advanced throughout the Class 3N Facility site under the supervision of GEC personnel. The borings were advanced to depths ranging from approximately 19 to 200 feet below ground surface (bgs) and are identified as B-1 through B-57. The locations were chosen to insure that the borings were adequately spaced to thoroughly characterize the hydrogeologic setting. Other considerations included placing the groundwater piezometers at strategic locations across the Class 3N Facility site, and correlating lithology to the results of the surface geophysical survey. Prior to drilling activities, a survey grid was established across the Class 3N Facility site based upon 500-foot centers and all borings were located and plotted on the site map in relation to this grid system. **FIGURE 3** shows the locations of the 57 borings.

The soil borings were advanced by utilizing either solid flight auger or wash rotary drilling techniques. A Simco 2400 SKL drill rig equipped with 6.25-inch solid flight augers was used to drill most of the shallow borings. A CME-55 wash rotary drill rig equipped with a 6-inch drag bit was used to drill the deep borings and to drill and install some of the piezometers. The drilling technique utilized for each boring is specified on the boring logs presented in **APPENDIX D**.

Soil samples were generally collected at 5-foot intervals throughout the entire depth of each boring utilizing a stainless steel 1.5-foot split spoon sampler. Once a depth of 50 feet bgs was reached in the deep borings, soil samples were generally collected at 10-foot intervals when possible. Shelby tube samples were also collected at various depths in the borings for geotechnical analysis. Soil samples were collected from the 57 borings (and test pits) for the purpose of logging and to characterize the geotechnical properties of the underlying soils.

The drilling contractor utilized to drill the borings was Anderson Engineering of Little Rock, Arkansas. A GEC Geologist was present during all drilling/well construction activities and the borings were logged in the field following descriptions provided in the Unified Soil Classification System (USCS). The soil boring logs are presented in **APPENDIX D**. The results of the geotechnical analysis are discussed in further detail in **SECTION 4.0** of this report.

3.5.2 Site Geology

The site is underlain by Quaternary Age unconsolidated alluvial deposits, which are characterized by a coarsening downward sequence. In general, the lithology encountered at the Class 3N Facility site consists of a clay or silty clay unit at the surface, a middle sand unit, and a

thick sand and gravel unit that comprises the base of the alluvial deposits. A mixture of sand, silt, and clay was encountered in each of these units. The thickness of these units varied considerably across the Class 3N Facility site. A detailed description of the lithology encountered across the Class 3N Facility site is discussed below.

The soils encountered at the surface generally consist of brown to gray, clay to silty clay, or occasionally sandy clay. The clay is comprised of varying amounts of silt and occasionally some fine sand. The clay bed varies in thickness across the site and was encountered in the borings at a thickness ranging from 2 to over 30 feet, with an average thickness of approximately 15 feet.

Some discontinuous silty sand lenses underlie the clay bed. Underlying most of the clay material, a brown to tan, fine to coarse, sand with some silt and clay is present. The sand ranged from well to poorly sorted, and rounded to angular. The sand was encountered at depths ranging from approximately 2 feet bgs to over 30 feet bgs.

This sand unit then grades into a sand and gravel unit with some silt and clay. The sand and gravel unit consists primarily of fine to coarse sand with gravel up to 40 millimeters (mm) in diameter. The percentage of gravel varies throughout the unit and is subrounded to subangular. The top of the sand and gravel unit was encountered in the borings at depths ranging from 30 to 103 feet bgs. The sand and gravel unit comprises a large percentage of the total thickness of the alluvial deposits and represents the base of the alluvial deposits. The sand and gravel unit was present up to a depth of approximately 150 feet bgs in B-21.

Beneath the alluvial deposits, a brown to gray sand with some silt is encountered. This silty sand is believed to represent the top of the Tertiary Age Claiborne Group.

Several geologic cross sections that illustrate the underlying stratigraphy of the site were generated from the soil boring logs logged during this hydrogeologic investigation. When applicable, the cross sections contain the results of the subsurface geophysical logs, depth to groundwater encountered during drilling and potentiometric groundwater elevation, depth and location of each boring, surface topography and lithologic descriptions.

The locations of the cross section lines are shown in **FIGURE 6**. Cross sections A-A', B-B', and C-C' trend west to east across the property and are presented in **FIGURES 7-1**, 7-2, and 7-3, respectively. Cross sections D-D', E-E', and F-F' trend north to south across the property and are presented in **FIGURE 7-4**.

3.5.3 Subsurface Geophysical Logs

Borehole geophysical logging was conducted in eleven (11) of the borings drilled across the site. The downhole geophysical logging was conducted primarily in the deeper borings drilled at the site and included borings B-2, B-5, B-7, B-9, B-17, B-18, B-21, B-26, B-46, B-51, and B-54. The logging method included natural gamma and formation conductivity. Upon completion of drilling the borehole to be logged, 2-inch diameter Schedule 40 PVC casing was installed to the total depth of the boring. Logging of each hole was then accomplished by lowering the logging tools through the center of the casing.

Natural gamma logs are records of the amount of natural gamma radiation that is emitted from all soils and rocks. In sedimentary formations, the log normally reflects the shale or clay content of the formation under investigation. This is because the radioactive elements tend to concentrate in shale and clay. Clean formations generally have very low natural radioactivity unless a radioactive contaminant such as volcanic ash or granite wash is present or the formation waters contain dissolved radioactive salts. The most common gamma-emitting isotope normally found in sediments or rocks is potassium-40 (K^{40}). Potassium, which contains about 0.012 percent K^{40} , is typically found in feldspars and micas that are found in many different rock types and readily decompose into clays. In hydrogeologic investigations, a common application is the identification of clay or shale deposits that may act as a confining layer for the aquifer. The primary use of natural gamma logs is for the identification of lithology and stratigraphic correlation in open or cased, liquid or air filled holes (Keys and MacCary, 1983; Schlumberger, 1987).

The gamma log is interpreted by using the vertical scale (measured as depth in feet) and the horizontal scale provided at the top of the log. The horizontal scale used in this investigation increases from zero on the left, up to 300 counts per second on the right. The clay material typically exhibits high gamma values. Sand and gravel material is typically interpreted by observing when the log has a baseline shift to the left (low gamma values). This baseline shift is seen as a more gradual shift when the probe passes through gradations in lithology from clay to sand.

In addition to natural gamma, each borehole was logged with an EM-39 formation conductivity probe. This is an induction-logging tool. This type of probe operates using a transmitter and receiver coil. A high-frequency alternating current of constant intensity is sent through the transmitter coil. The alternating magnetic field created induces currents in the formation surrounding the borehole. The currents flow in circular loops parallel with the transmitter coil and create a magnetic field that induces a voltage in the receiver coil. Because of the constant amplitude and frequency of the transmitter coil, the currents induced are directly proportional to the formation conductivity. The probe is designed in such a way as to eliminate the signal originating from the transmitter. The resistivity associated with the conductivity is calculated based upon the conductivity of the formation (Keys and MacCary, 1983; Schlumberger, 1987).

The formation conductivity probe is used to assist in differentiating the conductive clay layers from the lower conductivity layers such as rock, cherty gravel, or sand. The formation conductivity is measured in milliSeimens/meter (mS/meter). The scale is read from zero on the left, up to 250 mS/meter on the right. The clay material typically exhibits high conductivity values. Sand and gravel material is typically interpreted by observing when the log has a baseline shift to the left.

The conductivity, resistivity and natural gamma plots are illustrated on all of the geophysical logging results, which are included in **APPENDIX E**.

3.6 HYDROGEOLOGIC INVESTIGATION (22.1102 (C)(5))

This section describes the data gathered during this investigation regarding the hydrologic characteristics of the uppermost aquifer underlying the site of the Class 3N Facility.

3.6.1 Installation of Piezometers

During this hydrogeologic investigation, fourteen (14) groundwater piezometers (PZ-1 through PZ-14) were installed on the Class 3N Facility site. The piezometers were utilized to characterize the hydrologic characteristics of the Class 3N Facility site, including depth to groundwater, hydraulic conductivity, aquifer transmissivity, hydraulic gradient, and groundwater flow direction. The piezometers will also be used to assist in determining the wells to be used in the proposed groundwater monitoring system and to establish water quality. All of the piezometers were constructed such that they could subsequently be converted into groundwater monitoring wells.

It should be noted that piezometers PZ-9 and PZ-14 were designed to be used only during the 24hour pump test. Therefore, the construction material, including surface completion, of piezometers PZ-9 and PZ-14 varied somewhat from the completion of the remaining piezometers.

Each piezometer completion was performed in accordance with ASTM D 5092-90 *Design and Installation of Groundwater Monitoring Wells in Aquifers* and current industry standards. With the exception of PZ-9 and PZ-14, the piezometers were constructed using a 10-foot section of 0.010 slotted PVC screen, and 2-inch diameter Schedule 40 threaded PVC riser pipe. A 4-inch bottom cap was installed on the bottom of each screen. The screened interval was threaded to a solid 2-inch diameter PVC riser to bring the well to above ground surface completion. The annulus of each piezometer was filled with 10/20 mesh silica sand from the bottom of the boring to approximately 2 feet above the screened interval. A 2-foot layer of bentonite pellets was then placed in the annulus on top of the sand filter pack. The remaining annulus was filled with bentonite chips to ground surface.

The solid PVC riser in the piezometers was brought to approximately 3 feet above ground surface. A 4-foot long metal protective locking collar was then installed over the PVC and a 3-foot by 3-foot concrete pad constructed around each piezometer. Protective bollard posts were then installed around each corner of the concrete pad.

Piezometers PZ-9 and PZ-14 were constructed to similar standards, with the following exceptions: Four (4)-inch diameter PVC was used to construct the piezometers; PZ-14 was constructed with a 20-foot section of screen; and, metal protective locking collars and concrete pads were not constructed around these two piezometers. GEC proposes to properly plug and abandon these 2 piezometers, as discussed in **SECTION 23** (Groundwater Monitoring and Corrective Action) of this Permit Application.

Well construction details for the 14 piezometers are presented in **TABLE 4**. Well construction diagrams for the piezometers are included on the boring logs in **APPENDIX D**. The locations of the piezometers are presented in **FIGURE 3**.

.

TABLE 4Piezometer Construction DetailsClass 3N FacilityOsceola, Arkansas

Well	Total	Screen	Riser Length	Depth to Top	Depth to Top	Depth to Top
Number	Depth ¹	Length	(includes 3'	of Sand ²	of Bentonite	of Bentonite
			stickup)		Seal ²	Grout ²
			(ft)	(ft)	(ft)	(ft)
	(ft)	(ft)				
PZ-1	33.63	10	23.63	17.6	15.7	0
PZ-2	30.23	10	20.23	14	12	0
PZ-3	32.62	10	22.62	18.5	16.4	0
PZ-4	29.43	10	19.43	14.4	12.4	0
PZ-5	32.50	10	22.50	18	16	0
PZ-6	28.45	10	18.45	13.5	11.5	0
PZ-7	31.60	10	21.60	15	13	0
PZ-8	32.40	10	22.40	16	14	0
PZ-9*	29.96	10	19.96	15	13	0
PZ-10	25.60	10	15.60	11	8	0
PZ-11	28.76	10	18.76	14	12	0
PZ-12	22.41	10	12.41	7	5	, 0
PZ-13	28.17	10	18.17	14.5	13	0
PZ-14*	39.92	20	19.92	18	16	0

* PZ-9 and PZ-14 are constructed with 4-inch diameter PVC

¹ below top of casing

² below ground surface

3.6.2 Groundwater Flow Direction

Prior to recording fluid levels, the top of casing (TOC) elevations were surveyed to the nearest 100^{th} of a foot by Central Arkansas Surveying, Inc. in order to establish relative elevations of the wells. The static water level in each well was then determined by slowly lowering an electronic water level meter into the well. The water level meter is graduated in 0.01 feet increments and is read from the TOC to the nearest 100^{th} of a foot.

The groundwater elevations were calculated by subtracting the depth to static water elevation from the TOC elevation for each well. Fluid level measurements (recorded on April 23 and May 2, 2001), TOC elevations, and groundwater elevations are presented in **TABLE 5**.

Easter

TABLE 5Fluid Level MeasurementsClass 3N FacilityOsceola, Arkansas

Station I.D.	Date of Fluid	TOC Elevation	Depth to	Total Depth ¹	Groundwater
	Level	(ft)	Water ¹	(ft)	Elevation
	Measurement		(ft)		(ft)
PZ-1	4-23-01	242.35	21.65	33.63	220.70
	5-2-01		21.53		220.82
PZ-2	4-23-01	243.57	22.18	30.23	221.39
	5-2-01		22.13		221.44
PZ-3	4-23-01	241.23	20.32	32.62	220.91
	5-2-01		20.35		220.88
PZ-4	4-23-01	240.50	19.55	29.43	220.95
	5-2-01		19.55		220.95
PZ-5	4-23-01	242.75	21.76	32.50	220.99
	5-2-01		21.57		221.18
PZ-6	4-23-01	241.92	21.33	28.45	220.59
	5-2-01		21.30		220.62
PZ-7	4-23-01	245.29	23.52	31.60	221.77
	5-2-01		23.45		221.84
PZ-8	4-23-01	244.83	22.20	32.40	222.63
	5-2-01		22.54		222.29
PZ-9	4-23-01	246.36	11.01	29.96	235.35
-	5-2-01		11.37		234.99
PZ-10	4-23-01	242.51	19.57	25.60	222.94
	5-2-01		19.78		222.73
PZ-11	4-23-01	244.33	22.51	28.76	221.82
	5-2-01		22.76		221.57
PZ-12	4-23-01	247.16	10.41	22.41	236.75
	5-2-01		11.81		235.35
PZ-13	4-23-01	246.74	NR	28.17	NR
	5-2-01		14.85		231.89

¹ Feet Below Top of Casing (TOC)

NR - Not Recorded During This Event

NOTE : PZ-14 (4-inch pumping well) was not Utilized to Determine Groundwater Elevations.

The fluid levels recorded on May 2, 2001 were used to calculate the potentiometric surface of the groundwater. A groundwater flow map is presented in **FIGURE 8**. As illustrated by **FIGURE 8**, there is a minor flow component to the south from PZ-9, PZ-12 and PZ-13, towards PZ-11. This southern flow component (along the eastern property boundary only) is likely the result of the thick sequence of clay encountered in the borings associated with PZ-9, PZ-12, and PZ-13 causing the groundwater to be under confined conditions in this portion of the site. However, the overall groundwater flow direction across the entire site appears to be to the west.

Hydraulic gradient is calculated by drawing a line perpendicular to the overall groundwater elevation contours. Based on the difference in groundwater elevation between PZ-12 and PZ-3 (14.47 feet), and divided by the distance between the 2 piezometers (5,100 feet), a hydraulic gradient of 0.0028 feet per foot (ft/ft) was calculated.

3.6.3 Aquifer Testing

Aquifer testing was conducted at the Class 3N Facility site in order to determine the hydraulic conductivity, transmissivity, and storativity of the uppermost aquifer underlying the site. On April 23 and 24, 2001, a multiple well pump test was performed utilizing PZ-14 as the pumping well and piezometer PZ-5 as an observation well. PZ-14 was chosen as the pumping well based upon the proximity to the Class 3N Facility waste boundary and the representative subsurface lithology encountered in this boring. In addition to the pump test, slug tests were conducted in piezometers PZ-1, PZ-4, PZ-8 and PZ-11. FIGURE 3 shows the location of the piezometers in which aquifer tests were conducted.

Piezometer PZ-14 (4-inch pumping well) was installed to a depth of approximately 38 feet bgs and penetrates into the sand unit encountered below the upper clay unit. The well partially penetrates the Alluvial Aquifer and groundwater was encountered between 17 and 19 feet bgs in this boring. The static groundwater level in PZ-14 is approximately 17 feet bgs and the pumping interval (screened interval) in the well is from 18 to 38 feet bgs. Piezometer PZ-5 (2-inch observation well) was installed approximately 20 feet west of PZ-14 and the screened interval in PZ-5 is from 19 to 29 feet bgs.

Monitoring of the pump test was accomplished using pressure transducers to record drawdown data in the pumping well (PZ-14) and in the observation well (PZ-5). Because the pumping well partially penetrates only the uppermost portion of the Alluvial Aquifer (only 18 feet of water standing in the well available for drawdown), and was installed in the upper sand portion of the aquifer, PZ-14 exhibited a relatively low yield during this test. During the course of the pump test, it was determined that adequate recharge to the well could not be maintained at pumping rates above 5 gallons per minute (gpm) without excessive drawdown. The pumping rate established during a majority of the constant-rate pump test was approximately 4 gpm.

The constant-rate pump test involved pumping PZ-14 at a constant rate (4 gpm) until the drawdown stabilized or until 24 hours had passed. The data loggers were set near the bottom of each piezometer and the feet of water in head above the data logger was recorded. The initial water level was identified as a zero reference point and drawdown was recorded as the difference between the initial reference value and the instantaneous pressure measurement taken by the logger. Drawdown was recorded as a positive value. The results of the pump test are discussed in **SECTION 3.6.4**. Copies of the data collected during the pump test are included in **APPENDIX F** of this report.

On April 25, 2001 slug testing was performed in piezometers PZ-1, PZ-4, PZ-8 and PZ-11, which are screened in the uppermost aquifer underlying the site. The slug tests were performed by first placing a pressure transducer into the piezometer and allowing the water level to stabilize. After stabilizing, the data recorder was started and a slug of water removed as rapidly

as possible. The recharge to the well over time was recorded and the test run until the water level achieved equilibrium. The procedure was then repeated in each piezometer. This resultant recovery data was analyzed utilizing the Bower and Rice method.

3.6.4 Results of Aquifer Testing

The data collected during the pump test and the slug tests was processed using the AqtesolvTM Aquifer Test Solver computer program. While PZ-14 was pumped during the pump test, drawdown data was collected from PZ-14 and PZ-5. The pump test was stopped after about 22 hours when the drawdown in the pumping well and the observation well had stabilized for an extended time.

The aquifer parameters were analyzed by using the Neuman (1974) curve-matching method. The results were calculated by using the unconfined solution method and were adjusted to account for partial penetration of the wells into the aquifer. The Neuman method considers the effects of partial penetration in unconfined aquifers (Freeze - 1979). The following assumptions were used in the calculation of the aquifer parameters:

- The saturated aquifer thickness is 130 feet. This is the estimated maximum saturated thickness of the Alluvial Aquifer in this region.
- The observation well is partially penetrating the aquifer.
- The ratio of the vertical hydraulic conductivity to the horizontal conductivity was assumed to equal 1.0.

Upon entry of the drawdown data, the Aqtesolv program estimates the aquifer properties automatically by determining a "best fit" matching curve from the data. A graphical presentation of the Aqtesolv calculations from drawdown in PZ-5 are presented in **APPENDIX G**.

Utilizing the Neuman method, a transmissivity of 19.22 ft^2/min (27,676 ft^2/day) was calculated from the drawdown data collected from PZ-5 during pumping of PZ-14. Additionally, a storativity value of 0.0096 was calculated from the data collected from PZ-5.

Using the data calculated by AqtesolvTM during the pump test, the hydraulic conductivity (K) of the uppermost aquifer was calculated by using the following equation:

(1)
$$K_{avg} = T_{avg} / b$$

Where:

 K_{avg} = hydraulic conductivity (ft/min) T_{avg} = transmissivity (19.22 ft²/min) b = thickness of saturated aquifer (130 feet)

Based upon the transmissivity data obtained during the pump test, the above calculation indicates the hydraulic conductivity of the aquifer is 1.47×10^{-1} ft/min (7.46 X 10^{-2} cm/sec). Copies of all calculations are included in **APPENDIX G** of this report.

Slug test data from piezometers PZ-1, PZ-4, PZ-8 and PZ-11 were also analyzed to aid in the calculated hydraulic conductivity (K) of the uppermost aquifer underlying the entire Class 3N Facility site. Two slug tests were conducted in each piezometer. As discussed in **SECTION 3.6.3** of this report, the slug test data was analyzed utilizing the Bower and Rice method. The results of the slug test data, and the conductivity value calculated from the pump test, indicate that the average hydraulic conductivity of the aquifer is 2.15×10^{-2} ft/min (1.09 x 10^{-2} cm/sec), which is comparable to the results calculated from the pump test data.

The results of the slug tests conducted in PZ-1, PZ-4, PZ-8 and PZ-11 are presented in **TABLE** 6. The slug test graphical calculations are presented in **APPENDIX G**.

Well I.D.	K (ft/min)	K (cm/sec)
PZ-1 (Test 1)	1.14 X 10 ⁻²	5.79 X 10 ⁻³
PZ-1 (Test 2)	1.39 X 10 ⁻²	7.06 X 10 ⁻³
PZ-4 (Test 1)	8.89 X 10 ⁻³	4.51 X 10 ⁻³
PZ-4 (Test 2)	9.97 X 10 ⁻³	5.06 X 10 ⁻³
PZ-8 (Test 1)	2.03 X 10 ⁻⁴	1.03 X 10 ⁻⁴
PZ-8 (Test 2)	2.19 X 10 ⁻⁴	1.11 X 10 ⁻⁴
PZ-11 (Test 1)	1.03×10^{-3}	5.23 X 10 ⁻⁴
PZ-11 (Test 2)	1.14 X 10 ⁻³	5.79 X 10 ⁻⁴
PZ-14 ¹	1.47 X 10 ⁻¹	7.46 X 10 ⁻²
AVERAGE	2.15 X 10 ⁻²	1.09 X 10 ⁻²

TABLE 6Slug Test ResultsClass 3N FacilityOsceola, Arkansas

¹As estimated by transmissivity data obtained during the pump test.

Using the calculated average hydraulic conductivity, the average linear velocity of groundwater flow at the site is calculated using Darcy's Law:

$$V = \underline{Kavg (dh/dl)}$$

Where:

(2)

V = average linear velocity

 K_{avg} = average hydraulic conductivity (1.09 X 10⁻² cm/sec, from TABLE 6)

(dh/dl) = hydraulic gradient (0.0028, as presented in Section 3.6.2)

 $n_e =$ effective porosity (27% = 0.27)

A porosity value of 30 percent (Terzaghi, 1996) was used for the dense, poorly sorted sand material. An effective porosity (n_e) was then determined by multiplying the porosity by 0.90 (90 percent). Effective porosity is always equal to or less than the porosity and utilizing 90 percent

is a conservative approach, since part of the total porosity is occupied by static fluid held to the mineral surface by surface tension. An effective porosity was determined to be 27 percent. Utilizing the above values, the groundwater flow at the site is to the west at an average linear velocity (V) of 1.13×10^{-4} cm/sec or 116.94 ft/year.

3.6.5 Site Groundwater Chemistry

Currently, there is no Class 3N Facility site specific groundwater quality data available. The general groundwater quality from several of the regional aquifers is discussed in SECTION 2.5 of this report. Site specific background water quality will be determined prior to placing waste at the Class 3N Facility. The proposed groundwater monitoring system, Sampling and Analysis Plan, and Statistical Analysis and Contingency Plan are presented in SECTION 23 (Groundwater Monitoring and Corrective Action) of this permit application.

4.0 GEOTECHNICAL TESTING (22.1102 (C)(6))

Geotechnical samples were collected during the drilling of the borings to characterize the geotechnical properties of the soils and to aid in the design of the Class 3N Facility. Each textural horizon was classified where appropriate with the physical tests listed below. The physical tests included:

- Atterberg limits (ASTM D 4318),
- Sieve analysis (ASTM D 1140 & D 422),
- Hydraulic conductivity (ASTM D 5084),
- Unconfined compressive strength (ASTM D 2166),
- Unconsolidated-undrained compressive strength of soils (ASTM D 2850),
- Consolidated-undrained compressive strength of soils (ASTM D 4767),
- Standard proctor density (ASTM D 698),
- One dimensional consolidation (ASTM D 2435),
- Natural moisture content of soils (ASTM 2216).

4.1 SIEVE ANALYSIS SUMMARY

Particle size analyses were conducted on soil samples collected at varying locations and depths for the purpose of analyzing grain size distribution and classification of the soils underlying the Class 3N Facility site. The sieve analysis involves a series of sieves (screens) having different size openings that are stacked with the larger sizes over the smaller. The soil sample is dried and passed through the sieves by shaking. The weight of the particle size distribution is presented as percent retained and percent finer. A silt or clay soil is generally defined as a soil passing a No. 200 sieve. Sand is defined as particles of rock passing a No. 4 sieve, but retained by a No. 200 sieve. Gravel is defined as particles of rock retained by a No. 4 sieve.

TABLE 7 summarizes the results of the sieve analyses that were performed. The geotechnical analysis report is included in **APPENDIX H**. Sieve analysis was conducted on a total of fifty-two (52) split spoon and shelby tube samples. Due to the small amount of recovery in split-spoon samples collected from the sandier units, certain intervals of similar material were composited in order to obtain an adequate amount of soil for testing.

As indicated by **TABLE** 7, the percentage of clay, silt and sand size particles in the upper clay unit encountered across the Class 3N Facility site varies somewhat. Of the 30 soil samples submitted for analysis from the 0 to 10 feet bgs interval, the percentage of clay or silt size particles passing (finer than) the No. 200 sieve ranged from 1.0 to 99.4 percent, with an average of 75 percent passing the No. 200 sieve.

Of the 17 samples that were submitted for analysis between 10 feet bgs and 30 feet bgs, the percentage of clay or silt size particles passing the No. 200 sieve ranged from 0.9 to 98.6, with an average of 39 percent. Of the remaining 5 samples submitted for analysis below 30 feet bgs, the percentage of clay or silt size particles passing the No. 200 sieve ranged from 3 to 83.4, with an average of 28 percent.

TABLE 7Geotechnical Analysis ResultsClass 3N FacilityOsceola, Arkansas

Boring	Sample	USCS	Natural	A	tterberg Limit	ts	Mechanical	Grain Size	Permeability
	Depth	Classifica-	Moisture				Anal	ysis	(cm/sec)
	(ft)	tion	%				(percent f	iner than)	
				L.L.	P.L.	P.I.	#4	#200	
B- 1	3-5 ¹	CL	29.1	45	26	19	100	98.2	1.4 X 10 ⁻⁴
B-1	$14-20^{2}$	CL					100	83.3	
B-2	4-5	CL	38	47	22	25	100	95.6	
B-4	3-5 ¹	CL	33.8	41	21	20	100	99.4	6.9 X 10 ⁻⁸
B-5	9-10	СН	33.7	58	24	34			
	24-25	SM							
	79-80	CL		27	16	11			
B-7	3-5 ¹	CL	31.9	44	23	21	100	99.4	6.7 X 10 ⁻⁴
B-10	3-5 ¹	ML	30.6				100	98.9	6.8 X 10 ⁻⁷
	19-20	CL	48	38	19	19	100	92	
	24-25	SP-SM	16.4				99.4	11.5	
B-11	4-5	CL	29.8	46	21	25	100	88.9	
B-12	9-10	SM	·				100	35.5	
B-13	4-5	CL	25.8	.34	20	14	100	78.6	
	19-20	SM	20.0				100	16.1	
B- 14	9-10	CH	27.1	51	21	30	100	93.0	
	$14-20^{2}$	SP	4.2				100	3.0	
B-15	4-5	CL	31.7	44	23	21	100	91.5	

¹Denotes Shelby Tube Sample

²Composite Interval Due To Low Sample Recovery

TABLE 7 (cont)Geotechnical Analysis ResultsClass 3N FacilityOsceola, Arkansas

C

Boring	Sample	USCS	Natural	A	tterberg Limit	S	Mechanical	Grain Size	Permeability
	Depth	Classificati	Moisture				Ana	ysis	(cm/sec)
		on	%	1			(percent f	iner than)	
-				L.L.	P.L.	P.I.	#4	#200	
B-17	9-10	СН	38.1	79	32	47	100	96	
	14-15	SM	19.0				100	32.4	
	$34-40^2$	CL	32.1	33	23	10	100	83.4	
	69-7 0	SP-SM	21.1				98.8	7.1	
	79-80	SP	19.0				99.7	4.8	
B-20	9-10	SP	3.2				99.8	1.0	
B-21	3-5 ¹	СН	38.8	58	23	35	100	96.6	1.1 X 10 ⁻⁴
	19-20	SM	23.4				100	25.3	
B-23	9-15 ²	SP-SM	6.9				99.9	8.7	
B-24	4-5	SP-SM	2.1				100	9.5	
-	19-20	SP	16.1				100	0.9	
B-26	3-5 ¹	CL	19.2	26	16	10	99.5	57.4	2.6 X 10 ⁻⁴
	$14-25^2$	SM	17.9				99.5	20.3	
	49-50	SC	29.9		·		89.1	43.5	
	59-130 ²	SP	11.9				82.3	3	
B-27	19-30 ²	CH	39.9	·			99.9	93.9	
B-28	19-20	СН	57.7	65	27	38	100	98.6	
B-29	3-5 ¹	CL	23.3	38	19	19	100	74.1	7.8 X 10 ⁻⁸
B-30	4-5	SM	10.1				100	13.7	·
B-31	9-10	CL	25.2	33	19	14	100	68.1	

¹Denotes Shelby Tube Sample

²Composite Interval Due To Low Sample Recovery

Permit Application Geotechnical and Hydrogeological Investigation

TABLE 7 (cont)Geotechnical Analysis ResultsClass 3N FacilityOsceola, Arkansas

Boring	Sample Depth	USCS Classificati on	Natural Moisture %	Atterberg Limits		Mechanical Grain Size Analysis (percent finer than)		Permeability (cm/sec)	
				L.L.	P.L.	P.I.	#4	#200	
B-33	3-5 ¹	SC	10.4	22	13	9	100	21	
B-38	4-5	СН	38	80	28	52	100	96.8	
B-40	4-15 ²	SM	17.9				100	12.9	
B-4 1	3-5 ¹	CL	35.4	45	21	24	100	95	
B-42	9-10	CL	20.5		÷		100	56.7	
B-43	3-5 ¹	CL	34.3	44	21	23	100	99	1.0 X 10 ⁻⁶
B-44	3-5 ¹	CL	30.5	44	21	23	100	98.8	2.0 X 10 ⁻⁴
B-45	9-10	CL	33.2				100	97.2	
	$20-30^2$	SM	20.1				100	32.2	
B-50	9-10	SP	13.3				100	4.2	
B-51	3-5 ¹	CH	35.7	61	31	30	100	95.4	3.7 X 10 ⁻⁸
B-54	4-5	CL	33.6	38	23	15	100	97.1	
	8-10 ¹	CH	44.2	74	26	48	100	98	
	$25-30^2$	SM	24.5				100	27.1	
B- 55	3-5 ¹	CL	32.4	33	23	10	100	93.7	4.1 X 10 ⁻⁷
	19-30 ²	СН	47.6	56	28	28	100	88.1	
B-56	$9-20^{2}$	SC	33.9	32	23	9	100	15.2	

¹Denotes Shelby Tube Sample

²Composite Interval Due To Low Sample Recovery

4.2 ATTERBERG LIMITS AND USCS CLASSIFICATION

In the remolded state, the consistency of clay soil varies in proportion to the water content. At high water content, the soil-water mixture possesses the properties of a liquid. At a lesser water content, the soil-water mixture possesses properties that resemble plastic. At even lower water contents, the soil-water mixture possesses the properties of a solid or semi-solid. The water content indicating the division of the liquid and plastic state has been designated the liquid limit. The division between the plastic and semi-solid state is referred to as the plastic limit. The numerical difference between the liquid limit and the plastic limit is identified as the plasticity index (P.I.). These values are often referred to as Atterberg limits. Atterberg limits are used widely in soil applications and are a good measure of the soil workability for use in solid waste liner systems.

Atterberg limits were determined on a total of twenty-nine (29) split spoon and shelby tube samples. The samples were also classified by the Unified Soil Classification System (USCS) in order to further describe the physical properties of the subsurface soils. **TABLE 7** summarizes the Atterberg limits analyses and USCS classification of the soil samples. The geotechnical laboratory analysis is included in **APPENDIX H** of this report.

As indicated by **TABLE** 7, plastic soils of the upper clay unit (0 to 10 feet bgs) exhibited a liquid limit (L.L.) ranging from 22 to 80, with an average L.L of 47. The soil samples (0 to 10 feet bgs) exhibited a plastic limit (P.L.) ranging from 13 to 32, with an average P.L. of 22.5. The soil samples (0 to 10 feet bgs) exhibited a P.I. ranging from 9 to 48, with an average P.I. of 24.5. The P.I. results indicate that the upper clay unit exhibits medium plasticity and that small to moderate amounts of silt are present within this unit.

The soil samples submitted from the 0 to 10 feet bgs interval were generally classified by the USCS classification as CL (lean clay) to CH (fat clay). However, 6 of the samples (collected within 0 to 10 feet bgs) were classified as either ML (silt and clay), SC (sandy clay), or SM (silty sand).

As indicated by B-28 (19 to 20 feet bgs), high plasticity clay (CH) was encountered at depths of up to 20 feet bgs at the site. Soils that are classified as CH are characterized by high to very high dry strength and high toughness at the plastic limit. Soils that are classified as CL are characterized by medium to high dry strength and medium toughness at the plastic limit (Terzaghi, 1996).

Soil samples collected from the sand and gravel units below 10 feet were generally classified as SC (sandy clay), SM (silty sand), and SP(sand and gravel).

4.3 STANDARD PROCTOR DENSITY (TEST PIT SAMPLES)

GEC obtained bucket samples from five (5) separate test-pit (TP) locations in order to determine the suitability of the soil in the construction of the clay liner and/or a final cover layer. The testpits were excavated to a depth of approximately 8 feet bgs by utilizing a backhoe and a composite sample was collected from each test-pit. The bucket composite samples are identified as TP-1 through TP-5. The locations of the test-pits are shown in **FIGURE 3**.

The 5 bucket samples were submitted for various geotechnical testing parameters, including standard proctor density testing, in order to determine moisture density relationships as defined in ASTM D 698. The effectiveness of soil compaction is measured by the maximum dry density (mass of solids per unit volume) and the corresponding optimum moisture content.

Based upon the proctor analysis of the composite sample TP-1, it is anticipated that the optimum moisture content of the material will be 22 percent with a maximum dry density of 96 pounds per cubic foot (lb/cuft). The proctor analysis of composite sample TP-2 indicates that the optimum moisture content will be 22.5 percent with a maximum dry density of 98.5 lb/cuft. The proctor analysis of composite sample TP-3 indicates that the optimum moisture content will be 18 percent with a maximum dry density of 102 lb/cuft. The proctor analysis of composite sample TP-4 indicates that the optimum moisture content will be 25 percent with a maximum dry density of 94.5 lb/cuft.

Composite sample TP-5 contained excessive sand (SP) and did not contain adequate fines for compaction. The geotechnical laboratory analysis for the standard proctor analyses are included in **APPENDIX H** of this report.

4.4 PERMEABILITY SUMMARY

Shelby tube samples were obtained from various depths and locations within the upper clay unit for characterizing the permeability of in-situ clays in accordance with ASTM D 5084. **TABLE 7** summarizes the results of the permeability analysis for the subsurface soils.

A total of eleven (11) samples were submitted for permeability testing from 0 to 5 feet bgs. As indicated by **TABLE** 7, the permeability of the 11 samples ranged from 6.7 X 10^{-4} cm/sec to 3.7 X 10^{-8} cm/sec, with an average permeability of 1.26 X 10^{-4} cm/sec. Copies of the geotechnical laboratory analysis are included in **APPENDIX H** of this report.

4.5 SHEAR STRENGTH EVALUATION SUMMARY

Shear strength analysis was conducted on soil samples for defining the relative stability of the clay material in natural and engineering applications by testing for unconfined compressive strength (ASTM D 2166), unconsolidated-undrained (UU) compressive strength of soils (ASTM D 2850-70), and consolidated-undrained (CU) compressive strength of soils (ASTM D 4767). From these tests, strength properties, internal angle of friction, and cohesion of the clay were determined.

The unconfined compressive strength, shear strength values, and internal angle of friction of the soil samples submitted for geotechnical analysis are presented in **TABLE 8**. Copies of the geotechnical laboratory analysis are included in **APPENDIX H** of this report.

Class 3N Solid Waste Facility Plum Point Energy Associates, LLC

TABLE 8Shear Strength Analysis ResultsClass 3N FacilityOsceola, Arkansas

Sample I.D.	Depth (ft)	Unconfined Compressive Strength of Soils (ASTM D 2166)				
	()	Unconfined Compressive Strength	Shear Strength			
		(psf)	(psf)			
B-1	3-5	3370.7	1685.3			
B-4	3-5	1562.7	781.4			
B- 7	3-5	1766.2	883.1			
B-26	3-5	4125.6	2062.8			
B-43	3-5	2978.2	1489.1			
B-51	3-5	1230.2	615.1			
B-55	3-5	734.3	367.1			

Sample I.D.	Depth (ft)	Unconsolidated Undrained Compressive Strength (ASTM D2850)				
		Strength (psf)	Internal Angle of Friction (\$)			
B-21	3-5	1100	00			
B-4 4	3-5	1750	5 ⁰			
TP-4	0-8	1964	5°			

Sample	Depth (ft)	Consolidated Undrained Compressive Strength (ASTM D 4767)			
		Total Strength (psf)	Internal Angle of Friction	Effective Strength (nsf)	Internal Angle of Friction
TP-4	0-8	234.1	16.8 ⁰	252.4	26.4 ⁰

4.6 ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

One dimensional consolidation (ASTM D 2435) tests were conducted on two (2) of the soil samples to determine the compressibility of the soil. Compressibility is the term applied to one dimensional volume changes that occur in cohesive soils that are subjected to compressive loading (McCarthy, D. F., 1988).

The results of the one dimensional consolidation testing indicate that the coefficient of consolidation (C_V) for B-7 (3 to 5 feet bgs) were 1.8, 0.3, 0.7, 2.0, 2.0, 1.9, and 0.2 feet²/day at pressures of 0.25, 0.5, 1, 2, 4, 8, and 16 kips per square foot (ksf), respectively. The coefficient of consolidation (C_V) for B-51 (3 to 5 feet bgs) were 2.9, 0.4, 1.3, 1.8, 1.7, 2.1, and 0.4 feet²/day at pressures of 0.25, 0.5, 1, 2, 4, 8, and 16 kips per square foot (ksf), respectively. Copies of the geotechnical laboratory data are included in **APPENDIX H.**

5.0 CONCEPTUAL HYDROGEOLOGIC MODEL (22.1102(D))

This section provides an integrated presentation of the hydrogeological characteristics of the Class 3N Facility site. The data presented in this section is a compilation of the data gathered during the hydrogeologic investigation, supplemented by published geologic data obtained during the literature review.

The hydrogeologic investigation confirmed the presence of Quaternary Age Alluvial deposits, consisting of gravels, sands, silts, clays and mixtures of any and all of these. The alluvial deposits are characterized by a general coarsening downward sequence. The lower sand and gravel deposits are capped at the surface by a bed of clay or silty clay that varies in thickness. Underlying the alluvial deposits are very-fine sands, silts, and silty clays of the Tertiary Age Claiborne Group.

Although various mixtures of clay, silt, sand and gravel do occur throughout the alluvial deposits, the upper clay unit and underlying sand and gravel units can be grouped into somewhat distinct hydrogeologic units. The hydrogeologic units are grouped based upon similar geologic, geotechnical, and hydrogeologic properties. The hydrogeologic units are presented in **TABLE** 9. A graphical representation of the conceptual hydrogeologic model for the Class 3N Facility is illustrated in the various cross-sections presented in **FIGURES** 7-1 through 7-4.

TABLE 9Hydrogeologic Model UnitsClass 3N FacilityOsceola, Arkansas

Geologic	Brief Description	
Unit	· · ·	Hydrologic Characteristics
1	Clay, silty clay and occasionally some sandy clay.	Confining unit. Permeability ranging
	Percentage of silt varies. USCS classification is generally	from 6.7 x 10^{-4} cm/sec to 3.7 x 10^{-8}
	CH and CL, some SC.	cm/sec. Can be a water bearing unit.
2	Silty fine sand in discontinuous lenses. Appears to	Often a water bearing unit. Low to
	represent a gradational change from upper silty clay unit to	moderate yield.
	lower sand unit.	
3	Fine to coarse sand with some silt and clay. USCS	Moderate to high yield. High
	classification is generally SP and SM, some SC.	transmissivity.
4	Sand and gravel with some silt and clay. Gravel up to 40	High yield. High transmissivity.
	mm. USCS classification is SP to SM.	·

Hydrogeologic Unit 1 (Unit 1) consists of a brown to gray, clay to silty clay, with some sandy clay. The clay is comprised of varying amounts of silt and some fine sand. Unit 1 varies in thickness across the site, ranging from 2 to over 30 feet, with an average thickness of approximately 15 feet. When groundwater is encountered during drilling within this unit, the water level rises several feet until reaching equilibrium with atmospheric pressure. Permeabilities range from 6.7×10^{-4} cm/sec to 3.7×10^{-8} cm/sec, with an average permeability of 1.26×10^{-4} cm/sec.

Hydrogeologic Unit 2 consists of a gray, silty fine sand and is encountered as a gradational zone between the upper clay unit and the lower sand unit. Unit 2 is encountered as an occasional discontinuous lense and is not present across a majority of the Class 3N Facility site. This unit is a potential water bearing unit.

Hydrogeologic Unit 3 consists of a brown to tan, fine to coarse, sand with some silt and clay present. The sand ranged from well to poorly sorted, and rounded to angular. Unit 3 was encountered at depths ranging from approximately 2 feet bgs to over 30 feet bgs. Unit 3 can range in thickness from approximately 5 to 85 feet. When groundwater is encountered during drilling within this unit, the water is under unconfined conditions.

Hydrogeologic Unit 4 consists of a gray sand and gravel with some silt and clay. The sand is fine to coarse. The percentage of gravel within this unit is generally low, but variable. The gravel is subrounded to subangular, and up to 40 millimeters (mm) in diameter. The top of the sand and gravel unit is encountered at depths ranging from 30 to 103 feet bgs. The sand and gravel unit comprises a large percentage of the total thickness of the alluvial deposits and represents the base of the alluvial deposits. Unit 4 was encountered up to a depth of approximately 150 feet bgs in B-21.

Underlying Unit 4 is a brown to gray, silty fine sand. This silty sand appears to represent the top of the Cockfield Formation of the Claiborne Group.

Groundwater at the Class 3N Facility site is consistently encountered at 17 to 22 feet bgs. When the first encountered groundwater zone occurs within the clay unit, it rises several feet in the boring/piezometer under confined conditions. When the first encountered groundwater zone occurs in the sand unit, it remains at that depth under unconfined conditions.

Although a minor groundwater flow component to the south exists along the eastern property boundary, the overall groundwater flow direction across the entire site appears to be to the west at an estimated hydraulic gradient of 0.0028 feet/foot. Based upon the pump test data and slug test data obtained during the hydrogeologic investigation, the average hydraulic conductivity of the entire uppermost aquifer is estimated to be 1.09×10^{-2} cm/sec. The transmissivity of the aquifer is calculated to be $19.22 \text{ ft}^2/\text{min}$, and the storativity is calculated to be 0.0096. The overall groundwater flow direction at the site is to the west at an estimated linear flow velocity of 1.13×10^{-4} cm/sec, or approximately 117 ft/year.

6.0 CONCLUSIONS

GEC has completed the hydrogeologic and geotechnical investigation at the site of the Class 3N Facility to be located near Osceola in Mississippi County, Arkansas. The investigation was performed in association with a Class 3N Facility that will include approximately 190 acres of permitted waste disposal area. The investigation was designed to meet the requirements of Chapter 11 of ADEQ Solid Waste Management Division Regulation 22. The Class 3N Facility is located within Section 13 of Township 12 North, Range 10 East, and Section 18 of Township 12 North, Range 11 East. The property boundary of the Class 3N Facility is shown in FIGURE 3.

The following tasks were conducted by GEC in order to thoroughly characterize the hydrogeologic setting of the site:

- an extensive literature review was performed on various State and Federal regional hydrogeologic publications;
- detailed surface geologic mapping was performed through literature review, site reconnaissance, and aerial photograph analysis;
- a surface geophysical survey was conducted across the Class 3N Facility property by utilizing electromagnetic (EM) inductive techniques to measure conductivity values of the subsurface materials;
- a subsurface exploration investigation was conducted by drilling 57 soil borings, collecting various geotechnical soil samples, and performing subsurface geophysical logging in select borings;
- extensive geotechnical testing was performed on soil samples collected from the borings in order to classify each textural horizon and to aid in the design of the Class 3N Facility;
- a seismic investigation was conducted by installing a deep test boring and determining the shear wave velocities of the subsurface materials;
- the hydrology of the Class 3N Facility site was characterized by installing 14 groundwater piezometers and performing slug and pump tests in order to determine groundwater characteristics; and,
- based upon a compilation of data obtained during the hydrogeologic investigation, a comprehensive hydrogeologic model for the Class 3N Facility site was developed.

A total of fifty-seven (57) borings were drilled across the site. The 57 borings were advanced to depths ranging from approximately 19 to 200 feet bgs and are identified as B-1 through B-57. The Class 3N Facility is underlain by Quaternary Age alluvial deposits consisting of various
mixtures of clay, silt, sand, and gravel. The lithology encountered at the site consists of a coarsening downward sequence. In general, the lithology consists of a clay or silty clay unit at the surface, a middle sand unit, and a thick sand and gravel unit that comprises the base of the alluvial deposits. The thickness of each unit is variable across the site.

The upper clay unit ranged in thickness from 2 to over 30 feet, with an average thickness of approximately 15 feet. The middle sand unit was encountered at depths ranging from 2 to over 30 feet bgs. The lower sand and gravel unit comprises a large percentage of the total thickness of the alluvial deposits. The alluvial deposits are then underlain by the Cockfield Formation of the Claiborne Group, which consists of a silty fine sand. Deposits of the Cockfield Group were encountered at the site at approximately 150 feet bgs in B-21.

The surface geophysical investigation generally correlated well with the lithology identified during drilling activities and a discussion of the geophysical results are discussed in **SECTION 3.4** of this report. In addition, subsurface geophysical logging was conducted in eleven (11) of the deeper borings.

Fourteen (14) piezometers (P-1 through P-14) were installed at the Class 3N Facility site. The piezometers were utilized to characterize the hydrologic characteristics of the site, including hydraulic conductivity, aquifer transmissivity, hydraulic gradient, and groundwater flow direction. The piezometers will also be used to assist in determining the wells to be used in the proposed groundwater monitoring system and to establish water quality. All of the piezometers were constructed such that they could subsequently be converted into groundwater monitoring wells. Piezometer construction details are discussed in SECTION 3.6.1.

Groundwater at the Class 3N Facility site is consistently encountered at 17 to 22 feet bgs. Groundwater can be encountered within the clay unit (when present at a thickness of greater than approximately 17 feet), or within the sand unit. When the first encountered groundwater zone occurs within a clay unit, it rises several feet in the boring/piezometer under confined conditions. When the first encountered groundwater zone occurs in a sand unit, it remains at that depth under unconfined conditions.

A multiple well 24-hour pump test was performed utilizing PZ-14 as the pumping well and PZ-5 as an observation well. The drawdown results obtained from PZ-5 during the pump test indicate that the uppermost aquifer exhibits a transmissivity of 19.22 ft^2/day , and the storativity of the aquifer is calculated to be 0.0096. Based upon the slug tests, and the data obtained during the pump test, the average hydraulic conductivity (K) of the uppermost aquifer is estimated to be 1.09 X 10⁻² cm/sec. The overall groundwater flow direction across the entire site is to the west at an estimated linear flow velocity of 1.13 X 10⁻⁴ cm/sec, or 116.94 ft/year.

Geotechnical samples were collected during the drilling of the borings in order to classify the geotechnical properties of the soils and to aid in the design of the Class 3N Facility. The results of the geotechnical testing on soil samples collected indicate that the upper clay unit is generally classified as a clay with high plasticity (CH), or a clay with low plasticity (CL). The average percentage of silt and clay size particles passing the No. 200 sieve in the upper clay unit (0 to 10 feet) is 75 percent and the average plasticity index (P.I.) of the soils is 24.5. The average

permeability of the in-situ soils within the upper clay unit is 1.26×10^{-4} cm/sec. A detailed discussion of the geotechnical program and testing results is discussed in **SECTION 4.0**.

Based upon a compilation of data obtained during this investigation, a comprehensive hydrogeologic model for the Class 3N Facility site was developed. Geologic cross sections that illustrate the underlying stratigraphy and hydrologic characteristics are presented in FIGURE 7-1 through FIGURE 7-4. When applicable, all cross sections contain the results of the subsurface geophysical logs, depth to groundwater encountered during drilling and potentiometric groundwater surface, slug testing results, location and depth of each boring, surface topography and the corresponding lithologic descriptions.

A seismic investigation was conducted as part of this hydrogeologic investigation in order to determine the shear wave velocities of the subsurface materials at the site. The results of the seismic investigation are discussed in **SECTION 17** (Design Report) of this Permit Application. Surficial mapping of the geology surrounding the Class 3N Facility site, in addition to review of geologic maps of the area, has not indicated the presence of active faulting within 200 feet of the proposed Class 3N Facility.

A water well search, using well construction reports on file at the Arkansas Geological Commission, and site reconnaissance activities, indicate that there are two (2) domestic water wells used for drinking water within a 1-mile radius of the facility. However, the wells are located greater than 500 feet from the active portion of the Class 3N Facility. The irrigation well located on the northern portion of the property (identified as well No. 10 in **APPENDIX A**) should be properly plugged and abandoned prior to placing waste at the Class 3N Facility.

The geotechnical testing results indicate that the Class 3N Facility site contains clay material suitable for construction of the liner and cover systems.

Based upon the data gathered during this investigation, the overall hydrogeologic conditions at the property appear to be suitable for the proposed 190 acre Class 3N Facility. A minimum of five (5) feet separation between the top of the Class 3N Facility liner system and the groundwater elevation must be maintained. Therefore, the depth to the first encountered groundwater (≥ 17 feet bgs) should be considered in the overall design of the Class 3N Facility.

7.0 REFERENCES

Arkansas Geological Commission, 1993, Geologic Map of Arkansas.

- Arkansas Soil and Water Conservation Commission (ASWCC), 1988, <u>Arkansas State Water</u> <u>Plan – Eastern Arkansas Basin</u>.
- Bower, H. and Rice, R. C., 1976, <u>A Slug Test for Determining Hydraulic Conductivity of</u> <u>Unconfined Aquifers with Completely or Partially Penetrating Wells</u>, Water Resources Research, Volume 12, pp. 423-428.

Freeze, R. A. and Cherry, John A., 1979, Groundwater.

- Keys, W. S. and MacCary, L. M., 1983, <u>Application of Borehole Geophysics to Water-Resources Investigations</u>: Techniques of Water-Resources Investigations of the United States Geological Survey, Book 2, Chapter E1.
- McFarland, John D., 1998, <u>Stratigraphic Summary of Arkansas</u>, Arkansas Geological Commission Information Circular No. 36.
- McNeill, J.D., 1980, <u>Electromagnetic Terrain Conductivity Measurement at Low Induction</u> <u>Numbers</u>, Geonics Limited Technical Note TN-6.

Pugh, Aaron L. et. al., 1997, <u>Thickness of the Mississippi Valley Alluvial Aquifer in Eastern</u> <u>Arkansas</u>, USGS Water Resources Investigations Report 97-4049.

Petersen, James C., 1981, <u>Geohydrologic Units of the Gulf Coastal Plain in Arkansas</u>, USGS Water Resources Investigations Report No. 85-4116.

Schlumberger, 1987, Log Interpretation Principles/Applications: Schlumberger Educational Services.

Terzaghi, Karl, 1996, Soil Mechanics in Engineering Practice.

U.S. Department of Agriculture (USDA), June 1971, <u>Soil Survey of Mississippi County</u>, Arkansas, Soil Conservation Service in cooperation with Arkansas Agricultural Experiment Station. 6-

¢

ng menun wurnten.

(注)







 $\overline{}$





SURVEYORS NOTE:

The basis for North and the location of the Section corner common to Section 13 and 14, T-12-N, R-10-E and Section 18 and 19, T-12-N, R-11-E is based on a monument set for said Section corners as refered to in the descriptions as "according to Plat prepared by John R. Archer, RLS, dated 12/13/91."

	CONTR	OL POI	NT TABLE	
BORING NO.	NORTHING	EASTING	DESCRIPTOR	ELEVATION
1	490931.14	1915267.41	B-1/PZ-1	242.35*
2	490940.03	1915767.34	B-2	239.75
3	490948.92	1916267 26	B-3	240.23
4	490957.81	1916767.18	B-4/PZ-2	243.57*
5	490966.71	1917267.11	B-5	241.27
6	490975 60	1917767 03	B-6	241 60
7	490984.49	1918266.96	B-7/PZ-7	245.29*
8	490993 38	1918766 88	B-8	242 60
9	491002.27	1919266.80	B-9	243.33
10	491011.17	1919766 73	B-10/PZ-8	244.83*
11	490511.27	1919777.33	B-11	242.89
12	490493.49	1918777 49	B-12	242.17
13	490475.71	1917777 64	B-13	240.88
14	490457 92	1916777.79	B-14	240.05
15	490440.14	1915777.94	B-15	239.04
16	490431.25	1915270.03	B-16	239.46
17	490051.36	1915288.62	B-17	238.57
18	489940.25	1915788.55	B-18	238.32
19	489949.14	1916288.47	B-19	238.74
20	489958.03	1916788.40	B-20	239.36
21	489687.19	1917291.70	B-21	239.61
22	489699 04	1917793.71	B-22/PZ-5	242 75*
23	489984 71	1918288.17	B-23	240.71
24	489993.60	1918788 09	B-24	241 40
25	490002 49	1919288 01	B-25	241.89
26	490011.38	1919787.94	B-26	242.20
27	490020 28	1920297.86	B-27/PZ-9	246 36*
28	489520.39	1920298 47	B-28	241.83
29	489502 60	1919298.62	B-29	241.39
30	489484.82	1918298.77	B-30	240.08
31	489467.03	1917298.92	B-31	239 08
32	489449.25	1916299.08	B-32	237 86
33	489431 47	1915299 23	B-33/PZ-3	241.23*
34	488931.58	1915334.83	B-34	238.62
35	488940 47	1915819.76	B-35	237.12
36	488949 36	1916309.68	B-36	237.69
37	488958 25	1916809 61	B-37	237.22
38	488967.14	1917309.53	B-38	237.89
39	488976 04	1917809.45	B-39/PZ-6	241.92*
40	488984.93	1918309 38	B-40	239.41
41	488993.82	1918809.30	B-41	239.72
42	489002.71	1919309.23	B-42	240.60
43	489011.60	1919809.15	B-43	241.61
44	489020.50	1920309.07	B-44	241.14
45	488570.59	1920318.62	B-45/PZ-11	244.33*
46	488561 70	1919818.69	B-46	240.11
47	488552 81	1919318.77	B-47	240.10
48	488543.92	1918818.85	B-48/PZ-10	242.51*
49	488535.03	1918318.92	B-49	238.60
50	488526 13	1917819.00	B-50	237.98
51	488467.25	1917320.14	B-51	237.55
52	488458.36	1916820 21	B-52/PZ-4	240.50*
53	488449 47	1916320.29	B-53	236.47
54	488440.58	1915820.36	B-54	236.59
55	490020.28	1920287 86	B-55/PZ-12	247.16*
56	490020.28	1920187.86	B-56/PZ-13	246.74*
57	489699 04	1917813.71	B-57/PZ-14	I

* DENOTES TOP OF CASING ELEVATION

LEGEND

●B-47 •^{B-45/PZ-11}

SOIL BORING

PIEZOMETER

TEST PIT LOCATION

₽²

SOIL BORING AND PIEZOMETER LOCATION MAP

PLUM POINT ENERGY ASSOCIATES, LLC

ARKANSAS SHEET NO .:

APPVD. BY: SCALE: DATE: JOB NO. 7/12/01 084-001-01008 ACAD NO. 015 OF

FIGURE 3

MR

ABS

MR

1" = 300'

DESIGNED BY:

DRAWN BY:



















ST SACTURE	GEC	GENESIS ENVIRONMENTAL CONSULTING, INC.	HYDRO	
19070-1111 19070-1111		11400 West Baseline Road Little Rock, AR 72209 (501) 455–2199	MISSISSIPPI COUNTY	





Class 3N Solid Waste Facility Plum Point Energy Associates, LLC AN IN ALL ALL AND A

APPENDIX A WATER WELL LOGS AND WELL LOCATION MAP



.

A ¹ Contractor Name & Number: <u>Gipson Well Co</u>	C ^{#1205} 10
2 Driller Name & Number:Charlie Agee	D [#] -2507 SECTION BELC
3 Pump Installer Name & Number: Leon P. Gipson Jr.	P [#] 378 + + + + + + + + + + + + + + + +
4 Date Weil Completed: <u>5-20-93</u>	New Well Replace or Work-over
5 COUNTY 6 FRACTION 7 SECTION	ON 8 TOWNSHIP 9 RANGE
MISSISSIPPT NE 1/4 of SE 1/4 of 1	2 $12 \times 10 E$
B1 DESCRIPTION OF FORMATION: DEPTHS IN FEET	
Clay 0 FROM TO 15	NAME Capital Ag #7
Fine Sand 15 45	STREET ADDRESS SUITE 2220
Cor. Sand-Med. Sand 45 55	Chi Memphis IN 38157 Job #-6239-071-
Coarse Sand 55 82	- 2 CASING FROM () TO 50 W/ 16 "ID FROM TO W/ "ID
Cor. Sand & Gravel 82 100	
······································	TYPE: V-WIRE DIA 16 SLOT/GA
	- SET FROM 60 FT TO 100 FT
	TYPE: DIA SLOT/GA
ATTACH ADDITIONAL SHEETS IF NECESSARY	- + GRAVEL FACK FROM 15 FITO 100
2 TOTAL DEPTH OF WELL 100 ft	FROM 0 FTTO 15 FT
3 DEPTHS TO WATER PRODUCING FORMATIONS. 15'	6 SEALED WITH: FROM FT TO FT
4 STATIC WATER 4 LEVEL δ Ft below land surface	FROM FT TO FT
5 YIELD2000+gallons per ☑ min □ t	
6 DIAMETER OF BORE HOLE 22 IN	DOMESTIC COMMERCIAL
C PUMP REPORT Customer's Pump	
	OIL/GAS SUPPLY D SEMI-PUBLIC
2 SETTING DEPTH: 50 FEET	PUBLIC SUPPLY D OTHER
3 BRAND NAME AND SERIAL NUMBERS: Delta S#-5013 Amarillo 60HP S#-164854	(A.'C HEATPUMP TYPE WELLS) SOURCE I RETURN
4 RATED CAPACITY 3200 gallons per minute	
5 TYPE LUBRICATION	 Heating or Air Conditioning?
6 DROP PIPE OR COLUMIN PIPE SIZE 10 x 1 3115	If yes, name use: yes 🗆
7 WIRE SIZE MA	10 (For Al Ciopen-loop only) Into what medium is water ref
8 PRESSURE TANK SIZE, MAKE, MODEL	11 REMARKS
9 DATE OF INSTALLATION OF REPAIR 7-7-93	
10 Is there an abandoned water well on the property? $\frac{10}{10}$	12 SIGNED

. '*

•

-

-				
A 1	Contractor Name & Number:	Gipson Well Company	y C# <u>1205</u>	10
	·			LOCATE WITH 'X'IN
2	Driller Name & Number:	<u>Charlie Agee</u>	D# <u>2607</u>	SECTION BELOW
1				
3	Pump Installer Name & Number:	Dave L. Gipson	P# <u>4511</u>	
	-	•		
4	DATE WELL DRILLED: 11-18-98	New Well (x)	Replace or Work-over ()	
5 ler				
to M	SSISSIDDI CTV AD			
9 2	MILES S OF OSCEOLA OFF HWY 61 SWNE	E Sec. 13 (T)	2 N RIOF	╽┠╼╂╼╂╼╂╼╂╼╂╼╂
LATITU	DE	ONGITUDE	GIPSON WELL NO.	
11 2	53950	afaaa		
	[8	90808	G980-458-9811AP	
B 1	DESCRIPTION OF FORMATION: DEPTHS IN FEET		D 1 LAND OWNER OR OTHER CO	NTACT PERSON:
			DILLDINE FARMS	
			540 E ST HIGHWAY 239	
1	NAR 4 .00		BLYTHEVILLE AR 72315	
1 -		· · · · · · · · · · · · · · · · · · ·		
	22.35 CLAY & EQ MIX		2 MATERIALS USED	CASING
	35-40 MCS			
	40-45 CS			6 N
	45-48 CLAY			
	48-63 MS		16" PVC SCREEN 40'	FROM (U) TO (
	63-105 CS CSG		16" PVC CASING 65"	
	105-107 CSG CLY MIX		1 BAGS POLY	SCREEN
2	DEPTHS TO WATER	<u>105</u> ft	12 BAGS PLUG	FROM (65) TO (1
3	PRODUCING FORMATIONS	<u>22</u> ft	3 GRAVEL PACK	FROM (5) TO 1
4	STATIC WATER LEVEL 1	6 ft below land surface	4 BACK FILLED WITH GRAVEL F	PACK
5	YIELD: 2	2000 + gallons per min		FROM (5) TO (1
6	DIAMETER OF BORE HOLE	22 inchs	5 SEALED WITH HOLEPLUG: BE	NTONITE CHIPS
C	PUMP REPORT			FROM (0) TO (
. 1	1-50 HP JOHNSON GEADODINE SAL 453652		6 USE OF WELL:	
	60' X 10" X 1 1/4" CCL & SHAFT		IRRIGATION (X)	
	#14 PUMP BOWL		LIVESTOCK/POULTRY	
	1- 10" SUCTION PIPE		PUBLIC SUPPLY	
	1-10" Z DISCHG PIP W/ 2" AVR, & 10 " BELL			IE
2	SUBMERSIBLE	IURBINE (X)	7 DISINFECTED WITH: CHLORIN	
3	SETTING DEPTH: (60) FEET	8 (For A/C only) Will system also	be used for purposes other than
4	RATED CAPACITY: (35	500) gallons per minute	Heating or Air Conditioning?	
5	TYPE LUBRICATION: (W	ATER)	lfyes, name use:	
6	DRCP PIPE OR COLUMN PIPE SIZE	(10) inch	9 (For A/C open-loop only) Into with	nat medium is water returned?
7	WIRE SIZE	(N/A)		
8	PRESSURE TANK SIZE, MAKE, MODEL		RENARKS:	
		N/A		2 DITE
9	DATE OF INSTALLATION OR REPAIR:	11/30/98	11 SIGNED	C UAIE
10	is there an abandoned water well on the property?	(N)	TI Accelles L	220 11 3er

(2)

.* .

3

A ¹ Contractor Name & Number: <u>Gipson Wel</u>	11-00	C# 1205 10 # 2607 LOCATE WITH	' X' 1
2 Driller Name & Number:ClidFile Ag		D# SECTION BE	LÔW
3 Pump Installer Name & Number: <u>Leon P.</u>	Gipson Jr.	P#43/8	+ + -
4 Date Well Completed: <u>5-21-93</u>		New Well A Replace or Work-over	++-
5 COUNTY 6 FRACTION	7 SECTION	8 TOWNSHIP 9 RANGE	
Mississippi NW ¼ of NW	1/4 of 13	12 10 2 10 2	<u>++</u>
LONGITUDE	LATITUDE		<u>I:</u>
<u>11°'"</u>	. 11	′″	
B1 DESCRIPTION OF FORMATION: DEPTHS IN	FEET	D1 LAND OWNER OR OTHER CONTACT PERSON:	
Clay 0 FROM	то 12	NAME Capital Ag #8	
Fine Sand 12	40	STREET ADDRESS 5050 POPIAL AVE. Suite 2220	70.007
Cor. Sand, Med. Sand Mix 40	71	Memphis IN 38157 JOD#- 6240-0	/2-521
Cor. Sand, Very Cor. Sand	440	FROM TO W/	"ID
& Gravel 71	112	TYPE CASING: Steel	
		3 SCREEN	-
	•	TYPE: V-wire DIA 16 SLOT/GA	
		SET FROM 72 TTO 112 1 FT	
		TYPE: DIA SLOT/GA	
		SELFROM FITO	2 i F
ATTACH ADDITIONAL SHEETS IF NECESSARY		4 GRAVEL PACK FROM 15 FITO 11	2 *
2 TOTAL DEPTH OF WELL 112 1	ft	FROM 0 FT TO 15 FT	
3 DEPTHS TO WATER PRODUCING FORMATIONS. 121		6 SEALED WITH:	
STATIC WATER		FROM FTTO FT	
LEVEL 4 Ft belo	w land surface	7 DISINFECTED WITH:	
5 YIELD gallons	per 🗙 min 🗆 hr	8 USE OF WELL:	
6 DIAMETER OF BORE HOLE 22	IN	DOMESTIC D COMMERCIAL	
C PUMP REPORT Customerals	0.000		
		LIVESTOCK/POULTRY LI TEST WELL	C
		PUBLIC SUPPLY D OTHER	
2 SETTING DEPTH: 60 FEET			_
3 BRAND NAME AND SERIAL NUMBERS:	28R-5 (VHS)	SOURCE C RETURN	L
4 BATED CAPACITY and gall	ons per minute		
5 TYPE LUBRICATION WATER		(For.A. (Conly) Will system also be used for purposes	other that
6 DROP PIPE OR COLUMN PIPE SIZE 10 x 1	3/16	If yes, name use: yes I	j nel
7 WIRE SIZE VA		10 (For A. Clopen-loop only) Into what medium is wate	returned
8 PRESSURE TANK SIZE, MAKE, MODEL		TI FAREMARKS	
9 DATE OF INSTALLATION OR REPAIR	5-15-93		
10 Is there an abandoned water well on the prop	perty? NC	12 SIGNED 7/ 5 / 7	DATE:

Accell CoANERS — C. A subset output to increasing on a more supercode Copyred March 2012 and 40 set of 60 set Actin (1994).

. '.

A1 Contractor Name & Number:Gipson Hel	1 Company			C [#]	205	10	
2 Driller Name & Number: <u>Charlie Agee</u>				D#?	607	LOCATE WIT SECTION	H'X'IN
3 Pump Installer Name & Number: Leon	P. Gios	on.	dr.	P# 1	279	ATT	
4 Date Well Completed: 1-30-93	1	New W	/ell [7] Beola	ce or Work	-over		
5 COUNTY 6 FRACTION	7 SECTION	V 8	TOWNSHIP	9 RANG	E	I Ľ₽₽ Φ	
lississippi Current NW	4 of 14		12 11	10 /			
LONGITUDE	LATITUDE						
<u>11 ° ′ ″</u>	11	0		"			
B1 DESCRIPTION OF FORMATION: DEPTHS IN F	EET	D_1	LAND OWNE	R OR OTH	ER CONTA	ACT PERSON:	
Clay O FROM 1	12		NAME Capita	I Ag Pi	roperti	es/Pruden	tial 🚁
Fine Sand 12	20		STREET ADDRES	s suit	2 223	0	
Nedium Fine	201.*		city memph	is TN .	1 <u>00#</u> G17	9-1070 # #	
Fine Sand/Sand 20	40	2	CASING FR	ом С	* To! 5) w/ 12	"ID
Fine Sand/and Fine 40	50		FR	IOM	то	W/	"ID
Vour Column Road 50	00		TYPE CASING:	teel			
Course	<u></u>	3	SCREEN		12	SLOT/G	▲ 6.5.5
Clay/ Sand Mix 90	02		SET FROM 50) FTT	ທີ່ງດ	FT	••• •••2 •
			TYPE:	DIA		SLOT/G	A
			SET FROM	FI 1	0	FI	
ATTACH ADDITIONAL SHEETS IF NECESSARY		4	GRAVEL PACK	FRC	DM 15	FIIO	<u>07</u> F
2 TOTAL DEPTH OF WELL)) ft	5	FROM O FI	TH: <u>15</u>	FT .	1.1.1108	
3 DEPTHS TO WATER PRODUCING FORMATIONS.	2 ft.	6	SEALED WITH:				
A STATIC WATER			FROM FT	ГТО	FT		
LEVEL 7 Ft below	land surface	7	DISINFECTED W	ITH:			
5 YIELD 2000+ gallons pe	r 🗍 min 🛛 hr	8	USE OF WELL:		<u>rina</u>		
6 DIAMETER OF BORE HOLE	22 IN		DOMESTIC			COMMERCIAL	
C PUMP REPORT fump furnesh	by Others)		IRRIGATION		RK !	MONITOR	
	JET D		OIL/GAS SUP	PLY		SEMI-PUBLIC	C
2 SETTING DEPTH: 50 FEET			PUBLIC SUPPL	<u>Y</u>		OTHER	
3 BRAND NAME AND SERIAL NUMBERS:			(A./ C HEATPUM	P TYPE WE	LLS)	DETUDN	
J-Line SN14468 / Elect. Motor ID A	PUSEM		CLOSED LOOF	>		REIORIN	
4 RATED CAPACITY 1200 gallon	s per minute	ÿ	(For A Conly)	Will system	n also be us	ed for purpose	sothertha
5 TYPE LUBRICATION WATER		j .	Heating or Air C	onditioning	· ۲		
6 DROP PIPE OR COLUMN PIPE SIZE 8 ** × 1	1 111		It yes, name use		1	yes	er returnet
7 WIRE SIZE NA		10	(For A.ºC open-lo	oop only)	into what	medium is wat	
8 PRESSURE TANK SIZE, MAKE, MODEL		1.41	REMARKS				
9 DATE OF INSTALLATION OR REPAIR 4-27	-53	1					
10 Is there an abandoned water well on the proper	ty?	12	SIGNED				DATE
	A D	>	- and the	E~4	set any	2	

Arkansas Wator (Von Construction Commission, One Capitor Mar. State 210, Little Berg, 4R, 2201

401B 7 544 39 461, 5945

- 1.10 M 8

	inner Mall	# 2007 10
A Contractor Name & Number:G	luson well Co	C" 1205 IO LOCATE WITH 'X' IN
2 Driller Name & Number:C	narile Agee	D#_250/SECTION BELOW
3 Pump Installer Name & Number:L	eon P. Gipson J	r P#_4373 ++++++++++++++++++++++++++++++++
4 Date Well Completed:12-14-	92	New Well K Replace or Work-over
5 COUNTY 6 FRACTION	7 SECTIO	N 8 TOWNSHIP 9 RANGE
	11	o , , , , , , , , , , , , , , , , , , ,
B1 DESCRIPTION OF EORMATION: DEPT	HS IN FEET	D1 LAND OWNER OR OTHER CONTACT PERSON:
FR	OM TO	NAME Capital Ag Properties / Prudencia1#3
Clay	0 12	STREET ADDRESS 5050 POPIAT Abence
Fine Sand	12 20	Mingh's Terro Job#G164-MV60-9212 #
		2 CASING FROM 0 10 60 W/ 12 "ID FROM TO W/ "ID
Clay	20 24	TYPE CASING: Steel
Fine Sand	24 35	3 SCREEN
Med Sand -Med Course	356 50	TYPE: V-Wire DIA 12" SLOT/GA .050 SET FROM 60 FT TO 100 FT
Course Sand & Graby1	50 100	TYPE: DIA SLOT/GA
		SET FROM FT TO FT
ATTACH ADDITIONAL SHEETS IF NECESSARY		4 GRAVEL PACK FROM 5 FT TO 100
2 TOTAL DEPTH OF WELL	100 ft	5 BACK FILLED WITH: Drill Cuttings
3 DEPTHS TO WATER PRODUCING FORMATIONS. 12	ft	6 SEALED WITH: Saabs
4 STATIC WATER 4 LEVEL 14 F	t below land surface	FROM FTTO FT
5 YIELD 4	llons per 🖞 min 🗆 hr	/ DISINFECTED WITH: Chlorine
6 DIAMETER OF BORE HOLE	22 IN	DOMESTIC COMMERCIAL
C PLIMP REPORT P. A.J.	a reall without	IRRIGATION C MONITOR
		PUBLIC SUPPLY
3 BRAND NAME AND SERIAL NUMBERS:		(A. CHEATPUMP TYPE WELLS)
<u>J-line #-14467 / 40 HP-#Rð</u>	<u>87M</u>	
4 RATED CAPACITY 1200	gallons per minuté	9 (For A. Conly) Will system also be used for purposes other the
5 TYPE LUBRICATION water		Heating or Air Conditioning?
6 DROP PIPE OR COLUMN PIPE SIZE 8	x 1 3/18"	III yes, name ose: yes a
7 WIRE SIZE NA		· ro (ror A, C open-loop only) Into what medium is visitor for
8 PRESSURE TANK SIZE, MAKE, MOD	EL .	11 REMARKS
9 DATE OF INSTALLATION OR REPAIR	1/23/92	DATE
10 Is there an abandoned water well on the	a property?	12 SIGNED
	U	Country a second the

AUD 7 (AN 80) Accursts Write Ten Construction Conservation One Cantor Matt. State 2 C. Little Hers. Ast 72203 April 4046.

Work-over Wall Performance Mall		Se la construction de la constru
A la control replacement weil	County //	ALSSISE DO.
Owner of Well Chitword Harm Equip.		(in which well is loc
Contractor A abel + 50 200 C1010	Well is near US 61	HIWAY F
iller Name and No. aluce Barton D. 2098	Section_//Township_/2	
Date Well was Completed 8/21/86	Directions for Reaching Well: 14	itar 5
		(use permanent landmi
1. Total Depth of WellFt.	OSCERCE ON USCI -	5 ande we
2. Water Producing Formation: FromFt.	Description and Color of Formation	Depths in term
To //3 Ft	(sand, shale, sandstone, etc.)	from to
and the first firs	N. C.	A Ca
3. Water Level Below Land Surface 91	7. 2. 0	
4. Gallons per their 12.	tire films	
5. Well Disinfected with The A las of the	Sand y grand	60 100
6 Carinese 172	Gracel	100-113
C. Cashing to Ft.	<u> </u>	
7. Cased with Diameter Clasing	• • • • • • • • • • • • • • • • • • •	
8. Cemented from Ft. toFt.		
<u> </u>	Remarks:	
9. Use of Well: Domestic Irrigation Municipal Other	Signed: _ alune Barton	Date: 8/22/81
Form No. AWD-3	Mail to: Committee on Water Well Constr Little Rock, Arkans DGY COPY	ruction, 2915 So. Pine Street. as 72204
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I	Mail to: Committee on Water Well Constr Little Rock, Arkans OGY COPY ARKANSAS WELL CONSTRUCTION	ruction, 2915 So. Pine Street. as 72204
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well	Mail to: Committee on Water Well Constr Little Rock, Arkans OGY COPY ARKANSAS WELL CONSTRUCTION County	MISSISS/PPI
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiturood Farm Equip.	Mail to: Committee on Water Well Constr Little Rock, Arkans OGY COPY ARKANSAS WELL CONSTRUCTION County	MISSISSIPPI (in which well is located
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chitwood Farm Equip. Contractor AH abel VSon, The . C1010	Mail to: Committee on Water Well Constructive Rock, Arkans DGY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61	MISSISSIPPI (in which well is located Roa
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiturood Farm Equip. Contractor AN abel VSon, The . C1010 Driller Name and No. Chin Barton D. 2098	Mail to: Committee on Water Well Constr Little Rock, Arkans OGY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 22	MISSISSIPPI (in which well is located Manual Range 10 E
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chitwood Farm Equip. Contractor AH abel VSon, ne. C1010 Driller Name and No. Chin Barton D.2098 Date Well was Completed	Mail to: Committee on Water Well Constructive Rock, Arkans DGY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 /2	MISSISSIPPI (in which well is located Manage 1/DE
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chitwood Farm Equip: Contractor AH abel VSon. Inc. C1010 Driller Name and No. <u>Clein Barton D.2098</u> Date Well was Completed <u>8/21/86</u>	Mail to: Committee on Water Well Constr Little Rock, Arkans DGY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 2 Directions for Reaching Well: 12 0	Function, 2915 So. Pine Street. as 72204 $M_{13} \leq s \leq p p 1$ (in which well is located (in which well is located Roa $M_{13} \leq s \leq p p 1$ (in which well is located Roa $M_{13} \leq s \leq p p 1$ (in which well is located (in which well is located) (in which well is located)
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiturood Farm Equip. Contractor At abel 450, Fr. Contractor At abel 450, Ft. Total Depth of Well 90 Ft.	Mail to: Committee on Water Well Constr Little Rock, Arkans DGY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 120 OSCOLA ON US 61-	In the second se
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chilistood Auron Equips Contractor At abel v Sor, ne. c1010 Driller Name and No. <u>Alein Barton D.2098</u> Date Well was Completed <u>8/21/86</u> 1. Total Depth of Well <u>90</u> Ft. 2. Water Producing Formation: FromFt.	Mail to: Committee on Water Well Constructions DGY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 120 Directions for Reaching Well: 120 Discription and Color of Formation	MISSISSIPPI (in which well is located Manage 100 (use permanent landmart <u>Lange Lines</u> Depths in feet
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiltingod Farm Equip: Contractor Al Abel VSon, Fre. C1010 Driller Name and No. Abel VSon, Ft. Date Well was Completed 1. Total Depth of Well 2. Water Producing Formation: FromFt. 5. ToFt. 5. ToFt. 5	Mail to: Committee on Water Well Constr Little Rock, Arkans DGY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 A OSCOLA CN US 61- Description and Color of Formation (sand, shale, sandstone, etc.)	MISSISSIPPI (in which well is located Manage 1/2E (use permanent landmar) Land Le WEST Depths in feet from to
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Aiturood Aarm Equip: Contractor At Abel v50, no. c1010 Driller Name and No. Alun Barto D. 2098 Date Well was Completed 8/21/86 1. Total Depth of Well 90 Ft. 2. Water Producing Formation: FromFt. ToFt.	Mail to: Committee on Water Well Constructive Rock, Arkans Day COPY ARKANSAS WELL CONSTRUCTION Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 OSCOLA CN US 61- Description and Color of Formation (sand, shale, sandstone, etc.)	ruction, 2915 So. Pine Street. as 72204 M_{1} SSISSIPPI (in which well is located (in which well is located Roa M_{1} Range $1DE$ (use permanent landmar) $\frac{1}{2}$ Mile WEST Depths in feet from to 0 - 35
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chitwood Aum Equip: Contractor AN abel V Son. Are. C/010 Driller Name and No. Alexin Barton D. 2098 Date Well was Completed 8/21/86 1. Total Depth of Well 90 Ft. 2. Water Producing Formation: From Ft. To Ft. 3. Water Level Below Land Surface 9'	Mail to: Committee on Water Well Constr Little Rock, Arkans DBY COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 OSCOLA ON US 61- Description and Color of Formation (sand, shale, sandstone, etc.) Mambo Fine Samb	Puction, 2915 So. Pine Street. as 72204 $M_{1}SS_{1}SS_{2}PPI$ (in which well is located (in which well is located Roa $M_{1}Range 1:0E$ $M_{2}Range 1:0E$
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiftwood Farm Equip: Contractor AH allel VSor, Fr. C/0/0 Driller Name and No. Alerin Barton D. 2098 Date Well was Completed 8/21/86 1. Total Depth of Well 90 Ft. 2. Water Producing Formation: From Ft. 3. Water Level Below Land Surface 9' 4. Gallons per Hour 1200	Mail to: Committee on Water Well Constr Little Rock, Arkans Day COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 A OSEOLA ON US 61- Description and Color of Formation (sand, shale, sandstone, etc.) Aundo Fine Sand	Function, 2915 So. Pine Street. as 72204 $M_{1} S_{5} S_{5} PP I$ (in which well is located) (in which well is located) (in which well is located) Range IDE M_{1} Range IDE M_{2} Range IDE M_{3} Range IDE M_{4} Range IDE M_{5} Range M_{5} Range M_{5} M_{5} Range M_{5} R
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiftwood Farm Equip: Contractor At Abel V Soc. The C1010 Driller Name and No. Alwin Barton D. 2098 Date Well was Completed 8/21/86 1. Total Depth of Well 90 Ft. 2. Water Producing Formation: From Ft. 3. Water Level Below Land Surface 9' 4. Gallons per Hour 1200 5. Well Disinfected with Math Lat Law Arinking	Mail to: Committee on Water Well Constr Little Rock, Arkans DBY COPY ARKANSAS WELL CONSTRUCTION County A Well is near $U \leq 61$ Section 11 Township 12 Directions for Reaching Well: 12 Directions	Puction, 2915 So. Pine Street. as 72204 MISSISSIPPI (in which well is located) (in which well is located) Roa M Range $1DE$ (use permanent landmark L Mile WEST Depths in feet from to D = 25 25 - 35 35 - 50 50 - 70
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiftwood Farm Equip. Contractor At Alel VSoc. Fre. C1010 Driller Name and No. Aleun Barton D. 2098 Date Well was Completed 8/21/86 1. Total Depth of Well 90 Ft. 2. Water Producing Formation: From Ft. 3. Water Level Below Land Surface 9' 4. Gailons per Hour 1200 5. Well Disinfected with Mat Lan Aninking 6. Casing to 57 Ft.	Mail to: Committee on Water Well Constr Little Rock, Arkans DBY COPY ARKANSAS WELL CONSTRUCTION Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 p OSEOLA ON US 61- Description and Color of Formation (sand, shale, sandstone, etc.) June Game Sand V Gracel Sand V Gracel	Function, 2915 So. Pine Street. as 72204 $M_{ISSISS, PPI}$ (in which well is located (in which well is located N Range 1/ DE $M_{Ias Suttient}$ $M_{Ias Permanent landmarks}$ $M_{Ias Permanent landmarks}$ $M_$
Form No. AWD-3 GEOLO STATE OF REPORT OF WATER T New Well X Work-over Well Replacement Well Owner of Well Chiftio od Auron Equip: Contractor At allel V Son, Are. C1010 Driller Name and No. <u>Allein Barton D. 2098</u> Date Well was Completed <u>8/21/86</u> 1. Total Depth of Well <u>90</u> Ft. 2. Water Producing Formation: From <u>Ft.</u> 3. Water Level Below Land Surface <u>9'</u> 4. Gallons per Hour <u>1200</u> 5. Well Disinfected with <u>7125</u> ft. 7. Cased with <u>125</u> Diameter Steel Casing	Mail to: Committee on Water Well Constr Little Rock, Arkans Day COPY ARKANSAS WELL CONSTRUCTION Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 OSCOLA ON US 61- Description and Color of Formation (sand, shale, sandstone, etc.) Mumbo Time Samb Sand V Gracel Sand V Gracel Sand V Gracel	Function, 2915 So. Pine Street. as 72204 $M_{I} SS_{I} SS_{I} PPI$ (in which well is located) (in which well is located) (in which well is located) Range IDE $M_{Range} IDE$ $M_{Range} IDE$ M_{Range
Form No. AWD-3 GEOLC STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiftwood Furn Equip: Contractor At Abel V50, Fr. C1010 Driller Name and No. Alexin Barton D. 2098 Date Well was Completed I. Total Depth of Well 90 Ft. Water Producing Formation: FromFt. Water Level Below Land Surface 7 Well Disinfected with Mat fun Aninking Casing to57 Kenned from St. to Ft.	Mail to: Committee on Water Well Constr Little Rock, Arkans DBY COPY ARKANSAS WELL CONSTRUCTION Well is near US 61 Section 11 Township 2 Directions for Reaching Well: 120 Directions for Reaching Well: 120 OSCOLA CNUS 61- Description and Color of Formation (sand, shale, sandstone, etc.) Umbo Fine Sand Sand V Graul Sand V Graul	Puction, 2915 So. Pine Street. as 72204 $M_{1} SS_{1} SS_{2} PP I$ (in which well is located) (in which well is located) (in which well is located) Priles South of the street of
Form No. AWD-3 BEDLC STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiturood Aum Equip: Contractor At Abel VSon, Are. C/0/0 Driller Name and No. Alcuin Barton D. 2098 Date Well was Completed 8/21/86 1. Total Depth of Well 90 Ft. 2. Water Producing Formation: FromFt. 3. Water Level Below Land Surface 9' 4. Gallons per Hour 1200 5. Well Disinfected with Mart fan Animeting 6. Casing toFt. 7. Cased with 12 ft. 7. Cased ft. 7. Cased ft. 7. Cased with 12 ft. 7. Cased with 12 ft. 7. Cased with 12 ft. 7. Cased ft. 7. Case	Mail to: Committee on Water Well Constr Little Rock, Arkans Day COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 12 A OSCOLA ON US 61- Description and Color of Formation (sand, shale, sandstone, etc.) Annbo Fine Sand Sand V Graul Sand V Graul Manbo Fine Sand	Function, 2915 So. Pine Street. as 72204 $M_{1} S_{5} S_{5} PP I$ (in which well is located (in which well is located N Range $1/DE$ M_{1} Range $1/DE$ M_{2} Range $1/DE$ M_{3} Range $1/DE$ M_{4} Range $1/DE$ M_{5} Range
Form No. AWD-3 GEOLC STATE OF STATE OF REPORT OF WATER I New Well X Work-over Well Replacement Well Owner of Well Chiturood Thum Equip: Contractor At Abel V502, The C1010 Driller Name and No. Alcun Barton D. 2098 Date Well was Completed 8/21/86 1. Total Depth of Well 90 Ft. 2. Water Producing Formation: FromFt. 3. Water Level Below Land Surface 9' 4. Gallons per Hour 1200 5. Well Disinfected with Tlat fan Animeing 6. Casing toFt. 7. Cased with/2' Diameter Star Casing 8. Cemented fromFt. toFt.	Mail to: Committee on Water Well Constr Little Rock, Arkans Day COPY ARKANSAS WELL CONSTRUCTION County A Well is near US 61 Section 11 Township 12 Directions for Reaching Well: 120 Directions for Reaching Well: 120 OSCOLA CNUS 61- Description and Color of Formation (sand, shale, sandstone, etc.) Mumbo Fine Game Cause cand Sand V Graud Manuel Manuel Manuel Remarks: Signed: Chin Batta	Puction, 2915 So. Pine Street. as 72204 MiSSiSSIPPI (in which well is located) (in which well is located) (in which well is located) Range $1DE$ M Range $1DEile South eT(use permanent landmark5 mile westDepths in feetfrom to0 - 3535 - 3535 - 5050 - 7070 - 70Date 5/2 - 36$

Mail to: Committee on Water Well Consoluction, 2015 So. Proc. Street Little Rock, Arkansas 72204

				', ',' <i>≩</i>) 1 d
NEW WELL T	STATE O Report of Wat	F ARKANSAS	C		
			County in which we	is located:	
Please print or type)	and the second se	Trans of the state of the	<u> </u>	ississippi	
Union Carbide Corporation VELL CONTRACTOR Singer-Layne Ark. Divn.	<u>n</u>	Well is near-	·····	road,	approximate
ONTRACTOR LICENSE NO C-1099		miles N NE E	SE S SW W NW of	(TOWN	ETCI
IAME OF DRILLER	son	Section, Township_12	Range	(100011)	210,)
RILLER REGISTRATION NO. D-2202		Directions for reaching well:	Northwest corner of I	at 351 wast	at dain
DATE WELL WAS COMPLETED9	5 75	well		JI JJ West	or deep
MO.	DAY YR.				

15016.0			4		
. Total Depth of Well		Description and Color of Format	ion:	Depths	in Eeet
2. Water Producing Formation: From 103	ft.	(Sand, Shale, Sandstone, etc.)		From	То
Mathod of Construction	63 ft.			0	1
X October 2	•	Sandy clay		1	8
Water Level Pelew Land Surface 244	oredDug	Fine sana		8	16
Callons per Hours	ft.	Aledium and		10	20
		Coarse sand		20	00
. Well disinfected with HTH	3	Coarse sand with small an	nvel	100	162
		Clay	uv 01	163	163
. Cased to 93'ft, with Diameter .37	75 Casing			100	100
. Cemented fromft. to	93' Ift.			-	
. Casing Perforated fromft. toft.	ft.				
0.Well Backfilled with:		Remarks:			
AND. CLAY, CEMENT, MUDI	ft. toft.				
00	150				
1. Gravel Pack fromft. toft. to	159ft.				
16 99	150				
Type Screen Layne Shutter S steel	71 ft.	Signed.	1/ 1		
A lise of Well.	Slot Size		Krigell		
1.036 UF 14611:	¥				75
	A				

· · ·

......

1

		. A.
NEW	WELL	X

REPLACEMENT WELL

STATE OF ARKANSAS Report of Water Well Construction

County in which well is located:

Mississippi

(Please print or type)

OWNER OF WELLUnion Carbide Corp.		Well is near	road, app	roximately
WELL CONTRACTOR Singer-Layne Ark. Divn.		miles N NF F SF S SW W NW of		omnatery
CONTRACTOR LICENSE NO. C-1099		Section 8 Township 12 N Pange 11 W	(TOWN, ETC	.)
NAME OF DRILLER Alven Brewer				
DRILLER REGISTRATION NO D-2195		-Directions for reaching well: 4 Miles south of Osceola		•
DATE WELL WAS COMPLETED 7 30	75			
MO. DAY	YR.			
				e
			1. A.	
1. Total Depth of Well 1589'	ž	Description and Color of Formation:	Depths in I	Feet
2. Water Producing Formation: From 14/3	ft.	(Sand, Shale, Sandstone, etc.)	From	То
то 1589	ft.	lop soil 0 1 Fine sand	753	820
3. Method of Construction:		Sandy clay 1 8 Medium sand	820	881
Rotary X Cable Driven Jetted Bored D	нg	Fine sand 8 16 Hard shale	881	958
4. Water Level Below Land Surface 35	1 ft	Clay 16 20 Boulders	958	960
5 Gallons per Hour Gallons per Minute 1900		Medium sand 20 60 Hard shale	960	1004
		Coarse sand 60 100 Fine sand	1004	1053
6. Well disinfected with HTH		C. sand w/grav. 100 163 Hard shale	1053	1069
	÷	Clay 163 168 Medium sand	1069	1144
7. Cased to 1475' ft with 16" Diameter .375	Casing	Sand w/clay 168 234 Hard shale	1144	1158
8 Cemented from 0 ft to 1475	ft	Clay 234 296 Rock	1158	1159
9 Casing Perforated from ft to	(t. f+	Sand 296 312 Hard shale	1159	1205
10. Well Backfilled with:		Glay the 312 403 Blue gumbo	1205	1363
from ft to	ft	Shale 403 456 Shale w/strks, sand	1363	1416
(SAND, CLAY, CEMENT, MUD)	I .	Med. sand 456 529 Hard shale	1416	1424
11 Gravel Pack from 1489	4	Shale 529 568 Med. to coarse sand	1424	1451
12 Screen Diameter		Sandy shale 568 616 Fine sand	1451	1473
10 inches from 1489 (1. 1. 1589		Med. sand 616 661 Madium sand	1473	1519
13 Tuno Sorono Layne Shutter	8 ^{rt.}	Events and 661 684 Med to course sand	1519	1586
14. hpc of Woll	- iji -	Shale w/sand 684 753 Stopped in sond		
14.05e of went: X			75	
DOMESTIC IRRIGATION MUNICIPAL OTHER	R	MONTH (DAY	YEAR	

Mail to: Committee on Water Well Construction - 3815 W. Roosevelt Road - Little Rock, Arkansas 72204

FORM NO. WD-1 1



STATE OF ARKANSAS Report of Water Well Construction

County in which well is located:

Mississippi

.

(Please print or type)

OWNER OF WELL Union Carbide	Corporation		Well is near			road, ar	oproximatel
WELL CONTRACTOR Singer-Loyne CONTRACTOR LICENSE NO. C-1099	Arkansas Division Alven Brewer		miles N NE Section, Township	E SE S 12 N, F	SW W NW of Range11 W	(TOWN, E	TC.)
DRILLER REGISTRATION NO DATE WELL WAS COMPLETED	5 9 1	7 75	Directions for reaching well: (use permanent landmarks) 	South o	f Osceola 4 miles		•
	мо.	DAY YR.	and the second sec		****		
1. Total Depth of Well	1 1		Description and Color of For	mation:		Depths in	n Feet
2. Water Producing Formation:	From 1508	1609 ft.	(Sand, Shale, Sandstone, etc.	.) 1	Coarse sand	From 708	To
3. Method of Construction:	10		Sandy clay 1	10	Sandy shale	760	776
Rotary Cable Driven	JettedBored	Dug	Fine sand 10 Clay 18	18	Fine sand	<u> </u>	843
5. Gallons per Hour	allons per Minute 19	001.	Coarse sand 21	60	Shale	901	950
6. Well disinfected with	нтн	eren an a •	Clay 60 C, sand w/grav. 87	87 144	Boulders Shale	<u>950</u> 953	953 965
7. Cased to 1495' ft. with 16"	Diameter	5 Casing	Clay 144 Sand w/strk. clay 176	176	Rock Hard shale	965 966	966 1009
8. Cemented from	ft. to 1495	ft.	Med. sand 209 Clay w/strk. sand 244	244	Coarse sand	1009	1096
9. Casing Perforated from 10.Well Backfilled with:	ft. to	ft.	Remarks: 200	399	Shale	1131	1302
(SAND, CLAY, CEMENT, MUD)	fromft.	toft.	White clay 401	445	Hard shale Sandy shale	1302 1348	<u>1348</u> <u>1387</u>
11.Gravel Pack from 12.Screen Diameter:	ft. to	9 ft.	Med. sand 440	480	Fine sand Med. fine sand	1387	1432
inches_from	1509 ft. to 16	09 ft.	Shale 565	584	Break	1472	1474
13. Type ScreenFittin 14. Use of Well:	gs_3. Steel_Slot S	Size	Shale 612	615	Fine sand Break	1474	1508 1513
DOMESTIC	MUNICIPAL	OTHER	Bard shale MOTO	616	Med. sand	1513 1605 YEA	1605 R 1610
Mail to: Committee on Water Well Constru	uction — 3815 W. Rooseve	elt Ro ad Li	itti Bauldera rkansas 7220 623 Hard shale 625	625 645	9/30,	/75 ^{°°°}	,
		GEOLC	G'SARAY 645	708	FORM NO. W	VD-1	*

APPENDIX B AERIAL PHOTOGRAPH

GEC Project No. 01008

REV.	DATE	BY
------	------	----

1

.

DESCRIPTION

1		<u> </u>
	HYD	ROGEOLOGIC
MISSISSIPF	PI COUNTY	CLASS 3
DESIGNED BY	MR	//
CHECKED BY	MR	//
DRAWN BY	ABS	
MONTH/YEAR	JUNE, 2001	

.

.

x	
- /	
•	

· ·

----- - -Ţ

÷.

----____

· _. :

-

AERIAL PHOTO AND GEOTECHNICAL INVESTIGATION 3N SOLID WASTE FACILITY

ARKANSAS

PROJECT NO 084-001-01008 GENES'S ENVIRONMENTAL CONSULTING INC 6/5/01 DATE 11400 West Baseline Road Little Rock, AR 72209 (501) 455–2199 SCALE 1" = 500' ACAD NO 018

.

•		
С.		Ξ.
		1
	~	
	ł	
•	-	

.

-

-

Class 3N Solid Waste Facility Plum Point Energy Associates, LLC

C

APPENDIX C SURFACE CONDUCTIVITY DATA

e.

	Station	Coord	Coordinates Spacing			Spacing			
				10m 20m 4			40	40m	
		X	Y	HD	VD	HD	VD	HD	VD
A	1.0	1915267.41	490931.14	36.0	24.0	32.0	20.0	27.0	13.0
A	1.5	1915517.37	490935.58	52.0	40.0	44.0	20.0	28.0	5.0
A	2.0	1915767.34	490940.03	34.0	22.0	28.0	14.0	22.0	11.0
A	2.5	1916017.30	490944.48	42.0	28.0	34.0	14.0	22.5	10.0
A	3.0	1916267.26	490948.92	40.0	26.0	32.0	18.0	24.0	13.0
A	3.5	1916517.22	490953.37	40.0	36.0	36.0	24.0	25.0	13.0
A	4.0	1916767.18	490957.81	40.0	34.0	32.0	19.0	24.0	11.5
A	4.5	1917017.15	490962.26	32.0	28.0	27.5	19.0	20.0	15.0
A	5.0	1917267.11	490966.71	29.0	22.0	25.0	18.5	17.5	16.0
A	5.5	1917517.07	490971.15	21.0	20.0	18.5	18.0	15.0	15.5
A	6.0	1917767.03	490975.60	24.0	22.5	21.0	15.5	16.0	13.0
A	6.5	1918016.99	490980.04	19.5	17.0	15.5	14.5	12.0	14.0
A	7.0	1918266.96	490984.49	18.5	13.5	15.0	12.0	12.5	12.0
A	7.5	1918516.92	490988.94	22.0		15.0	5.2	6.0	50.0
A	8.0	1918766.88	490993.38	19.0	14.0	14.5	13.0	12.5	15.0
Α	8.5	1919016.84	490997.83	16.5	13.0	15.0	12.5	12.0	17.0
A	9.0	1919266.80	491002.27	19.5	14.0	18.0	11.5	14.5	9.0
A	9.5	1919516.77	491006.72	18.0	15.0	16.0	15.0	14.0	13.0
A	10.0	1919766.73	491011.17	27.5	27.0	25.0	20.0	19.5	10.5
B	1.0	1915278.02	490431.25	42.0	30.0	36.0	24.0	20.0	22.0
В	1.5	1915523.99	490435.69						
В	2.0	1915777.94	490440.14	44.0	42.0	42.0	30.0	24.0	12.0
B	2.5	1916027.90	490444.59	40.0	36.0	38.0	22.0	20.0	10.0
В	3.0	1916277.87	490449.03	24.5	17.0	20.0	16.0	16.0	17.0
B	3.5	1916527.83	490453.48	23.0	13.5	17.5	14.0	16.0	15.0
B	4.0	1916777.79	490457.92	23.0	14.0	18.0	9.0	15.0	11.0
B	4.5	1917027.75	490462.37	23.0	12.5	17.5	12.5	15.0	14.0
В	5.0	1917277.71	490466.81	22.0	15.5	20.0	12.0	16.0	10.0
B	5.5	1917527.68	490471.26						
В	6.0	1917777.64	490475.71	19.0	13.0	15.0	10.5	12.0	13.0
В	6.5	1918027.60	490480.15	17.0	12.5	14.0	12.5	12.0	13.5
В	7.0	1918277.56	490484.60	16.5	12.0	13.5	10.5	12.5	11.5
В	7.5	1918527.52	490489.04	14.0	10.0	13.0	10.5	11.5	12.0
B	8.0	1918777.49	490493.49	14.5	10.5	12.0	12.5	11.0	14.0
В	8.5	1919027.45	490497.94	13.5	9.5	13.0	12.0	11.0	15.0
В	9.0	1919277.41	490502.38	12.5	9.5	11.5	12.5	8.5	
В	9.5	1919527.37	490506.83	10.0	11.5	9.0	11.5	9.0	10.5
B	10.0	1919766.73	491011.17	18.0	14.5	15.0	12.5	12.0	10.5
С	1.0	1915288.62	489931.36	45.0	34.0	39.0	16.0	18.0	16.0
С	1.5	1915538.59	489935.80	29.5	23.0	27.0	22.5	22.5	12.0
C	2.0	1915788.55	489940.25	24.0	17.5	19.0	17.0	14.0	13.5
С	2.5	1916038.51	489944.69	31.0	20.0	22.0	12.0	17.0	9.0
С	3.0	1916288.47	489949.14	32.0	21.0	22.0	12.0	16.5	8.5
C	3.5	1916538.43	489953.59	32.0	18.5	22.0	8.5	14.5	9.0
C	4.0	1916788.40	489958.03	21.5	10.0	15.5	9.5	12.0	11.0
C	4.5	1917038.36	489962.48	15.0	9.U	10 5	11.0	17.0	12.0
C	5.0	191/288.32	489966.92	22.0	12.5	10.0	11.0	10 5	10.5
C	5.5	191/538.28	4099/1.3/	9.5	23.U	25.0	10.0	10.5	9.0

۹!

este

Sta	ation	Coord	inates	Spacing								
				10m 20m 40m			10m 20m		10m 20m)m
		X		HD	VD	HD	VD	HD	VD			
С	6.0	1917788.24	489975.82	18.0	12.0	14.0	10.5	12.0	13.0			
С	6.5	1918038.20	489980.26	14.5	11.5	11.0	10.0	9.0	10.0			
С	7.0	1918288.17	489984.71	16.5	9.5	11.0	8.5	10.0	10.5			
С	7.5	1918538.13	489989.15	16.5	11.5	12.5	9.0	10.5	9.0			
С	8.0	1918788.09	489993.60	14.0	9.5	10.5	9.5	9.0	10.5			
C	8.5	1919038.05	489998.05	15.0	10.5	12.0	10.5	10.0	9.5			
С	9.0	1919288.01	490002.49	11.5	8.5	9.5	9.0	8.5	10.5			
C	9.5	1919537.98	490006 94	9.5	10.0	9.0	10.0	9.5	11.0			
C	10.0	1919787.94	490011.38	15.0		12.5		70	11.0			
C	10.5	1920037.90	490015 83	17.0	14.0	15.5	16.5	13.5	12.0			
č	11.0	1920187 86	490020 28	40.0	42 0	38.0	32.0	29.0	11 5			
D	10	1915299 23	489431 47	46.0	37.0	39.0	16.5	20.0	21.5			
Б ·	1.5	1015540 10	400401.47	23.0	8.5	17.5	0.0	16.0	175			
	2.0	1015700 15	409400.91	23.0	10.0	17.5	9.0	10.0	17.5			
D I	2.0	1915799.15	409440.30	105	0.0	14.0	11.0	13.0	0.0			
D .	2.5	1910049.11	409444.00	10.0	0.0	14.0	11.0	12.0	9.5			
	3.0	1910299.00	409449.20	21.0	13.0	15.0	10.5	13.0	7.5			
5	3.5	1916549.04	489453.70	15.5	13.0	12.0	9.0	11.0	10.0			
5	4.0	1916/99.00	489458.14				·					
D	4.5	1917048.96	489462.59	30.0	20.0	23.0	14.5	16.5	9.0			
D	5.0	191/298.92	489467.03	36.0	24.0	28.0	15.5	25.0	12.5			
D	5.5	191/548.89	489471.48	30.0	17.0	26.0	10.5	19.0	5.5			
D	6.0	1917798.85	489475.93	14.5	7.5	12.5	11.0	17.0	11.5			
D	6.5	1918048.81	489480.37	12.0	11.5	13.0	10.5	14.0	10.5			
D	7.0	1918298.77	489484.82	14.0	15.5	10.5	9.3	14.5	10.0			
D	7.5	1918548.73	489489.26	14.0	11.5	12.0	11.5	11.0	9.5			
D	8.0	1918798.70	489493.71	17.0	10.5	13.0	9.5	11.0	8.5			
D	8.5	1919048.66	489498.16	17.0	12.0	13.0	11.0	11.0	10.0			
D .	9.0	1919298.62	489502.60	15.0	10.0	12.5	11.0	11.0	11.0			
D	9.5	1919548.58	489507.05	13.5	11.0	11.5	12.5	11.5	14.0			
D	10.0	1919798.54	489511.49	20.0	14.0	15.5	11.5	11.5	12.5			
D	10.5	1920048.51	489515.94									
D	11.0	1920298.47	489520.39	32.0	36.0	36.0	30.0	24.5	40.0			
Е	1.0	1915307.67	488930.33	44.0	40.0	32.0	15.0	26.0	21.5			
E	1.5	1915572.30	488936.02	30.0	36.0	26.0	15.0	19.0	7.5			
Е	2.0	1915809.76	488940.47	22.5	15.5	19.5	15.0	15.0	16.0			
E.	2.5	1916059.72	488944.91									
E	3.0	1916309.68	488949.36	24.0	8.5	14.5	3.5	12.0	8.5			
E	3.5	1916559.64	488953.81	19.0	12.0	15.0	13.5	13.5	15.0			
Е	4.0	1916809.61	488958.25	42.5	22.0	28.5	12.0	22.0	12.5			
Е	4.5	1917059.57	488962.70	44.0	22.5	34.0	10.5	12.0	8.0			
E	5.0	1917309.53	488967.14	48.5	32.0	34.0	18.5	26.5	15.0			
Е	5.5	1917559.49	488971.59	21.5	14.0	21.5	14.0	19.5	10.0			
Е	6.0	1917809.45	488976.04	17.0	7.5	13.5	8.2	12.5	12.5			
Е	6.5	1918059.42	488980.48	20.0	12.0	14.0	12.0	12.5	14.0			
Е	7.0	1918309.38	488984.93	17.5	12.5	15.5	13.0	13.0	13.0			
Е	7.5	1918559.34	488989.37	30.0	23.0	22.0	15.0	18.0	16.0			
Е	8.0	1918809.30	488993.82	29.0	24.0	26.0	19.5	21.5	12.5			
E	8.5	1919059.26	488998.27	20.0	15.0	16.5	14.0	16.0	14.0			

:

(por

form

 Sta	station Coordinates			Spacing					
				10	10m 20m		40m		
		X	Y	HD	VD	HD	VD	HD	VD
E	9.0	1919309.23	489002.71	17.0	10.5	15.0	11.0	13.5	11.0
E	9.5	1919559.19	489007.16	15.0	13.0	13.0	13.5	13.5	15.5
E	10.0	1919809.15	489011.60	23.0	20.5	20.0	17.0	15.5	12.0
E.	10.5	1920059.11	489016.05						
E	11.0	1920309.07	489020.50	21.0	18.0	18.0	17.0	16.0	17.5
F	2.0	1915820.36	488440.58	56.0	36.0	0.5	2.1	0.2	1.1
F	2.5	1916070.33	488445.02						
F	3.0	1916320.29	488449.47	0.4	2.6	0.3	16.0	25.5	10.5
F	3.5	1916570.25	488453.92	62.0	29.0	43.0	9.0	29.5	7.6
F	4.0	1916820.21	488458.36	40.0	33.0	32.0	18.5	25.5	17.0
F	4.5	1917070.17	488462.81	52.0	26.0	38.0	18.0	27.0	10.5
F.	5.0	1917320.14	488467.25	42.5	36.0	36.0	15.0	24.0	8.3
F	5.5	1917569.57	488496.69	23.0	16.5	18.0	13.5	14.5	16.0
F	6.0	1917819.00	488526.13	21.5	12.3	19.0	14.5	15.5	19.5
F	6.5	1918068.96	488530.58	54.0	39.5	44.0	22.5	29.0	17.5
F	7.0	1918318.92	488535.03	54.0	37.0	46.0	29.0	29.5	17.0
F	7.5	1918568.88	488539.47	56.0	50.0	49.5	29.0	31.0	19.0
F	8.0	1918818.85	488543.92	54.0	44.0	44.0	23.5	26.0	9.0
F	8.5	1919068.81	488548.36	34.0	23.0	23.5	20.0	16.0	14.0
F	9.0	1919318.77	488552.81						
F	9.5	1919568.73	488557.26	20.0	16.0	18.0	20.0	11.0	15.0
F	10.0	1919818.69	488561.70	31.0	18.0	24.0	16.0	13.0	9.0
F	10.5	1920068.66	488566.15	23.0	16.0	21.0	18.0	11.0	14.0
F	11.0	1920318.62	488570.59	26.0	21.0	24.0	20.0	15.0	16.0

ļ

4

Class 3N Solid Waste Facility Plum Point Energy Associates, LLC

APPENDIX D BORING LOGS

GEC Project No. 01008
	GEC	// GEN	ESIS ENVIRONMENTAL CON	SULTING. INC	FIELD	BOREHO	LE LOG
		// 11400 // Phone	O West Baseline RoadLittle Rocke: (501) 455-2199Fax (501)	, AR 72209 I) 455-4547		IO.: B-1/PZ-1 TO ES: 490931.14N 1915	TAL DEPTH: 30' 267.41E
1							ATION: 242.55
	PROJEC		Point Energy Station	DRI		ng INFURIMATI	
	SITELO		Osceola, AR	DRI		aul Harris	ing
	JOB NO	.:	01008	RIG	TYPE: Si	imco 2400 SKL	
	LOGGE	D BY:	ME	MET	HOD OF DRILL	.ING: 6.25" diam.	Solid flight auger
	DATE D	RILLED:	4/09/01	SAM	IPLING METHO	DS: Split Spoon	-
	GRAVEL P	ACK: 10-20 \$	Sand SEAL: Bentonite pellets	GROUT	: Bentonite chips		Page 1 of 1
	CASING/SC	CREEN TYPE:	PVC DIAMETER: 2-inch	CASING LENGTH	1: 23.63	STATIC WATER LEVE	L:21.53' BELOW TOC
	SCREEN L	ENGTH:10	SLOT SIZE: 0.010	T.D. OF WELL 33	3.63' BELOW TOC	DATE OF WATER LEV	/EL: 5/02/01
	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	0		Brown silty clay, slightly moist. Brown silty clay, slightly moist. Dark tan silt with clay, moist. Brown clayey silt, very moist. Tan fine to coarse sand, wet.	2,4,5 3,3,4 1,1,2 6,10,13	Pushed shelby tube from 3'- 5'. Hit H2O @ 20'. Used Hollow stem augers from 25'-30' t construct well due to heaving sands. Total depth @ 30'.		3' of stick-up Bentonite chips from surface to 15.7'. Bentonite pellets from 15.7' to 17.6'. 10-20 sand from 17.6' to 30.63'.

	IESIS EN			NG, INC.	BOREHOLE) B	B-2 TOT	LEL(DG H: 50'
// Phon	e: (501) 455	5-2199 Fax (501)	455-4	COORDINATES: 490940.03N 1915767.34E ELEVATION: 239.75' TOC ELEVATION: n/a					
PROJE	CT INFO	ORMATION			DRILL	ING	INFORMATIO	ON	
PROJECT: Plun	a Point l	Energy Station		DRILL	ING CO.: A	Ande	erson Engineeri	ng	
SITE LOCATION:	Osceola	ı, AR		DRILL	ER:	Jay a	and Wayne Joh	nson	
JOB NO.:	01008			RIG T	YPE:	СМІ	55		
LOGGED BY:	TG			METH	IOD OF DRIL	LIN	G: Wash rotar	y i	
DATE DRILLED:	4/03/01			SAMF	PLING METH	ODS	S: Split Spoon		
GRAVEL PACK: n/a		SEAL: n/a		GROUT:	n/a			Page	e 1 of 2
CASING/SCREEN TYPE	:n/a	DIAMETER:n/a C	ASING	G LENGTH:	n/a	ST	ATIC WATER LEVE	L:n/a BE	LOW TOC
SCREEN LENGTH:n/a		SLOT SIZE: n/a 7	.D. Of	WELL n/a	BELOW TOC	DA	TE OF WATER LEV	/EL: n/a	
DEPTH SYMBOL	SOI	LDESCRIPTION	B C(LOW DUNTS	COMMENTS	5	BORING COMPLETION	WE	
	Dark b Brown dry. Brown medium	rown silty clay. to gray silty clay, silty sand, fine to grained.	1,1	L,1 2,4 6,8					

	PROJE	ECT: Plum I	Point Energy Station			Page 2 of 2			
0	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPT		
_	-25 -		Brown to tan, coarse to very coarse sand with trace silt, subangular to	5,13,18					
			minerals, wet.						
			Brown to tap goarge to	6 4 20					
	-30 -		very coarse sand with trace silt, rounded to subrounded, wet.	6,4,20					
	-								
_	-35		Brown to tan, coarse to very coarse sand, rounded to subrounded, wet.	6,20,22					
	1								
-	-40 -		Brown to tan, very coarse sand, subangular to subrounded, wet.	6,17,19					
	-45		Brown to tan, very coarse sand with gravel, rounded to subrounded, wet.	7,26,17+					
		0000							
		2000	Brown to tan coarse sand to small gravel, rounded to subrounded, wet.	7,22,25	Total depth @ 50'.				

GEC // GE // 114 // 114 Pho PROJECT: Plu SITE LOCATION JOB NO.: LOGGED BY: DATE DRILLED:	NESIS ENVIRONMENTAL CONS 00 West Baseline Road Little Rock, ne: (501) 455-2199 Fax (501) ECT INFORMATION m Point Energy Station Osceola, AR 01008 ME 04/02/01	ULTING, INC. AR 72209 455-4547 DRILLI DRILLE RIG TY METHO SAMPL	LTING, INC. FIELD BOREHOLE LOG 8 772209 BOREHOLE NO.: B-3 TOTAL DEPTH: 24' COORDINATES: 490948.92N 1916267.28E ELEVATION: 240.23 TOC ELEVATION: DRILLING INFORMATION DRILLING CO.: Anderson Engineering DRILLER: Paul Harris RIG TYPE: Simco 2400 SKL METHOD OF DRILLING: Solid flight auger 6.25"dia SAMPLING METHODS: Split Spoon					
GRAVEL PACK: n/a	SEAL: n/a	GROUT: n/	/a		Page 1 of 1			
CASING/SCREEN TYP	E:n/a DIAMETER:n/a C	ASING LENGTH:	n/a	STATIC WATER LEVE	EL: n/a BELOW TOC			
SCREEN LENGTH:n/a	SLOT SIZE: n/a T	.D. OF WELL n/a	BELOW TOC	DATE OF WATER LE	VEL: n/a			
DEPTH SYMBO	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION			
	Dark grey, silty clay, slightly moist, with orange mottles, low plasticity. 11'-14' Grey clay, slightly moist. 14'-15' Grey clay with fine to medium grained sand. Tan-brown sand, wet, with trace gravel, angular, up to 20 mm.	2,2,4 1,2,2 2,3,3 3,3,2 Hi ft 3,3,2 Sa 17 Tc 24	it H2O @ 19 ands heaved ''. otal depth @					

/ 11400 // Phon	IESIS ENVIRONMENTAL CONS D West Baseline Road Little Rock, e: (501) 455-2199 Fax (501)	SULTING, INC.AR 72209455-4547BOREHOLE NO.: B-4/PZ-2COORDINATES: 490957.81N1916767.18EELEVATION:TOC ELEVATION: 243.5
PROJEC		DRILLING INFORMATION
PROJECT: Plun	1 Point Energy Station	DRILLING CO.: Anderson Engineering
SITE LOCATION:	Osceola, AR	DRILLER: Paul Harris
JOB NO.:	01008	RIG TYPE: Simco 2400 SKL
LOGGED BY:	ME	METHOD OF DRILLING: 6.25"diam. solid flight
DATE DRILLED:	4/09/01	SAMPLING METHODS: Split Spoon
GRAVEL PACK: 10-20	Sand SEAL: Bentonite pellets	GROUT: Bentonite chips Page 1
CASING/SCREEN TYPE	PVC DIAMETER: 2-inch C	CASING LENGTH: 20.23' STATIC WATER LEVEL: 22.13' BELC
SCREEN LENGTH:10'	SLOT SIZE: 0.010 T	D. OF WELL 30.23' BELOW TOC DATE OF WATER LEVEL: 5/02/01
DEPTH SYMBOL	SOIL DESCRIPTION	BLOW COMMENTS BORING WELL COUNTS
0 - -5 - -10 - -15 - -20 - -20 - 0 - - - - - - - - - - - - - -	<pre>Brown and gray silty clay, slightly moist, medium plasticity. Brown and gray silty clay, slightly moist, medium plasticity. Dark brown to gray silty clay, moist. Dark brown to gray silty clay, with fine to medium grained sand, wet.</pre>	Pushed shelby tube from 3'- 5'.

GEC	C // GE	NESIS E	NVIRONMENTAL CO	NSULT	ING IN	c	FIELD) E	OREHC	LE LOC
	/ 114 Pho	00 West Ba ne: (501) 4	aseline Road Little Ro 55-2199 Fax (5	ck, AR 7 01) 455-	72209 4547	5	BOREHOLE COORDINAT ELEVATION	NO.: TES: : 241	B-5 TC 490966.71N 191 .27' TOC ELEN	DTAL DEPTH: 12 7267.11E VATION: n/a
	PROJE	CT INF				DRILLI	NG	INFORMAT		
PROJE	CT: Plui	n Point	Energy Station		DRI	LLIN		Inde	rson Engineer	iun
SITE LO	CATION:	Osceo	la, AR		DRI	LLE	R: J	av o	nd Wayne Tel	ing
JOB NO	.:	01008			RIG	TYP	PE: C	IME	55	IIISOII
LOGGE	D BY:	TG			MET	ГНО		IINC	2. Wash rotar	
DATE D	RILLED:	4/03/01	L .		SAM	IPLI		פחכ	Solit Speen	y
GRAVEL PA	ACK: n/a		SEAL: n/a		GROUT	: n/a			. Spit Spoon	
CASING/SC	REEN TYPE	:n/a	DIAMETER: n/a	CASING	LENGTH		n/a	STA		Page 1 of
SCREEN LE	ENGTH:n/a		SLOT SIZE: n/a	T.D. OF	WELL n/	a	BELOW TOC	DAT	E OF WATER I F	/El: n/a
DEPTH	SOIL SYMBOL	SO	L DESCRIPTION	BI		С	OMMENTS		BORING COMPLETION	WELL
-5 - -10 - -15 - -20 - -25 -	H H H H H H H H H H H H H H H H H H H	Gray to clay, o Gray to clay, o Gray to dry. Brown to sandy o Tan san fine to subangu moist.	b brown, silty dry. b brown, silty dry. b tan, silty clay, to tan, very fine elay, moist. d with some silt, medium grained, lar to subrounded,	2,3, 3,4, 4,5, 5,7, 5,20	,5 5 7 9 ,23					
-30 -		Gray me rounded	dium grained sand, to subangular.	5,6,	20,17					
40 -		Tan to grained subangu	gray, medium sand, rounded to lar, some clay.	5,14	,14					
45 -		Coarse : organic:	sand with black	5,15,	21					
50 -		Very coa gravel to subro	arse sand with <30 mm), angular punded, some gray	5,8,1	.2			n na hanna ann an tha ann ann ann ann ann ann ann ann ann a		

PROJEC	CT: Plum	Point Energy Station			BUI	KEH	OLE NO.: B-5 Pag	e 2 of 2	
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	3	COMMENT	s	BORING COMPLETION	WELL	-
-55 -	00000 00000	silt.			· · · · · · · · · · · · · · · · · · ·				
-60 -	0000	Medium to coarse sand with gravel (<15 mm), some organics.	5,21,21						
-65 -	0000								
-70 -	00000	Gray, medium to coarse sand with some silt and gravel (<25 mm), subrounded to subangular, trace organics	5,26,19						
-75 - K		crace organics.							
-80 -		Gray medium grained sand and gravel (<35 mm), with some gray clay.	6,22,22						
-85-									
-90 -		Gray, very coarse sand with gravel and some gray clay.							
-95-									
-100		Sand with organics and gravel (<30 mm), rounded to subrounded.	6,23,25			and a second			
-110		coarse sand with minor gravel, poorly sorted, rounded to subangular, minor gray clay.							
-115		Coarse sand with minor		Tot-1	double 0				
-120	/	counded to subangular, minor gray clay.	5,24,24	120'.	. deptn (

				FIELD	BOREHO	I E L OG
GE	C ∥ G	ENESIS ENVIRONMENTAL CON	SULTING, INC.	BORFHOLE		
	1 P	400 West Baseline Road Little Rock	AR 72209	COORDINATI	ES: 490975.60N 1917	767.03E
		Cito: (001) 400-2135 Fax (301) +00-+0+7	ELEVATION:	241.60' TOC ELEV	ATION:
	PRO	ECT INFORMATION		DRILLII	NG INFORMATI	ON
PROJ	ECT: Pl	Im Point Energy Station	DRILI	LING CO.: A	nderson Engineer	ing
SITE L	OCATIO	I: Osceola, AR	DRILI	LER: P	aul Harris	
JOB N	Ю.:	01008	RIG 1	TYPE: S	imco 2400 SKL	
LOGG	ED BY:	ME	METH	HOD OF DRILL	-ING: 6.25" diam.	solid flight auger
DATE	DRILLED	04/03/01	SAMP	PLING METHO	DS: Split Spoon	
GRAVEL	. PACK: n/a	SEAL: n/a	GROUT:	n/a		Page 1 of 1
CASING	SCREEN TY	PE:n/a DIAMETER:n/a (CASING LENGTH:	n/a	STATIC WATER LEVE	EL: n/a BELOW TOC
SCREEN	LENGTH:n/	SLOT SIZE: n/a	T.D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMB	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-						
·						
-5]		Dark brown to grey silty	2,2,2			
		T trace fine to medium				
-] plasticity.				
-						
-10	- <u>X-X-X-</u>	Dark brown to grey sandy	2,3,3			5. S.
-10-		plasticity.				
	-7-7-7-	-2				
-						
15		Dark brown silty sand	2,4,5			
-12 -		moist.				
-						
-			I	Hit H20 @ 19'		
		Dark brown to grey clayey	2,4,7			
-20 -		grained sand, wet.		Sand heaved @ 24', no		-
				recovery at 29'-30'		and the second second second
				sampling interval due 1		
		Tan to brown fine to	3,5,12	heaving sands	•	
-25 -		coarse grained sand, wet, subrounded.				
]				7 -1-1 1		
				rotal depth @ 29'.		

GEC PROJECT: SITE LOCA JOB NO.: LOGGED B DATE DRILL GRAVEL PACK:	GENESIS EI 11400 West Ba Phone: (501) 45 ROJECT INF Plum Point FION: Osceol 01008 Y: ME LED: 4/10/01 10-20 Sand	VIRONMENTAL CONSU seline Road Little Rock, A 55-2199 Fax (501) ORMATION Energy Station a, AR SEAL: Bentonite pellets	ULTING, INC AR 72209 455-4547 DRIL DRIL RIG MET SAM GROUT:	FIELD BOREHOLE I COORDINAT ELEVATION: DRILLII LING CO.: A LER: P TYPE: S HOD OF DRILL PLING METHO Bentonite chips	NO.: B-7/PZ-7 TOT ES: 490984.49N 1918 TOC ELEV NG INFORMATION INFORMATION INFORMATION INFORMATION ING: 6.25"diam. DDS: Split Spoon	LE LOG TAL DEPTH: 30' 266.96E ATION: 245.29' ON ing solid flight auger Page 1 of 1
SCREEN LENG	N TYPE:PVC	SLOT SIZE: 0.010	D. OF WELL 31	: 21.60'	STATIC WATER LEVE	L:23.45' BELOW TOC
DEPTH SY	SOIL MBOL SO	IL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	I I I <td>silty clay, low city, slightly lty, fine to medium slightly moist. .ne to coarse sand, ine to coarse sand,</td> <td>3,5,7 6,8,7 3,6,12</td> <td>Pushed shelby tube from 3'- 5'. Hit H2O @ 20'</td> <td></td> <td><pre>3' of stick-up Bentonite chips from surface to 13'. Bentonite pellets from 13' to 15'. 10-20 sand from 15' to 28.6'.</pre></td>	silty clay, low city, slightly lty, fine to medium slightly moist. .ne to coarse sand, ine to coarse sand,	3,5,7 6,8,7 3,6,12	Pushed shelby tube from 3'- 5'. Hit H2O @ 20'		<pre>3' of stick-up Bentonite chips from surface to 13'. Bentonite pellets from 13' to 15'. 10-20 sand from 15' to 28.6'.</pre>
-25 -	Tan fi wet.	ine to coarse sand,		hollow stem augers to continue bore and to construct wel due to heavin sands @ 24'. Total depth @ 30'.		

				EIEL D	DODEUO	ELCO		
GE		ESIS ENVIRONMENTAL CON	SULTING, INC					
	11400 Phone	West Baseline Road Little Rock, e: (501) 455-2199 Fax (501	AR 72209	COORDINATES	: 490993.38N 1918	766.88E		
	-		ELEVATION: 242.60' TOC ELEVATION: n/a					
	PROJE	CT INFORMATION		DRILLING	G INFORMATIO	N		
PROJE	CT: Plum	Point Energy Station	DRIL	LING CO.: And	lerson Engineeri	ng		
SITE L	OCATION:	Osceola, AR	DRIL	LER: Par	ll Harris			
JOB N		U1008	RIG		100 2400 SKL			
DATE		04/03/01	SAM		NG: 0.25 diam.	sond night auger		
GRAVEL	PACK: n/a	SEAL: n/a	GROUT	: n/a	O. Spit Spoon	Page 1 of 1		
CASING/	SCREEN TYPE:	n/a DIAMETER:n/a (l: n/a S	TATIC WATER LEVE	L:n/a BELOW TOC		
SCREEN	LENGTH:n/a	SLOT SIZE: n/a	T.D. OF WELL n/	a BELOW TOC D	ATE OF WATER LEV	EL: n/a		
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION		
					~			
	I.I.I							
_5		Dark brown to grey clay with some silt, dry, low	4,5,5					
_,		plasticity.						
	I.I.I							
-10 -		Tan to brown fine to coarse grained sand with	4,6,9					
-		moist.						
		Tan to brown fine to	199					
-15 -		coarse grained sand with trace silt, moist.	4,0,5	Hit H20 & 17!				
-				No recovery at				
				19' due to heaving sands @ 17.5'.				
				makal a sa				
-20 -				19'.				

÷

GEC	// GEN // 11400 // Phone	ESIS EI) West Ba e: (501) 4	Seline Road Little Roc S5-2199 Fax (50	NSULT k, AR 7 01) 455-4	TING, INC. 72209 5-4547 BOREHOLE NO.: B-9 TOTAL DEPTH: 50' COORDINATES: 491002.27N 1919266.80E ELEVATION: 243.33' TOC ELEVATION: n/a				
	PROJE	CT INF	ORMATION			 DRILLI	NG	INFORMATIO	ON
PROJEC	T: Plun	n Point	Energy Station		DRILI	ING CO.: A	Inde	rson Engineeri	ng
SITE LOC	CATION:	Osceol	a, AR		DRILI	LER: J	lay a	nd Wayne John	ason
JOB NO.:	• • •	01008			RIG T	YPE: C	CME	55	
LOGGED	BY:	TG			METH	IOD OF DRIL	LINC	: Wash rotary	7
DATE DR	RILLED:	4/05/0	1		SAMF	PLING METHO	DDS	: Split Spoon	
GRAVEL PA	CK: n/a		SEAL: n/a	-	GROUT:	n/a			Page 1 of 2
CASING/SCI	REEN TYPE:	:n/a	DIAMETER: n/a	CASIN	G LENGTH:	n/a	STA	TIC WATER LEVE	L:n/a BELOW T
SCREEN LE	NGTH:n/a		SLOT SIZE: n/a	T.D. OI	WELL n/a	BELOW TOC	DAT	E OF WATER LEV	'EL: n/a
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	B C	UOW OUNTS	COMMENTS		BORING COMPLETION	WELL DESCRIPTIO
-10 -		Brown sand.	clay with sand. to tan clay with to tan sandy clay	2,3	3,5 3,3				
-20 -		Light clay,	brown to tan sand sand fine grained	y 4,	4,10	Hit H2O @ 20'	•		

PROJ	ECT: Plum	DNMENTAL CONSULTING, INC Point Energy Station		BOREH	BOREHOLE NO.: B-9 Page 2 of 2			
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTIO		
-25 -	222222 222222 222222 222222 222222 22222	Brown to tan, medium to coarse sand with clay, subrounded to subangular.	5,22,23+					
-30 -	222222 222222 2222222 2222222 2222222 2222	Brown to tan, silty clay with coarse to very coarse sand.	5,6,11					
-35 -	2-2-2-2-2 2-2-2-2-2-2 2-2-2-2-2-2-	Brown to tan, fine to medium sand with some clay, rounded to subangular.	5,16,20					
-40	<u>222222</u> 2222222 22222222 22222222 222222	Brown to tan, sandy clay, fine to medium grained sand.						
-45 -	×000000	Coarse sand and gravel (<30mm) with minor silt.	5,16,18					
-50 -		Tan, coarse to very coarse sand, subangular to rounded, trace organics.	6,19,25	Total depth @ 50'.				

· ·			FIFID	BORFHO	FLOG
GEC // GE	NESIS ENVIRONMENTAL CONS 00 West Baseline Road Little Rock, ne: (501) 455-2199 Fax (501)	SULTING, INC. AR 72209 455-4547	BOREHOLE I COORDINATI ELEVATION:	NO.: B-10/PZ-8 TO ES: 491011.17N 1919 TOC ELEV	TAL DEPTH: 30' 766.73E 'ATION: 242.08'
PROJE	CT INFORMATION		DRILLI	NG INFORMATI	ON
PROJECT: Plu	n Point Energy Station	DRILL	ING CO.: A	nderson Engineer	ing
SITE LOCATION:	Osceola, AR	DRILL	ER: P	aul Harris	
JOB NO.:	01008	RIG T	YPE: S	imco 2400 SKL	
LOGGED BY:	ME	METH	OD OF DRIL	LING: 6.25"diam.	solid flight auger
DATE DRILLED:	4/11/01	SAMP	LING METHO	ODS: Split Spoon	· .
GRAVEL PACK: 10-20	Sand SEAL: Bentonite pellets	GROUT:	Bentonite chips		Page 1 of 1
CASING/SCREEN TYP	E: PVC DIAMETER: 2-inch C	ASING LENGTH:	22.40'	STATIC WATER LEVE	EL:22.54' BELOW TOC
SCREEN LENGTH:10'	SLOT SIZE: 0.010 T	.D. OF WELL 32.4	0' BELOW TOC	DATE OF WATER LEV	/EL: 5/02/01
DEPTH SYMBO	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
$0 \qquad \qquad$	Brown, silty clay, slightly moist, low plasticity. Light brown, clayey silt, slightly moist. Brownish gray, silty clay, moist. Gray clay, moist, high plasticity (19'-19.5').	2,4,4 2,4,6 1,2,5	ushed shelby ube from 3'- '.		3' of stick-up Bentonite chips from surface to 14'. Bentonite pellets from 14' to 16'. 10-20 sand from 16' to 29.4'.

GEC	GEN // GEN // 1140	IESIS E 0 West Ba e: (501) 4	NVIRONMENTAL CON Iseline Road Little Rock 55-2199 Fax (50	SULT , AR 7 1) 455-4	ING, INC 2209 1547	c.	FIELD BOREHOLE COORDINAT ELEVATION:	NO.: ES: 242.	B-11 TO 490511.27N 1919 89' TOC ELEV	LE LOG TAL DEPTH: 25' 777.33E ATION: n/a
	PROJE	CT INF	ORMATION				DRILLI	NG	INFORMATI	ON
PROJEC	CT: Plun	a Point	Energy Station		DRI	LLIN	IG CO.: A	Inde	rson Engineer	ing
SITE LC	CATION:	Osceol	a, AR		DRII	LLE	R: P	aul	Harris	
JOB NO	.:	01008			RIG	TY	PE: S	imc	o 2400 SKL	
LOGGE	D BY:	ME			MET	THO	D OF DRIL	LIN	G: 6.25"diam.	solid flight auge
DATE D	RILLED:	04/05/	01		SAN	IPLI	ING METHO	DDS	: Split Spoon	
GRAVEL P	ACK: n/a		SEAL: n/a		GROUT	: n/a	۱			Page 1 of 1
CASING/S	CREEN TYPE	:n/a	DIAMETER: n/a	CASIN	3 LENGTH	H:	n/a	STA	ATIC WATER LEVE	L:n/a BELOW TO
SCREEN L	ENGTH:n/a		SLOT SIZE: n/a	T.D. Of	WELL n/	/a	BELOW TOC	DA	TE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	B			COMMENTS		BORING COMPLETION	WELL DESCRIPTION
-10 -		Brown, Brown, some f graine Tan, f moist, subrou	silty clay, moist. silty clay with fine to medium ed sand, moist. fine to medium sand, subangular to mded.	2,3	,5 ,7 12,13					
-20 -		Tan, f moist, subrou	ine to medium sand, subangular to unded.	5,5	,9	Hit Hea 23' Tot 25'	H2O @ 21' ving sands · al depth @ ·	. @		

PROJ PROJECT: Plu SITE LOCATION JOB NO.: LOGGED BY: DATE DRILLED:	00 West Baseline Road Little Rock one: (501) 455-2199 Fax (501 ECT INFORMATION m Point Energy Station : Osceola, AR 01008 ME	AR 72209) 455-4547 DRILLI DRILLE	DRILLI	NO.: B-12 10 ES: 490493.49N 1918 242.89' TOC ELEV NG INFORMATI nderson Engineer	TAL DEPTH: 19' 777.49E ATION: n/a ON
PROJ PROJECT: Plu SITE LOCATION JOB NO.: LOGGED BY: DATE DRILLED:	ECT INFORMATION m Point Energy Station : Osceola, AR 01008 ME	DRILLI	DRILLII NG CO.: A	NG INFORMATI	ON
PROJECT: Plu SITE LOCATION JOB NO.: LOGGED BY: DATE DRILLED:	m Point Energy Station : Osceola, AR 01008 ME	DRILLI	NG CO.: A	nderson Engineeri	
SITE LOCATION JOB NO.: LOGGED BY: DATE DRILLED:	: Osceola, AR 01008 ME	DRILLE		neeroon meneroon	ing
JOB NO.: LOGGED BY: DATE DRILLED:	01008 ME		ER: P	aul Harris	
DATE DRILLED:	ME	RIGTY	(PE: S	imco 2400 SKL	
DATE DRILLED:	04/04/04	METHO		_ING: 6.25"diam.	solid flight auger
	04/03/01	SAMPL	LING METHO	DS: Split Spoon	
GRAVEL PACK: n/a	SEAL: n/a	GROUT: n/	/a		Page 1 of 1
CASING/SCREEN TY	E:n/a DIAMETER:n/a	CASING LENGTH:	n/a	STATIC WATER LEVE	L: n/a BELOW TOC
SCREEN LENGTH:n/a	SLOT SIZE: n/a	T.D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH SYMBO	L SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	Dark brown silty clay, slightly moist. Tan silt with fine grained sand. Tan silt with fine grained sand, subangular to subrounded, slightly moist. Tan to brown fine to coarse sand, subangular to subrounded, moist.	4,3,3 3,4,7 4,9,12 He 18 To 19	eaving sands '. otal depth @	e	

GEO	C // GEN	ESIS ENVIRONMENTAL CONS	SULTING, INC	FIELD	BOREHO	LE LOG
	// 11400 // Phone	West Baseline Road Little Rock, c: (501) 455-2199 Fax (501	AR 72209) 455-4547	COORDINAT	NU.: B-13 TO ES: 490475.71N 1917 240.88' TOC ELEV	777.64E ATION: 11/18
	PROJEC	CT INFORMATION		DRILLI	NG INFORMATI	ON
PROJE	CT: Plum	Point Energy Station	DRIL	LING CO.: A	Anderson Engineer	ing
SITE LO	OCATION:	Osceola, AR	DRIL	LER: P	Paul Harris	
JOB NO	D.:	01008	RIG	TYPE: S	Simco 2400 SKL	
LOGGE	D BY:	ME	MET	HOD OF DRIL	LING: 6.25"diam.	solid flight auger
DATE D	ORILLED:	04/03/01	SAM	PLING METHO	ODS: Split Spoon	
GRAVEL I	PACK: n/a	SEAL: n/a	GROUT	: n/a	. · ·	Page 1 of 1
CASING/S	SCREEN TYPE:	n/a DIAMETER:n/a 0	CASING LENGTH	i: n/a	STATIC WATER LEVE	EL: n/a BELOW TOC
SCREEN	LENGTH:n/a	SLOT SIZE: n/a	T.D. OF WELL n/a	a BELOW TOC	DATE OF WATER LE	/EL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-10 -		Dark brown silty clay, slightly moist. Brown silty clay with some silt , moist.	3,3,4			
-15 -		Tan to brown, fine to coarse grained sand, subangular to subrounded.	5,10,11	Hit H20 @ 18	3'.	
-20 -		Tan to brown, fine to coarse grained sand, subangular to subrounded, wet.	6,10,13	Heaving sands 22'. Total depth (24'.	s @ @	
-25-]		·		

GEC	// GENI // 11400 Phone	ESIS ENVIRONMENTAL CONS West Baseline Road Little Rock, A 5: (501) 455-2199 Fax (501)	ULTING, INC. AR 72209 455-4547	E BOREHOLE NO COORDINATE ELEVATION: 2	BOREHO D.: B-14 TOT S: 490457.92N 1916 240.05' TOC ELEV	LE LOG TAL DEPTH: 30' 777.79E ATION: n/a
	PROJEC	CT INFORMATION		DRILLIN	G INFORMATIO	ON
PROJECT	: Plum	Point Energy Station	DRIL	LING CO.: Ar	derson Engineeri	ng
SITE LOC	ATION:	Osceola, AR	DRIL	LER: Pa	ul Harris	
JOB NO.:		01008	RIG 7	TYPE: Sin	mco 2400 SKL	
LOGGED	BY:	ME	METI	HOD OF DRILL	ING: 6.25"diam.	solid flight auger
DATE DRI	ILLED:	4/04/01	SAM	PLING METHO	DS: Split Spoon	
GRAVEL PAC	CK: n/a	SEAL: n/a	GROUT:	n/a		Page 1 of 1
CASING/SCR	REEN TYPE:	n/a DIAMETER: n/a C	ASING LENGTH	: n/a	STATIC WATER LEVE	L:n/a BELOW TOC
SCREEN LEN	NGTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
		<pre>Brown silty clay, slightly moist.</pre> Brown silty clay, slightly moist. Tan, sandy silt with trace clay, slightly moist. Tan, sandy silt with trace clay (19'-19.5'). Tan to brown, fine to coarse sand, subangular to subrounded, moist.	2,4,7 3,4,3 5,6,10	Pushed shelby tube from 3'- 5'. Hit H20 @ 24'.		
-25 -		Tan to brown, fine to coarse sand, subangular to subrounded, wet.	8,13,18			

GEC	// GEN // 11400 // Phone	ESIS ENVIRONMENTAL CONSU West Baseline Road Little Rock, A : (501) 455-2199 Fax (501)	JLTING, INC R 72209 155-4547	BOREHOLE COORDINAT ELEVATION:	BOREHO NO.: B-15 TO ES: 490440.14N 1915 239.04' TOC ELEV	LE LOG TAL DEPTH: 29' 777.94E ATION: n/a
	PROJEC	T INFORMATION		DRILLI	NG INFORMATI	ON
PROJEC	CT: Plum	Point Energy Station	DRIL	LING CO.:	Anderson Engineer	ing
SITE LO	CATION:	Osceola, AR	DRIL	LER: I	Paul Harris	
JOB NO		01008	RIG	TYPE: S	Simco 2400 SKL	
LOGGEI	D BY:	ME	MET	HOD OF DRIL	LING: 6.25"diam.	solid flight auger
DATE D	RILLED:	4/04/01	SAM	PLING METH	ODS: Split Spoon	
GRAVEL P	ACK: n/a	SEAL: n/a	GROUT	: n/a	· · · ·	Page 1 of 1
CASING/SC	CREEN TYPE:	n/a DIAMETER: n/a C/	SING LENGTH	l: n/a	STATIC WATER LEVE	EL:n/a BELOW TOC
SCREEN L	ENGTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n/	a BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
		Brown to gray clay, slightly moist, medium plasticity. Brown to gray clay, slightly moist, medium plasticity. Dark gray clay, very moist, medium plasticity. Dark gray clay, very	2,2,2 2,2,2 2,2,2	Pushed shelby tube from 8'- 10'. Hit H20 @ 17		
-25 -		Medium to coarse sand with decreasing gray clay to 25'. (Medium to coarse sand from 25'-29')	2,2,4	Heaving sands from 25'-29' Total depth 29'.	s • @	

				i dina di	i de la constante de la constante La constante de la constante de	FIELD	P	ORFHO	FLOG	
GEC	C // GEN	ESIS EN	VIRONMENTAL CO	NSULT	ING, INC			B-16 TOT		
	11400) West Bas	seline Road Little Roo 5-2199 Eax (5	ck, AR 7	2209	COORDINAT	ES:	490431.25N 1915	270.03E	
	,, 1101			01) 400-		ELEVATION:	239.	46' TOC ELEV	ATION: n/a	
	PROJE		ORMATION			DRILLI	NG	INFORMATIO	ON	
PROJE	CT: Plun	n Point	Energy Station	-	DRIL	LING CO.: A	nde	rson Engineeri	ng	
SITE LO	DCATION:	Osceol	a, AR		DRILLER: Paul Harris					
JOB NC	D.:	01008		. '	RIG TYPE: Simco 2400 SKL					
LOGGE	DBY:	ME			MET	METHOD OF DRILLING: 6.25"diam. solid flight auger				
	DRILLED:	4/04/01			SAM		DDS	Se Split Spoon	Descharte	
GRAVEL F	ACK: NA			CASIN	GROUT:	n/a	ST.		Page 1 of 1	
SCREEN	ENGTH:n/a	.n/a					DA	TE OF WATER LEVE	E: n/a BELOW IOC	
	SOIL	Q.L.P.J.A		F	LOW			BORING	W/FI I	
DEPTH	SYMBOL	SO	L DESCRIPTION	c	OUNTS	COMMENTS		COMPLETION	DESCRIPTION	
		Broom	to grav alow with	2						
-5 -		trace	silt, slightly	2,.	5,4					
		morse.								
-										
				-					-	
		Brown	to gray clay with	2,	3,4					
-10 -		moist.	silt, slightly							
									· · · · · · · · · · · · · · · · · · ·	
-15-		Brown, trace	silty clay with fine sand, very	2,	2,4					
	Ξ.Ξ.Ξ.	moist,	low plasticity.							
	Ξ:Ξ:⊐					Hit H20 @ 19'		н 		
		Tan to	brown, fine to	6,	13,16					
-20 -		coarse	e sand, wet.			Heaving sands	5			
-						from 20'-24'.				
-										
						Total depth @)			
-						20				
	and him the second s	L		l	/				· · · · · · · · · · · · · · · · · · ·	

	// 11400 W Phone: (/est Baseline Road Little F 501) 455-2199 Fax	Rock, AR 7 (501) 455-	'2209 4547	BOREHOLE COORDINAT	NO.: B-1 ES: 4900	7 TO 51.36N 1915	TAL DEPTH: 13 5288.62E		
	PROJECT	INFORMATION			DRILL		ORMATI			
PROJEC	T: Plum P	oint Energy Station		DRILLING CO: Anderson Engineering						
SITE LO	CATION: O	sceola. AR		DRILL	FR:	av and V	Wayne Joh	nson		
JOB NO	• 01	008		PIG T		'ME 55	Wayne oon	1113014		
	· · · · · ·	G		METH	ETHOD OF DPILLING: Wesh roters					
		03/01		SAME	HOD OF DRILLING: Wash rotary					
							put spoon			
				GROUT	n/a	07470		Page 1 of		
CASING/SC			CASIN	G LENGTH:		STATIC		L:n/a BELOW		
SUREEN LE		SLOT SIZE: n/a	T.D. O	r WELL n/a	BELOW TOC		- WATER LE	vel: n/a		
DEPTH	SOIL	SOIL DESCRIPTION	C		COMMENTS	E CO	ORING MPLETION	WELL DESCRIPTI		
							•			
	<u>т:т:</u> ,	rown to tan silty a						· · ·		
-5 -		ry.	ay, 2,							
	=: =: =:									
-										
-10 -		rown to tan, silty cl	ay, 2,	4,4						
		-3.								
	<u></u>	rown to tan gand wit	h							
-15 -		ome clay, silt, fine	to	4,5						
		ubangular.	το							
-20 -	B	rown to tan, sand wit	h 5,	10,17						
20		edium grain, rounded	to to							
	SI	ubangular.								
-25 -	re	an to gray, coarse sa ounded to subrounded,	nd, 3,4	4,5						
	t: t	race silt.						74		
-30	Т	an to gray, coarse sa	nd, 5,	6,4						
	ro t	ounded to subrounded, race clay.								
	<u></u> т.т.т.									
				- 1		11		11		

	GENES PROJE	SIS ENVIRO	ONMENTAL CONSULTING, INC	•	BOREH	OLE NO.: B-17 Page	2 of 3
Locar	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL
	-40 -		Gray, silty clay with some fine sand, moist.	3,3,4		· · ·	
	-45 -		Medium grained sand, rounded to subrounded with some gray clay.	5,13,15			
	-50 -		Gray, silty sand, subrounded to subangular, coarse grained.	5,15,16			
	-55 -						
5	-60 -		Gray, silty sand, subrounded to subangular, coarse grained.	5,18,23			
	-65 -						
	-70 -		Gray, silty sand, subrounded to subangular, coarse grained, some minor gravel (<10mm).	5,18,27			
	-75 -						
	-80 -		Gray sand with some silt.	5,27,17+			
)	-85 -						



GEC // GEN // 1140 Phot	VESIS ENVIRONMENTAL CONSULT 0 West Baseline Road Little Rock, AR 7 he: (501) 455-2199 Fax (501) 455-4	TING, INC. 72209 4547 4547 FIEL BOREHOL COORDIN/ ELEVATIO	D BOREHOI E NO.: B-18 TOT ATES: 489940.25N 19157 N: 238.32' TOC ELEVA	LE LOG AL DEPTH: 25' /88.55E ATION: n/a		
PROJE	CT INFORMATION	DRIL	LING INFORMATIO	ON		
PROJECT: Plur	n Point Energy Station	DRILLING CO.:	Anderson Engineeri	ng		
SITE LOCATION:	Osceola, AR	DRILLER:	DRILLER: Paul Harris			
JOB NO.:	01008	RIG TYPE: Simco 2400 SKL				
LOGGED BY:	ME	METHOD OF DR	ILLING: 6.25"diam. s	olid flight auge		
DATE DRILLED:	4/06/01	SAMPLING MET	HODS: Split Spoon			
GRAVEL PACK: n/a	SEAL: n/a	GROUT: n/a		Page 1 of 1		
CASING/SCREEN TYPE	::n/a DIAMETER:n/a CASIN	G LENGTH: n/a	STATIC WATER LEVE	L:n/a BELOW TO		
SCREEN LENGTH:n/a	SLOT SIZE: n/a T.D. O	F WELL n/a BELOW TO	DATE OF WATER LEV	EL: n/a		
DEPTH SYMBOL	SOIL DESCRIPTION		TS BORING COMPLETION	WELL DESCRIPTION		
-5 - H H H H H H H H H H H H H H H H H H H	Brown to gray clay with trace silt, slightly moist. Brown clayey silt, slightly moist. Tan to brown, fine to coarse sand, wet.	5,6 3,4 6,7				

// 114 // Pho	OO West Baseline Road Little Rock, one: (501) 455-2199 Fax (501)	AR 72209 455-4547	BOREHOLE NO.	: B-19 TOT	TAL DEPTH: 19'
			ELEVATION: 23	8.74' TOC ELEV.	288.47E ATION: n/a
PROJE	ECT INFORMATION		DRILLING		ON
PROJECT: Plu	m Point Energy Station	DRILLI	NG CO.: And	erson Engineeri	ng
SITE LOCATION	: Osceola, AR	DRILLI	ER: Pau	l Harris	
JOB NO.:	01008	RIG T	(PE: Sim	co 2400 SKL	
LOGGED BY:	ME	METH	OD OF DRILLIN	IG: 6.25"diam.	solid flight auger
DATE DRILLED:	4/06/01	SAMPI	LING METHOD	S: Split Spoon	
GRAVEL PACK: n/a	SEAL: n/a	GROUT: n	/a		Page 1 of 1
CASING/SCREEN TYP	E:n/a DIAMETER:n/a C	ASING LENGTH:	n/a S	TATIC WATER LEVE	L:n/a BELOW TOC
SCREEN LENGTH:n/a	SLOT SIZE: n/a T	.D. OF WELL n/a	BELOW TOC D	ATE OF WATER LEV	'EL: n/a
DEPTH SOIL	L SOIL DESCRIPTION	BLOW	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	Brown to gray, silty clay, slightly moist. Tan to brown, fine to medium sand with some silt, moist. Tan to brown, fine to coarse grained sand, moist.	2,3,4 5,9,10 4,6,9	t H2O @ 18'.		

GEC	// GENI	ESIS ENVIRONMENTAL C	ONSULT	ing, inc	BOREHOLE	BOREHC NO.: B-20 T	DLE LOG
	11400 Phone	West Baseline Road Little R : (501) 455-2199 Fax	Rock, AR 7 (501) 455-4	2209 4547	COORDINAT	ES: 489958.03N 19 239.36' TOC ELE	16788.40E EVATION: n/a
Р	ROJEC	T INFORMATION			DRILLI	NG INFORMA	ΓΙΟΝ
PROJECT:	Plum	Point Energy Station		DRIL	LING CO.: A	Anderson Enginee	ering
SITE LOCA	TION:	Osceola, AR		DRIL	LER: I	Paul Harris	
JOB NO.:		01008		RIG	TYPE: S	Simco 2400 SKL	
LOGGED E	BY:	ME		MET	HOD OF DRIL	LING: 6.25"dian	ı. solid flight au
DATE DRIL	LED:	4/05/01		SAM	PLING METH	ODS: Split Spoo	n
GRAVEL PACK	(: n/a	SEAL: n/a		GROUT:	n/a		Page 1 of
CASING/SCRE	EN TYPE:	n/a DIAMETER: n/a	CASIN	G LENGTH	: n/a	STATIC WATER LE	VEL: n/a BELOW
SCREEN LENG	GTH:n/a	SLOT SIZE: n/a	T.D. O	F WELL n/a	BELOW TOC	DATE OF WATER L	EVEL: n/a
DEPTH	SOIL YMBOL	SOIL DESCRIPTION	E C	BLOW	COMMENTS	BORING COMPLETIC	WELL DESCRIPTION
-5 -	2-2-2-2 2-2-2-2-2 2-2-2-2-2 2-2-2-2-2 2-2-2-2-2 2-2-2-2-2 2-2-2-2-2-2 2-2-2-2-2-2 2-	Dark brown, sandy clay with some silt, moist, low plasticity. Tan to brown, fine to coarse sand, subangula to subrounded, moist.	, 3, Ar ⁵ ,	5,6			
-15 -		Tan to brown, fine to coarse sand, subangula to subrounded, moist.	ar 5,	8,9	Hit H2O @ 17	· •	
-20 -		Tan to brown, fine to coarse sand, subangula to subrounded, wet.	ar 4,	9,12	Heaving sand: from 18'-24'	5	
			-		Total depth (24'.	d	

						1				
GE	C // GEN	NESIS EN	VIRONMENTAL CON	ISULT	ing, inc		ELD	BOK		LE LOG
	1140	0 West Bas	seline Road Little Rock	k, AR 7	2209		EHOLE NO).: B-21/3 5: 489687.	-1 10 19N 1917	291.70E
N		ie: (501) 45	5-2199 Fax (50	1) 455-4	1547	ELEV	ATION: 2	39.61' T	OC ELEV	ATION: n/a
	PROJE	CT INF	ORMATION			L	RILLIN	G INFO	RMATI	ON
PROJ	ECT: Plun	n Point	Energy Station		DRI	LING C	0.: An	derson E	ngineer	ing
SITEL	OCATION:	Osceola	a, AR		DRIL	LER:	Jay	and Wa	yne Joh	nson
JOB N	Ю.:	01008			RIG	TYPE:	CM	ſE 55		
LOGG	ED BY:	TG			MET	HOD OF	DRILLI	NG: Wa	sh rotar	y
DATE	DRILLED:	4/10/01			SAN	IPLING I	METHOD	DS: Spli	it Spoon	
GRAVEL	PACK: n/a		SEAL: n/a		GROUT	: Portland o	ement			Page 1 of 4
CASING	SCREEN TYPE	:PVC	DIAMETER: 3-inch	CASIN	g length	H: 120'	S	STATIC WA	TER LEVE	EL: n/a BELOW TOC
SCREEN	V LENGTH:none		SLOT SIZE: n/a	T.D. O	WELL 12	22' BELC		DATE OF W	ATER LE	/EL: n/a
DEPTH	SOIL SYMBOL	SOI	L DESCRIPTION	B	LOW OUNTS	COM	MENTS	BOI COMP	RING LETION	WELL DESCRIPTION
			and a fair fair an ann an tair an							
0 -								P	a	
	. I:I									3-inch solid
		Tan, s	ilty clay, dry.			Shelby	tube			PVC casing set
-5 -						5'.	LIOM 5 -			demonstration.
1										
					_					
-10 -		Brown	to tan, silty clay	. 1,2	2,7					
1										
1	I:I:I				-					
-15 -		Tan to with s	brown, sandy silt ome clay, medium	5,5	5,5					
		graine to sub	d sand, subrounded angular.							
-										
-20 -	<u></u>	Brown sandy	to tan, silty, clay.	5,1	13,16					
-	-1-7-7-7-7	_								
	7-7-7-7-7-7-7									
-25 -		Brown coarse	to tan, medium to grained sand with	5,1	15,19					
-		some s subang	ilt, subrounded to ular.							
-30 -		Tan, c coarse	oarse to very sand, subrounded	5,1	19,26+					
-		to sub gravel	angular, trace (<15mm).							
-									8	
-35 -		Tan, c	oarse to very sand, subrounded	5,3	19,16					
-]			-				12	

PROJE	ECT: Plum	DINMENTAL CONSULTING, INC Point Energy Station	BOREH	BOREHOLE NO.: B-21/S-1 Page 2 of 4		
DEPTH SYMBOL		SOIL YMBOL SOIL DESCRIPTION		COMMENTS	BORING	WELL
		to subangular, trace gravel (<15mm).				
-40 -		Tan, coarse to very coarse sand, subrounded to subangular, trace gravel (<15mm).	5,19,10			
-45 -		Gray, coarse sand, subrounded to subangular, trace clay.	5,21,24			
-50 -		Gray, coarse sand, subrounded to subangular.		Logged by cuttings from 50'-200', due to lack of		
-55 -				recovery from split spoon.		
-60 -		Brown, very coarse sand, subrounded to angular.				
-65 -						
-70 -		Brown, very coarse sand, subrounded to angular.				
-75 -						
-80 -		Brown, very coarse sand, subrounded to angular.				
-85 -						
-90		Gravel with some sand and				
	00000000000000000000000000000000000000	subangular.				



PROJE	SIS ENVIRO ECT: Plum P	NMENTAL CONSULTING, INC Point Energy Station	BOREHOLE NO.: B-21/S-1 Page 4 of 4			
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-155						
-						
-160-						
-165						
-						
-170		Brown to gray, sand with some silt.				
-175						
-180						
-185						
-190	·····					
L. L.	Ξ:Ξ:Ξ Ξ:Ξ:Ξ					
	工:工:コ ニ:工:工:				- -	
-195-						
		Brown, silty clay.		Total depth @		

GEC PROJEC SITE LOU JOB NO. LOGGEE DATE DE GRAVEL PA CASING/SC	PROJEC PROJEC T: Plum CATION: : DBY: RILLED: ACK: 10-20 S REEN TYPE:	IESIS ENVIRONMENTAL CONS D West Baseline Road Little Rock, E (501) 455-2199 Fax (501) CT INFORMATION N N Point Energy Station Osceola, AR 01008 ME 4/11/01 Sand Sand SEAL: Bentonite pellets PVC DIAMETER: 2-inch	SULTING, INC. AR 72209 455-4547 DRILL DRILL RIG T METH SAMI GROUT: CASING LENGTH	FIELD BOREHOLE COORDINAT ELEVATION: DRILLI LING CO.: A LER: I TYPE: S HOD OF DRIL PLING METHO Bentonite chips : 22.5'	D BOREHO NO.: B-22/PZ-5 TO ES: 489699.04N 1917 TOC ELEV NG INFORMATI Anderson Engineer Paul Harris Simco 2400 SKL LING: 6.25"diam. ODS: Split Spoon STATIC WATER LEVE	LE LOG TAL DEPTH: 30' 793.71E ATION: 242.75' ON ing solid flight auger Page 1 of 1 EL:21.57' BELOW TOC
SCREEN LE	ENGTH:10' SOIL	SLOT SIZE: 0.010 T	D. OF WELL 32.	50' BELOW TOC	DATE OF WATER LEV BORING	VEL: 5/02/01
05		Brown, silty clay, slightly moist, low plasticity. Tan, fine to coarse sand with some silt, moist.	9,11,15	Pushed shelby tube from 3'- 5'.		3' of stick-up Bentonite chips from surface to 16'.
-15 -		<pre>Tan, fine to coarse sand, subangular to subrounded, moist. Tan, fine to coarse sand, subangular to subrounded, wet. Tan, fine to coarse sand, subangular to subrounded, wet.</pre>	8,10,12	Hit H2O @ 19' Heaving sands 20'-30', switched to hollow stem augers to construct wel Total depth @ 30'.		Bentonite pellets from 16' to 18'. 10-20 sand from 18' to 29.5'.

GEC				FIELD	BOREHO	LE LOG
	GEN	ESIS ENVIRONMENTAL CONS	ULTING, INC	BOREHOLE	NO.: B-23 TOT	AL DEPTH: 24'
	// 11400	e: (501) 455-2199 Fax (501)	ar 72209 455-4547	COORDINAT	ES: 489964.71N 1916	288.17E
				ELEVATION:	240.71' TOC ELEV	ATION: n/a
	PROJEC	CT INFORMATION		DRILLI	NG INFORMATIO	NC
PROJEC	T: Plum	Point Energy Station	DRI	LLING CO.: A	nderson Engineeri	ng
SITE LOC	CATION:	Osceola, AR	DRI	LLER: P	aul Harris	
JOB NO.:		01008	RIG	TYPE: S	imco 2400 SKL	
LOGGED	BY:	ME	MET	THOD OF DRIL	LING: 6.25"diam.	solid flight auger
DATE DR	RILLED:	4/05/01	SAN	IPLING METHO	ODS: Split Spoon	
GRAVEL PA	CK: n/a	SEAL: n/a	GROUT	ſ: n/a		Page 1 of 1
CASING/SCF	REEN TYPE:	n/a DIAMETER: n/a C.	ASING LENGT	H: n/a	STATIC WATER LEVE	L: n/a BELOW TOC
SCREEN LE	NGTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n	a BELOW TOC	DATE OF WATER LEV	'EL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-10 -		<pre>Tan, sandy silt with some clay, slightly moist. Tan, fine to medium grained sand with silt, slightly moist. Tan to brown, fine to coarse sand, subangular to subrounded, moist.</pre>	4,5,5 4,8,9 6,9,10			
-20 -		Tan to brown, fine to coarse sand, subangular to subrounded, wet.	3,2,1	Hit H2O @ 18' Heaving sands from 18'-24'.	•	
-25				24'.		

GEC				FIELD	BOREHO	LE LOG
	11400 Phone	0 West Baseline Road Little Rock, e: (501) 455-2199 Fax (501)	AR 72209 455-4547		IO.: B-24 TO ES: 489993.60N 1918 241.40' TOC ELEV	FAL DEPTH: 24' 788.09E ATION: n/a
	PROJE			DRILLI		
PROJEC	T: Plun	a Point Energy Station	DRI	LLING CO.: A	nderson Engineer	ing
SITE LO	CATION:	Osceola. AR	DRI	LLER: P	aul Harris	
JOB NO.	•	01008	RIG	TYPE: S	imco 2400 SKL	
LOGGE	BY:	ME	ME	THOD OF DRILL	ING: 6.25"diam.	solid flight auger
DATE DI	RILLED:	4/05/01	SAN	PLING METHO	DDS: Split Spoon	
GRAVEL P/	CK: n/a	SEAL: n/a	GROU	T: n/a		Page 1 of 1
CASING/SC	REEN TYPE	:n/a DIAMETER:n/a C	ASING LENGT	H: n/a	STATIC WATER LEVE	L:n/a BELOW TOO
SCREEN LE	ENGTH:n/a	SLOT SIZE: n/a T	D. OF WELL n	/a BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	-:	Brown silty clay, dry.				
-5 -		Tan, fine to medium sand with some silt, slightly moist.	4,5,5			
-10 -		Tan, fine to medium grained sand with silt, slightly moist.	4,5,6			
-15 -		Tan, fine to medium grained sand, slightly moist.	6,10,11			
-20 -		Tan to brown, fine to coarse sand, subangular to subrounded, wet.	5,11,13	Hit H2O @ 18' Heaving sands from 18'-24'.		
-25				Total depth @ 24'.		

GEO				FIELD	BOREHO	LE LOG
GEU	GEN	ESIS ENVIRONMENTAL CONS West Baseline Road Little Rock, 7 (501) 455-2199 Eav (501)	BOREHOLE N	BOREHOLE NO.: B-25 TOTAL DEPTH: 29' COORDINATES: 490002.49N 1919288.01E		
		5. (301) 4332133 Pax (301)	400 4041	ELEVATION:	241.89' TOC ELEV	ATION: n/a
	PROJEC	CT INFORMATION		DRILLI	NG INFORMATI	ON
PROJEC	T: Plum	Point Energy Station	DRIL	LING CO.: A	nderson Engineer	ing
SITE LO	CATION:	Osceola, AR	DRIL	LER: P	aul Harris	
JOB NO.	:	01008	RIG	TYPE: S	imco 2400 SKL	
LOGGE	BY:	ME	MET	HOD OF DRILL	LING: 6.25"diam.	solid flight auger
DATE DE	RILLED:	4/05/01	SAM	IPLING METHO	DS: Split Spoon	
GRAVEL PA	CK: n/a	SEAL: n/a	GROUT	: n/a		Page 1 of 1
CASING/SC	REEN TYPE:	n/a DIAMETER: n/a C	ASING LENGTH	1: n/a	STATIC WATER LEVE	EL: n/a BELOW TOC
SCREEN LE	NGTH:n/a	SLOT SIZE: n/a T.	.D. OF WELL n/	a BELOW TOC	DATE OF WATER LEV	
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	=: = : = :	Brown, silty clay, dry.				
-						
		_				
-5 -		Tan silt with some fine sand, dry.	5,4,4			
	<u> </u>					
		Tan, fine to medium sand,	5,7,7			
-10 -		subangular to subrounded, dry.				
-						
-15 -		Tan, fine to medium sand, subangular to subrounded,	6,9,10			
		moist.				
-						
	·····	Tan fine to modium sand	4 8 12			
-20 -	-7-7-7-7-7-7	subangular to subrounded,	4,0,12	Hit H20 @ 22'		
	-1-1-1-1-1 -1-1-1-1-1-1	clay, moist.				
	-1-1-7-1-7			Heaving sands from 23'-29'.		
		Tan, fine to medium sand,	3,5,10			and the second sec
-25 -		subangular to subrounded, wet.				
				Total depth @		
-30						

GEC	// GEN	ESIS EI	VVIRONMENTAL CONS	ULTING	G, INC.	BOREHOLE) E	B-26 TOT	LE LOG
	// 11400 // Phone) West Ba e: (501) 45	seline Road Little Rock, (55-2199 Fax (501)	2209 547 COORDINATES: 490011.38N 1919787.94E ELEVATION: 242.20' TOC ELEVATION: n/a					
	PROJEC	CT INF	ORMATION			DRILLI	NG	INFORMATIO	ON
PROJEC	T: Plum	l Point	Energy Station		DRILL	ING CO.: A	And	erson Engineeri	ng
SITE LOC	CATION:	Osceol	a, AR		DRILL	.ER: J	ay a	and Wayne Joh	nson
JOB NO.:		01008			RIG T	YPE: (CM	E 55	
LOGGED	BY:	TG			METH	IOD OF DRIL	LIN	G: Wash rotar	y
DATE DR	ILLED:	4/05/01	Ling and set		SAMF	LING METH	DDS	S: Split Spoon	
GRAVEL PA	CK: n/a		SEAL: n/a	G	ROUT:	n/a			Page 1 of 3
CASING/SC	REEN TYPE:	n/a	DIAMETER: n/a C	ASING LI	ENGTH:	n/a	ST	ATIC WATER LEVE	L: n/a BELOW TOO
SCREEN LE	NGTH:n/a		SLOT SIZE: n/a T	.D. OF W	ELL n/a	BELOW TOC	DA	TE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	BLO COU	W NTS	COMMENTS		BORING COMPLETION	WELL DESCRIPTION
	$\begin{array}{c} H \\ H $	Brown dry. Brown moist. Tan, f subang with m Tan, f subang with m Tan, f subang with m	to tan, silty clay, to tan, sandy clay, fine sand, gular to subrouned minor clay, moist. fine sand, gular to subrouned minor clay, moist.	4,4,4 4,6,1 4,18, 5,21, 5,21,	0 21 24+	ushed shelby ube from 3'- '.			
-30 -		Tan, i rounde	fine to coarse sand, ed to subrounded.	5,21,	24+				

GENE PROJ	ECT: Plum	DNMENTAL CONSULTING, INC Point Energy Station	BOREHOLE NO.: B-26 Page 2 of 3			
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-35 -		Tan, fine to coarse sand, rounded to subrounded, with some gravel (<8mm).	5,32,13+			
-40		Tan, fine to coarse sand, rounded to subrounded, with some gravel (<10mm) and organics.	5,19,22			
-45 -		Gray, fine to coarse sand with trace gravel and	5,29,16+			
		Cray.				
-50	75757575757 75757575757 7575757575 75	Gray, sandy clay, coarse sand, trace gravel.	5,26,19+			
- 55 -	00000					
-60 -	00000	Gray, coarse to very coarse sand, rounded to angular with gravel (<30mm), trace clay.	5,25,20+			
-65 -	00000					
-70 -	000000	Gray, fine to coarse sand with gravel (<40mm).	4,30,16+			
-75 -	00000					
-80 -	00000	Gray, fine to coarse sand with gravel (<20mm).	5,30,15+			
	0000					




	CEC				FIELD	BOREHO	LE LOG					
	GEC	•	ESIS ENVIRONMENTAL CON	SULTING, INC.	BOREHOLE	NO.: B-28 TO	TAL DEPTH: 30'					
_ consta	l	11400	West Baseline Road Little Rock	AR 72209	COORDINAT	ES: 489520.39N 1920	298.47E					
- J.	1	i none		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ELEVATION:	241.83' TOC ELEV	ATION: n/a					
		PROJEC			DRILLING INFORMATION							
	PROJE	CT: Plum	Point Energy Station	DRIL	LING CO.: A	nderson Engineeri	ing					
	SITE LC	CATION:	Osceola, AR	DRIL	LER: P	aul Harris						
n sin Lina si	JOB NO).:	01008	RIG	TYPE: S	imco 2400 SKL						
	LOGGE	D BY:	ME	METI	HOD OF DRILL	_ING: 6.25"diam.	solid flight auger					
	DATE D	RILLED:	4/12/01	SAM	PLING METHO	DS: Split Spoon						
	GRAVEL P	ACK: n/a	SEAL: n/a	GROUT:	n/a		Page 1 of 1					
	CASING/S	CREEN TYPE:	n/a DIAMETER: n/a	CASING LENGTH	: n/a	STATIC WATER LEVE	L:n/a BELOW TOC					
	SCREEN L	ENGTH:n/a	SLOT SIZE: n/a	T.D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a					
	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION					
		Ξ.Τ.Ι	Brown, silty clay,		Pushed shelby							
N. S.	-5 -		plasticity.		5'.		-					
	-											
erest of												
		Г. <u> </u>										
	-10 -	=: =: =: =:	Brown, silty clay, slightly moist, low	1,1,2								
	4		plasticity.		•							
(*****												
	-15 -	E: I : I	Brown, silty clay, very moist, low plasticity.	1,2,2								
	-	<u> </u>										
	-				Hit H20 @ 18'	•						
t e Start												
	-20 -		plasticity, wet.	1,1,1								
					•							
			Grey clay with organics	1.1.3								
	-25		and medium grained sand,	1,1,5								
- And			wet.									
J					Total denth A							
	-				30'.							
	-30 J L][

	// 11400	West Baseline Road Little Rock, A 5: (501) 455-2199 Fax (501)	AR 72209 455-4547	COORDINAT	ES: 489502.60N 1919	298.62E
	11 11010			ELEVATION:	241.39' TOC ELEV	ATION: n/a
	PROJEC	CT INFORMATION		DRILLI	NG INFORMATIO	ON
PROJEC	T: Plum	Point Energy Station	DRI	LING CO.: A	Inderson Engineeri	ing
SITE LOO	CATION:	Osceola, AR	DRI	LER: P	aul Harris	
JOB NO.	:	01008	RIG	TYPE: S	imco 2400 SKL	
LOGGED) BY:	ME	MET	HOD OF DRIL	LING: 6.25"diam.	solid fligł
DATE DF	RILLED:	4/12/01	SAN	IPLING METHO	ODS: Split Spoon	
GRAVEL PA	CK: n/a	SEAL: n/a	GROUT	: n/a		Page
CASING/SC	REEN TYPE:	n/a DIAMETER:n/a C/	ASING LENGT	H: n/a	STATIC WATER LEVE	L:n/a BE
SCREEN LE	NGTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n	a BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WE DESCR
	[=:::					
-	Ξ.Ξ.Ξ					
	 工:工:コ	Brown, silty clay, low		Pushed shelby		
-5 -	= : = : = :	moist.		5'.		
	II:I:I					
	II:I:I					
-10 -		Tan to brown, fine to medium grained sand,	3,5,6			
		subangular to subrounded.				
		Man gilty gand with	316			
-15 -		trace clay.	3,4,0			
-						
		Tan to brown sand. fine	5,6,6	HIT HZO @ 19.	•	
-20 -		to coarse grained, subangular to subrounded.				
		wet.		Heaving sands	3	
				Total depth 4		2

GEC	11			FIELD	BOREHO	LE LOG				
GEC	// GEN	UVESTS ENVIRONMENTAL CONS	ULTING, INC.	BOREHOLE	NO.: B-30 TO	TAL DEPTH: 30'				
· · /	// Phone	e: (501) 455-2199 Fax (501)	455-4547	COORDINATES: 489484.82N 1918298.77E ELEVATION: 240.08' TOC ELEVATION: n/a						
ſ	PROJE			DRILLI	NG INFORMATI	ON				
PROJECT	: Plun	Point Energy Station	DRILL	ING CO.: A	Anderson Engineer	ing				
SITE LOC	ATION:	Osceola, AR	DRILL	.ER: J	ay and Wayne Joh	nson				
JOB NO .:		01008	RIG T	YPE: C	CME 55					
LOGGED	BY:	TG	METH	IOD OF DRIL	LING: Wash rotar	y .				
DATE DRI	LLED:	4/13/01	SAMP	PLING METHO	ODS: Split Spoon					
GRAVEL PAC	K: n/a	SEAL: n/a	GROUT:	n/a		Page 1 of 1				
CASING/SCRI	EEN TYPE:	n/a DIAMETER: n/a C/	ASING LENGTH:	n/a	STATIC WATER LEVE	L:n/a BELOW TOC				
	GTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a				
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION				
	: II : II :	Brown, silty clay.		· · · · · · · · · · · · · · · · · · ·						
	⊥•⊥•-4 ∶⊥∶⊥:									
		Tap modium grained and	2.2.6							
-5 -		with trace clay, dry.	2,3,0							
-										
		Tan, medium grained sand,	3,5,8							
-10 -		dry.								
						· .				
4						- -				
-15 -		Tan, medium grained sand,								
		carguery morse.								
			н	it H2O @ 20'	•					
-20 -		Tan, medium grained sand, wet.								
				•						
		Tan modium anaired and				and the second se				
-25 -		wet.								
		Tan, medium grained sand,	Т	otal depth @						
-30 -	· · · · · · · · ·	wet.	3	0'.						

GEC PROJEC SITE LO	PROJEC T: Plum CATION:	ESIS EN West Bac : (501) 45 CT INF Point Osceol	VIRONMENTAL CON seline Road Little Rock 5-2199 Fax (50 ORMATION Energy Station a, AR	ISULTI (, AR 7: 1) 455-4	DRILI	FIELD BOREHOLE COORDINAT ELEVATION: DRILLI LING CO.: A LER: I	NO.: ES: 239.0 NG Ande Paul	B-31 TOT 489467.03N 19172 08' TOC ELEV/ INFORMATIC rson Engineeri Harris	AL DE 298.92E ATION: DN ng	-OG PTH: 20' n/a
JOB NO.	:	01008			RIG 1	TYPE: S	Simco	0 2400 SKL		
LOGGE	DBY:	ME			METH	HOD OF DRIL	LINC	G: 6.25"diam. s	olid f	ight auger
DATE DE	RILLED:	4/06/01	L		SAM	PLING METH	DDS	: Split Spoon		
GRAVEL PA	ACK: n/a		SEAL: n/a		GROUT:	n/a			P	age 1 of 1
CASING/SC	REEN TYPE:	n/a	DIAMETER:n/a	CASIN	G LENGTH:	n/a	STA	TIC WATER LEVE	L:n/a	BELOW TOC
SCREEN LE	NGTH:n/a		SLOT SIZE: n/a	T.D. OI	WELL n/a	BELOW TOC	DAT	TE OF WATER LEV	EL: n/a	
DEPTH	SOIL SYMBOL	SO	L DESCRIPTION	E C		COMMENTS		BORING COMPLETION	DES	
-5 -		Brown, Brown ferrou slight Brown sandy	<pre>silty clay, dry. to gray clay, is staining, ly moist. to gray, silty clay, moist.</pre>	2,5	3, 4					
-15 -		Brown, medium moist.	silty, fine to a grained sand,	3,	4,6	Hit H2O @ 17	•			
-20 -		Brown, graine to sul	, fine to coarse ed sand, subangular prounded, wet.	7,	11,14	Total depth (20'.	g			

PROJECT INFORMATION DRILLING INFORMATION PROJECT: Plum Point Energy Station DRILLING INFORMATION SITE LOCATION: Osceola, AR DRILLING CO.: Anderson Engineering JOB NO: 01008 LOGGED BY: ME DATE DRILLED: 4/06/01 GRAVEL PACK: n/a SCREEN LENOTH: SLOT SIZE: NG DIAMETER: AMPLING METHODS: Split Spoon GRAVEL PACK: n/a GRAVEL PACK: N/a SCREEN LENOTH: MATTON SCREEN LENOTH: DAMETER: SOIL SLOT SIZE: SOIL SOIL DESCRIPTION COMMENTS BORING COMMENTS BORING V IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	GEC	GEN 11400 Phone	ESIS ENVIRONMENTAL CONSI West Baseline Road Little Rock, A e: (501) 455-2199 Fax (501)	ULTING, INC NR 72209 455-4547	Field Borehole Log7220945474547Field Borehole No.: B-32Borehole No.: B-32TOTAL DEPTH: 24'Coordinates: 489449.25N 1916299.06EELEVATION: 237.86'TOC ELEVATION: n/a						
PROJECT: Plum Point Energy Station DRILLING CO.: Anderson Engineering SITE LOCATION: Osceola, AR DRILLER: Paul Harris JOB NO.: 01008 RIG TYPE: Simco 2400 SKL LOGGED BY: ME METHOD OF DRILLING: 6.25"diam. solid flight at DATE DRILLED: 4/06/01 SAMPLING METHODS: Split Spoon GRAVEL PACK: n/a SEAL: n/a GROUT: n/a Page 1 or CASING/SCREEN TYPE:n/a DIAMETER:n/a CASING LENGTH: n/a STATIC WATER LEVEL: n/a BEOWN SOIL DESCRIPTION BLOW COMMENTS BORING COMPLETION WELL OMENTS DEPTH SVMBOL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION WELL DESCRIPTION ************************************		PROJEC			DRILLI		ON				
SITE LOCATION: Osceola, AR JOB NO.: 01008 LOGGED BY: ME DATE DRILLED: 4/06/01 GRAVEL PACK: n/a SEAL: n/a SEAL: n/a GROUT: n/a SAMPLING METHODS: Split Spoon GRAVEL PACK: n/a SEAL: n/a GROUT: n/a STATIC WATER LEVEL: n/a BELOW SCREEN LENGTH: n/a SEAL: n/a T.D. OF WELL n/a BELOW TOC DATE OF WATER LEVEL: n/a BELOW SCREEN LENGTH: n/a BELOW TOC DATE OF WATER LEVEL: n/a BELOW SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BELOW SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a BLOW TOC DATE OF WATER LEVEL: n/a BECAN SCREEN LENGTH: n/a SILT SCRIPTION BLOW COUNTS COMMENTS BORING OM VELL DEPTH SVMBOL SOLL DESCRIPTION SILT CASING (4'-4.5'); Tan, fine to coarse grained sand, subangular to subrounded, moist. Tan, fine to coarse grained sand, subangular to subrounded, moist. Tan, fine to coarse grained sand, subangular to subrounded, moist. Tan, fine to coarse grained sand, subangular to subrounded, moist. Hit H20 @ 18'.	PROJEC	T: Plum	Point Energy Station	DRIL	LING CO.: A	Anderson Engineer	ing				
JOB NO:: 01008 RIG TYPE:: Simco 2400 SKL LOGGED BY: ME METHOD OF DRILLING: 6.25"diam.solid flight an DATE DRILLED: 4/06/01 SAMPLING METHODS: Split Spoon GRAVEL PACK: n/a GROUT: n/a Page 1 o CASING/SCREEN TYPE:n/a DIAMETER:n/a CASING LENGTH: n/a STATIC WATER LEVEL: n/a SCREEN LENGTH:n/a SLOT SIZE:n/a T.D. OF WELL n/a BELOW TCC DATE OF WATER LEVEL: n/a DEPTH SOIL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION DESCRIPTION V IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SITE LO	CATION:	Osceola, AR	DRIL	LER: I	aul Harris					
LOGGED BY: ME METHOD OF DRILLING: 6.25"diam. solid flight an SAMPLING METHODS: Split Spon GRAVEL PACK: n/a SEAL: n/a GROUT: n/a Page 1 o CASING/SCREEN TYPE:n/a DIAMETER:n/a CASING LENGTH: n/a STATIC WATER LEVEL: n/a SCREEN LENGTH:n/a SLOT SIZE: n/a T.D. OF WELL n/a BELOW TCC DATE OF WATER LEVEL: n/a SCREEN LENGTH:n/a SLOT SIZE: n/a T.D. OF WELL n/a BELOW TCC DATE OF WATER LEVEL: n/a DEPTH SOIL SYMBOL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION DESCRIPTION V IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	JOB NO.	:	01008	RIG	TYPE: S	imco 2400 SKL					
DATE DRILLED: 4/06/01 SAMPLING METHODS: Split Spoon GRAVEL PACK: n/a SEAL: n/a GROUT: n/a Page 1 o CASING/SCREEN TYPE:n/a DIAMETER:n/a CASING LENGTH: n/a STATIC WATER LEVEL: Relow SCREEN LENGTH:/n/a SLOT SIZE:n/a T.D. OF WELL n/a BELOW TOC DATE OF WATER LEVEL: n/a DEPTH SOIL SOIL DESCRIPTION BLOW COMMENTS BORING COMPLETION WELL T SIGhtly moist (4'-4.5'); Slightly moist (4'-4.5'); Brown, silty clay, dry. 3,5,7 -5 Image: Sightly moist (4'-5'-9'). Sol, slightly moist (4'-5'-9'). 3,5,7 -10 Image: Sightly moist (4'-5'-9'). Sol, subrounded, moist. 5,8,9 -10 Image: Sightly moist. Sol, subrounded, moist. 3,7,8 -15 Tan, fine to coarse Sol, subrounded, moist. Blow -15 Tan, fine to coarse Sol, subrounded, moist. Hit H20 @ 18'.	LOGGE	BY:	ME	MET	HOD OF DRIL	LING: 6.25"diam.	solid flight auger				
GRAVEL PACK: n/a SEAL: n/a GROUT: n/a Page 1 o CASING/SCREEN TYPE:n/a DIAMETER:n/a CASING LENGTH: n/a STATIC WATER LEVEL: n/a BELOW SCREEN LENGTH:n/a SLOT SIZE:n/a T.D. OF WELL n/a BELOW TOC DATE OF WATER LEVEL: n/a DEPTH SOIL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION V Image: Complexity of the symbol SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION V Image: Complexity of the symbol SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION V Image: Complexity of the symbol SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION V Image: Complexity of the symbol SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION Image: Complexity of the symbol Soil the symbol Soil the symbol Soil the symbol Soil the symbol Image: Complexity of the symbol Soil the symbol Soil the symbol Soil the symbol Soil the symbol Image: Complexity of the symbol Soil the symbol Soil the symbol Soil the symbol Soil the symbol Image: Complexity of the symbol Soil the symbol Soil the symbol Soil the symbol Image: Complexity of the symbol<	DATE D	RILLED:	4/06/01	SAM	PLING METH	ODS: Split Spoon					
CASING/SCREEN TYPE:n/a DIAMETER:n/a CASING LENGTH: n/a STATIC WATER LEVEL:n/a BELOW SCREEN LENGTH:n/a SLOT SIZE:n/a T.D. OF WELL n/a BELOW TOC DATE OF WATER LEVEL: n/a DEPTH SOIL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION WELL DESCRIPTI U IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	GRAVEL PA	ACK: n/a	SEAL: n/a	GROUT	n/a	·	Page 1 of 1				
SCREEN LENGTH:n/a SLOT SIZE:n/a T.D. OF WELL n/a BELOW TOC DATE OF WATER LEVEL: n/a DEPTH SOIL SYMBOL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION WELL DESCRIPTION 0 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	CASING/SC	REEN TYPE:	n/a DIAMETER: n/a CA	SING LENGTH	l: n/a	STATIC WATER LEVE	EL: n/a BELOW TOC				
DEPTH SOIL SYMBOL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION WELL DESCRIPTION U IIIII IIIII IIIII IIIIII IIIIII IIIIII IIII	SCREEN LE	ENGTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a				
-5 - -5 - -10 - -15 - -16 - -17 - -17 - -18 - -18 - -19 - -10 - - -10 - -10 - -	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION				
-20 - Tan, fine to coarse grained sand, subangular to subrounded, with trace gravel, moist. Total depth @	-5	1 II IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	<pre>Brown,silty clay, dry. Brown,silty clay, slightly moist (4'-4.5'); Tan silty sand, slightly moist (4.5'-9'). Tan, fine to coarse grained sand, subangular to subrounded, moist. Tan, fine to coarse grained sand, subangular to subrounded, moist. Tan, fine to coarse grained sand, subangular to subrounded, with trace gravel, moist.</pre>	3,5,7 5,8,9 3,7,8 4,8,9	Hit H2O @ 18' Heaving sands from 20'-24'. Total depth @						

GEC // GEN // 1140 // Phore	IESIS ENVIRONMENTAL CONS 0 West Baseline Road Little Rock, e: (501) 455-2199 Fax (501)	SULTING, INC. AR 72209 455-4547	FIELD BOREHOLE I COORDINAT ELEVATION:	BOREHO NO.: B-33/PZ-3 TO ES: 489431.47N 1915 TOC ELEV	LE LOG TAL DEPTH: 30' 299.23E 'ATION: 241.23'
PROJE	CT INFORMATION		DRILLI	NG INFORMATI	ON
PROJECT: Plun	n Point Energy Station	DRILL	ING CO.: A	nderson Engineer	ing
SITE LOCATION:	Osceola, AR	DRILL	ER: P	aul Harris	
JOB NO.:	01008	RIG T	YPE: S	imco 2400 SKL	
LOGGED BY:	ME	METH	IOD OF DRIL	LING: 6.25"diam.	solid flight aug
DATE DRILLED:	4/11/01	SAMP	LING METHO	ODS: Split Spoon	
GRAVEL PACK: 10-20	Sand SEAL: Bentonite pellets	GROUT:	Bentonite chips		Page 1 of 1
CASING/SCREEN TYPE	:PVC DIAMETER: 2-inch C	ASING LENGTH:	22.62'	STATIC WATER LEVE	EL: 20.35' BELOW T
SCREEN LENGTH:10'	SLOT SIZE: 0.010 T	.D. OF WELL 32.6	2' BELOW TOC	DATE OF WATER LEV	/EL: 5/02/01
DEPTH SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTIO
0 - -5 - -10 - -15 - -20 - 0 - - -20 - 0 - - - - - - - - - - - - - -	<pre>Brown, silty clay, dry. Brown, silty, clayey sand, slightly moist. Gray to brown, clay with some silt, medium plasticity, moist. Gray to brown, silty clay, low to medium plasticity, moist. Tan to light gray, fine to coarse sand, subrounded to subangular, weat</pre>	Pt 1,2,3 1,1,2 7,9,10	ushed shelby ube 3'-5'. it H2O @ 19'		3' of stick- up. Bentonite chips from surface to 16.4'. Bentonite pellets from 16.4' to 18.5'. 10-20 sand from 18.5' 1

GEC	GEN 11400	ESIS EI 0 West Ba e: (501) 45	VVIRONMENTAL COl seline Road Little Roo 55-2199 Fax (5)	NSULT ж, AR 7 01) 455-4	ING, INC 2209 1547	BORE COOR	ELD EHOLE N RDINATE ATION: 2	BORE 0.: B-34 (S: 488931.54 238.62' TO	TOT TOT IN 19153 C ELEVA	LE LOG AL DEPTH: 30' 334.83E ATION: n/a
	PROJE	CT INF	ORMATION			D	RILLIN	IG INFOR	MATIC	DN
PROJEC	T: Plun	n Point	Energy Station		DRIL	LING C	D.: AI	nderson En	gineeri	ng
SITE LO	CATION:	Osceol	a, AR		DRIL	LER:	Ja	y and Way	ne Johr	1 SON
JOB NO		01008			RIG	TYPE:	CI	ME 55		
LOGGE	OBY:	ME			MET	HOD OF	DRILL	ING: Wasl	ı rotary	
DATE D	RILLED:	4/13/01			SAM	PLING N	IETHO	DS: Split	Spoon	
GRAVEL P	ACK: n/a		SEAL: n/a		GROUT	n/a				Page 1 of 1
CASING/SC	REEN TYPE	:n/a	DIAMETER: n/a	CASIN	G LENGTH	i: n/a		STATIC WAT	ER LEVEI	.: n/a BELOW TOO
SCREEN LI	ENGTH:n/a		SLOT SIZE: n/a	T.D. OF	WELL n/a	a BELO	W TOC	DATE OF WA	TER LEV	EL: n/a
DEPTH	SOIL SYMBOL	SO	L DESCRIPTION	B	LOW DUNTS	COM	IENTS	BORI	NG ETION	WELL DESCRIPTION
-5 - -10 - -15 -		Brown, brown, trace Brown, moist. Tan to medium moist.	<pre>silty clay, dry. silty clay with fine sand, moist. fine sandy clay, brown, fine to grained sand, brown, fine to grained sand,</pre>	1,1	.,1					
-25 -		Tan to medium moist.	brown, fine to grained sand,							

GEC	// GEN // 11400 // Phon	IESIS ENVIRONMENTAL CONS 0 West Baseline Road Little Rock, e: (501) 455-2199 Fax (501	SULTING AR 72209) 455-4547	, INC.	FIELD BOREHOLE I COORDINATI ELEVATION:	BO NO.: B-3: ES: 4889 237.12'	REHO 5 TOT 40.47N 1915 TOC ELEV	LE LOG TAL DEPTH: 30' 819.76E ATION: n/a
	PROJE	CTINFORMATION			DRILLI	NG INF	ORMATI	ON
PROJEC	T: Plun	a Point Energy Station		DRILLII	NG CO.: A	ndersor	1 Engineeri	ng
SITE LO	CATION:	Osceola, AR		DRILLE	R: J	ay and V	Wayne Joh	nson
JOB NO.	•	01008		RIG TY	PE: C	CME 55		
LOGGE	OBY:	ME		METHC	D OF DRIL	LING: V	Vash rotar	y
DATE DI	RILLED:	4/13/01		SAMPL	ING METHO	DDS: S	plit Spoon	
GRAVEL PA	ACK: n/a	SEAL: n/a	GF	ROUT: n/a	3		-	Page 1 of 1
CASING/SC	REEN TYPE	:n/a DIAMETER:n/a (CASING LE	NGTH:	n/a	STATIC	WATER LEVE	L: n/a BELOW TOC
SCREEN LE	NGTH:n/a	SLOT SIZE: n/a	T.D. OF WE	LL n/a	BELOW TOC	DATE O	F WATER LEV	ÆL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOV	V ITS	COMMENTS	E CO	ORING MPLETION	WELL DESCRIPTION
-10 -		Brown, silty clay, dry. Tan to brown, silty, fine to coarse sand, subangular to subrounded. Tan to brown, silty, fine to coarse sand, subangular to subrounded with trace clay. Tan to brown, fine to coarse sand, subangular to subrounded. Tan to brown, fine to coarse sand, subangular	3,6,9	.8 Hi1	t H2O @ 20'			
-		to subrounded.						
-25 -		Tan to brown, fine to coarse sand, subangular to subrounded, wet.						
-30 -		Tan to brown, fine to coarse sand, subangular to subrounded, wet.		To 30	tal depth @ '.			

GEC // GEN // 1140 Phor	NESIS ENVIRONMENTAL CONS 10 West Baseline Road Little Rock, ne: (501) 455-2199 Fax (501)	ULTING, INC. AR 72209 455-4547 E	FIELD B BOREHOLE NO.: COORDINATES: ELEVATION: 237.	OREHO B-36 TOT 488949.36N 1916. 69' TOC ELEV.	LE LOG TAL DEPTH: 30' 309.68E ATION: n/a
PROJE	CT INFORMATION		DRILLING	INFORMATI	ON
PROJECT: Plur	n Point Energy Station	DRILLING	GCO.: Ande	rson Engineeri	ng
SITE LOCATION:	Osceola, AR	DRILLER	: Jay a	nd Wayne Joh	nson
JOB NO.:	01008	RIG TYPI	E: CME	55	
LOGGED BY:	ME	METHOD	OF DRILLING	G: Wash rotary	y
DATE DRILLED:	4/12/01	SAMPLIN	IG METHODS	: Split Spoon	
GRAVEL PACK: n/a	SEAL: n/a	GROUT: n/a		· · · · · · · · · · · · · · · · · · ·	Page 1 of 1
CASING/SCREEN TYPE	:n/a DIAMETER:n/a C	ASING LENGTH: N	/a STA	TIC WATER LEVE	L:n/a BELOW TOC
SCREEN LENGTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n/a E	BELOW TOC DAT	E OF WATER LEV	EL: n/a
DEPTH SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	OMMENTS	BORING COMPLETION	WELL DESCRIPTION
-5 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	<pre>Brown, silty clay, low plasticity, slightly moist. Brown, clayey silt with trace fine sand. Tan, fine to coarse sand with trace clay. Tan, fine to coarse sand, subrounded to subangular, wet. Tan, fine to coarse sand, subrounded to subangular, wet.</pre>	2,4,6 4,6,10 3,6,7 Hit H	H2O @ 18'.		

GEC // arm			FIELD	BOREHO	LE LOG
GEN 11400 Phone	ESIS ENVIRONMENTAL CON West Baseline Road Little Roc 2: (501) 455-2199 Fax (50	NGULTING, INC. k, AR 72209 h1) 455-4547	BOREHOLE COORDINAT ELEVATION:	NO.: B-37 TO ES: 488958.25N 1916 237.22' TOC ELEV	TAL DEPTH: 30' 809.61E ATION: n/a
PROJEC	CT INFORMATION		DRILLI	NG INFORMATI	ON
PROJECT: Plum	Point Energy Station	DRILLI	NG CO.: A	nderson Engineer	ing
SITE LOCATION:	Osceola, AR	DRILLE	ER: J	ay and Wayne Joh	nson
JOB NO.:	01008	RIG TY	(PE: 0	CME 55	
LOGGED BY:	ME	METHO	OD OF DRIL	LING: Wash rotar	у
DATE DRILLED:	4/12/01	SAMPI	LING METHO	ODS: Split Spoon	
GRAVEL PACK: n/a	SEAL: n/a	GROUT: n	/a		Page 1 of 1
CASING/SCREEN TYPE:	n/a DIAMETER: n/a	CASING LENGTH:	n/a	STATIC WATER LEVE	L: n/a BELOW TOO
SCREEN LENGTH:n/a	SLOT SIZE: n/a	T.D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-5 - -5 - -10 - -10 - -20 - -25	<pre>Brown, silty clay, low plasticity, slightly moist. Brown, silty clay, low plasticity, slightly moist. Tan, clayey silt, moist. Tan, fine to coarse sand subrounded to subangular wet. Tan, fine to coarse sand subrounded to subangular wet.</pre>	1,3,4 5,6,4 3,6,8 Hi	it H2O @ 18'		

GEC				FIELD	BOREHO	LE LOG
	11400 West E Phone: (501)	3aseline Road Little Rock, 455-2199 Fax (501)	AR 72209) 455-4547	BOREHOLE I COORDINAT ELEVATION:	NO.: B-38 TO ES: 488967.14N 1917 237.89' TOC ELEV	TAL DEPTH: 30' 309.53E 'ATION: n/a
P	ROJECT IN	FORMATION	· · · · · · · · · · · · · · · · · · ·	DRILLI	NG INFORMATI	ON
PROJECT:	Plum Poin	t Energy Station	DRILL	ING CO.: A	Anderson Engineer	ing
SITE LOCA	TION: Osce	ola, AR	DRILL	ER: J	ay and Wayne Joh	nson
JOB NO.:	0100	3	RIG T	YPE: C	CME 55	
LOGGED E	BY: ME		METH	OD OF DRIL	LING: Wash rotar	y
DATE DRIL	LED: 4/12/	01	SAMP	LING METHO	ODS: Split Spoon	
GRAVEL PACK	(: n/a	SEAL: n/a	GROUT: r	va		Page 1 of 1
CASING/SCRE	EN TYPE:n/a	DIAMETER: n/a C	CASING LENGTH:	n/a	STATIC WATER LEVE	EL: n/a BELOW TOC
SCREEN LENG	GTH:n/a	SLOT SIZE: n/a T	f.D. OF WELL n/a	BELOW TOC	DATE OF WATER LEV	/EL: n/a
DEPTH S	SOIL YMBOL S	OIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
	Tan, with	<pre>h, silty clay, low ticity, slightly t. h, silty clay, low ticity, slightly t. fine to coarse sand trace clay. fine to coarse sand trace clay.</pre>	1,3,4 2,2,3 H	it H2O @ 18'		
-25 -	Tan, subr wet.	fine to coarse sand, ounded to subangular,				



GEO	GEN // GEN	IESIS EN\ 0 West Base e: (501) 455-	/IRONMENTAL CONS line Road Little Rock, 2199 Fax (501	SULT AR 7:) 455-4	ING, IN 2209 1547	C.	FIELD BOREHOLE COORDINAT ELEVATION:) B NO.: ES: 239.	OREHO B-40 TO 488984.93N 1918 41' TOC ELEV	LE LOG TAL DEPTH: 30' 309.38E ATION: n/a
-	PROJE	CT INFO	RMATION				DRILLI	NG	INFORMATI	ON
PROJE	CT: Plun	1 Point E	nergy Station		DRI	ILLIN	IG CO.: A	Ande	rson Engineer	ing
SITE LC	CATION:	Osceola,	, AR		DRI	ILLE	R: J	lay a	nd Wayne Joh	nson
JOB NC).:	01008			RIG	S TYF	PE: C	CME	55	
LOGGE	D BY:	ME			ME	THO	D OF DRIL	LINC	G: Wash rotar	y
DATE D	RILLED:	4/12/01			SAN	MPLI	NG METHO	ODS	Split Spoon	
GRAVEL P	ACK: n/a		SEAL: n/a		GROU	T: n/a				Page 1 of 1
CASING/S	CREEN TYPE	n/a C	DIAMETER: n/a	ASING	G LENGT	ΓH:	n/a	STA	TIC WATER LEVE	L: n/a BELOW TO
SCREEN L	ENGTH:n/a	S	LOT SIZE: n/a 1	.D. OF	WELL n	n/a	BELOW TOC	DAT	E OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SOIL	DESCRIPTION	B	LOW DUNTS	0	OMMENTS		BORING COMPLETION	WELL DESCRIPTION
-10 -		Brown, splastic: Tan, classightly Tan, simoist. Tan, fin subangu	silty clay, low ity, dry. ayey silt, y moist. lty sand, slightly ne to coarse sand, lar to subrounded. ne to coarse sand,	2,4 3,5 4,6	,6 ,9					
-20 -		subangu Tan, fir	lar to subrounded.							
-30 -		Tan, fi subangu	ne to coarse sand, lar to subrounded.			Tot 30'	al depth @ •			

GEC	// GEN // 11400 // Phone	ESIS ENVIRONMENTAL CONS West Baseline Road Little Rock, e: (501) 455-2199 Fax (501)	ULTIN AR 722 455-454	G, INC. 09 17	FIELD BOREHOLE I COORDINAT ELEVATION:	B NO.: ES: 239.	OREHO B-41 TOT 488993.82N 19188 72' TOC ELEV	LE LOG TAL DEPTH: 30' 809.30E ATION: n/a	
	PROJE	CT INFORMATION		DRILLING INFORMATION					
PROJEC	T: Plum	1 Point Energy Station		DRILL	ING CO.: A	Inde	rson Engineeri	ng	
SITE LOO	CATION:	Osceola, AR		DRILL	.ER: J	ay a	nd Wayne Joh	nson	
JOB NO.:		01008		RIG T	YPE: C	CME	55		
LOGGED	BY:	ME		METH	IOD OF DRIL	LINC	G: Wash rotary	ÿ	
DATE DF	RILLED:	4/12/01		SAMF	LING METHO	DDS	: Split Spoon		
GRAVEL PA	CK: n/a	SEAL: n/a		GROUT:	n/a			Page 1 of 1	
CASING/SC	REEN TYPE:	n/a DIAMETER:n/a C	ASING	LENGTH:	n/a	STA	ATIC WATER LEVE	L:n/a BELOW TOO	
SCREEN LE	NGTH:n/a	SLOT SIZE: n/a T	.D. OF V	VELL n/a	BELOW TOC	DAT	TE OF WATER LEV	/EL: n/a	
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BL CO	WC STAL	COMMENTS		BORING COMPLETION	WELL DESCRIPTION	
-5 -		Brown, silty clay, low plasticity, dry.		Pt 5	ushed shelby ube from 3'-				
-10 -		Brown, silty clay with trace fine sand, low plasticity, dry.	1,2,	3					
-15 -		Tan, fine to coarse sand with trace silt.	2,6,	8					
-20 -		Tan, fine to coarse sand, subangular to subrounded.							
-25 -		Tan, fine to coarse sand, subangular to subrounded.							
-30 -		Tan, fine to coarse sand, subangular to subrounded.			Fotal depth @ 30'.)			

GEC	GEN 11400 Phone	ESIS ENVIRONMEI) West Baseline Road e: (501) 455-2199	NTAL CONSUL Little Rock, AR Fax (501) 45	TING, INC 72209 5-4547	BOREHOLE COORDINAT	D BORE NO.: B-42 TES: 489002.77 : 240.60' TO	TOTA TOTA IN 19193 C ELEVA	LE LOG AL DEPTH: 30' 09.23E TION: n/a
	PROJEC	CT INFORMATIC	DN		DRILLI	ING INFOR	MATIC	N
PROJEC	T: Plum	Point Energy St	ation	DRIL	LING CO.:	Anderson En	gineerir	ıg
SITE LO	CATION:	Osceola, AR		DRIL	LER: J	Jay and Way	ne John	son
JOB NO.	:	01008		RIG	TYPE: 0	CME 55		
LOGGE	OBY:	ME		MET	HOD OF DRIL	LING: Was	h rotary	
DATE DI	RILLED:	4/12/01		SAM	IPLING METH	ODS: Split	Spoon	
GRAVEL PA	ACK: n/a	SEAL: n/a		GROUT	: n/a	r		Page 1 of 1
CASING/SC	REEN TYPE:	n/a DIAMETER: n	a CAS	ING LENGTH	l: n/a	STATIC WAT	ERLEVEL	:n/a BELOW TOO
SCREEN LE	ENGTH:n/a	SLOT SIZE: n	/a T.D.	OF WELL n/	a BELOW TOC	DATE OF WA	ATER LEVE	:L: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIP	NOIT	BLOW COUNTS	COMMENTS	BOR COMPL	ING ETION	WELL DESCRIPTION
-10 -		Brown, silty classightly moist. Brown to tan silfine to medium a trace clay. Tan, fine to con with trace clay	ay, lt, with sand and arse sand 5	,4,6 ,14,14	Pushed shelby tube from 3'- 5'.			
-20 -		Tan, fine to co wet.	arse sand,		Hit H2O @ 20	••		
-25 -		Tan, fine to co wet.	arse sand,					
-30 -		Tan, fine to co wet.	arse sand,		Total depth 30'.	e		



GEC							FI	ELD	BOR	EHO	LE LOG
GLU	GEN	ESIS E	NVIRONME	ENTAL CO	CK, AR 7	NG, INC 2209	BOR	EHOLE N	NO.: B-44	TO	TAL DEPTH: 30'
	// Phone	e: (501) 45	5-2199	Fax (5	01) 455-4	547	COO ELEV	RDINATI	ES: 489020 241.14' 7	TOC ELEV	309.07E ATION: n/a
	PROJE	CT INF	ORMATI	ON			[DRILLI	NG INFC	RMATI	ON
PROJEC	CT: Plun	1 Point	Energy S	tation		DRIL	LING C	0.: A	nderson]	Engineeri	ing
SITE LO	CATION:	Osceol	a, AR			DRIL	LER:	J	ay and W	ayne Joh	nson
JOB NO	.:	01008				RIG	TYPE:	C	CME 55		
LOGGE	D BY:	ME				MET	HOD O	F DRILI	LING: Wa	ash rotar	y
DATE D	RILLED:	4/12/01	L -			SAM	IPLING	METHO	DDS: Sp	lit Spoon	
GRAVEL P	ACK: n/a		SEAL: n/a	1		GROUT	: n/a				Page 1 of 1
CASING/SC	REEN TYPE	n/a	DIAMETER:	:n/a	CASIN	3 LENGTH	l: n/a		STATIC W	ATER LEVE	EL: n/a BELOW TO
SCREEN L	ENGTH:n/a		SLOT SIZE:	n/a	T.D. Of	WELL n/	a BEL	OW TOC	DATE OF V	NATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SO	IL DESCRI	PTION	B		СОМ	MENTS	BC COM	RING PLETION	WELL DESCRIPTION
		Brown, slight Brown, slight Tan to coarse	silty cl ly moist silty cl ly moist brown, s lium grain brown, s s, sand, t	lay, silty, fi ned sand, fine to wet.	2,5 ne 5,6	5,5 3,12 ,15,20	Pushed tube fr 5'. Hit H20	shelby com 3'-	•		
-25 -		Tan to coarse	brown, e, sand,	fine to wet.	5,2	10,12					

GE	EC	// GEN	ESIS EI	NVIRONMENTAL CONS	ULTI	NG, IN	C.				
		11400	West Ba	seline Road Little Rock,	AR 72	209	=	COORDINAT	NO.:	488570.59N 1920	138.62E
r		11 Phone	9: (501) 4:	55-2199 Fax (501)	455-45	947		ELEVATION:		TOC ELEV	ATION: 244.33'
		PROJE	CT INF	ORMATION				DRILLI	NG	INFORMATI	ON
PROJ	EC	T: Plum	n Point	Energy Station		DRI	LLIN	IG CO.: A	And	erson Engineer	ing
SITE	LO	CATION:	Osceol	a, AR		DRI	LLE	R: J	ay a	and Wayne Joh	nson
JOB	10.	:	01008			RIG	TY	PE: C	СМІ	E 55	
LOGO	3EC	DBY:	TG			ME	гно	D OF DRIL	LIN	G: Wash rotar	y
DATE	DF	RILLED:	4/12/0	l ·		SAN	I PL	ING METH	DDS	S: Split Spoon	
GRAVE	LPA	ACK: 10-20 \$	Sand	SEAL: Bentonite chips		GROUT	Г: Ве	ntonite pellets			Page 1 of 1
CASING	S/SC	REEN TYPE:	PVC	DIAMETER: 2-inch C	ASING	LENGT	H: -	18.76'	ST	ATIC WATER LEVE	EL: 22.76' BELOW TOC
SCREE	N LE	NGTH:10'		SLOT SIZE: 0.010 T.	D. OF	WELL 2	8.76'	BELOW TOC	DA	TE OF WATER LE	/EL: 5/02/01
DEPTI	H	SOIL SYMBOL	so	IL DESCRIPTION	BL CO	.OW UNTS	· (COMMENTS		BORING COMPLETION	WELL DESCRIPTION
-											3' of stick-up
0 -		=: ± : ± :					-				-
		I I I I I I I I					-				
-		т. <u>т.</u> т.	-				Pus	hed shelby			
-5 -							5';				
·							160	Jovery.			Bentonite
-											to surface.
-10		<u>+</u> <u>+</u> . ::_	Brown,	silty clay.	2,2,	3					
		=:				an a					
		=: T : T :									Bentonite
-		L	Tan to	brown, medium	3.10	0.12					perrets from 12' to 14'.
-15 -			graine	ad sand, subrounded	-,-(,					
-			clay.	,							
-											
-20 -			Tan, f graine	ine to medium d sand, subrounded	5,12	2,9					10-20 Sand
-			to sub clay.	angular with some			1				from 14' to
1			-								20
0.5			Brown	to tan, sandy clay.	4,8,	17					
-25 -		-7-7-7-7-7-7									Vooming onde
-											prohibit
-		-7-7-7-7-7-7		fine to make		7	_				reach 30'bgs.
-30 -		-7-7-7-7-7	graine	ed, sandy clay.	5,8,		30'	ai depth @ '.			
-											

GE	•					FIELD) B	OREHO	LE LOG	
			NVIRONMENTAL CO	NSULT	ING, INC	BOREHOLE	NO.:	B-46 TO	TAL DEPTH: 50'	
	// 1140 // Phon	e: (501) 45	5-2199 Fax (501) 455-	2209 4547	COORDINA	TES:	488581.70N 1919	818.69E	
н. 1917 - С.						ELEVATION	: 240	.11' TOC ELEV	ATION: n/a	
	PROJE	CT INF	ORMATION		DRILLING INFORMATION					
PROJE	CT: Plun	1 Point	Energy Station		DRIL	LING CO.:	Ande	erson Engineer	ing	
SITE LO	OCATION:	Osceol	a, AR		DRIL	LER:	Jay a	nd Wayne Joh	nson	
JOB NO	D.:	01008			RIG	TYPE:	СМІ	55		
LOGGE	ED BY:	TG			MET	HOD OF DRI	LIN	G: Wash rotar	y	
DATE	DRILLED:	4/06/01	[SAM	PLING METH	ODS	S: Split Spoon		
GRAVEL	PACK: n/a		SEAL: n/a		GROUT	: n/a			Page 1 of 2	
CASING/S	SCREEN TYPE	:n/a	DIAMETER:n/a	CASIN	G LENGTH	t: n/a	ST	ATIC WATER LEVE	L:n/a BELOW TOO	
SCREEN	LENGTH:n/a		SLOT SIZE: n/a	T.D. O	FWELL n/	a BELOW TOC	DA	TE OF WATER LE	/EL: n/a	
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	E C	BLOW OUNTS	COMMENTS	3	BORING COMPLETION	WELL DESCRIPTION	
			· · · ·							
		Brown,	silty clay.			Pushed shelb	7	1		
_ 1						tube from 3'- 5'.	-			
-5 -										
-		Brown	clav with trace	1.	5.4					
-10 -		silt.								
					-					
.][-7-7-7-7-7									
-15 -	-1-1-1-1-1-1 -1-1-1-1-1-1	Brown, is ver	sandy clay, sand y fine.	1 4,	4,7					
	-1-1-1-1-1									
-	-7-7-7-7-7									
-	-X-X-X-X-X									
		Brown,	silty clay, mois	st. 4,	4,5					
-20 -	=: _ : _									
	I:I:I							- -		
-		Brown	to tan modium							
-25 -		graine	ed sand, subangula	ar 4,	10,1/					
-		silt	stounded, with sol	ne -						
-										
	11.*.*.*.*.*.*	1			1			1	1	

SOIL SYMBOL SOIL DESCRIPTION BLOW COUNTS COMMENTS BORING COMPLETION WELL DESCRIPTION -30 -31 -32 -33 <t< th=""><th>GENE: PROJE</th><th>ECT: Plum I</th><th>DNMENTAL CONSULTING, INC Point Energy Station</th><th>•</th><th>BOREH</th><th>OLE NO.: B-46 Page</th><th>e 2 of 2</th></t<>	GENE: PROJE	ECT: Plum I	DNMENTAL CONSULTING, INC Point Energy Station	•	BOREH	OLE NO.: B-46 Page	e 2 of 2
-30 - -30 - Brown to tan, silty, sandy clay with trace gray clay. Gray sand, subrounded to subangular, with trace gravel (<10mm). -40 - -40 - -40 - Brown and gray, medium to coarse grained sand. Brown and gray, medium to coarse grained sand. -50 - -50 - -50 - -50 - -35 - Brown and gray, medium to coarse grained sand. -50 - -50 -	DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-35 - Gray sand, subrounded to subangular, with trace gravel (<10mm). -40 - Tan to brown, very fine to coarse grained sand, subrounded to subangular with trace clay. -45 - Brown and gray, medium to coarse grained sand. Brown and gray, medium to coarse grained sand. Brown and gray, medium to coarse grained sand.	-30	2222222 2222222 2222222 2222222 2222222	Brown to tan, silty, sandy clay with trace gray clay.	1,0,0			
-40 - -40 - -40 - -40 - -40 - -45 - -45 - -50 - -5	-35 -	222222 2222222	Gray sand, subrounded to subangular, with trace gravel (<10mm).	4,14,17			
-45 - -45 - -50 - Brown and gray, medium to coarse grained sand. Brown and gray, medium to coarse grained sand. 4,15,22 4,16,23 Total depth @ 50'.	-40 -		Tan to brown, very fine to coarse grained sand, subrounded to subangular with trace clay.	4,25,21+			
-50 - Brown and gray, medium to coarse grained sand.	-45 -		Brown and gray, medium to coarse grained sand.	4,15,22			
	-50 -		Brown and gray, medium to coarse grained sand.	4,16,23	Total depth @ 50'.		

هور.

GEC	GEN 1140 Phon	IESIS EN 0 West Bar e: (501) 45	VVIRONMENTAL CONS seline Road Little Rock, 55-2199 Fax (501	SULTING, INC AR 72209) 455-4547	BOREHOLE COORDINAT ELEVATION:	NO.: B-47 ES: 488552.81N 19 240.10' TOC EL	OTAL DEPTH: 30' D19318.77E EVATION: n/a
	PROJE	CT INF	ORMATION		DRILLI	NG INFORMA	TION
PROJEC	T: Plun	n Point	Energy Station	DRIL	LING CO.: A	Anderson Engine	ering
SITE LO	CATION:	Osceol	a, AR	DRIL	LER: J	lay and Wayne J	ohnson
JOB NO.	.:	01008		RIG	TYPE: C	CME 55	
LOGGE	OBY:	ME		MET	HOD OF DRIL	LING: Wash rot	ary
DATE DI	RILLED:	4/12/01	l	SAM	PLING METH	ODS: Split Spo	0 n
GRAVEL PA	ACK: n/a		SEAL: n/a	GROUT	: n/a		Page 1 of 1
CASING/SC	REEN TYPE	:n/a	DIAMETER:n/a	CASING LENGTH	ł: n/a	STATIC WATER LE	EVEL: n/a BELOW TO
SCREEN LE	ENGTH:n/a		SLOT SIZE: n/a	T.D. OF WELL n/	a BELOW TOC	DATE OF WATER	LEVEL: n/a
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETIC	WELL DN DESCRIPTIO
-5 - -10 - -15 - -20 -		Brown, Brown, Brown, Brown,	silty clay. silty clay. silty clay. silty clay.				



GEC II an					FIELD	BOREH	OLE LOG	
GLC // GEr // 1140 // Phor	NESIS ENVI 10 West Baselin ne: (501) 455-2	RONMENTAL COl ne Road Little Roo 199 Fax (5	NSULT k, AR 7 01) 455-4	2209 547	BOREHOLE COORDINAT ELEVATION:	NO.: B-49 TES: 488535.03N 1 : 238.60' TOC EI	TOTAL DEPTH: 30' 918318.92E _EVATION: n/a	
PROJE	CT INFO	RMATION			DRILLI	NG INFORMA	TION	
PROJECT: Plur	n Point Er	ergy Station		DRILLING CO.: Anderson Engineering				
SITE LOCATION:	Osceola,	AR		DRILL	ER: J	lay and Wayne	Johnson	
JOB NO.:	01008			RIG T	YPE: C	CME 55		
LOGGED BY:	ME			METH	OD OF DRIL	LING: Wash ro	tary	
DATE DRILLED:	4/13/01			SAMP	LING METH	ODS: Split Spo	on	
GRAVEL PACK: n/a	s	EAL: n/a		GROUT: 1	n/a		Page 1 of 1	
CASING/SCREEN TYPE	E:n/a Di	AMETER: n/a	CASIN	G LENGTH:	n/a	STATIC WATER L	EVEL: n/a BELOW TO	
SCREEN LENGTH:n/a	SL	OT SIZE: n/a	T.D. OI	WELL n/a	BELOW TOC	DATE OF WATER	LEVEL: n/a	
DEPTH SYMBOL	SOIL	DESCRIPTION	E	LOW OUNTS	COMMENTS	BORING	WELL ON DESCRIPTION	
	Brown, s plastici moist. Brown, s plastici moist. Brown, s plastici moist. Brown, s plastici	<pre>ilty clay, low ty, slightly ilty clay, low ty, slightly ilty clay, low ty, slightly ilty clay, low ty, moist.</pre>	1, : 1, : 2, : 1, : 5, ;	L,2 2,1 3,3 L,1 H	it H20 @ 20'			

GEC	// GENE // 11400 \ // Phone:	ESIS ENVIRONMENTAL CONS West Baseline Road Little Rock, : (501) 455-2199 Fax (501	SULTIN AR 722) 455-45	NG, INC 209 47	BOREHOLE COORDINAT ELEVATION:	NO.: 1 ES: 4 237.9	OREHO B-50 TOT 88528.13N 19178 98' TOC ELEV/	LE LOG TAL DEPTH: 30' 819.00E ATION: 11/18
	PROJEC	TINFORMATION			DRILLI	NG I	NFORMATIC	ON .
PROJEC	T: Plum	Point Energy Station		DRIL	LING CO.: A	Inder	rson Engineeri	ng
SITE LOC	CATION: 0	Osceola, AR		DRIL	LER: J	ay ar	nd Wayne John	nson
JOB NO.:	. (01008		RIG	TYPE: C	CME	55	
LOGGED	BY: 1	TG		MET	HOD OF DRIL	LING	: Wash rotary	7
DATE DR	RILLED: 4	4/13/01		SAM	PLING METHO	ODS:	Split Spoon	
GRAVEL PA	CK: n/a	SEAL: n/a		GROUT:	n/a			Page 1 of 1
CASING/SCF	REEN TYPE:	n/a DIAMETER:n/a (CASING	LENGTH	: n/a	STA	TIC WATER LEVE	L:n/a BELOW TOC
SCREEN LE	NGTH:n/a	SLOT SIZE: n/a	r.d. of	WELL n/a	BELOW TOC	DAT	E OF WATER LEV	EL: n/a
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BL CO	.OW UNTS	COMMENTS		BORING COMPLETION	WELL DESCRIPTION
-10 -		Brown, silty clay, dry. Tan, medium grained sand with some silt, dry. Tan, medium grained sand with some silt, slightly moist.	2,3,	, 5				
-20 -		Tan, medium grained sand with some silt, slightly moist.						
-25 -		Tan, medium grained sand with some silt, wet. Tan, medium grained sand with some silt, wet.			Total depth (30'.	ġ		

GEO	11			FIELD	BOREHO	LE LOG		
GEU	GENES	SIS ENVIRONMENTAL CONS Vest Baseline Road Little Rock, / (501) 455-2199 Fax (501)	ULTING, INC AR 72209 455-4547	BOREHOLE COORDINAT	NO.: B-51 TOT ES: 237.55' TOC ELEV	TAL DEPTH: 130' ATION: n/a		
	PROJECT	TINFORMATION		DRILLING INFORMATION				
PROJEC	T: Plum I	Point Energy Station	DRIL	LING CO.: A	Anderson Engineeri	ng		
SITE LO	CATION: O	Dsceola , AR	DRIL	LER: J	ay and Wayne Joh	nson		
JOB NO.	: 0:	1008	RIG	TYPE: C	CME 55			
LOGGE	BY: T	G/ME	MET	HOD OF DRIL	LING: Wash rotar	y		
DATE D	RILLED: 4/	/4/01	SAM	IPLING METHO	ODS: Split Spoon			
GRAVEL PA	ACK: n/a	SEAL: n/a	GROUT	: n/a		Page 1 of 3		
CASING/SC	REEN TYPE:n/a	/a DIAMETER: n/a C	ASING LENGTH	l: n/a	STATIC WATER LEVE	L:n/a BELOW TOC		
SCREEN LE	ENGTH:n/a	SLOT SIZE: n/a T.	D. OF WELL n/	a BELOW TOC	DATE OF WATER LEV	/EL: n/a		
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION		
-10 -		Brown clay with some silt, moist. Brown to tan, clay with some silt and black organics, moist. Tan to brown, fine to coarse grained sand with brown clay, moist.	2,3,3 8,10,10 8,10,15	Pushed shelby tube from 3'- 5'.				
-20 -		Brown to gray, clayey sand, fine to coarse grained, wet.	8,11,15					
-30 -	1 2 2 2 2 2 2 2 2 2 2 2 2 2	Brown to gray, fine to coarse grained sand with gray clay.	4,6,6					
-35 -		Gray to brown, medium to coarse grained sand,	6,13,14					

PROJE	CT: Plum I	Point Energy Station	•	BOREHOLE NO.: B-51 Page 2 of 3			
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPT	
_		rounded to subangular,					
-		with some sitt.		·			
		Gray clay with sand.	2,2,3				
-40 -	-7-7-7-7-7						
	-X-X-X-X-X						
	-7-7-7-7-7						
-45 -	-7-7-7-7-7	Gray clay and gray sand.	5,20,25+				
	-7-7-7-7-7						
. 41	-X-X-X-X-X						
1	-7-7-7-7-7						
-50 -	-7-7-7-7-7	Gray, clayey, fine to medium grained sand.	8,13,16				
	-7-7-7-7-7-7						
	-7-7-7-7-7						
	-7-7-7-7-7-7					•	
-55 -	-X-X-X-X-X						
	-7-7-7-7-7						
	- <u>X-X-X-X-X</u>						
		Gray to tan, fine to	5,31,14+				
-60 -		medium grained sand.					
4							
-65 -							
-70 -		Gray, fine to coarse grained sand.	5,24,25				
-							
-75 -						•	
-80		Gray, fine to coarse	5,17,28+				
	00	grained sand with minor gravel.					
	NO O						
	0,0						
-85 -							
	$\left \right\rangle $						
11	0.0						

GENES PROJE	SIS ENVIRC CT: Plum F	ONMENTAL CONSULTING, INC Point Energy Station	•	BOREH	IOLE NO.: B-51 Page	3 of 3
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-90 -	0.0	Gray, fine to coarse grained sand with minor				
	0.00	gravel.				
	0,0					
-95 -	0,0					
	\mathcal{O}					
-100	0					
-	0.0					
-	0,0					
-105	0,0					
-	0,0					
	$\mathcal{O}_{\mathcal{O}}$					
-110	0	Gray, fine to coarse grained sand and gravel.	6,23,21+			
-	0 0					
-	00					
-115	0.00					
	0,0					
	0,0					
-120	0,0					
	0.00					
	010					
-125-	0 0					
	0.0					•
_130	0.0	Gray, fine to coarse	6,26,23	Total depth @		•
-130		grained sand and gravel with black organics.		130'.		

GEC // GENE // 11400 Phone	ESIS ENVIRONMENTAL CONS West Baseline Road Little Rock, 2 (501) 455-2199 Fax (501)	ULTING, INC. AR 72209 455-4547	BOREHOLE I COORDINATI ELEVATION:	BOREHO NO.: B-52/PZ-4 TOT ES: 488458.36N 1916 TOC ELEV	LE LOG TAL DEPTH: 30' 820.21E ATION: 240.50'					
PROJEC	CT INFORMATION		DRILLI	NG INFORMATI	ON					
PROJECT: Plum	Point Energy Station	DRIL	LING CO.: A	nderson Engineeri	ing					
SITE LOCATION:	Osceola, AR	LER: J	ay and Wayne Joh	nson						
JOB NO.:	01008	TYPE: C	CME 55							
LOGGED BY: TG METHOD OF DRILLING: Wash rotary										
DATE DRILLED: 4/12/01 SAMPLING METHODS: Split Spoon										
GRAVEL PACK: 10-20 S	and SEAL: Bentonite pellets	GROUT:	Bentonite chips	-	Page 1 of 1					
CASING/SCREEN TYPE:I	PVC DIAMETER: 2-inch C	ASING LENGTH	: 19.43'	STATIC WATER LEVE	L: 19.55' BELOW TOC					
SCREEN LENGTH:10'	SLOT SIZE: 0.010 T	D. OF WELL 29	.43' BELOW TOC	DATE OF WATER LEV	/EL: 5/02/01					
DEPTH SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING	WELL DESCRIPTION					
0 -5 -10 -15 -20 -20 -20 -15 -15 -20 -20 -20 -20 -20 -20 -20 -20	<pre>Brown, silty clay. Brown and gray clay with organics. Tan, medium grained sand with trace gray clay. Brown to gray clay with medium grained sand. Brown to tan, medium</pre>	1,1,1 4,8,10 2,3,5 3,15,15	Pushed shelby tube from 3'- 5'. Hit H2O @ 20'		3' stick-up Bentonite chips from 12.43' to surface. Bentonite pellets from 12.43' to 14.43' 10-20 sand from 14.43' to 26.43'.					

GEC	// GEN // 11400 // Phone	ESIS EI West Ba e: (501) 45	VVIRONMENTAL CONS seline Road Little Rock, 55-2199 Fax (501)	ULTIN AR 722 455-45	IG, INC :09 47	— во со ЕЦ	REHOLE ORDINAT	D B NO.: TES: 236.	OREHO B-53 TO 488449.47N 1910 47' TOC ELEV	PLE LOG DTAL DEPTH: 30' 6320.29E /ATION: n/a
F	PROJEC	CT INF	ORMATION	I	DRILLI	NG	INFORMAT	ION		
PROJECT	: Plum	Point	Energy Station	LING	CO.: /	Ande	rson Engineer	ring		
SITE LOC	ATION:	Osceol	a, AR	LER:	J	Jay a	nd Wayne Jol	nson		
JOB NO.:		01008		TYPE:	(CME	55			
LOGGED	BY:	ME			MET	HOD	of Dril	LIN	G: Wash rotai	ry i
DATE DRI	LLED:	4/13/01	L		SAM	IPLING	S METH	ODS	: Split Spoor	1
GRAVEL PAC	:K: n/a		SEAL: n/a		GROUT	: n/a				Page 1 of 1
CASING/SCR	EEN TYPE:	n/a	DIAMETER: n/a C	ASING	LENGTH	l: n/a		ST	ATIC WATER LEV	EL:n/a BELOW TO
SCREEN LEN	GTH:n/a		SLOT SIZE: n/a T	.D. OF	WELL n/a	a BE	LOW TOC	DA	TE OF WATER LE	VEL: n/a
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	BL CO	OW UNTS	CO	MMENTS	\$	BORING COMPLETION	WELL DESCRIPTION
-10152020	$\begin{array}{c} H \\ H $	Brown clay, Brown clay, Brown, fine c	to gray, silty slightly moist. to gray, silty slightly moist. silty clay with grained sand, moist. silty, fine to a grained sand, wet.	2,3, 1,3, 3,8, 2,8,	4 3 9 12	Hit H:	20 @ 20'			

GEC	// GEN	ESIS EN		SULT	ING, INC	c.	FIELD BOREHOLE) E	ВОREHO в-54 тот	LE LOG
	// Phone	e: (501) 45	5-2199 Fax (50		COORDINATES: 488440.58N 1915820.36E ELEVATION: 236.59' TOC ELEVATION: n/a					
	PROJEC	CT INF	ORMATION		DRILLI	NG	INFORMATI	ON		
PROJEC	T: Plum	Point	Energy Station	LLIN	IG CO.: A	nd	erson Engineer	ing		
SITE LOO	CATION:	Osceol	a, AR	R: J	ay a	and Wayne Joh	nson			
JOB NO.	:	01008		PE: C	CMI	E 55				
LOGGE	BY:	TG		гно	D OF DRIL	LIN	G: Wash rotar	у		
DATE DR	RILLED:	4/04/01	t i statione		SAN	/IPLI	ING METHO	DDS	S: Split Spoon	
GRAVEL PA	CK: n/a		SEAL: n/a		GROUT	T: n/a				Page 1 of 2
CASING/SC	REEN TYPE:	n/a	DIAMETER: n/a	CASIN	G LENGT	H:	n/a	ST	ATIC WATER LEVE	L:n/a BELOW TO
SCREEN LE	NGTH:n/a		SLOT SIZE: n/a	T.D. OI	F WELL n	/a	BELOW TOC	DA	TE OF WATER LEV	/EL: n/a
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	E C	BLOW OUNTS	C	COMMENTS		BORING COMPLETION	WELL DESCRIPTION
		Brown,	silty clay.							
-										·
-5 -		Brown some s	to tan clay with ilt, moist.	2,3	3,4		,			
								*		
						Pus	shed shelby			
		Brown	to tan clay with			tub 10'	be from 8'- '.			-
-10 -		some s	siit, moist.							
		-								
		Brown	to tan clav with	2.	1.2					
-15 -		some s	silt, moist.		, -					
-		-								
-20		Gray of silt.	lay with trace	1,	2,2					
		moist								
										No. 19
-										
		Gray,	fine grained sand,	5,	9,15					
-25 -		round silt.	to subangular, som	e						
-										
-										
11										

GENES PROJE	SIS ENVIRO	DINMENTAL CONSULTING, INC Point Energy Station	BOREH	OLE NO.: B-54 Page	2 of 2	
DEPTH	SOIL SYMBOL	SOIL DESCRIPTION	BLOW COUNTS	COMMENTS	BORING COMPLETION	WELL DESCRIPTION
-30	222222 222222 222222 222222 222222 22222	Gray, fine sandy clay with black minerals.	5,12,16			
-35 -	2-2-2-2-2-	Gray, fine sand, rounded to subrounded, with organics.	5,19,25			
-40 -		Gray, fine to medium grained sand, subrounded to subangular with some silt.	5,25,20+			
-45 -		Gray, medium to coarse grained sand, subrounded to rounded with some silt.	6,25,19+			
						· · ·
-50 -		Gray, medium to coarse grained sand, subrounded to rounded with some silt and gravel.	4,26,20	Total depth @ 50'.		



	_					FIELD	B	DREHO	E LOG				
GE	C // GEN	ESIS EI	VIRONMENTAL CONS		G, INC.	BOREHOLE	NO.: B	-56/PZ-13 TOT	AL DEPTH: 30'				
	// 11400 // Phone) West Ba e: (501) 4	55-2199 Fax (501)	455-4547	9	COORDINATES: 490020.28N 1920187.86E							
						ELEVATION:		TOC ELEV	ATION: 246.74'				
	PROJECT INFORMATION DRILLING INFORMATION												
PROJE	CI: Plum	um Point Energy Station DRILLING CO.: Anderson Engineering											
SHEL	JCATION:	Usceol	a, AK		DRILLER: Paul Harris								
JOBING		01008 ME				G TYPE: Simco 2400 SKL							
	LOGGED BY: ME METHOD OF DRILLING: 6.25" diam. solid flight												
GRAVEL	PACK: 10-20 \$	Sand	SEAL: Bentonite Pellets		BROUT: B	entonite Chips		Spin Spoor	Page 1 of 1				
CASING/S	SCREEN TYPE:	PVC	DIAMETER: 2-inch C	ASING L	ENGTH:	18.17'	STAT	IC WATER LEVE	L: 14.85 BELOW TOC				
SCREEN	LENGTH:10'		SLOT SIZE: 0.010 T.	D. OF W	ELL 28.17	BELOW TOC	DATE	OF WATER LEV	EL: 5/02/01				
DEPTH	SOIL SYMBOL	SO	IL DESCRIPTION	BLO	W NTS	COMMENTS	c	BORING COMPLETION	WELL DESCRIPTION				
													
0 -									up.				
	=: ± : ± :												
-							-						
-5 -	Ξ:Ξ	Brown, slight	silty clay, tly moist.	2,2,2		· · · ·			Bentonite chips from				
									surface to 13'.				
-10		Brown	silty clay, moist.	1,2,2	2								
	Ξ:Ξ:Ξ								Pontonito				
	-T -T -T	Gray,	clayey silt, very	4,4,3					pellets from				
-15 -		moist	•						10-20				
-					Hi	t H2O @ 18'			from 14.5' to				
-		Creation		1 2					<i>د</i> ار .				
-20 -		some	fine sand, wet.	1,2,4	Sw	vitched to							
-					hc au	ollow stem ngers due to							
					ca	ave-ins and	to						
-25 -		Gray, some	clayey silt, with fine sand, wet.		cc pi	lezometer.							
-													
-													
-30-		Gray,	clayey silt, with		To	otal depth @							
		Some	Line bunu, wet.		30								
11		L		الـ	l		JL		L				

GEC) // GEN	ESIS EI	VVIRONMENTAL CONS	ULTI	NG, INC	с.) E	B-57/PZ-14 TO	LE LOG
	// 11400 // Phone) West Ba e: (501) 45	seline Road Little Rock, 55-2199 Fax (501)	E	COORDINATES: n/a ELEVATION: n/a TOC ELEVATION: n/a					
	PROJE	CT INF	ORMATION		DRILL	ING	SINFORMATI	ON		
PROJECT: Plum Point Energy Station DRILLING CO.: Anderson Engineering										ing
SITE LC	CATION:	Osceol	a, AR	LLEF	8: · · · ·	Jay	and Wayne Joh	nson		
JOB NC).:	01008		TYP	E:	СМ	E 55			
LOGGE	D BY:	MR/M	E		ME	THO	OF DRI	LLIN	G: Wash rotar	y
DATE D	RILLED:	4/24/01	L		SAN	APLIN	NG METH	OD	S: n/a	
GRAVEL P	ACK: 10-20	Sand	SEAL: Bentonite		GROUT	T: Ben	tonite			Page 1 of 1
CASING/S	CREEN TYPE	PVC	DIAMETER: 4-inch C	ASING	LENGT	H: 1	9.92'	S	TATIC WATER LEVE	EL: 19.74' BELOW TO
SCREEN L	ENGTH:20'		SLOT SIZE: 0.010 T	D. OF	WELL 3	9.92	BELOW TOO	; D/	ATE OF WATER LEV	/EL: 5/02/01
DEPTH	SOIL SYMBOL	so	IL DESCRIPTION	BL CC		С	OMMENTS	3	BORING COMPLETION	WELL DESCRIPTION
0 -						Logo cutt	ged by ings.			4" pumping well 2' of stick-u
-5 -		Brown, slight plasti	silty clay, ly moist, low city.							Bentonite chips from surface to
-10 -		Tan, f with s	ine to coarse sand some silt, moist.							16'.
-15		moist.	jular to subrounded,							Bentonite pellets from 16' to 18'.
-20 -		subang wet.	gular to subrounded,							10-20 sand from 18' to 38'.
-25		subang wet.	gular to subrounded,							
-30 -										
-35 -		Tan, f subang wet.	fine to coarse sand, gular to subrounded,			Tota 40'	al depth	e		Heaved sand 38'.
- 10										

ł

APPENDIX E BOREHOLE SUBSURFACE GEOPHYSICAL LOGS

GEC Project No. 01008












- --



 $\widehat{}$

~



 \sim

•

l







Ç.

APPENDIX F PUMP TEST DATA

GEC Project No. 01008

Ý

Date	Time	C ET (min) F	than[2] eet H2O	Date	Time	C ET (min) F	han[2] eet H2O	Date	Time	ET (min) F	than[2] eet H2O
4/24/01	11:01:28	1.4728	0	4/24/01	11:10:32	10.5413	0.025	4/24/01	11:42:46	42.7762	0.052
4/24/01	11:01:33	1.5613	0.002	4/24/01	11:11:10	11.168	0.013	4/24/01	11:43:46	43.7762	0.054
4/24/01	11:01:39	1.6547	-0.009	4/24/01	11:11:49	11.8312	0.023	4/24/01	11:44:46	44.7762	0.052
4/24/01	11:01:45	1.753	0.012	4/24/01	11:12:32	12.5347	0.021	4/24/01	11:45:46	45.7762	0.054
4/24/01	11:01:51	1.858	0	4/24/01	11:13:16	13.2795	0.021	4/24/01	11:46:46	46.7762	0.055
4/24/01	11:01:58	1.9678	0	4/24/01	11:14:04	14.0695	0.023	4/24/01	11:47:46	47.7762	0.056
4/24/01	11:02:05	2.0845	0.004	4/24/01	11:14:54	14.9062	0.017	4/24/01	11:48:46	48.7762	0.059
4/24/01	11:02:12	2.2097	0.004	4/24/01	11:15:47	15.7913	0.027	4/24/01	11:49:46	49.7762	0.057
4/24/01	11:02:20	2.3412	0.002	4/24/01	11:16:43	16.7295	0.031	4/24/01	11:50:46	50.7762	0.057
4/24/01	11:02:28	2.4812	0.004	4/24/01	11:17:43	17.723	0.034	4/24/01	11:51:46	51.7762	0.057
4/24/01	11:02:37	2.6297	0.002	4/24/01	11:18:46	18.7762	0.038	4/24/01	11:52:46	52.7762	0.057
4/24/01	11:02:47	2.7863	0.002	4/24/01	11:19:46	19.7762	0.042	4/24/01	11:53.46	53.7762	0.057
4/24/01	11:02:57	2.953	0.002	4/24/01	11:20:46	20.7762	0.042	4/24/01	11:54:46	54.7762	0.057
4/24/01	11:03:07	3.1297	0.008	4/24/01	11:21:46	21.7762	0.044	4/24/01	11:55:46	55.7762	0.063
4/24/01	11:03:19	3.3162	0.004	4/24/01	11:22:46	22.7762	0.042	4/24/01	11:56:46	56.7762	0.061
4/24/01	11:03:30	3.5145	0.004	4/24/01	11:23:46	23.7762	0.04	4/24/01	11:57:46	57.7762	0.061
4/24/01	11:03:43	3.7245	0.002	4/24/01	11:24:46	24.7762	0.044	4/24/01	11:58:46	58.7762	0.055
4/24/01	11:03:56	3.9463	0.006	4/24/01	11:25:46	25.7762	0.046	4/24/01	11:59:46	59.7762	0.057
4/24/01	11:04:10	4.1812	0.01	4/24/01	11:26:46	26.7762	0.046	4/24/01	12:00:46	60.7762	0.061
4/24/01	11:04:25	4.4295	0.01	4/24/01	11:27:46	27.7762	0.046	4/24/01	12:01:46	61.7762	0.055
4/24/01	11:04:41	4.6928	0.01	4/24/01	11:28:46	28.7762	0.046	4/24/01	12:02:46	62.7762	0.065
4/24/01	11:04:58	4.9728	0.012	4/24/01	11:29:46	29.7762	0.046	4/24/01	12:03:46	63.7762	0.060
4/24/01	11:05:16	5.2697	0.01	4/24/01	11:30:46	30.7762	0.048	4/24/01	12:04:46	64.7762	0.071
4/24/01	11:05:35	5.583	0.019	4/24/01	11:31:46	31.7762	0.046	4/24/01	12:05:46	65.7762	0.073
4/24/01	11:05:54	5.9145	0.019	4/24/01	11:32:46	32.7762	0.048	4/24/01	12:06:46	66.7762	0.076
4/24/01	11:06:16	6.2663	0.013	4/24/01	11:33:46	33.7762	0.048	4/24/01	12:07:46	67.7762	0.078
4/24/01	11:06:38	6.6395	0.011	4/24/01	11:34:46	34.7762	0.046	4/24/01	12:08:46	68.7762	0.078
4/24/01	11:07:02	7.0345	0.011	4/24/01	11:35:46	35.7762	0.042	4/24/01	12:09:46	69.7762	0.076
4/24/01	11:07:27	7.453	0.015	4/24/01	11:36:46	36.7762	0.042	4/24/01	12:10:46	70.7762	0.076
4/24/01	11:07:53	7.8962	0.011	4/24/01	11:37:46	37.7762	0.046	4/24/01	12:11:46	71.7762	0.082
4/24/01	11:08:22	8.3663	0.013	4/24/01	11:38:46	38.7762	0.046	4/24/01	12:12:46	72.7762	0.085
4/24/01	11:08:51	8.8645	0.015	4/24/01	11:39:46	39.7762	0.044	4/24/01	12:13:46	73.7762	0.084
4/24/01	11:09:23	9.3913	0.017	4/24/01	11:40:46	40.7762	0.046	4/24/01	12:14:46	74.7762	0.075
4/24/01	11:09:57	9.9497	0.021	4/24/01	11:41:46	41.7762	0.05	4/24/01	12:15:46	75.7762	0.076

Xu0 121646 Br/TB2 0.17 4/24/01 12:55:46 11.7782 0.177 4/24/01 13:25:46 14.7762 Xu0 12:16:46 77.7762 0.071 4/24/01 12:55:46 11.7782 0.177 4/24/01 13:25:46 14.7762 0.177 4/24/01 13:25:46 14.7762 0.177 4/24/01 13:25:46 14.7762 0.177 4/24/01 13:27:46 14.7762 17.762 Xu01 12:21:46 81.7762 0.077 4/24/01 12:55:46 11.7782 0.177 4/24/01 13:27:46 14.7762 Xu01 12:23:46 81.7762 0.177 4/24/01 13:27:46 15.7762 17.762 Xu01 12:23:46 81.7762 0.176 4/24/01 13:30:46 15.7762 16.7762 17.762 Xu01 12:23:46 81.7762 0.176 4/24/01 13:30:46 15.7762 17.762 Xu01 12:23:46 81.7762 0.177 4/24/01 13:30:46 15.7762	ate	Time	C ET (min) F	han[2] eet H2O	Date	Time	C ET (min) F	han[2] eet H2O	Date	Time	C ET (min) F	han[2] eet H2O
$ \begin{array}{ ccccccccccccccccccccccccccccccccccc$	5	12:16:46	76.7762	0.075	4/24/01	12:50:46	110.7762	0.177	4/24/01	13:24:46	144.7762	0.168
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	5	12:17:46	77.7762	0.076	4/24/01	12:51:46	111.7762	0.175	4/24/01	13:25:46	145.7762	0.168
01 $12:29:46$ 73.7762 0.071 47.2401 $12:27:46$ 14.7762 0.177 42.401 $13:27:46$ 14.7762 01 $12:20:46$ 80.7762 0.073 42.401 $12:30:46$ 15.7762 16.7762 01 $12:22:46$ 82.7762 0.096 42.401 $12:35:46$ 14.7762 15.7762 01 $12:23:46$ 85.7762 0.117 42.401 $3:33:46$ 55.7762 01 $12:23:46$ 85.7762 0.117 42.401 $3:33:46$ 55.7762 01 $12:23:46$ 85.7762 0.172 42.401 $3:33:46$ 55.7762 01 $12:23:46$ 85.7762 0.172 42.401 $3:33:46$ 55.7762 01 $12:23:46$ 85.7762 0.176 0.172 42.401 $3:33:46$ 55.7762 01 $12:23:46$ 85.7762 0.176 42.401 $3:33:46$ 55.7762 01 $12:364$	5	12:18:46	78.7762	0.071	4/24/01	12:52:46	112.7762	0.177	4/24/01	13:26:46	146.7762	0.17
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5	12:19:46	79.7762	0.071	4/24/01	12:53:46	113.7762	0.177	4/24/01	13:27:46	147.7762	0.166
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	2	12:20:46	80.7762	0.073	4/24/01	12:54:46	114.7762	0.179	4/24/01	13:28:46	148.7762	0.164
01 1222:46 82.7762 0.086 4/24/01 12:56:46 16.7762 0.176 4/24/01 13:30:46 15.7762 01 12225:46 8.7762 0.098 4/24/01 12:57:46 117.7762 0.178 4/24/01 13:30:46 15.7762 01 12:25:46 8.7762 0.198 4/24/01 13:30:46 15.7762 01 12:25:46 8.7762 0.113 4/24/01 13:30:46 15.7762 01 12:26:46 19.7762 0.113 4/24/01 13:30:46 15.7762 01 12:26:46 19.7762 0.113 4/24/01 13:33:46 15.7762 01 12:26:46 19.7762 0.117 4/24/01 13:33:46 15.7762 01 12:26:46 13:01:46 13:01:46 13:01:46 12.7762 15.7762 01 12:26:48 13:01:46 12:0702 0.116 4/24/01 13:33:46 15.7762 01 12:20:48 13:01:46 12:0101	5	12:21:46	81.7762	0.076	4/24/01	12:55:46	115.7762	0.177	4/24/01	13:29:46	149.7762	0.166
01 12233:46 83.7762 0.094 4/24/01 13:51:46 151.7762 01 1223:46 85.7762 0.196 4/24/01 13:33:46 151.7762 01 1223:46 85.7762 0.116 4/24/01 13:33:46 151.7762 01 1223:46 85.7762 0.116 4/24/01 13:33:46 155.7762 01 1223:46 87.7762 0.165 4/24/01 13:33:46 155.7762 01 1223:46 81.7762 0.163 4/24/01 13:33:46 155.7762 01 1223:46 91.7762 0.116 4/24/01 13:35:46 155.7762 01 1223:46 91.7762 0.184 4/24/01 13:35:46 155.7762 01 1223:46 91.7762 0.184 4/24/01 13:35:46 155.7762 01 1223:46 91.7762 0.184 13:05:46 155.7762 0.176 4/24/01 13:35:46 155.7762 01 1223:46 92.7762	5	12:22:46	82.7762	0.086	4/24/01	12:56:46	116.7762	0.177	4/24/01	13:30:46	150.7762	0.166
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	6	12:23:46	83.7762	0.094	4/24/01	12:57:46	117.7762	0.176	4/24/01	13:31:46	151.7762	0.164
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	6	12:24:46	84.7762	0.098	4/24/01	12:58:46	118.7762	0.18	4/24/01	13:32:46	152.7762	0.164
01 12:26:46 86.7762 0.136 4/24/01 13:00:46 12.07762 0.174 4/24/01 13:34:46 15.7762 01 12:27:46 87.7762 0.156 4/24/01 13:01:46 15.7762 0.174 4/24/01 13:33:46 15.7762 01 12:27:46 87.7762 0.176 4/24/01 13:30:46 15.7762 0.176 4/24/01 13:33:46 15.7762 01 12:30:46 90.7762 0.176 4/24/01 13:30:46 15.7762 0.176 4/24/01 13:33:46 15.7762 01 12:31:46 91.7762 0.176 4/24/01 13:30:46 15.7762 0.176 4/24/01 13:33:46 15.7762 01 12:33:46 93.7762 0.176 4/24/01 13:30:46 15.7762 0.1762 15.7762 01 12:33:46 95.7762 0.168 4/24/01 13:30:46 15.7762 0.176 4/24/01 13:31:46 16.7762 01 12:33:46 95.7762 <td>0</td> <td>12:25:46</td> <td>85.7762</td> <td>0.116</td> <td>4/24/01</td> <td>12:59:46</td> <td>119.7762</td> <td>0.172</td> <td>4/24/01</td> <td>13:33:46</td> <td>153.7762</td> <td>0.168</td>	0	12:25:46	85.7762	0.116	4/24/01	12:59:46	119.7762	0.172	4/24/01	13:33:46	153.7762	0.168
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	6	12:26:46	86.7762	0.136	4/24/01	13:00:46	120.7762	0.168	4/24/01	13:34:46	154.7762	0.17
(0) 12:28:46 88.7762 0.168 4/24/01 13:02:46 12:36:46 156.7762 (0) 12:28:46 89.7762 0.179 4/24/01 13:02:46 12:37:762 0.176 4/24/01 13:03:46 157.7762 (0) 12:29:46 89.7762 0.179 4/24/01 13:03:46 12:37.762 0.1763 4/24/01 13:03:46 157.7762 0.1763 4/24/01 13:03:46 15.7762 0.1763 4/24/01 13:03:46 15.7762 0.1763 4/24/01 13:03:46 12.77762 0.1763 4/24/01 13:03:46 15.7762 0.1763 4/24/01 13:03:46 15.7762 0.1763 4/24/01 13:07:46 15.7762 0.1763 4/24/01 13:07:46 15.7762 0.1762 4/24/01 13:47:46 16.77762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 16.7762 1762 16.7762 16.7762	6	12:27:46	87.7762	0.155	4/24/01	13:01:46	121.7762	0.174	4/24/01	13:35:46	155.7762	0.17
(0) 12:28:46 89.7762 0.179 4/24/01 13:37:46 157.7762 (0) 12:30:46 90.7762 0.173 4/24/01 13:37:46 157.7762 (0) 12:30:46 90.7762 0.173 4/24/01 13:37:46 157.7762 (0) 12:33:46 91.7762 0.173 4/24/01 13:37:46 157.7762 (0) 12:33:46 95.7762 0.184 4/24/01 13:37:46 157.7762 (0) 12:33:46 95.7762 0.184 4/24/01 13:07:46 127.7762 (0) 12:33:46 95.7762 0.184 4/24/01 13:41:46 161.7762 (0) 12:33:46 95.7762 0.184 4/24/01 13:41:46 161.7762 (0) 12:36:46 95.7762 0.184 128.7762 0.173 4/24/01 13:41:46 161.7762 (1) 12:37:46 13:1762 0.173 4/24/01 13:41:46 161.7762 (1) 12:3762 0.184	6	12:28:46	88.7762	0.168	4/24/01	13:02:46	122.7762	0.17	4/24/01	13:36:46	156.7762	0.166
(0) 12:30:46 90.7762 0.185 4/24/01 13:04:46 12:47762 0.173 4/24/01 13:38:46 158.7762 (0) 12:33:46 91.7762 0.179 4/24/01 13:40:46 160.7762 (0) 12:33:46 92.7762 0.184 4/24/01 13:40:46 160.7762 (0) 12:33:46 93.7762 0.184 4/24/01 13:07:46 161.7762 (0) 12:33:46 95.7762 0.184 4/24/01 13:07:46 161.7762 (0) 12:33:46 95.7762 0.184 4/24/01 13:07:46 163.7762 (0) 12:34:46 95.7762 0.184 4/24/01 13:07:62 0.175 (0) 12:37:46 95.7762 0.18 4/24/01 13:41:66 163.7762 (0) 12:37:46 96.7762 0.18 4/24/01 13:41:66 163.7762 (0) 12:37:46 97.7762 0.173 4/24/01 13:41:66 167.7762 (1) <	6	12:29:46	89.7762	0.179	4/24/01	13:03:46	123.7762	0.176	4/24/01	13:37:46	157.7762	0.172
(0) 12:31:46 91.7762 0.179 4/24/01 13:05:46 125.7762 0.166 4/24/01 13:39:46 159.7762 (0) 12:33:46 92.7762 0.184 4/24/01 13:05:46 125.7762 0.168 4/24/01 13:40:46 160.7762 (0) 12:33:46 93.7762 0.184 4/24/01 13:07:46 127.7762 0.173 4/24/01 13:41:46 161.7762 (0) 12:35:46 95.7762 0.188 4/24/01 13:07:62 0.173 4/24/01 13:43:46 163.7762 (0) 12:35:46 95.7762 0.183 4/24/01 13:1762 0.173 4/24/01 13:43:46 163.7762 (0) 12:35:46 97.762 0.183 4/24/01 13:1762 0.173 4/24/01 13:43:46 163.7762 (0) 12:37:46 97.762 0.183 4/24/01 13:43:46 165.7762 (0) 12:37:46 13:1762 0.173 4/24/01 13:43:46 167.7762 <td>6</td> <td>12:30:46</td> <td>90.7762</td> <td>0.185</td> <td>4/24/01</td> <td>13:04:46</td> <td>124.7762</td> <td>0.173</td> <td>4/24/01</td> <td>13:38:46</td> <td>158.7762</td> <td>0.172</td>	6	12:30:46	90.7762	0.185	4/24/01	13:04:46	124.7762	0.173	4/24/01	13:38:46	158.7762	0.172
(0) 12:32:46 92.7762 0.184 4/24/01 13:06:46 126.7762 0.17 4/24/01 13:40:46 160.7762 (0) 12:33:46 93.7762 0.188 4/24/01 13:07:46 12:7762 0.17 4/24/01 13:41:46 161.7762 (0) 12:33:46 93.7762 0.188 4/24/01 13:09:46 12:07762 0.173 4/24/01 13:41:46 161.7762 (0) 12:35:46 95.7762 0.187 4/24/01 13:07:46 162.7762 0.173 4/24/01 13:44:46 165.7762 (0) 12:35:46 96.7762 0.187 4/24/01 13:1762 0.173 4/24/01 13:44:46 165.7762 (0) 12:36:46 96.7762 0.176 0.173 4/24/01 13:44:46 165.7762 (0) 12:36:46 98.7762 0.173 4/24/01 13:44:46 165.7762 (0) 12:36:46 91.7762 0.173 4/24/01 13:48:46 166.7762 (0	6	12:31:46	91.7762	0.179	4/24/01	13:05:46	125.7762	0.166	4/24/01	13:39:46	159.7762	0.176
(0) 12:33:46 93.7762 0.18 4/24/01 13:07:46 127.7762 0.17 4/24/01 13:41:46 161.7762 (0) 12:33:46 94.7762 0.184 4/24/01 13:08:46 127.7762 0.173 4/24/01 13:41:46 161.7762 (0) 12:35:46 95.7762 0.184 4/24/01 13:09:46 120.7762 0.173 4/24/01 13:41:46 161.7762 (1) 12:35:46 95.7762 0.183 4/24/01 13:1762 0.173 4/24/01 13:41:46 167.7762 (0) 12:35:46 95.7762 0.183 4/24/01 13:1762 0.173 4/24/01 13:41:46 167.7762 (0) 12:36:46 13:1762 0.173 4/24/01 13:41:46 167.7762 (0) 12:36:46 13:1762 0.173 4/24/01 13:46:46 167.7762 (1) 12:41:46 13:1762 0.173 4/24/01 13:46:46 167.7762 (1) 12:40:46 13:1	6	12:32:46	92.7762	0.184	4/24/01	13:06:46	126.7762	0.168	4/24/01	13:40:46	160.7762	0.175
(0) 12:34:46 94.7762 0.184 4/24/01 13:08:46 128.7762 0.173 4/24/01 13:42:46 65.7762 (0) 12:35:46 95.7762 0.188 4/24/01 13:09:46 129.7762 0.172 4/24/01 13:43:46 65.7762 (0) 12:35:46 95.7762 0.187 4/24/01 13:1762 0.173 4/24/01 13:45:46 165.7762 (0) 12:35:46 95.7762 0.187 4/24/01 13:1762 0.175 4/24/01 13:47:62 (0) 12:37:46 97.7762 0.187 4/24/01 13:1762 0.175 4/24/01 13:47:66 165.7762 (0) 12:37:46 97.7762 0.173 4/24/01 13:47:66 165.7762 (0) 12:38:46 98.7762 0.185 4/24/01 13:47:62 16.7762 (1) 12:31:46 13:1762 0.173 4/24/01 13:47:62 16.7762 (0) 12:34:46 13:17762 0.173 4/24/01 <td>6</td> <td>12:33:46</td> <td>93.7762</td> <td>0.188</td> <td>4/24/01</td> <td>13:07:46</td> <td>127.7762</td> <td>0.17</td> <td>4/24/01</td> <td>13:41:46</td> <td>161.7762</td> <td>0.172</td>	6	12:33:46	93.7762	0.188	4/24/01	13:07:46	127.7762	0.17	4/24/01	13:41:46	161.7762	0.172
01 12:35:46 95.7762 0.188 4/24/01 13:09:46 129.7762 0.173 4/24/01 13:43:46 65.7762 01 12:35:46 96.7762 0.187 4/24/01 13:10:46 130.7762 0.173 4/24/01 13:45:46 165.7762 01 12:35:46 97.7762 0.187 4/24/01 13:1762 0.175 4/24/01 13:45:46 165.7762 01 12:37:46 98.7762 0.173 4/24/01 13:47:46 165.7762 0.173 4/24/01 13:47:46 165.7762 01 12:38:46 98.7762 0.173 4/24/01 13:47:46 165.7762 0.173 4/24/01 13:47:46 165.7762 01 12:38:46 136.7762 0.173 4/24/01 13:47:46 166.7762 01 12:40:46 13:17:62 0.173 4/24/01 13:49:46 166.7762 01 12:40:46 13:17:62 0.173 4/24/01 13:49:46 166.7762 01 12:40:46	5	12:34:46	94.7762	0.184	4/24/01	13:08:46	128.7762	0.173	4/24/01	13:42:46	162.7762	0.173
01 12:36:46 96.7762 0.18 4/24/01 13:10:46 130.7762 0.173 4/24/01 13:44:46 164.7762 01 12:37:46 97.7762 0.187 4/24/01 13:1762 0.175 4/24/01 13:45:46 165.7762 01 12:37:46 97.7762 0.187 4/24/01 13:15:2 0.175 4/24/01 13:45:46 165.7762 01 12:38:46 98.7762 0.191 4/24/01 13:15:2 0.173 4/24/01 13:45:6 166.7762 01 12:38:46 190.7762 0.191 4/24/01 13:15:46 13:7762 0.173 4/24/01 13:45:6 166.7762 01 12:40:46 100.7762 0.19 4/24/01 13:15:46 13:7.7762 0.173 4/24/01 13:45:46 166.7762 01 12:40:46 100.7762 0.19 4/24/01 13:16:2 0.173 4/24/01 13:51:46 170.7762 01 12:41:46 13:7762 0.173 4/24/01 </td <td>5</td> <td>12:35:46</td> <td>95.7762</td> <td>0.188</td> <td>4/24/01</td> <td>13:09:46</td> <td>129.7762</td> <td>0.172</td> <td>4/24/01</td> <td>13:43:46</td> <td>163.7762</td> <td>0.17</td>	5	12:35:46	95.7762	0.188	4/24/01	13:09:46	129.7762	0.172	4/24/01	13:43:46	163.7762	0.17
01 12:37:46 97.7762 0.187 4/24/01 13:11:46 13.1762 0.175 4/24/01 13:45:46 165.7762 01 12:38:46 98.7762 0.189 4/24/01 13:12:46 13:2.7762 0.173 4/24/01 13:45:46 165.7762 01 12:38:46 99.7762 0.191 4/24/01 13:12:46 13:2.7762 0.173 4/24/01 13:45:46 165.7762 01 12:38:46 100.7762 0.191 4/24/01 13:15:46 13:5.7762 0.173 4/24/01 13:45:46 166.7762 01 12:41:46 101.7762 0.19 4/24/01 13:15:46 13:5.7762 0.168 4/24/01 13:5:46 167.7762 01 12:41:46 102.7762 0.19 4/24/01 13:5:46 13:5.7762 0.168 4/24/01 13:5:46 170.7762 01 12:41:46 102.7762 0.183 4/24/01 13:5:46 13:7.7762 0.172 4/24/01 13:5:1:46 170.7762	2	12:36:46	96.7762	0.18	4/24/01	13:10:46	130.7762	0.173	4/24/01	13:44:46	164.7762	0.172
01 12:38:46 98.7762 0.189 4/24/01 13:12:46 132.7762 0.173 4/24/01 13:46:46 166.7762 01 12:38:46 99.7762 0.191 4/24/01 13:13:46 133.7762 0.173 4/24/01 13:47:46 167.7762 01 12:39:46 99.7762 0.191 4/24/01 13:14:46 13.7762 0.173 4/24/01 13:47:46 169.7762 01 12:40:46 100.7762 0.19 4/24/01 13:14:46 13.7762 0.112 4/24/01 13:15:46 169.7762 0.173 4/24/01 13:50:46 170.7762 01 12:41:46 101.7762 0.18 4/24/01 13:15:46 13.77762 0.112 4/24/01 13:57:46 170.7762 01 12:43:46 103.7762 0.18 4/24/01 13:15:46 13:7762 0.112 4/24/01 13:55:46 170.7762 01 12:45:46 103.7762 0.18 4/24/01 13:55:46 173.7762	5	12:37:46	97.7762	0.187	4/24/01	13:11:46	131.7762	0.175	4/24/01	13:45:46	165.7762	0.174
01 12:39:46 99.7762 0.191 4/24/01 13:13:46 13.7762 0.173 4/24/01 13:47:46 167.7762 01 12:40:46 100.7762 0.185 4/24/01 13:43:46 168.7762 01 12:41:46 101.7762 0.185 4/24/01 13:14:46 135.7762 0.173 4/24/01 13:49:46 169.7762 01 12:41:46 101.7762 0.19 4/24/01 13:15:46 135.7762 0.168 4/24/01 13:49:46 169.7762 01 12:42:46 102.7762 0.19 4/24/01 13:16:46 135.7762 0.172 4/24/01 13:51:46 171.7762 01 12:43:46 103.7762 0.183 4/24/01 13:51:46 171.7762 01 12:44:46 103.7762 0.183 139.7762 0.172 4/24/01 13:51:46 171.7762 01 12:44:46 13:17:46 13:7762 0.172 4/24/01 13:55:46 172.7762 01 12:46	5	12:38:46	98.7762	0.189	4/24/01	13:12:46	132.7762	0.17	4/24/01	13:46:46	166.7762	0.174
01 12:40:46 100.7762 0.185 4/24/01 13:14:46 134.7762 0.1173 4/24/01 13:14:46 13:17:42 0.1172 4/24/01 13:15:46 17:1762 0.117 4/24/01 13:15:146 17:1762 0.117 4/24/01 13:51:46 17:1762 01 12:43:46 100.7762 0.18 4/24/01 13:51:46 13:0.7762 0.172 4/24/01 13:51:46 170.7762 01 12:43:46 100.7762 0.183 7/24/01 13:51:46 170.7762 0.172 4/24/01 13:55:46 171.7762 01 12:45:46 <t< td=""><td>5</td><td>12:39:46</td><td>99.7762</td><td>0.191</td><td>4/24/01</td><td>13:13:46</td><td>133.7762</td><td>0.173</td><td>4/24/01</td><td>13:47:46</td><td>167.7762</td><td>0.174</td></t<>	5	12:39:46	99.7762	0.191	4/24/01	13:13:46	133.7762	0.173	4/24/01	13:47:46	167.7762	0.174
01 12:41:46 101.7762 0.19 4/24/01 13:15:46 135.7762 0.168 4/24/01 13:49:46 169.7762 01 12:41:46 102.7762 0.19 4/24/01 13:15:46 136.7762 0.172 4/24/01 13:50:46 170.7762 01 12:42:46 103.7762 0.19 4/24/01 13:17:46 137.7762 0.172 4/24/01 13:51:46 171.7762 01 12:43:46 103.7762 0.18 4/24/01 13:1762 0.172 4/24/01 13:51:46 171.7762 01 12:43:46 103.7762 0.172 4/24/01 13:51:46 171.7762 0.172 4/24/01 13:55:46 172.7762 01 12:45:46 106.7762 0.172 4/24/01 13:55:46 173.7762 01 12:45:46 13:1762 0.172 4/24/01 13:55:46 174.7762 01 12:46:46 140.7762 0.172 4/24/01 13:55:46 175.7762 01 12:46:4	5	12:40:46	100.7762	0.185	4/24/01	13:14:46	134.7762	0.173	4/24/01	13:48:46	168.7762	0.168
01 12:42:46 102.7762 0.19 4/24/01 13:16:46 136.7762 0.172 4/24/01 13:51:46 171.7762 01 12:43:46 103.7762 0.18 4/24/01 13:17:46 137.7762 0.183 4/24/01 13:51:46 171.7762 01 12:43:46 103.7762 0.18 4/24/01 13:17:46 137.7762 0.17 4/24/01 13:51:46 171.7762 01 12:45:46 106.7762 0.18 4/24/01 13:19:46 139.7762 0.172 4/24/01 13:53:46 172.7762 01 12:45:46 106.7762 0.18 4/24/01 13:19:46 139.7762 0.172 4/24/01 13:55:46 172.7762 01 12:45:46 106.7762 0.18 4/24/01 13:52:46 140.7762 0.172 4/24/01 13:55:46 175.7762 01 12:46:46 107.7762 0.172 4/24/01 13:55:46 175.7762 01 12:48:46 107.7762 0.172 4/24/01 13:55:46 175.7762 01 12:48:46 107.7762 <td>2</td> <td>12:41:46</td> <td>101.7762</td> <td>0.19</td> <td>4/24/01</td> <td>13:15:46</td> <td>135.7762</td> <td>0.168</td> <td>4/24/01</td> <td>13:49:46</td> <td>169.7762</td> <td>0.174</td>	2	12:41:46	101.7762	0.19	4/24/01	13:15:46	135.7762	0.168	4/24/01	13:49:46	169.7762	0.174
(01 12:43:46 103.7762 0.18 4/24/01 13:17:46 137.7762 0.183 4/24/01 13:17:46 137.7762 0.17 4/24/01 13:51:46 171.7762 (01 12:44:46 104.7762 0.18 4/24/01 13:18:46 138.7762 0.17 4/24/01 13:52:46 172.7762 (01 12:45:46 105.7762 0.18 4/24/01 13:19:46 139.7762 0.172 4/24/01 13:53:46 173.7762 (01 12:45:46 106.7762 0.172 4/24/01 13:52:46 140.7762 0.172 4/24/01 13:55:46 174.7762 (01 12:46:46 130.7762 0.172 4/24/01 13:55:46 175.7762 (01 12:48:46 106.7762 0.177 4/24/01 13:55:46 175.7762 (01 12:48:46 108.7762 0.177 4/24/01 13:55:46 175.7762 (01 12:48:46 108.7762 0.172 4/24/01 13:55:46 176.7762	δ	12:42:46	102.7762	0.19	4/24/01	13:16:46	136.7762	0.172	4/24/01	13:50:46	170.7762	0.176
(01 12:44:46 104.7762 0.18 4/24/01 13:18:46 138.7762 0.17 4/24/01 13:52:46 172.7762 (01 12:45:46 105.7762 0.18 4/24/01 13:19:46 139.7762 0.172 4/24/01 13:53:46 173.7762 (01 12:46:46 106.7762 0.18 4/24/01 13:20:46 140.7762 0.172 4/24/01 13:55:46 174.7762 (01 12:46:46 100.7762 0.177 4/24/01 13:22:46 141.7762 0.168 4/24/01 13:55:46 175.7762 (01 12:48:46 108.7762 0.177 4/24/01 13:22:46 142.7762 0.172 4/24/01 13:56:46 176.7762 (01 12:48:46 108.7762 0.177 4/24/01 13:56:46 176.7762 (01 12:49:46 108.7762 0.172 4/24/01 13:56:46 176.7762 (01 12:49:46 108.7762 0.172 4/24/01 13:557:46 176.7762	6	12:43:46	103.7762	0.18	4/24/01	13:17:46	137.7762	0.183	4/24/01	13:51:46	171.7762	0.168
(01 12:45:46 105.7762 0.18 4/24/01 13:19:46 139.7762 0.172 4/24/01 13:53:46 173.7762 (01 12:46:46 106.7762 0.18 4/24/01 13:20:46 140.7762 0.172 4/24/01 13:55:46 174.7762 (01 12:46:46 107.7762 0.172 4/24/01 13:21:46 141.7762 0.172 4/24/01 13:55:46 175.7762 (01 12:48:46 107.7762 0.177 4/24/01 13:22:46 142.7762 0.172 4/24/01 13:56:46 175.7762 (01 12:48:46 108.7762 0.177 4/24/01 13:22:46 142.7762 0.172 4/24/01 13:56:46 175.7762 (01 12:48:46 108.7762 0.177 4/24/01 13:22:46 142.7762 0.172 4/24/01 13:57:46 177.7762 (01 12:49:46 108.7762 0.177 4/24/01 13:57:46 177.7762 (01 12:49:46 108.7762 0.177 4/24/01 13:57:46 177.7762	6	12:44:46	104.7762	0.18	4/24/01	13:18:46	138.7762	0.17	4/24/01	13:52:46	172.7762	0.17
01 12:46:46 106.7762 0.18 4/24/01 13:20:46 140.7762 0.172 4/24/01 13:51:46 141.7762 0.168 4/24/01 13:57:46 175.7762 01 12:47:46 107.7762 0.177 4/24/01 13:21:46 141.7762 0.168 4/24/01 13:55:46 175.7762 01 12:48:46 108.7762 0.177 4/24/01 13:22:46 142.7762 0.172 4/24/01 13:55:46 176.7762 01 12:48:46 108.7762 0.177 4/24/01 13:22:46 143.7762 0.172 4/24/01 13:57:46 177.7762 01 12:49:46 109.7762 0.166 4/24/01 13:57:46 177.7762	5	12:45:46	105.7762	0.18	4/24/01	13:19:46	139.7762	0.172	4/24/01	13:53.46	173.7762	0.17
(01 12:47:46 107.7762 0.177 4/24/01 13:21:46 141.7762 0.168 4/24/01 13:55:46 175.7762 (01 12:48:46 108.7762 0.177 4/24/01 13:22:46 142.7762 0.172 4/24/01 13:56:46 176.7762 (01 12:48:46 108.7762 0.177 4/24/01 13:25:46 142.7762 0.172 4/24/01 13:56:46 176.7762 (01 12:49:46 109.7762 0.177 4/24/01 13:57:46 177.7762	6	12:46:46	106.7762	0.18	4/24/01	13:20:46	140.7762	0.172	4/24/01	13:54:46	174.7762	0.166
01 12:48:46 108.7762 0.177 4/24/01 13:22:46 142.7762 0.172 4/24/01 13:56:46 176.7762 01 12:49:46 109.7762 0.177 4/24/01 13:23:46 143.7762 0.166 4/24/01 13:57:46 177.7762	5	12:47:46	107.7762	0.177	4/24/01	13:21:46	141.7762	0.168	4/24/01	13:55:46	175.7762	0.1
01 12:49:46 109.7762 0.177 4/24/01 13:23:46 143.7762 0.166 4/24/01 13:57:46 177.7762	5	12:48:46	108.7762	0.177	4/24/01	13:22:46	142.7762	0.172	4/24/01	13:56:46	176.7762	0.172
	5	12:49:46	109.7762	0.177	4/24/01	13:23:46	143.7762	0.166	4/24/01	13:57:46	177.7762	0.17

0.162 0.162 0.157 0.16 0.16 0.16 0.16 0.16 0.153 0.158 0.162 0.162 0.16 0.162 0.158 0.164 0.161 0.163 0.164 0.162 0.166 0.164 0.166 0.164 0.162 0.166 0.162 ET (min) Feet H2O 0.162 0.164 0.162 0.155 0.157 0.147 0.164 Chan[2] 246.7762 247.7762 248.7762 249.7762 250.7762 251.7762 252.7762 253.7762 254.7762 255.7762 256.7762 257.7762 259.7762 261.7762 262.7762 263.7762 264.7762 265.7762 266.7762 267.7762 268.7762 269.7762 270.7762 271.7762 272.7762 274.7763 278.7763 279.7763 258.7762 260.7762 273.7763 275.7763 276.7763 277.7763 15:06:46 15:07:46 15:08:46 15:09:46 5:10:46 5:11:46 5:15:46 5:19:46 5:27:46 5:28:46 5:12:46 5:13:46 5:14:46 5:16:46 5:17:46 5:18:46 15:20:46 15:21:46 5:22:46 5:23:46 5:24:46 15:25:46 5:26:46 5:29:46 5:30:46 5:31:46 5:32:46 5:33:46 5:34:46 5:35:46 5:36:46 5:37:46 5:38:46 5:39:46 Time 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 1/24/01 1/24/01 4/24/01 Date ET (min) Feet H2O 0.168 0.17 0.166 0.162 0.168 0.17 0.173 0.171 0.169 0.17 0.17 0.17 0.168 0.166 0.168 0.172 0.172 0.172 0.172 0.166 0.168 0.168 0.168 0.166 0.161 0.163 0.163 0.164 0.166 0.169 0.163 0.164 Chan[2] 212.7762 213.7762 216.7762 225.7762 227.7762 229.7762 231.7762 233.7762 214.7762 215.7762 217.7762 218.7762 219.7762 220.7762 221.7762 222.7762 223.7762 224.7762 226.7762 228.7762 230.7762 232.7762 234.7762 235.7762 236.7762 237.7762 238.7762 239.7762 240.7762 241.7762 242.7762 244.7762 245.7762 243.7762 14:34:46 14:35:46 14:33:46 14:36:46 14:37:46 14:32:46 4:38:46 4:39:46 4:41:46 4:40:46 4:43:46 14:44:46 4:45:46 4:46:46 14:47:46 14:49:46 14:50:46 14:51:46 4:52:46 4:53:46 4:54:46 4:56:46 5:00:46 4:42:46 4:48:46 4:55:46 4:57:46 4:58:46 4:59:46 5:01:46 5:02:46 5:03:46 5:04:46 5:05:46 Time 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 1/24/01 1/24/01 4/24/01 4/24/01 Date 0.172 0.166 0.166 0.168 0.168 0.168 0.168 0.168 0.17 0.168 0.168 0.169 0.172 0.168 0.164 0.166 0.172 0.172 0.17 0.166 0.166 0.172 Chan[2] ET (min) Feet H2O 0.168 0.166 0.168 0.17 0.17 0.174 0.166 0.166 0.164 0.17 178.7762 179.7762 180.7762 181.7762 182.7762 185.7762 193.7762 194.7762 195.7762 196.7762 197.7762 198.7762 199.7762 200.7762 201.7762 202.7762 203.7762 204.7762 206.7762 207.7762 208.7762 210.7762 211.7762 183.7762 184.7762 186.7762 187.7762 188.7762 189.7762 190.7762 191.7762 192.7762 205.7762 209.7762 13:58:46 13:59:46 14:00:46 14:22:46 14:23:46 14:24:46 4:25:46 4:26:46 4:27:46 4:28:46 4:29:46 4:30:46 14:01:46 14:02:46 14:04:46 14:10:46 14:11:46 14:12:46 14:14:46 14:15:46 14:16:46 14:18:46 14:19:46 14:20:46 14:21:46 14:31:46 14:03:46 14:05:46 14:06:46 14:07:46 14:08:46 14:09:46 14:13:46 14:17:46 Time 4/24/01 1/24/01 1/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 Date

an[2] et H2O	0.159	0.159	0.153	0.155	0.151	0.157	0.147	0.151	0.157	0.153	0.155	0.155	0.153	0.157	0.157	0.157	0.157	0.155	0.157	0.159	0.157	0.141	0.157	0.159	0.155	0.157	0.155	0.153	0.155	0.157	0.153	0.153	0.157	0.151
Ch (min) Fe	.7763	.7763	.7763	.7763	.7763	1.7763	.7763	.7763	1.7763	.7763	1.7763	0.7763	.7763	.7763	.7763	1.7763	.7763	.7763	1.7763	.7763	1.7763	0.7763	1.7763	.7763	7763	1.7763	.7763	5.7763	1.7763	.7763	1.7763	0.7763	.7763	.7763
Ē	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381
Time	16:48:46	16:49:46	16:50:46	16:51:46	16:52:46	16:53:46	16:54:46	16:55:46	16:56:46	16:57:46	16:58:46	16:59:46	17:00:46	17:01:46	17:02:46	17:03:46	17:04:46	17:05:46	17:06:46	17:07:46	17:08:46	17:09:46	17:10:46	17:11:46	17:12:46	17:13:46	17:14:46	17:15:46	17:16:46	17:17:46	17:18:46	17:19:46	17:20:46	17:21:46
Date	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01
han[2] eet H2O	0.159	0.159	0.161	0.159	0.157	0.159	0.155	0.159	0.164	0.155	0.159	0.153	0.157	0.161	0.159	0.159	0.157	0.147	0.151	0.153	0.159	0.155	0.157	0.155	0.157	0.155	0.153	0.153	0.153	0.155	0.153	0.155	0.155	0.155
C ET (min) Fi	314.7763	315.7763	316.7763	317.7763	318.7763	319.7763	320.7763	321.7763	322.7763	323.7763	324.7763	325.7763	326.7763	327.7763	328.7763	329.7763	330.7763	331.7763	332.7763	333.7763	334.7763	335.7763	336.7763	337.7763	338.7763	339.7763	340.7763	341.7763	342.7763	343.7763	344.7763	345.7763	346.7763	347.7763
Time	16:14:46	16:15:46	16:16:46	16:17:46	16:18:46	16:19:46	16:20:46	16:21:46	16:22:46	16:23:46	16:24:46	16:25:46	16:26:46	16:27:46	16:28:46	16:29:46	16:30:46	16:31:46	16:32:46	16:33:46	16:34:46	16:35:46	16:36:46	16:37:46	16:38:46	16:39:46	16:40:46	16:41:46	16:42:46	16:43:46	16:44:46	16:45:46	16:46:46	16:47:46
Date	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01
than[2] eet H2O	0.156	0.16	0.16	0.16	0.156	0.16	0.158	0.158	0.16	0.16	0.156	0.157	0.157	0.16	0.161	0.158	0.157	0.157	0.163	0.159	0.162	0.163	0.162	0.153	0.161	0.161	0.161	0.163	0.163	0.163	0.161	0.161	0.161	0.159
C ET (min) F	280.7763	281.7763	282.7763	283.7763	284.7763	285.7763	286.7763	287.7763	288.7763	289.7763	290.7763	291.7763	292.7763	293.7763	294.7763	295.7763	296.7763	297.7763	298.7763	299.7763	300.7763	301.7763	302.7763	303.7763	304.7763	305.7763	306.7763	307.7763	308.7763	309.7763	310.7763	311.7763	312.7763	313.7763
Time	15:40:46	15:41:46	15:42:46	15:43:46	15:44:46	15:45:46	15:46:46	15:47:46	15:48:46	15:49:46	15:50:46	15:51:46	15:52:46	15:53:46	15:54:46	15:55:46	15:56:46	15:57-46	15:58:46	15:59:46	16:00:46	16:01:46	16:02:46	16:03:46	16:04:46	16:05:46	16:06:46	16:07:46	16:08.46	16:09:46	16:10:46	16:11:46	16:12:46	16:13:46
Date	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01

....

Jan

Chan[2]	Feet H2O	0.153	0.151	0.151	0.151	0.151	0.152	0.158	0.155	0.157	0.154	0.152	0.151	0.152	0.152	0.152	0.149	0.152	0.149	0.151	0.151	0.151	0.149	0.149	0.153	0.149	0.153	0.153	0.149	0.149	0.147	0.149	0.143	0.149	0.149
	ET (min)	450.7763	451.7763	452.7763	453.7763	454.7763	455.7763	456.7763	457.7763	458.7763	459.7763	460.7763	461.7763	462.7763	463.7763	464.7763	465.7763	466.7763	467.7763	468.7763	469.7763	470.7763	471.7763	472.7763	473.7763	474.7763	475.7763	476.7763	477.7763	478.7763	479.7763	480.7763	481.7763	482.7763	483.7763
	Time	18:30:46	18:31:46	18:32:46	18:33:46	18:34:46	18:35:46	18:36:46	18:37:46	18:38:46	18:39:46	18:40:46	18:41:46	18:42:46	18:43:46	18:44:46	18:45:46	18:46:46	18:47:46	18:48:46	18:49:46	18:50:46	18:51:46	18:52:46	18:53:46	18:54:46	18:55:46	18:56:46	18:57:46	18:58:46	18:59:46	19:00:46	19:01:46	19:02:46	19:03:46
	Date	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01
==	g	157	155	158	154	.16	158	156	156	156	158	156	152	158	156	158	152	149	153	152	151	152	152	151	151	152	149	153	153	155	151	151	153	152	153
Chan[2	Feet H	0	0	ò	Ö	0	ò	ò	ò	ò	ò	0	ò	0	ò	ò	ò	ò	ò	0	ò	Ö	ò	ò	Ö	ò	ò	ö	0	ò	0	ö	0	ö	ò
	ET (min)	416.7763	417.7763	418.7763	419.7763	420.7763	421.7763	422.7763	423.7763	424.7763	425.7763	426.7763	427.7763	428.7763	429.7763	430.7763	431.7763	432.7763	433.7763	434.7763	435.7763	436.7763	437.7763	438.7763	439.7763	440.7763	441.7763	442.7763	443.7763	444.7763	445.7763	446.7763	447.7763	448.7763	449.7763
	Time	17:56:46	17:57:46	17:58:46	17:59:46	18:00:46	18:01:46	18:02:46	18:03:46	18:04:46	18:05:46	18:06:46	18:07:46	18:08:46	18:09:46	18:10:46	18:11:46	18:12:46	18:13:46	18:14:46	18:15:46	18:16:46	18:17:46	18:18:46	18:19:46	18:20:46	18:21:46	18:22:46	18:23:46	18:24:46	18:25:46	18:26:46	18:27:46	18:28:46	18:29:46
	Date	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01
									_																						_				
han[2]	eet H20	0.157	0.153	0.153	0.155	0.153	0.157	0.151	0.153	0.157	0.155	0.157	0.155	0.161	0.155	0.155	0.155	0.157	0.155	0.157	0.153	0.16	0.162	0.158	0.158	0.156	0.158	0.157	0.157	0.157	0.149	0.153	0.151	0.157	0.157
U	ET (min) F	382.7763	383.7763	384.7763	385.7763	386.7763	387.7763	388.7763	389.7763	390.7763	391.7763	392.7763	393.7763	394.7763	395.7763	396.7763	397.7763	398.7763	399.7763	400.7763	401.7763	402.7763	403.7763	404.7763	405.7763	406.7763	407.7763	408.7763	409.7763	410.7763	411.7763	412.7763	413.7763	414.7763	415.7763
	Time	17:22:46	17:23:46	17:24:46	17:25:46	17:26:46	17:27:46	17:28:46	17:29:46	17:30:46	17:31:46	17:32:46	17:33:46	17:34:46	17:35:46	17:36:46	17:37:46	17:38:46	17:39:46	17:40:46	17:41:46	17:42:46	17:43:46	17:44:46	17:45:46	17:46:46	17:47:46	17:48:46	17:49:46	17:50:46	17:51:46	17:52:46	17:53:46	17:54:46	17:55:46
	Date	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01	4/24/01

0.145 0.149 0.149 0.149 0.149 0.149 0.149 0.149 0.149 0.145 0.145 0.145 0.149 0.149 0.149 ET (min) Feet H2O 0.151 0.149 0.149 0.147 0.147 0.149 0.147 0.149 0.147 0.147 0.147 0.147 0.147 0.147 0.147 0.145 0.147 0.147 Chan[2] 552.7763 572.7763 567.7763 568.7763 569.7763 570.7763 571.7763 573.7763 574.7763 575.7763 577.7763 578.7763 553.7763 555.7763 559.7763 560.7763 561.7763 562.7763 563.7763 564.7763 565.7763 566.7763 576.7763 579.7763 580.7763 585.7763 554.7763 556.7763 557.7763 558.776 581.776 582.776 583.776: 584.776 20:34:46 20:35:46 20:13:46 20:30:46 20:31:46 20:32:46 20:33:46 20:36:46 20:37:46 20:38:46 20:39:46 20:40:46 20:41:46 20:43:46 20:12:46 20:14:46 20:25:46 20:26:46 20:28:46 20:29:46 20:42:46 20:44:46 20:45:46 20:15:46 20:16:46 20:17:46 20:19:46 20:20:46 20:21:46 20:22:46 20:23:46 20:24:46 20:27:46 20:18:46 Time 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 Date 0.149 0.145 0.15 0.15 0.15 0.151 0.151 0.151 0.151 0.151 0.151 0.139 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.148 0.15 0.148 0.15 ET (min) Feet H2O 0.151 0.151 0.147 Chan[2] 518.7763 519.7763 532.7763 533.7763 534.7763 535.7763 536.7763 537.7763 538.7763 539.7763 540.7763 545.7763 526.7763 527.7763 530.7763 531.7763 541.7763 542.7763 543.7763 544.7763 547.7763 548.7763 549.7763 550.7763 520.7763 521.7763 522.7763 523.7763 524.7763 525.7763 528.7763 529.7763 546.7763 551.7763 19:38:46 19:39:46 20:07:46 20:11:46 19:40:46 19:47:46 19:53:46 19:54:46 9:56:46 20:02:46 20:03:46 20:04:46 20:05:46 20:06:46 20:08:46 20:09:46 20:10:46 19:41:46 19:42:46 19:43:46 19:44:46 19:45:46 19:46:46 19:48:46 19:49:46 19:50:46 19:51:46 19:52:46 9:55:46 **19:57:46** 9:58:46 9:59:46 20:00:46 20:01:46 Time 4/24/01 4/24/01 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 1/24/01 1/24/01 1/24/01 4/24/01 4/24/01 1/24/01 1/24/01 1/24/01 1/24/01 1/24/01 1/24/01 |/24/01 4/24/01 4/24/01 1/24/01 4/24/01 \$/24/01 Date 0.149 0.149 0.149 0.145 0.141 0.149 0.151 0.149 0.147 0.147 0.147 0.147 0.147 0.143 0.149 0.151 0.153 0.147 0.149 0.149 0.149 0.139 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 0.151 ET (min) Feet H2O 0.151 0.151 Chan[2] 513.7763 514.7763 515.7763 516.7763 517.7763 496.7763 498.7763 499.7763 500.7763 501.7763 502.7763 509.7763 510.7763 511.7763 512.7763 484.7763 485.7763 491.7763 492.7763 493.7763 494.7763 495.7763 497.7763 503.7763 504.7763 505.7763 506.7763 507.7763 508.7763 488.7763 489.7763 490.7763 486.7763 487.7763 19:05:46 19:12:46 19:14:46 19:18:46 19:33:46 19:11:46 19:13:46 19:15:46 19:16:46 19:17:46 19:19:46 9:29:46 19:30:46 19:31:46 **19:32:46** 9:34:46 19:35:46 19:04:46 9:06:46 19:07:46 19:08:46 19:09:46 19:10:46 19:20:46 19:21:46 19:22:46 9:23:46 19:24:46 **19:25:46** 19:26:46 19:27:46 19:28:46 9:36:46 19:37:46 Time 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 4/24/01 Date

isternet.

A.

0.149 ET (min) Feet H2O 0.151 0.151 0.151 0.151 0.153 0.153 0.153 0.153 0.153 0.153 0.153 0.153 0.153 0.151 0.151 0.153 0.153 0.153 0.149 0.149 0.149 0.151 0.153 0.151 0.151 0.153 0.149 0.149 0.149 0.149 0.149 0.149 0.151 Chan[2] 669.7763 670.7763 671.7763 672.7763 673.7763 674.7763 675.7763 684.7763 654.7763 655.7763 656.7763 657.7763 658.7763 659.7763 661.7763 665.7763 666.7763 667.7763 668.7763 676.7763 677.7763 678.7763 679.7763 680.7763 682.7763 683.7763 686.7763 687.7763 660.7763 662.7763 663.7763 664.7763 681.7763 685.7763 21:54:46 22:15:46 21:55:46 21:56:46 21:58:46 22:10:46 22:11:46 22:12:46 22:13:46 22:14:46 22:16:46 22:17:46 22:18:46 22:19:46 22:21:46 22:22:46 22:23:46 22:24:46 21:57:46 21:59:46 22:02:46 22:04:46 22:05:46 22:06:46 22:07:46 22:08:46 22:09:46 22:20:46 22:25:46 22:26:46 22:00:46 22:01:46 22:03:46 22:27:46 Time 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 Date 0.145 0.145 0.145 0.143 0.143 0.149 0.149 0.149 0.149 ET (min) Feet H2O 0.145 0.143 0.139 0.145 0.145 0.149 0.149 0.149 0.147 0.151 0.151 0.147 0.153 0.155 0.151 0.151 0.149 0.153 0.147 0.147 0.151 0.153 0.147 0.153 Chan[2] 620.7763 21:21:46 621.7763 622.7763 623.7763 624.7763 625.7763 626.7763 627.7763 628.7763 629.7763 630.7763 631.7763 632.7763 633.7763 634.7763 635.7763 636.7763 637.7763 638.7763 639.7763 640.7763 641.7763 642.7763 643.7763 644.7763 645.7763 346.7763 647.7763 648.7763 649.7763 650.7763 651.7763 352.7763 653.7763 21:20:46 21:23:46 21:22:46 21:32:46 21:34:46 21:35:46 21:36:46 21:38:46 21:39:46 21:40:46 21:41:46 21:42:46 21:44:46 21:45:46 21:47:46 21:48:46 21:49:46 21:24:46 21:25:46 21:26:46 21:27:46 21:28:46 21:29:46 21:30:46 21:31:46 21:33:46 21:37:46 21:43:46 21:46:46 21:50:46 21:51:46 21:52:46 21:53:46 Time 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 Date 0.145 0.145 0.149 0.149 0.149 0.149 0.149 0.149 0.149 0.149 0.145 0.145 0.145 0.145 0.149 0.145 0.145 0.145 0.145 0.147 0.145 0.149 0.149 0.149 0.149 0.141 0.147 0.147 0.145 0.145 0.151 0.151 0.147 0.147 ET (min) Feet H2O Chan[2] 601.7763 586.7763 588.7763 591.7763 592.7763 594.7763 599.7763 600.7763 602.7763 603.7763 604.7763 605.7763 608.7763 609.7763 610.7763 611.7763 612.7763 614.7763 615.7763 616.7763 587.7763 589.7763 590.7763 593.7763 595.7763 596.7763 597.7763 598.7763 606.7763 607.7763 613.7763 618.7763 619.7763 617.7763 20:46:46 21:02:46 21:04:46 21:08:46 21:09:46 21:10:46 21:11:46 20:47:46 20:48:46 20:49:46 20:51:46 20:58:46 20:59:46 21:00:46 21:01:46 21:03:46 21:05:46 21:06:46 21:07:46 21:12:46 21:13:46 21:14:46 21:15:46 21:16:46 21:17:46 21:18:46 21:19:46 20:50:46 20:52:46 20:53:46 20:54:46 20:55:46 20:56:46 20:57:46 Time 4/24/01 Date

from

0.145 0.149 0.145 0.145 0.145 0.143 0.143 0.149 0.149 0.149 ET (min) Feet H2O 0.143 0.145 0.145 0.145 0.145 0.147 0.151 0.145 0.145 0.147 0.151 0.151 0.147 0.147 0.149 0.149 0.145 0.149 0.149 0.146 0.148 0.146 0.146 Chan[2] 756.7763 760.7763 763.7763 772.7763 774.7763 775.7763 757.7763 758.7763 759.7763 761.7763 764.7763 765.7763 766.7763 767.7763 768.7763 769.7763 770.7763 771.7763 773.7763 776.7763 777.7763 778.7763 779.7763 789.7763 762.776: 780.776 781.7763 782.7763 783.7763 784.7763 785.776 786.776: 787.7763 788.776 23:57:46 23:58:46 23:59:46 23:37:46 23:38:46 23:56:46 0:00:46 0:01:46 23:39:46 23:40:46 23:41:46 0:02:46 0:03:46 23:36:46 23:42:46 23:43:46 23:46:46 23:48:46 23:54:46 0:04:46 0:05:46 23:44:46 23:45:46 23:47:46 23:49:46 23:50:46 23:51:46 23:52:46 23:53:46 23:55:46 0:09:46 0:06:46 0:07:46 0:08:46 Time 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/01 4/25/01 4/24/01 4/24/01 4/24/01 4/24/01 4/24/01 1/25/01 1/25/01 4/24/01 Date 0.147 0.145 0.145 0.149 0.149 0.149 0.149 0.149 0.149 0.149 ET (min) Feet H2O 0.147 0.151 0.151 0.151 0.147 0.147 0.147 0.147 0.149 0.149 0.149 0.149 0.147 0.147 0.149 0.147 0.149 0.147 0.147 0.145 0.147 0.147 0.147 Chan[2] 722.7763 738.7763 739.7763 724.7763 728.7763 729.7763 730.7763 731.7763 732.7763 734.7763 736.7763 737.7763 740.7763 741.7763 742.7763 743.7763 744.7763 745.7763 747.7763 748.7763 749.7763 751.7763 723.7763 725.7763 726.7763 727.7763 733.7763 735.7763 746.7763 750.7763 754.7763 755.7763 752.776 753.776: 23:03:46 23:04:46 23:10:46 23:11:46 23:17:46 23:02:46 23:05:46 23:06:46 23:08:46 23:09:46 23:12:46 23:13:46 23:14:46 23:15:46 23:16:46 23:18:46 23:19:46 23:20:46 23:21:46 23:23:46 23:24:46 23:25:46 23:27:46 23:28:46 23:29:46 23:30:46 23:31:46 23:32:46 23:07:46 23:22:46 23:26:46 23:33:46 23:34:46 23:35:46 Time 4/24/01 1/24/01 4/24/01 1/24/01 1/24/01 1/24/01 1/24/01 4/24/01 1/24/01 4/24/01 4/24/01 4/24/01 1/24/01 Date 0.145 0.149 0.149 0.149 0.149 0.149 0.151 0.149 0.149 0.149 0.147 0.147 0.147 0.145 0.145 0.145 0.145 0.146 0.151 0.147 0.147 0.151 0.151 0.151 0.151 0.147 0.147 0.147 0.141 0.147 0.145 0.151 0.147 0.147 ET (min) Feet H2O Chan[2] 688.7763 702.7763 703.7763 704.7763 705.7763 711.7763 713.7763 715.7763 716.7763 717.7763 721.7763 694.7763 696.7763 697.7763 698,7763 700.7763 701.7763 706.7763 107.7763 709.7763 710.7763 712.7763 714.7763 718.7763 719.7763 689.7763 690.7763 691.7763 692.7763 693.7763 695.7763 699.776 708.776 720.776 22:29:46 22:40:46 22:41:46 22:53:46 22:54:46 22:55:46 22:57:46 22:28:46 22:30:46 22:31:46 22:32:46 22:33:46 22:34:46 22:35:46 22:36:46 22:37:46 22:38:46 22:39:46 22:42:46 22:43:46 22:44:46 22:45:46 22:46:46 22:47:46 22:48:46 22:49:46 22:50:46 22:51:46 22:52:46 22:56:46 22:58:46 22:59:46 23:00:46 23:01:46 Time 4/24/01 Date

m

ET (min) Feet H2O 0.145 0.149 0.143 0.143 0.143 0.143 0.143 0,145 0.147 0.146 0.148 0.146 0.146 0.143 0.146 0.143 0.146 0.145 0.145 0.145 0.149 0.141 0.143 0.143 0.143 0.143 0.143 0.143 0.147 0.147 0.145 0.147 0.143 Chan[2] 875.7763 866.7763 867.7763 868.7763 869.7763 870.7763 872.7763 873.7763 874.7763 876.7763 877.7763 878.7763 879.7763 880.7763 881.7763 883.7763 891.7763 858.7763 859.7763 860.7763 862.7763 864.7763 865.7763 871.7763 882.7763 884.7763 885.7763 886.7763 887.7763 888.7763 890.7763 861.7763 863.7763 889.776 1:36:46 1:38:46 1:32:46 1:33:46 1:34:46 1:39:46 1:40:46 1:47:46 :37:46 1:42:46 1:43:46 1:44:46 1:45:46 1:46:46 1:21:46 1:25:46 1:28:46 :30:46 1:31:46 :35:46 :48:46 1:50:46 1:51:46 1:18:46 1:19:46 1:26:46 1:27:46 1:29:46 1:41:46 :20:46 22:46 1:23:46 1:24:46 :49:46 Time 4/25/01 1/25/01 4/25/01 4/25/01 4/25/01 4/25/0 1/25/0 4/25/0 Date 0.145 0.135 0.146 0.148 0.148 0.149 0.147 0.149 0.149 0.145 ET (min) Feet H2O 0.143 0.147 0.147 0.147 0.145 0.145 0.147 0.149 0,148 0.143 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.145 0.141 0.143 0.145 0.147 0.147 0.147 Chan[2] 838.7763 839.7763 840.7763 841.7763 0:45:46 825.7763 824.7763 826.7763 827.7763 828.7763 829.7763 830.7763 831.7763 832.7763 833.7763 834.7763 835.7763 836.7763 837.7763 842.7763 843.7763 844.776 845.7763 846.7763 847.7763 848.776 849.7763 850.7763 851.7763 852.7763 856.7763 857.7763 853.776 854.776 855.776: 0:59:46 1:01:46 1:02:46 1:03:46 1:04:46 1:08:46 1:06:46 1:07:46 1:10:46 1:12:46 :14:46 0:44:46 0:46:46 0:51:46 1:11:46 1:13:46 I:16:46 1:17:46 0:47:46 0:48:46 0:52:46 0:53:46 0:55:46 0:57:46 0:58:46 1:00:46 1:05:46 :15:46 0:49:46 0:50:46 0:54:46 0:56:46 1:09:46 Time 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/01 1/25/01 1/25/01 1/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/01 /25/01 4/25/0 4/25/0 Date 0.148 0.148 0.145 0.145 0.145 0.143 0.145 0.143 0.143 0.143 0.143 .145 0.149 0.148 0.148 0.146 0.149 0.146 0.146 0.149 0.147 0.148 0.148 0.148 0.148 0.146 0.146 0.148 0,147 0.146 0.148 0.147 0.147 0.143 ET (min) Feet H2O Chan[2] 798.7763 807.7763 808.7763 809.7763 815.7763 790.7763 792.7763 805.7763 806.7763 811.7763 812.7763 813.7763 814.7763 816.7763 823.7763 791.7763 793.7763 794.7763 795.7763 796.7763 797.7763 799.7763 800.7763 810.7763 817.7763 818.7763 819.7763 801.7763 802.7763 803.7763 804.7763 820.7763 822.776 821.776 0:10:46 0:11:46 0:32:46 0:34:46 0:35:46 0:38:46 0:39:46 0:18:46 0:14:46 0:26:46 0:28:46 0:30:46):36:46 0:37:46 0:42:46 0:19:46 0:25:46 0:27:46 0:29:46 0:31:46 0:33:46 0:12:46 0:13:46 0:15:46 0:16:46 0:17:46 0:20:46 0:21:46 0:22:46 0:23:46 0:24:46 :40:46):41:46):43:46 Time 4/25/01 4/25/0 4/25/0 4/25/0 4/25/0' 4/25/0 Date

m

0.135 0.137 0.137 0.143 0.137 0.137 0.135 0.139 0.139 0.135 0.134 0.135 0.133 0.139 0.133 0.139 0.139 0.137 0.137 0.139 0.139 0.137 ET (min) Feet H2O 0.141 0.141 0.141 0.141 0.143 0.139 0.141 0.141 0.141 0.141 0.135 Chan[2] 960.7763 975.7763 976.7763 977.7763 979.7763 971.7763 972.7763 973.7763 974.7763 978.7763 980.7763 981.7763 961.7763 962.7763 963.7763 964.7763 965.7763 966.7763 967.7763 968.7763 969.7763 970.7763 982.776 983.776 984.7763 985.776 986.7763 987.7763 988.776 989.7763 990.7763 991.776: 992.776 993.7763 3:00:46 3:01:46 3:02:46 3:17:46 3:19:46 3:20:46 3:21:46 3:22:46 3:23:46 3:24:46 3:25:46 3:26:46 3:27:46 3:28:46 3:29:46 3:09:46 3:11:46 3:13:46 3:14:46 3:16:46 3:30:46 3:03:46 3:04:46 3:10:46 3:12:46 3:15:46 3:18:46 3:05:46 3:06:46 3:07:46 3:08:46 3:33:46 31:46 32:46 Time 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/01 1/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 /25/01 125/01 1/25/01 Date 0.143 0.143 0.139 0.139 0.139 0.145 0.143 0.139 0.143 0.141 0.141 0.141 0.145 0.143 0.139 0.143 0.145 0.145 0.143 0.141 0.141 0.141 0.141 0.137 0.139 0.139 0.139 0.139 0.139 0.137 0.139 0.141 ET (min) Feet H2O 0.141 Chan[2] 941.7763 926.7763 938.7763 939.7763 940.7763 942.7763 943.7763 944.7763 948.7763 927.7763 928.7763 929.7763 930.7763 931.7763 933.7763 934.7763 935.7763 936.7763 937.7763 945.7763 946.7763 947.7763 949.7763 950.7763 951.7763 954.776 955.7763 956.7763 958.7763 959.7763 932.776 952.776 953.776 957.776 2:45:46 2:47:46 2:26:46 2:42:46 2:43:46 2:44:46 2:46:46 2:48:46 2:50:46 2:51:46 2:52:46 2:53:46 2:54:46 2:58:46 2:27:46 2:55:46 2:56:46 2:57:46 2:28:46 2:40:46 2:41:46 2:29:46 2:30:46 2:31:46 2:32:46 2:33:46 2:34:46 2:35:46 2:36:46 2:37:46 2:38:46 2:39:46 2:49:46 2:59:46 Time 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/01 4/25/01 1/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/01 1/25/01 //25/01 /25/01 4/25/01 4/25/01 4/25/01 /25/01 /25/01 1/25/01 4/25/01 4/25/01 4/25/0' Date 0.141 0.139 0.139 0.137 0.141 0.141 0.143 0.143 0.145 0.145 0.143 0.143 0.139 0.139 0.147 0.145 0.147 0.145 0.145 0.147 0.145 0.145 0.141 0.145 0.145 0.137 0.141 0.141 0.131 0.139 0.143 0.141 0.141 ET (min) Feet H2O Chan[2] 909.7763 914.7763 916.7763 892.7763 907.7763 908.7763 910.7763 911.7763 912.7763 913.7763 915.7763 917.7763 918.7763 920.7763 893.7763 897.7763 899.7763 900.7763 901.7763 906.7763 919.7763 921.7763 894.7763 895.7763 896.7763 898.7763 902.776 903.7763 904.776 905.7763 922.7763 923.776 924.776 925.776: 2:12:46 2:13:46 1:53:46 :54:46 :55:46 1:56:46 1:57:46 1:58:46 1:59:46 2:00:46 2:08:46 2:19:46 2:21:46 2:22:46 2:24:46 2:25:46 1:52:46 2:10:46 2:11:46 2:14:46 2:15:46 2:16:46 2:17:46 2:18:46 2:01:46 2:02:46 2:03:46 2:04:46 2:05:46 2:06:46 2:07:46 2:09:46 2:20:46 2:23:46 Time 4/25/01 1/25/01 1/25/01 1/25/01 Date

 \searrow

-

0.137 0.137 0.137 0.135 0.135 0.135 0.137 0.137 0.137 0.135 0.137 0.135 ET (min) Feet H2O 0.135 0.135 0.134 0.134 0.135 0.137 0.137 0.134 0.135 0.136 0.137 0.137 0.135 0.135 0.137 0.135 0.127 0.135 0.135 0.135 0.135 Chan[2] 1084.776 1085.776 1082.776 1083.776 1062.776 1070.776 1074.776 1080.776 1095.776 1063.776 1066.776 1067.776 1068.776 1069.776 1071.776 1072.776 1073.776 1075.776 1076.776 1077.776 1078.776 1079.776 1081.776 1086.776 1087.776 1088.776 1089.776 1090.776 1091.776 1092.776 1064.776 1065.776 1094.776 1093.77 5:02:46 5:03:46 4:48:46 5:01:46 5:04:46 5:05:46 5:06:46 5:07:46 5:08:46 5:09:46 4:43:46 4:45:46 4:46:46 4:56:46 4:58:46 4:59:46 5:00:46 5:10:46 4:44:46 4:49:46 4:50:46 4:52:46 4:55:46 4:57:46 5:11:46 5:12:46 4:42:46 4:47:46 4:51:46 4:54:46 5:13:46 4:53:46 5:14:46 5:15:46 Time 4/25/01 1/25/01 1/25/01 1/25/01 1/25/0 1/25/0 4/25/0 Date 0.137 0.135 0.135 0.133 0.133 0.133 0.135 0.135 0.135 0.135 0.137 0.13 0.139 0.139 0.139 0.139 0.139 0.139 0.139 0.139 0.139 0.139 0.137 0.135 0.137 0.139 0.137 ET (min) Feet H2O 0.137 0.135 0.134 0.135 0.137 0.139 Chan[2] 1048.776 1049.776 1052.776 1053.776 1042.776 1045.776 1028.776 1056.776 1058.776 1059.776 1061.776 1029.776 1046.776 1047.776 1050.776 1051.776 1030.776 1031.776 1032.776 1033.776 1034.776 1035.776 1036.776 1038.776 1043.776 1044.776 1057.776 1037.776 1039.776 1040.776 1041.77 1054.776 1055.776 060.77 1:27:46 1:28:46 4:26:46 4:29:46 4:09:46 4:11:46 4:22:46 4:24:46 4:30:46 4:31:46 4:32:46 4:33:46 4:08:46 4:10:46 4:34:46 4:35:46 4:36:46 4:12:46 4:18:46 4:25:46 1:37:46 4:13:46 4:14:46 4:15:46 4:16:46 4:17:46 4:19:46 4:20:46 4:21:46 4:23:46 :38:46 :39:46 :40:46 1:41:46 Time 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 /25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/01 1/25/01 4/25/0 4/25/0 4/25/0 4/25/0 4/25/0 4/25/0 /25/0 4/25/0 4/25/0 /25/0 Date 0.137 0.133 0.139 0.139 0.139 0.139 0.139 0.141 0.139 0.141 0.139 0.137 0.137 0.137 0.137 0.137 0.139 0.137 0.139 0.141 0.141 0.139 ET (min) Feet H2O 0.133 Chan[2] 1010.776 1013.776 1015.776 994.7763 995.7763 997.7763 998.7763 999.7763 000.776 001.776 002.776 1003.776 004.776 005.776 1006.776 1008.776 1009.776 1011.776 012.776 014.776 016.776 1017.776 1018.776 1019.776 1020.776 022.776 1023.776 1024.776 1027.776 1007.776 021.776 1025.776 1026.776 996.776 3:58:46 3:59:46 3:34:46 3:35:46 3:36:46 3:37:46 3:38:46 3:39:46 3:45:46 3:47:46 3:48:46 3:51:46 3:52:46 3:53:46 3:54:46 3:55:46 3:56:46 3:57:46 4:01:46 3:49:46 3:50:46 4:00:46 4:02:46 3:40:46 :03:46 :04:46 3:41:46 3:42:46 :05:46 1:06:46 1:07:46 3:43:46 3:44:46 3:46:46 Time 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 4/25/0 4/25/0 4/25/01 4/25/0 4/25/0 4/25/0 4/25/01 4/25/01 4/25/01 4/25/01 4/25/01 1/25/0 4/25/0 1/25/0 Date

A

than[2]	eet H2O	0.134	0.134	0.134	0.134	0.133	0.133	0.133	0.131	0.132	0.132	0.13	0.131	0.13	0.131	0.133	0.13	0.13	0.131	0.131	0.131	0.133	0.133	0.133	0.133	0.135	0.133	0.134	0.134	0.132	0.132	0.134	0.132	0.134	0.134
U	ET (min) F	1164.776	1165.776	1166.776	1167.776	1168.776	1169.776	1170.776	1171.776	1172.776	1173.776	1174.776	1175.776	1176.776	1177.776	1178.776	1179.776	1180.776	1181.776	1182.776	1183.776	1184.776	1185.776	1186.776	1187.776	1188.776	1189.776	1190.776	1191.776	1192.776	1193.776	1194.776	1195.776	1196.776	1197.776
	Time	6:24:46	6:25:46	6:26:46	6:27:46	6:28:46	6:29:46	6:30:46	6:31:46	6:32:46	6:33:46	6:34:46	6:35:46	6:36:46	6:37:46	6:38:46	6:39:46	6:40:46	6:41:46	6:42:46	6:43:46	6:44:46	6:45:46	6:46:46	6:47:46	6:48:46	6:49:46	6:50:46	6:51:46	6:52:46	6:53:46	6:54:46	6:55:46	6:56:46	6:57:46
	Date	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01
han[2]	eet H2O	0.13	0.13	0.13	0.134	0.135	0.134	0.135	0.134	0.136	0.136	0.13	0.124	0.132	0.132	0.134	0.132	0.132	0.135	0.131	0.135	0.133	0.131	0.13	0.131	0.131	0.131	0.134	0.131	0.134	0.134	0.132	0.13	0.135	0.135
	ET (min) F	1130.776	1131.776	1132.776	1133.776	1134.776	1135.776	1136.776	1137.776	1138.776	1139.776	1140.776	1141.776	1142.776	1143.776	1144.776	1145.776	1146.776	1147.776	1148.776	1149.776	1150.776	1151.776	1152.776	1153.776	1154.776	1155.776	1156.776	1157.776	1158.776	1159.776	1160.776	1161.776	1162.776	1163.776
	Time	5:50:46	5:51:46	5:52:46	5:53:46	5:54:46	5:55:46	5:56:46	5:57:46	5:58:46	5:59:46	6:00:46	6:01:46	6:02:46	6:03:46	6:04:46	6:05:46	6:06:46	6:07:46	6:08:46	6:09:46	6:10:46	6:11:46	6:12:46	6:13:46	6:14:46	6:15:46	6:16:46	6:17:46	6:18:46	6:19:46	6:20:46	6:21:46	6:22:46	6:23:46
	Date	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01
										-																									
han[2]	eet H2O	0.135	0.137	0.135	0.135	0.137	0.137	0.135	0.135	0.137	0.135	0.137	0.135	0.132	0.134	0.137	0.134	0.134	0.134	0.134	0.134	0.134	0.132	0.13	0.132	0.135	0.134	0.132	0.134	0.132	0.132	0.128	0.135	0.132	0.132
0	ET (min) F	1096.776	1097.776	1098.776	1099.776	1100.776	1101.776	1102.776	1103.776	1104.776	1105.776	1106.776	1107.776	1108.776	1109.776	1110.776	1111.776	1112.776	1113.776	1114.776	1115.776	1116.776	1117.776	1118.776	1119.776	1120.776	1121.776	1122.776	1123.776	1124.776	1125.776	1126.776	1127.776	1128.776	1129.776
	Time	5:16:46	5:17:46	5:18:46	5:19:46	5:20:46	5:21:46	5:22:46	5:23:46	5:24:46	5:25:46	5:26:46	5:27:46	5:28:46	5:29:46	5:30:46	5:31:46	5:32:46	5:33:46	5:34:46	5:35:46	5:36:46	5:37:46	5:38.46	5:39:46	5:40:46	5:41:46	5:42:46	5:43:46	5:44:46	5:45:46	5:46:46	5:47:46	5:48:46	5:49:46
	Date	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01

han[2] eet H2O		0.131	0.131	0.131	0.135	0.139	0.139	0.141	0.141	0.141	0.139	0.133	0.143	0.141	0.143	0.143	0.143	0.143	0.144	0.144	0.145	0.146	0.146	0.146	0.146	0.146	0.146	0.148	0.146	0.148	0.148	0.14	0.146	0.15	0.148
C ET (min) Fi		1266.776	1267.776	1268.776	1269.776	1270.776	1271.776	1272.776	1273.776	1274.776	1275.776	1276.776	1277.776	1278.776	1279.776	1280.776	1281.776	1282.776	1283.776	1284.776	1285.776	1286.776	1287.776	1288.776	1289.776	1290.776	1291.776	1292.776	1293.776	1294.776	1295.776	1296.776	1297.776	1298.776	1299.776
Time		8:06:46	8:07:46	8:08:46	8:09:46	8:10:46	8:11:46	8:12:46	8:13:46	8:14:46	8:15:46	8:16:46	8:17:46	8:18:46	8:19:46	8:20:46	8:21:46	8:22:46	8:23:46	8:24:46	8:25:46	8:26:46	8:27:46	8:28:46	8:29:46	8:30:46	8:31:46	8:32:46	8:33:46	8:34:46	8:35:46	8:36:46	8:37:46	8:38:46	8:39:46
Date		4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01
_	;		_			~	-	-	10	10			~			•	~	~	10	10	10	10	-+	*	~		_	_	-	10	~	-	+	*	10
Chan[2] Feet H2O		0.134	0.131	0.132	0.133	0.137	0.134	0.137	0.135	0.135	0.137	0.137	0.133	0.133	0.139	0.13	0.137	0.137	0.13	0.13	0.13	0.13	0.134	0.134	0.133	0.132	0.13	0.13	0.13	0.13	0.13	0.12	0.134	0.134	0.13
ET (min) F		1232.776	1233.776	1234.776	1235.776	1236.776	1237.776	1238.776	1239.776	1240.776	1241.776	1242.776	1243.776	1244.776	1245.776	1246.776	1247.776	1248.776	1249.776	1250.776	1251.776	1252.776	1253.776	1254.776	1255.776	1256.776	1257.776	1258.776	1259.776	1260.776	1261.776	1262.776	1263.776	1264.776	1265.776
Time		7:32:46	7:33:46	7:34:46	7:35:46	7:36:46	7:37:46	7:38:46	7:39:46	7:40:46	7:41:46	7:42:46	7:43:46	7:44:46	7:45:46	7:46:46	7:47:46	7:48:46	7:49:46	7:50:46	7:51:46	7:52:46	7:53:46	7:54:46	7:55:46	7:56:46	7:57:46	7:58:46	7:59:46	8:00:46	8:01:46	8:02:46	8:03:46	8:04:46	8:05:46
Date		4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01
than[2] eet H2O		0.134	0.134	0.135	0.137	0.137	0.137	0.137	0.135	0.135	0.137	0.137	0.13	0.137	0.137	0.138	0.132	0.136	0.137	0.134	0.137	0.135	0.135	0.135	0.135	0.137	0.135	0.137	0.137	0.133	0.131	0.131	0.131	0.133	0.134
C ET (min) F		1198.776	1199.776	1200.776	1201.776	1202.776	1203.776	1204.776	1205.776	1206.776	1207.776	1208.776	1209.776	1210.776	1211.776	1212.776	1213.776	1214.776	1215.776	1216.776	1217.776	1218.776	1219.776	1220.776	1221.776	1222.776	1223.776	1224.776	1225.776	1226.776	1227.776	1228.776	1229.776	1230.776	1231.776
Time		6:58:46	6:59:46	7:00:46	7:01:46	7:02:46	7:03:46	7:04:46	7:05:46	7:06:46	7:07:46	7:08:46	7:09:46	7:10:46	7:11:46	7:12:46	7:13:46	7:14:46	7:15:46	7:16:46	7:17:46	7:18:46	7:19:46	7:20:46	7:21:46	7:22:46	7:23:46	7:24:46	7:25:46	7:26:46	7:27:46	7:28:46	7:29:46	7:30:46	7:31:46
Date		4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01

and a	1	1 - S	

()

(

PZ-5 Drawdown Data

	•																																
Chan[2] Feet H2O	0.107	0.084	0.069	0.048	0.04	0.032	0.027	0.023	0.019	0.018	0.016	0.012	0.011	0.003																			
ET (min)	1334.776	1335.776	1336.776	1337.776	1338.776	1339.776	1340.776	1341.776	1342.776	1343.776	1344 776	1345.776	1346.776	1347.776																			
Time	9:14:46	9:15:46	9:16:46	9:17:46	9:18:46	9:19:46	9:20:46	9:21:46	9:22:46	9:23:46	9:24:46	9:25:46	9:26:46	9:27:46																			
Date	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01	4/25/01																			
Chan[2] Feet H2O	0.15	0.148	0.154	0.156	0.158	0.158	0.158	0.16	0.16	0.16	0.16	0.158	0.162	0.162	0.16	0.16	0.158	0.16	0.156	0.156	0.156	0.156	0.156	0.156	0.158	0.158	0.16	0.158	0.157	0.155	0.157	0.152	0.143
ET (min)	1300.776	1301.776	1302.776	1303.776	1304.776	1305.776	1306.776	1307.776	1308.776	1309.776	1310.776	1311.776	1312.776	1313.776	1314.776	1315.776	1316.776	1317.776	1318.776	1319.776	1320.776	1321.776	1322.776	1323.776	1324.776	1325.776	1326.776	1327.776	1328.776	1329.776	1330.776	1331.776	1332.776
Time	8:40:46	8:41:46	8:42:46	8:43:46	8:44:46	8:45:46	8:46:46	8:47:46	8:48:46	8:49:46	8:50:46	8:51:46	8:52:46	8:53:46	8:54:46	8:55:46	8:56:46	8:57:46	8:58:46	8:59:46	9:00:46	9:01:46	9:02:46	9:03:46	9:04:46	9:05:46	9:06:46	9:07:46	9:08:46	9:09:46	9:10:46	9:11:46	9:12:46
e	5	2	<u>0</u>	2	20	6	6	0	6	5	0	6	6	01	6	01	<u>6</u>	0	6	δ	δ	6	6	6	0	<u>6</u>	2	0	6	6	6	<u>6</u>	5

Class 3N Solid Waste Facility Plum Point Energy Associates, LLC

(_m.

APPENDIX G SLUG TEST AND PUMP TEST DATA





))














Class 3N Solid Waste Facility Plum Point Energy Associates, LLC

APPENDIX H GEOTECHNICAL LABORATORY REPORT

MAY 2001

GENESIS/PLUM POINT ENERGY/AR SUMMARY OF SOIL DATA

	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	r	T	T			_												
											Grain Size									
			Soil	Natural		Atter	berg			D	Distribution	1	Comp	action						Additional
Sample	Sample	Sample	Classi-	Moisture		Lin	nits	1		% Finer	% Finer	% Finer	Maximum	Optimum	1	Unit W	eight/	Permeability	Carbonate	Tests
Identification	Туре	Depth	fication	%					S.L.	No. 4	No. 200	.005	Dry Density	Moisture		Moisture	Dry	(cm/sec)	Content	Conducted
	·				L.L.	P.L.	P.I.	L.I.	%	Sieve	Sieve	mm	(lb/cuft)	%	Gs	%	(lb/cuft)			(See Notes)
TP-1	Bulk	-	CL	27.3	47	20	27	0.28		100.0	92.3	-	96.0	22.0	2.72	24.6	92.6	7.9E-06		
TP-2	Bulk	-	CL	31.1	41	20	21	0.50		100.0	99.1	-	98.5	22.5	2.72	28.3	93.5	1.1E-08	-	-
TP-3	Bulk		CL	22.8	36	19	17	0.20		100.0	95.9		102.0	18.0	2.71	25,2	96.3	5.2E-08	-	_
TP-4	Bulk		СН	32.8	50	23	27	0.35	16.2	100.0	99.3	52.0	94.5	25.0	2.72	29.9	88.9	2.9E-07	-	C,T
TP-5	Bulk	-	(SM)	-	-	•	-	-		100.0	27.6		-	•	-	9.6	89.1	1.3E-03	0	-
· .																				-
																				-
												2		-					,	
·																4 				
													•							
			· .																	

ABBREVIATIONS: LIQUID LIMIT (LL) PLASTIC LIMIT (PL) PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SHRINKAGE LIMIT (SI) SPECIFIC GRAVITY (GS) MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST

- **U** = UNCONFINED COMPRESSION TEST
- C = CONSOLIDATION TEST
- DS = DIRECT SHEAR TEST
- **O** = ORGANIC CONTENT

P = pH

Golder Associates Inc.

÷.,†



REVIEW 2



		AS ASTM D 42	1, D 2217	UN SIZE A 7, D 1140, (INALYSIS C 117, D 4	22, C 13	6	
	F	TESTS DI TIM DO	INT ENED	CVAR	SA			1
PROJECT NO	GEL GEL	012 2205	INI ENER	GY/AK	SANG			
REMARKS		. 013-3203		1	SAMPI	E DEPTH	Б	
P				Hygroscopic	Moisture For	Sieve Sample		· · · · · ·
WATER CONTR	INT (Delivered	Moisture)		nygroscopie i		Wet Soil &	Tare (om)	38.12
Wr Wet Soil & Ta	re (om)	(w1)	211 39			Dry Soil &	Tare (gm)	37.22
Wt Dry Soil & Ta	re (gm)	(11/2)	177.07			Tare Weig	ht (gm)	3 47
Weight of Tare (g	m)	(112)	51.38			Moisture (Content (%)	2.67
Weight of Water	(gm)	(w4 = w1 - w2)	34 32	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	verosconic Moi
Weight of Dry So	il (em)	$(w5 = w^2 - w^3)$	125.69 -		or sample of	Weight Of	Sample (gm)	54 51
Moisture Content	(%)	(w4/w5)*100	27 31	1		Tare Wei	oht (gm)	0.00
Monare Coment		(44/45) 100	27.31	4	(WA)	Total Dry	Weight (gm)	53.00
				L	(40)	I Otal Diy	Weight (gin)	33.09
SIEVE ANALYS	IS			Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	Æ	
0.00		+ Tare	({(wt ret/w6)+100}	(100-%ret)		· _ ·	
0.00	<u> </u> 12.0"	Tare		1(#1100 #0) 100}	(100- ///01	12.0"	cobbles	
	3.0"			<u> </u>		3.0"	coarse gravel	
	2.5			t		25"	coarse gravel	
	2.5	· · · · · ·		<u> </u>		2.5	coarse gravel	
	1.5*		· · ·	+		1.5*	coarse gravel	
	1.5					1.0"	coarse gravel	
	0.75"					0.75"	Gra gravel	
	0.75			 		0.75	fine gravel	
	0.50					0.30	fine gravel	
	0.375					0.373	ine gravei	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.05	0.05	0.09	99.91	#40	fine and	
	#40	0.58	1.04	1.09	96.91	#40	fine sand	
	#00	1.04	1.04	1.90	98.04	#100	fine sand	
	#100	1.12	1.72	3.24	90.70	#100	fine sand	
	#200	4.11	4.11	1.14	92.20	#200	nnes	
CODDI DO	PAN	T				PAN		
70 COBBLES	0.00		wine Tra				-	
70 C GRAVEL	0.00	Descrip	puve Terms	> 10%	mostly coarse	(C)		<u>(7</u>)
70 F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	n (m)		4/
TO C SAND	0.00	little	5 to 12%	< 10%	nne (c-m)		PL	20
70 M SAND	1.09	some	12 to 30%	< 10%	coarse (m-t)		PI	61
70 F SAND	6.65	and and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	•
TOTAL	92.26	-		< 10%	coarse and me	colum (t)		
70 IUTAL	100.00			> 10%	equal amounts	eacn (c-t)		
	DESCRIPTION	Olive Brown,	SILTY CLA	Y, little mediur	n to fine			
		sand.						
	USC	S CL					TECH	DH/TJ
							DATE	5/8/01
							CHECK	the.
				1999 - A.			REVIEW	hin

· · · · · · · · · · · · · · · · · · ·		MOI	SI UKE ASTN	A D 698	& 155	7			
PROJECT TITLE	GENESIS/PL	UM POINT EN	ERGY/AR	· ۱	TEST TYPE	D 698			
PROJECT NUMBER		013-3205		PF	ROCEDURE	METHOD A		Γ	
SAMPLE IDENTITY	TP-1	-	-	1 .				4	
SAMPLE TYPE	Bulk			•					
•		' TYP	E COMPAC	TOR P	REPARATIC	N	METHOD A:	20% OR LES	S RETAINED OF
MOLD NUMBER	4		Mechanical	1	Wet Method	1			
MOLD WEIGHT (gm)	2020.00			1		1	METHOD B	> 20% BET	ATNED ON MAAN
MOLD DIAMETER (in)	4.001		T	VPE PROCT	OR		ME INCO D.	20% OP 1 PS	S DETABUTO
MOLD HEIGHT (in)	4 560		•	STANDARD	1			20% OK LES	S KEIAINED ()
MOID VOLUME (cn ft)	÷ 0.0332		-	312.0280	J .		WERE C.	> 100 DPM	
	0.0332	5.	5 -lbf. RAMI	MER WITH	12 INCH DR	OP	METHOD C:	< 30% RET.	AINED ON 3/4"
WATER CONTENT		COARSE	TOTAL	TOTAL W	EIGHT BEF	ORE PROCE	ESSING AND	PERCENT	RETAINED
		FRACTION	SAMPLE	-					
Wt Tare & Soil	(W1)		211.39	TO	TAL WEIGHT	WET (COA	RSE & FINE)	16305.00	
Wt Tare & Soil	(W2)		177.07	TO	TAL WEIGHT	, DRY (COA	RSE & FINE)	12807.80	
Wt Tare	(₩3)		51.38	WE	SIEVE (WET)	0.00			
Wt Moisture	(W4=W1-W2)	0.00	34.32	WE	SIEVE (WET)				
Wt Dry Soil	(W5=W2-W3)	0.00	125.69	WE	IGHT RETAIL	NED ON 3/4"	SIEVE (WET)		1
Water Content (dec)	(wc=W4/W5)		0.2731	PER	CENT RETAIL	NED ON #4	SIEVE (DRY)	0.00%	1
Water Content (%)	(W4/W5)*100		27.31%	PER	CENT RETAI	NED ON 3/8"	SIEVE ORY	0.00%	1
				I DPD	CENT DETAIL	NED ON 3/4	SIEVE (DEV)	0.00%	1
		-							
POINT RESULTS (FINE)	1	2	3	4	5	6	7	
POINT RESULTS (FINE)	1	2	3	4	5	6	7]
POINT RESULTS (FINE Wt. Soil & Mold) (W1)	1 3784.80	2 3811.40	3 3799.50	4 3751.90	5 3629.50	6	7]
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold) (W1) (W2)	1 3784.80 2020.00	2 3811.40 2020.00	3 3799.50 2020.00	4 3751.90 2020.00	5 3629.50 2020.00	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil) (W1) (W2) (W3=W1-W2)	1 3784.80 2020.00 1764.80	2 3811.40 2020.00 1791.40	3 3799.50 2020.00 1779.50	4 3751.90 2020.00 1731.90	5 3629.50 2020.00 1609.50	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf)	(W1) (W2) (W3≠W1-W2) (W3/453.6*Vm)	1 3784.80 2020.00 1764.80 117.04	2 3811.40 2020.00 1791.40 118.80	3 3799.50 2020.00 1779.50 118.01	4 3751.90 2020.00 1731.90 114.85	5 3629.50 2020.00 1609.50 106.74	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS	(₩1) (₩2) (₩3=₩1-₩2) (₩3/453.6*¥m)	1 3784.80 2020.00 1764.80 117.04	2 3811.40 2020.00 1791.40 118.80	3 3799.50 2020.00 1779.50 118.01	4 3751.90 2020.00 1731.90 114.85	5 3629.50 2020.00 1609.50 106.74	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil	(W1) (W2) (W3≠W1-W2) (W3/453.6*Vm)	1 3784.80 2020.00 1764.80 117.04	2 3811.40 2020.00 1791.40 118.80 1881.41	3 3799.50 2020.00 1779.50 118.01	4 3751.90 2020.00 1731.90 114.85 336.11	5 3629.50 2020.00 1609.50 106.74 477.46	6	7]
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil	(W1) (W2) (W3≠W1-W2) (W3/453.6*Vm) (W4)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48	4 3751.90 2020.00 1731.90 114.85 336.11 299.50	5 3629.50 2020.00 1609.50 106.74 477.46 - 428.93	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare	(W1) (W2) (W3≠W1-W2) (W3/453.6*Vm) (W4) (W5)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115 53	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare	(W1) (W2) (W3≠W1-W2) (W3/453.6*Vm) (W4) (W5) (W6) (W7−W4-W6)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 213.27	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 240.75	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.07	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.41	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Moisture	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W4) (W5) (W5) (W6) (W7=W4-W5)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1406 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61	5 3629.50 2020.00 1609.50 106.74 477.46 477.46 428.93 115.53 48.53	6	7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40		7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%)	(W1) (W2) (W3 = W1-W2) (W3/453.6*Vm) (W4) (W5) (W6) (W7 = W4-W5) (W8 = W5-W6) (W7/W8)*100	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64%	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54%	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91%	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.495	6		
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf)	(W1) (W2) (W3 = W1-W2) (W3/453.6*Vm) (W4) (W5) (W6) (W7 = W4-W5) (W8 = W5-W6) (W7/W8)*100 (wd/(1+wc))	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4		7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf)	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc))	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4		7	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf)	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc))	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83 % 95.8	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4	, SILTY CLA	7 Y, little med]]]] [jum to]
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) [TTY (pcf) CONTENT (%)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83 % 95.8	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand.	, SILTY CLA	7 Y, little med]]] [ium to
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) TTY (pcf) CONTENT (%) y Density (pcf)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand.	6	7 Y, little med]]]] [ium to
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Optimum Moist	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (W7/W8)*100 (wd/(1+wc)) [TTY (pcf) CONTENT (%) y Density (pcf) sture (%)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6	Y, little med]]] [jum to
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) TTY (pcf) CONTENT (%) y Density (pcf) sture (%)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83 % 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6	Y, little mec]]] [jum to
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs Weight of Oven Dry Sam	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (W7/W8)*100 (W7/W8)*100 (wd/(1+wc)) TTY (pcf) CONTENT (%) y Density (pcf) sture (%)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2 se Aggregate	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6 , SILTY CLA	7 Y, little med]]]]]]
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs Weight of Oven Dry Sam	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) TTY (pcf) CONTENT (%) y Density (pcf) sture (%) storption of Coarse ple (gm) acc-Dry (gm)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2 se Aggregate A B	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES 27-88	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6 SILTY CLA	7]]]] [ium to
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs Weight of Oven Dry Sam Weight of Saturated Sam	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) TTY (pcf) CONTENT (%) y Density (pcf) sture (%) storption of Coarse ple (gm) ace-Dry (gm) ple in Water (or	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2 se Aggregate A B n) C	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6 SILTY CLA	7 Y, little mec 47 20 27]]] [ium to
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs Weight of Oven Dry Sam Weight of Saturated Sam Meight of Saturated Sam Masorption of Oversize Party	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) (W7/W8)*10((1+wc)) (W7	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2 se Aggregate A B n) C ((B-A)/A]*100	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6 SILTY CLA LL PL PI MC	7 Y, little med 47 20 27 27.31%]]]]]]]
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs Weight of Oven Dry Sam Weight of Saturated Sam Masorption of Oversize Pa Bulk Specific Gravity	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) (W7/W8)*10(0)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2 96.2 se Aggregate A B n) C ((B-A)/A]*100 A/(B-C)	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6 SILTY CLA LL PL PI MC	7 Y, little med 47 20 27 27.31%	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs Weight of Oven Dry Sam Weight of Saturated Sam Absorption of Oversize Pa Bulk Specific Gravity	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) (W7/W8) (W7/W8)*100 (wd/(1+wc)) (W7/W8)	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2 se Aggregate A B a) C ((B-A)/A]*100 A/(B-C)	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6 SILTY CLA	7 Y, little med 47 20 27 27.31%	
POINT RESULTS (FINE Wt. Soil & Mold Weight of Mold Wt. Of Wet Soil Wet Density, wd (pcf) WATER CONTENTS Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare & Soil Wt Tare Wt Moisture Wt Dry Soil Water Content (%) Dry Density (pcf) MAXIMUM DRY DENSI OPTIMUM MOISTURE Corrected Maximum Dr Corrected Maximum Dr Corrected Optimum Mois Specific Gravity And Abs Weight of Oven Dry Sam Weight of Saturated Sam Absorption of Oversize Pa Bulk Specific Gravity AVERAGE ABSORPTIO	(W1) (W2) (W3=W1-W2) (W3/453.6*Vm) (W3/453.6*Vm) (W4) (W5) (W6) (W7=W4-W5) (W8=W5-W6) (W7/W8)*100 (wd/(1+wc)) (W7/W8)*100 (wd/	1 3784.80 2020.00 1764.80 117.04 1923.53 1610.26 162.82 313.27 1447.44 21.64% 96.2 se Aggregate A B a) C ((B-A)/A]*100 A/(B-C)	2 3811.40 2020.00 1791.40 118.80 1881.41 1531.66 106.24 349.75 1425.42 24.54% 95.4 96.5 22.0 - ASTM C 12	3 3799.50 2020.00 1779.50 118.01 1942.45 1565.48 164.50 376.97 1400.98 26.91% 93.0 DES 27-88	4 3751.90 2020.00 1731.90 114.85 336.11 299.50 114.89 36.61 184.61 19.83% 95.8 SCRIPTION USCS	5 3629.50 2020.00 1609.50 106.74 477.46 428.93 115.53 48.53 313.40 15.49% 92.4 Olive Brown fine sand. CL	6 SILTY CLA	7 Y, little med 47 20 27 27.31%	TECH DH/ DATE 5/5/ THECK

Y

MOISTURE / DRY DENSITY CURVE D 698 METHOD A



1								A.)			-)	
															FLOW	PUMP #1
							FLEXIB	LE WALL I	PERMEAB	ILITY						
								ASTM D	5084							
						M	ETHOD D	, CONSTAN	T RATE	OF FLOW						
4							•									
PROJECT T	ITLE	GENESIS	PLUM POI	NT ENERG	Y/AR	1	BOARD #	10	- C	OMMENTS	The sampl	e was remo	ided to 96.0% of the Max	imum Dr	у	
PROJECT N	UMBER	013-3205				1	CELL #	10			Density an	d OPTM +	2.6% (using ASTM D 69	8).		
SAMPLE ID		TP-1	•	-	· .	Flow P	ump Speed	4								
SAMPLE TY	PE	Bulk				1	Technician	PWM	-							
		Language		·-		4										
Sample Data,	Initial					Sample Da	ta, Final									
Height, inche	5	3.003	B-Value, f	0.97		Height, ind	hes	3.009				****	Trimmings		Sample	
Diameter, in	ches	2.790	Cell Pres.	85.0		Diameter,	inches	2.876		WATER C	ONTENTS		Initial	8 A.	Final	
Area, cm ²		39.44	Bot. Pres.	80.0		Area, cm ²		41.91		Wt Soil &	Tare, i	g	555.81		644.64	
Volume, cm ³	•	300.85	Top Pres.	80.0	· · · ·	Volume, c	m ³	320.33		Wt Soil &	Tare, f	g	446.23		496.89	
Mass, g		555.81	Tot. B.P.	80.0		Mass, g		594.34		Wt Tare		g	0.00		51.74	
Moisture Co	ntent, %	24.56	Head, max.	69.64		Moisture (Content, %	33.19		Wt Moistu	re Lost	g	109.58		147.75	
Dry Density,	pcf	92.55	Head, min.	69.64		Dry Densit	y, pcf	86.93		Wt Dry So	ál.	g	446.23		445.15	
Spec. Gravity	y	2.716	Max. Grad	9.11		Volume So	lids, cm ³	164.30		Water Cor	itent	%	24.56%		33.19%	
Volume Solid	is, cm ³	164.30	Min. Grad.	9.11		Volume Vo	oids, cm ³	156.03	÷							
Volume Void	ls, cm ³	136.56] ·			Void Ratio	- -	0.95	· .							
Void Ratio		0.83				Saturation	, %	94.9%		DESCRIP	TION					
Saturation, 9	6	80.2%								Olive Brow	m, SILTY (LAY, little	medium to fine sand.		· · · ·	
									-							· .
		Flow Pum	p Rate	2.90E-03	cm ³ /sec		USCS	CL						· .		
	1.															
· · · ·			TIM	E FUNCTIO	ONS, SECO	ONDS			dP	- ¹⁶						
	DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability		¥ .	
					(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)			
	5/15/01	37026	9	0	18.7	0	0	0	. 0	0.99	69.64	9.11	7.9E-06			
	5/15/01	37026	9	5	18.7	5	5	300	300	0.99	69.64	9.11	7.9E-06			
	5/15/01	37026	9	10	18.7	5	10	300	600	0.99	69.64	9.11	7.9E-06			
	5/15/01	37026	9	15	18.7	5	15	300	900	0.99	69.64	9.11	7.9E-06	•		
	5/15/01	37026	9	20	18.7	5	20	300	1200	0.99	69.64	9.11	7.9E-06	•		
	5/15/01	37026	9	25	18.7	5	25	300	1500	0.99	69.64	9.11	7.9E-06	•		
	5/15/01	37026	9	30	18.7	5	30	300	1800	0.99	69.64	9.11	7.9E-06	•		
	*TRANSO	CRIBED FR	OM ORIGI	NAL DATA	SHEETS					PER	MEABILI	FY REPOR	TED AS ** 7.9E-06 cm	n/sec **		
		•													DATE	5/15/01
	,														CHECK	they
1															REVIEW	PINA



REVIEW P



REVIEW

		AS ASTM D 42	5TM GRA 1, D 2217	AIN SIZE A 7, D 1140, C	NALYSIS 2 117, D 4	22, C 136		
שחודריד דוידו ד	CENT	CIC/DI UM DO	NAT ENED	WAR	C.			
DOFECT NO	GEN	012 2205	ANI ENERG		SA DO		T	r-2
KUJECI NU.		013-3205		• · · · · · · · · · · · · · · · · · · ·	SAM	PLETYPE	B	ulk
KEMARAS			· · ·	There is a	SAMPI	LE DEPIH	<u> </u>	-
WATER CONTEN	T Malinanad M	a fatura)		Hygroscopic I	violature For a	Neve Sample	Tone (am)	44.42
WATER CONTEN	(Denvered Mi		005 22	4		Wet Soil &	Tare (gm)	44.49
Wt Wet Soll & Tare	(gm)	(W1)	104.00	4		Dry Soil &	Tare (gm)	41.93
Wi Dry Soll & Tare	(gm)	(w2)	104.32	1		l'are weigh	t (gm)	3.21
Weight of Hare (gill)	· .	(w3)	32.24	Total Mainht	066	Moisture Co	Differit (70)	0.01
Weight of Water (gh		(w4=w1-w2)	122.05	Total weight	Of Sample Us	Voicht Of S	corrected For H	ygroscopic Mo
Weight of Dry Soll (gm)	$(w_3 = w_2 - w_3)$	21.05	4		Tree Weight	sample (gm)	56.26
Molsture Content (X		(w4/w5)+100[51.05	4	01/6)	Tate weigh	n (gm)	0.00
				1	(wo)	Total Dry v	veigne (gm)	52.11
SIEVE ANALVSIS				Cumulative				
Tere Weight		W/t Det	(Wt-Tare)	(% Petsined)	Ø DASS	SIEVE	-	
A OO	7	+Tare	(WE-TAIC)	(Arctained)	70 FA33	312 1	-	
0.00		T Tale			(100-2010)	12.0"	cobbles	
	3.0"					2.0		
	3.0 3.5"					3.0	coarse gravel	
	2.5				·	2.5	coarse gravel	
	2.0					2.0	coarse gravel	
	1.5					1.5	coarse gravel	
	1.0					1.0	coarse graver	
	0.75					0.75	fine gravel	
	0.50					0.50	fine gravel	
Server .	0.375					0.375	ine gravel	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.02	0.02	0.04	99.90	#40	fine sand	
	#40	0.03	0.03	0.00	99.94	#40	fine sand	
	#00	0.07	0.07	0.13	99.07	#100	fine sand	
	#100	0.11	0.11	0.21	99.79	#100	fine sand	
	#200	0.40	V.40	0.8/	33.13	#200 DAN	lines	
COPPLE	PAN	1				PAN		
A COBBLES	0.00	1	ative Tames	> 10 <i>m</i>	months are	(-)		
	0.00	Descri	o to 50	> 10% 1	nosuy coarse	(C) 		41
A F URAVEL	0.00	trace	0 10 3%	> 10% 1	nosuy meatur See (e m)	n (m)		41
	0.00		J to 12%	< 10%			rL	20
W M JANU	0.06	some	12 10 30%	< 10%	coarse (m-I)	- (-m)		
7 F JAND 6 Eines	0.81	and and	30 10 30%	< 10% (coarse and line	c (m)	GS	·•
A TOTAL	99.13	-		< 10%	coarse and me			
% IOTAL	100.00	J .		> 10%	equal amounts	each (c-f)		
	Reontration					1		
D	ESCRIPTION	Ouve Brown,	SILTY CLAY	r, trace mediun	n to line			
		sand.				1		
	1000					1	(mm. Ar-	DITE
	USCS						TECH	DH/IJ
							DATE	5/8/01
							CHECK	
							REVIEW	1 / - /



. . . .

		MOI	STURE ASTN	C DENS A D 698	ITY CU & 1557	RVES			
PROJECT TITLE	GENESIS/PLU	UM POINT EN	ERGY/AR		TEST TYPE	D 698]
PROJECT NUMBER		013-3205	1	PJ	ROCEDURE	METHOD A		T	ليستحس
SAMPLE IDENTITY	TP-2	•	-			Line and a		1 .	
SAMPLE TYPE	Bulk								
		түр	E COMPACT	TOR P	REPARATIO	N	METHOD A:	20% OR LESS	CETAINED ON
MOLD NUMBER	4		Mechanical		Wet Method	1			
MOLD WEIGHT (m)	2020.00			•		1	METTIOD B.	> 20% PETAD	TO ON 44 AN
MOLD DIAMETER (in)	4.001		73	VPE PROCT	NR		METHOD D.	20% OF LESS	ED ON #4 AN
MOLD HEIGHT (m)	4 569		- 1	STANDARD	1				COLUMN CON
MOLD VOLIME (cr ft)	0.0332			UNAUDINO	1		METHOD C.	> 36% DETAIL	TED ON THE
	0.0352	5.	5 -њf. RAMI	MER WITH	12 INCH DRC)P		< 30% RETAIN	ED ON 3/4*
WATER CONTENT		COARSE FRACTION	TOTAL SAMPLE	TOTAL W	EIGHT BEF	ORE PROCE	ESSING AND	PERCENT RE	TAINED
Wt Tare & Soil	(W1)	4	225.33	το	TAL WEIGHT	WET (COA	RSE & FINE)	25053.00	
Wt Tare & Soil	(W2)		184.32	тс	TAL WEIGHT	, DRY (COA	RSE & FINE)	19117.22	
Wt Tare	(₩3)		52.24	w	EIGHT RETAI	NED ON #4	SIEVE (WET)	0.00	
Wt Moisture	W4=W1-W2)	0.00	41.01	w	EIGHT RETAI	NED ON 3/8"	SIEVE (WET)		
Wt Dry Soil	W5=W2-W3	0.00	132.08	w	EIGHT DETAT	NED ON 3/4*	SIEVE (WET)	{	
Water Content (dec)	(we=W4/Wh		0.3105	דים אין	CENT PETAT	NED ON #4	STEVE MPY	0.00%	
Water Content (%)			0.3105 PERCENT RETAINED ON #4 SIEVE (DR)						
				PE	RCENT RETAI	NED ON 3/4"	SIEVE (DRY)	0.00%	
POINT RESULTS (FINE)		I	2	3	4	5	6	7	
WA 0.7 4 34.13						1		······	
WE SOU & MORE	(W1)	3778.80	3839.30	3849.10	3811.90		<u></u>		
Weight of Mold	(W2)	2020.00	2020.00	2020.00	2020.00				
wt. Of wet Soil	(W3=W1-W2)	1758.80	1819.30	1829.10	1791.90			·	
Wet Density, wd (pcf) (V	V3/453.6*Vm)	116.64	120.65	121.30	118.83	l	.L	I	-
		1.1.1				•		. ·	
WATER CONTENTS			· · · · · · · · · · · · · · · · · · ·				·	· · · · · · · · · · · · · · · · · · ·	
Wt Tare & Soil	(W4)	1124.51	1091.58	876.63	877.91	ļ	. <u> </u>		
Wt Tare & Soil	(W5)	952.49	905.93	718.28	704.94	Į			
Wt Tare	(W6)	85.30	84.39	85.24	85.15				
Wt Moisture	(W7=W4-W5)	172.02	185.65	158.35	172.97				
Wt Dry Soil	(W8=W5-W6)	867.19	821.54	633.04	619.79				
Water Content (%)	(W7/W8)+100	19.84%	22.60%	25.01%	27.91%	Т	1		
Dry Density (pcf)	(wd/(1+wc))	97.3	98.4	97.0	92.9		1	11	
	(SC BIRTION				
OPTIMIN MOISTIDE CO	NTENT (R)		20.5		SCAIL HOW	Gra sand		ii, ilave media	
Competed Manimum Day 1				1		IIIIe salid.			
Corrected Maximum Dry I	Jensity (pci)			4	LICOS		1		
Corrected Optimum Moistur	e (%)		L	J	USCS		_] ·		
Specific Gravity And Absorp	tion of Coarse	e Aggregate -	ASTM C 127	-88		•			
Weight of Onen Day Samula	()	•		T	T	1			
Weight of Saturna Current	USUU) Data (arm)	A D			t	1	111 101	20	
Weight of Saturated Surface	wry (gui)	a . A .			<u> </u>	1	11 IG		
Absorption of Oversize Parti	cles (%)	Ш) [(B-A)/A]+100					MC	31.05%	
Bulk Specific Gravity		A/(B-C)		I	<u> </u>]			ГЕСН Т
AVERAGE ABSORPTION		·		1					DATE 5/9
AVERAGE BULK SPECIFIC	C GRAVITY		 	1				C	IECK
DULA SIEUIII			L	J					

1

													FLOW	PUI
						FLEXIBI	E WALL I	PERMEABI	LITY					
						•	ASTM D	5084						
					M	ETHOD D,	CONSTAN	IT RATE O	of flow					
ROJECT TITLE	GENESIS/	PLUM POIN	T ENERGY	Y/AR		BOARD #	8	CO	MMENTS	The sample	e was remole	led to 94.9% of the Maximum	1 Dry	
ROJECT NUMBER	013-3205					CELL#	8			Density an	d OPTM +	5.8% (using ASTM D 698).		
MPLE ID	TP-2	•	-	•	Flow P	ump Speed	12							
AMPLE TYPE	Bulk					Technician	PWM							
														_
mple Data, Initial					Sample Da	ta, Final								
eight, inches	3.012	B-Value, f	0.99		Height, inc	hes	3.010					Trimmings	Sample	
liameter, inches	2.790	Cell Pres.	85.0		Diameter, i	inches	2.789		WATER C	ONTENTS		Initial	Final	
rea, cm²	39.44	Bot. Pres.	80.0		Area, cm ¹		39.41	$(1,1) \in \mathbb{R}^{n}$	Wt Soil & '	Tare, i	g	579.56	0.30.89	
olume, cm ³	301.75	Top Pres.	80.0		Volume, ci	n ³	301.34	1 - 14 -	Wt Soil & '	Tare, f	g	451.89	503.38	
lass, g	579.56	Tot. B.P.	80.0		Mass, g	1	585.30		Wt Tare		g	0.00	52.05	
loisture Content, %	28.25	Head, max.	107.62		Moisture C	Content, %	29.52		Wt Moistu	re Lost	g	127.67	133.31	
ry Density, pcf	93.45	Head, min.	107.62		Dry Densit	y, pcf	93.57		Wt Dry Sol	1	g ·	451.89	431.33	
pec. Gravity	2.721	Max. Grad.	14.08		Volume So	lids, cm [°]	166.07		Water Con	tent	%	28.25%	27.5270	
olume Solids, cm ³	166.07	Min. Grad.	14.08		Volume Vo	oids, cm ³	135.27							
olume Voids, cm ³	135.68				Vold Ratio), s	0.81							
oid Ratio	0.82	1			Saturation	, %	98.6%	Jen and	DESCRIPT	TION				1
aturation, %	94.1%								Olive Brow	n, SILTY (CLAY, trace	medium to fine sand.		l
								, 1						
	Flow Pum	p Rate	6.30E-06	cm ³ /sec		USCS	CL	1 - 1997 - 199						l I
								1	T	.	T			
		TIM	E FUNCTIO	DNS, SECO	DNDS	T	1	dP	-	TT	G	Dammashilit		
DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	đt	dt,acc	Reading	Head	Gradient	rerineaointy		
				(C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)	14.00	(CIII/SEC)		
5/14/01	37025	15	15	20.1	0	0	0	0	1.53	107.62	14.08	1.12.00		
5/14/0	37025	15	20	20.1	5	5	300	300	1.53	107.62	14.08	1.16-08		
5/14/0	37025	15	25	20.1	5	10	300	600	1.53	107.62	14.08	1.1E-08		

	1.1E-08
S/14/01 37025 15 20 20.1 5 5 300 300 1.53 107.62 14.08	1.1E-08
5/14/01 37025 15 25 20.1 5 10 300 600 1.53 107.62 14.08	1.1E-08
5/14/01 5/025 15 20 1 5 15 300 900 1.53 107.62 14.08	1.1E-08 *
5/14/01 5/025 15 50 20.1 5 10 200 1.53 107.62 14.08	1.1E-08 *
5/14/01 37025 15 55 20.1 5 20 500 1650 165 10762 14.08	1.1E-08 *
5/14/01 37025 15 40 20.1 5 25 500 1500 1.55 107.02 14:00	1.1E-08 *
5/14/01 37025 15 45 20.1 5 30 300 1600 1.55 107.02 14:05	DAS ** 1 1E-08 cm/sec

Golder Ass

TRANSCRIBED FROM ORIGINAL DATA

**

r

DATE 5/14/01 CHECK REVIEW





tes Inc.

	AST	M GRAI	N SIZE	ANAL	YSIS	
ASTM D	421,	D 2217,	D 1140,	C 117,	D 422,	C 136

PROJECT TITLE	GENI	ESIS/PLUM PO	INT ENER	GY/AR	SA	MPLE ID	TI	2-3
.ROJECT NO.		013-3205			SAM	PLE TYPE	Bi	ılk
REMARKS				1	SAMPI	E DEPTH		-
				Hygroscopic 1	Moisture For S	Sieve Sample		
WATER CONTENT (D	elivered Mo	oisture)				Wet Soil & 7	Tare (gm)	42.47
Wt Wet Soil & Tare (gm)	(w1)	236.71	1		Dry Soil & 1	fare (gm)	41.75
Wt Dry Soil & Tare (gm	,)	(12)	202.34	1		Tare Weight	(gm)	3.17
Weight of Tare (gm)	/	(112)	51 56	1 .		Mojeture Co	ntent (%)	1.87
Weight of Water (gm)		(24 37	Total Weight	Of Sample Us	d For Sieve (Corrected For H	
Weight of Water (gin)		(w4-w1-w2)	150.79	10tal Weight	or Sample Os	Weight Of S		SA DA
Weight of Dry Soli (gm)		$(w_3 = w_2 - w_3)$	130.76	4		Weight Of 5	ampie (gm)	34.94
Moisture Content (%)		(w4/w3)+100	22.19	1	(206)	Total Dry W	(gin) eight (gm)	53.03
· · · · · · · · · · · · · · · · · · ·					(
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE		
0.00		+Tare		{(wt ret/w6)*100	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"	-				3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"			1		2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
· · ·	0.50"					0.50"	fine gravel	
Ne de la companya de	0 375"					0 375"	fine gravel	
	#A					#4	coarse cond	
	#10	0.00	0.00	0.00	100.00	#10	medium road	
	#10 #20	0.00	0.00	0.00	00.00	#20	medium and	
	#40	0.03	0.03	0.00	00.95	#40	fine rand	
	#40	0.08	0.05	0.15		#40	fine sand	
•	#00	0.15	0.13	0.26	99.72	#00	fine sand	
	#100	0.26	0.26	0.48	99.52	#100	line sand	
	#200	2.22	2.22	4.12	95.88	#200	lines	
# 40000 F	PAN	1				PAN		
% COBBLES	0.00	4						
% C GRAVEL	0.00	Descrip	otive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediur	n (m)	LL	36
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	19
% M SAND	0.15	some	12 to 30%	< 10%	coarse (m-f)		PI	17
% F SAND	3.97	and	30 to 50%	< 10%	coarse and fin	c (m)	Gs	•
% FINES	95.88			< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
DEC	DIDTION	Olive Provent	NI TY OL AN	/ tense medius	a to fine	1		
DESC	RIFIIUN	onve brown, s	DILII CLA	, uace mealur				
	. 1	sand.						
	USCS	CL			· ·	1	TECH	DH/TJ
							DATE	5/8/01
							CHECK	H-
3								



		MOI	STURE ASTN	DENS 1 D 698	TY CU & 1557	RVES				
PROJECT TITLE	GENESIS/PLI	JM POINT EN	ERGY/AR]	EST TYPE	D 698				
SAMPLE IDENTITY	TD 2	013-3205			OCEDURE	METHODA		1		
SAMPLE TYPE	Pull	i		1						
SAMPLE ITE	Duik					MT.	VETTOD	ANA OD I DEE	DETADOD	
			E COMPAC		REPARATIO		METHOD A:	20% OK LESS	RETAINED (
MOLD NUMBER	4		Mechanical		Wet Method					
MOLD WEIGHT (gm)	2020.00						METHOD B:	> 20% RETA	INED ON #4 A	
MOLD DIAMETER (in)	4.001		T	PE PROCTO	DR			20% OR LESS	RETAINED (
MOLD HEIGHT (in)	4.569			STANDARD						
MOLD VOLUME (cu.ft)	0.0332						METHOD C:	> 20% RETA	INED ON 3/8"	
•		5.5	5 -lbf. RAMI	MER WITH	2 INCH DRO	DP		< 30% RETA	INED ON 3/4"	
WATER CONTENT		COARSE	TOTAL SAMPLE	TOTAL W	EIGHT BEF(DRE PROCI	ESSING AND	PERCENT R	ETAINED	
WA Torra & Call	and a	FRACTION	SAME LE	1		11000 (00)				
WILLARE & SOU	(W1)		230.71	TO	AL WEIGHT,	WET (COA	ROE & FINE)	21921.00		
WI Tare & Soil	(W2)		202.34	то	AL WEIGHT	DRY (COA	RSE & FINE)	17851.73		
Wt Tare	(W3)		51.56	WE	IGHT RETAIN	ED ON #4	SIEVE (WET)	0.00		
Wt Moisture	(W4=W1-W2)	0.00	34.37	e we	ight retain	ED ON 3/8"	SIEVE (WET)			
Wt Dry Soil	(W5=W2-W3)	0.00	150.78	we we	IGHT RETAIN	ED ON 3/4"	SIEVE (WET)			
Water Content (dec)	(wc=W4/W5)		0.2279	PER	CENT RETAIL	ED ON #4	SIEVE (DRY)	0.00%		
Water Content (%)	GW4/GW/D#100		22 70%	090	CENT DETAIL	NED ON 3/8"	STRUE (DRV)	0.00%		
Water Content (%)	(114/113)-100		22.197		NED ON 3/6"	SIEVE (DRI)	0.00%			
				PER	CENT RETAIL	NED ON 3/4"	SLEVE (DRY)	0.00%		
POINT RESULTS (FINE)	1	2	3	4	5	6	7		
Wt. Soil & Mold	(WI)	3833.60	3867 10	3805 30	3701 30	3727.00	3813 50		· · ·	
Weight of Mold	(112)	2020.00	2020.00	2020.00	2020.00	2020.00	2020.00		••	
Weight of Wind	(₩2)	2020.00	2020.00	2020.00	2020.00	2020.00	2020.00			
Wet Dirvet Soll	(W3=W1-W2)	1813.60	184/.10	1/85.30	1//1.30	1/07.00	1/93.50			
(pci)	(W3/453.6*Vm)	120.27	122.49	118.40	117.47	113.20	118.94			
WATER CONTENTS				· · · ·						
WATER CONTENTS										
Wt Tare & Soil	(W4)	1924.06	1940.60	1882.95	1845.07	489.49	442.18			
Wt Tare & Soil	(W5)	1614.30	1610.15	1527.97	1466.96	442.63	394.12			
Wt Tare	(W6)	114.11	108.18	110.20	109.24	114.71	114.10			
Wt Moisture	(W7=W4-W5)	309.76	330.45	354.98	379.11	46.86	48.06			
Wt Dry Soll	ave-we wo	1500 10	1501.07	1417 77	1357 70	327.02	280.02			
We Dry Son	(110-115-110)	1500.19	1501.97	1417.77	1331.12	321.92	200.02			
Water Content (0)	and allowed on	00.65.77	00 00 m		42.00.00	11000	1 10 1/0			
Water Content (%)	(W7/W8)*100	20.03%	22.00%	25.04%	2/.92%	14.29%	17.10%			
Dry Density (pcf)	(wd/(1+wc))	99.7	100.4	94.7	91.8	99.0	101.5			

MAXIMUM DRY DENS	ITY (pcf)		102.0	DES	CRIPTION	Olive Brown	, SILTY CLA	Y, trace med	ium to	
OPTIMUM MOISTURE	CONTENT (%)	1	18.0	1		fine sand.				
Corrected Maximum Dr	y Density (pcf)			1						
Corrected Optimum Moi	sture (%)			1 ×	USCS	CL	T			
Specific Gravity And Abs	orption of Coars	se Aggregate	- ASTM C L	27-88	· .		_			
Weight - Come Days	-1. ()	. 1								
Weight of Oven Dry Sam	pie (gm)	A								
weight of Saturated-Surf	ace-Dry (gm)	В					PL	19		
weight of Saturated Sam	ple in Water (gr	n) C					PI	17		
Absorption of Oversize P	articles (%)	[(B-A)/A]*100		L		1	мс	22.79%		
Buik Specific Gravity		A/(B-C)		L	L	1			TECH DI	
AVERAGE ABSORPTIC	N								DATE 5/	
AVERAGE BULK SPEC	IFIC GRAVITY							C	HECK	
								RE	VIEW R	

	\sum								J.) La	
		· · ·		· · · · · · · · · · · · · · · · · · ·						-	,				FLOW	PUMP #1
							FLEXIB	LE WALL	PERMEAB	ILITY						
								ASTM D	5084						-	
						M	ETHOD D	, CONSTA	NT RATE (OF FLOW						
PROJECT TI	TLE	GENESIS/	PLUM POIN	T ENERG	Y/AR]	BOARD #	11	C	OMMENTS	The sampl	e was remo	ded to 94.4% of the Max	imum Dr	у	
PROJECT N	UMBER	013-3205					CELL #	11			Density an	d OPTM +	6.2% (using ASTM D 69	8).		
SAMPLE ID		TP-3	•	•	· · ·	Flow P	ump Speed	10								
SAMPLE TY	PE	Bulk					Technician	PWM				-			·	
Samula Data	Initial					Sample Da	ta Final									
Height inche	- 11136140	2.998	R-Value, f	1.00	1	Height, inc	thes	2.985					Trimmings		Sample	
Diameter, inc	hes	2.790	Cell Pres.	85.0		Diameter.	inches	2.777		WATER C	ONTENTS		Initial		Final	
Area, em2		39.44	Bot. Pres.	80.0		Area. cm2		39.08		Wt Soil &	Tare, i	g	580.04		636.75	
Volume. cm ³		300.35	Top Pres.	80.0		Volume, ci	m ³	296.27		Wt Soil &	Tare, f	8 g	463.36		514.66	
Mass. p	•	580.04	Tot. B.P.	80.0		Mass. g		585.54		Wt Tare		g	0.00		51.65	
Moisture Con	ntent. %	25.18	Head, max.	115.36		Moisture C	Content. %	26.37	-	Wt Moistu	re Lost	8	116.68		122.09	
Dry Density,	pcf	96.27	Head, min.	115.36		Dry Densit	y, pcf	97.59		Wt Dry So	il	g	463.36		463.01	
Spec. Gravity	r	2.706	Max. Grad.	15.21	1	Volume So	lids, cm'	171.23		Water Con	tent	%	25.18%		26.37%	
Volume Solid	is. cm ³	171.23	Min. Grad.	15.21		Voiume Vo	aids, cm ³	125.04								
Volume Void	s, cm ³	129.12		k		Void Ratio	1	0.73								
Void Ratio		0.75				Saturation	, %	97.7%		DESCRIP	TION					
Saturation, %	6	90.4%]	•					•	Olive Brow	n, SILTY (CLAY, trac	e medium to fine sand.			
		Flow Pum	p Rate	3.00E-05	cm ³ /sec		USCS	CL							· .	
			TIM	E FUNCTIO	ONS, SECO	NDS	· .		dP			l I				
	DATE	DAY	HOUR	MIN	TEMP	đt	dt,acc	đt	dt,acc	Reading	Head	Gradient	Permeability			
					(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)	ļ	(cm/sec)			
	5/15/01	37026	11	0	19	0	0	0	. 0	1.64	115.36	15.21	5.2E-08			
	5/15/01	37026	11	5	19	5	5	300	300	1.64	115.36	15.21	5.2E-08			
	5/15/01	37026	- 11	10	19	5	10	300	600	1.64	115.36	15.21	5.2E-08			
	5/15/01	37026	11	15	19	5	15	300	900	1.64	115.36	15.21	5.2E-08	•		
	5/15/01	37026	11	20	19	5	20	300	1200	1.64	115.36	15.21	5.2E-08	•		
	5/15/01	37026	11	25	19	5	. 25	300	1500	1.64	115.36	15.21	5.2E-08	•		
	5/15/01	37026	11	30	19	5	30	300	1800	1.64	115.36	15.21	5.2E-08	\$	J	
	*TRANS	CRIBED FR	OM ORIGIN	IAL DATA	SHEETS					PER	MEABILI	ry repor	TED AS ** 5.2E-08 cm	n/sec **	DATE	5/15/01

-	-	-			-	
		 -	 	 		

.

CHECK REVIEW

in



Golder Associates Inc.

REVIEW

SHRINKAGE LIMIT TEST ASTM METHOD 427

JOB NAME: GENESIS/PLUM POINT ENERGY/AR JOB NUMBER: 013-3205

A

SAMPLE ID PPEA-TP-4 DEPTH -

Shrinkage Limit/ Shrinkage Ratio

wt. of coated dish + wet so	45.32
wt. of coated dish + dry soi	37.21
wt. of coated dish	23.56
wt. of soil, Ws	13.65
wt. of water, Ww	8.11
water content, wo%	59.41
Vol. of wet soil, Vo (cm3)	13.42
Vol. of dry soil, Vf (cm3)	7.52
	• .

Shrinkage Limit		16.21
Shrinkage Ratio		1.82

Wet soil pat volume

wt. of coated dish	23.61
wt. of coated dish + Hg	205.42
wt. of Hg	181.81
Vol. of dish	13.42

Dry soil pat volume

wt. of evap. dish	1152.90
wt. of evap. dish + Hg disp	1254.80
wt. of Hg displaced	101.90
Vol. of dry soil pat	7.52

DATE	5/22.01
TECH	NG
REVIEWED	MB

Golder Associates Lakewood, CO



REVIEW

		·	AS mark C11	STM GRA	IN SIZE ANALY	YSIS				
		A	STM CII	17, CI30,	D421, D422, D11	40 and D2217				-
PROJECT TITLE	GENESIS/PLI	UM POINT EN	ERGY/AR		-	SAMPLE ID	1	TP_4	. 1	
PROJECT NO.	013-	3205			• •	SAMPLE TYPE	E	Bu	lk	
						SAMPLE DEP	ГН			
	WATER GO									
AS RECEIVED	WATER CO	NTENT		Hygrosc Eon Sier	opic Moisture	Wet Soil & Tare (gr	n)	49.80		
Tare No.	-)	aun	257.11	ror Siev	e Sample	Dry Soil & Tare (gr	n)	40.00		
WL Wet Soil & Tare (gr	n) n)	(WI)	205.49			Mointure Content (9	5	7.23		
Weight of Tare (em)		(12)	52.15	Total We	ght of Sample Used 1	For Sieve Analysi	Corrected 1	For Hygrosco	pic Moisture	*
Weight of Water (gm)		(W4 = W1-W2)	50.62		Weight + Tare, Befor	e Separating On The	#4 Sieve (gm)	931.23		
Weight of Dry Soil (gm)	n en	(W5 = W2-W3)	154.34			Tar	e Weight (gm)	218.82		
Moisture Content (%)		(₩4/₩5)*100	32.80			Tot	al Weight (gm)	664.40	(₩6)	
Plus #4 Materia	l Sieve			(Wt+Tare)	(((Wt-Tare)/W6)*100)	%PASSING				
TARE WEIGHT	0.00		12.0"				12.0"	cobbles		
			3.0*				3.0"	coarse gravel		
			2.5"				2.5"	coarse gravel		
			2.0"				1.0"	coarse gravel		
			1.5"				1.5"	coarse gravel		
			0.754				0.75*	fine eravel		
.*			0.75				0.50"	fine gravel		
			0.375*				0.375"	fine gravel		
			#4	0.00	0.0	100.0	#4	coarse and		
Specific Gravity Specific Gravity Amount Dispersing Age Type Dispersion Device	(sssumed) (tested) nt (ml)	2.650 125.00 Mechanical			Weight of Sample Wet of Calculated Dry Wt. use Hydrometer Bulb Numb	or Dry (gm) d in test (gm) per hole Sample	56.13 52.35 624378			-
ith of Dispersion Pe	riod	I Minute	L		To Pass #4 Sieve For W	noie Sampie	100.00	I		
TARE WEIGHT	0.00	HYDROME	TER BACH	KSIEVE (P	ercent Passing #10	- #200 Sieves)				
	0.00				Cumul Wt.					
				(Wt+Tare)	Retained	% PASSING	1			
			#10	0.00	0.00	100.0	#10	medium sand		•
			#20	0.03	0.03	99.9	#20	medium sand		
			#40	0.06	0.06	99.9	#40	fine sand		
			#60	0.09	0.09	99.8	#60	fine sand		
			#100	0.16	0.16	99.7	#100	fine sand		
			#200	0.36	0.36	99.3	#200	fines		
D. (HYDROME	TER CALC	ULATION	D TEMP COD		DEADDIG	EFFORM	rr	
S/0/01	TIME	EI (min)	D	T	K	Co	C	LENGTH		
5/9/01	9:55	2 00	51.0	22.00	0.013	6.50	44.50	9.1	1.00	
5/9/01	10:00	5.00	48.0	22.00	0.013	6.50	41.50	9.6	1.00	
5/9/01	10:10	15.00	43.0	22.00	0.013	6.50	36.50	10.4	1.00	
5/9/01	10:25	30.00	39.0	22.00	0.013	6.50	32.50	11.1	1.00	
5/9/01	10:55	60.00	35.0	22.00	0.013	6.50	28.50	11.7	1.00	
5/9/01	14:05	250.00	30.0	22.00	0.013	6.50	23.50	12.5	1.00	
5/10/01	9:55	1440.00	26.0	22.00	0.013	6.50	19.50	13.2	1.00	
		GRAIN SI	ZE PERCE	NTAGES						
Particle Diameter	% PASSING	% COBBLES		0.00	Description	Olive Brown, SI	LTY CLAY,	trace medium	to	1. T.
0.0284	85.0	S COARSE GRAV	EL	0.00		fine sand.	T			
0.0184	79.3	S FINE GRAVEL		0.00	USCS	СН	1			
0.0111	69.7	COARSE SAND		0.00		50	Ill			
1 0.0050	62.1	S EINE SAND		0.57		23	PL			
0.0030	44.0	S FINES		99.31	1	27	PI		TECH	TJ
0.0013	37.3	S TOTAL SAMPL	E	100.00			-		DATE	5/8/01
									CHECK	A
									REVIEW	IWM

Con.

		MOI	STURE ASTN	DENSI 1 D 698	TY CU & 1557	RVES			
	CIDIDATE (DI	A BODT EN	TROVING		TEST TUDE	n (09			
PROJECT IIILE	GENESIS/PL	UM POINT EN	ERGY/AR	705	LSI TITE	D 698		T	
PROJECT NUMBER		013-3205		Ph	OCEDURE	METHOD A		1	
SAMPLE IDENTITY	TP-4	-	<u> </u>						
SAMPLE TYPE	Bulk								
•		TYP	E COMPACT	TOR P	REPARATIO	N	METHOD A:	20% OR LES	S RETAINED O
MOLD NUMBER	4		Mechanical		Wet Method	•			
MOLD WEIGHT (gm)	2020.00	1 - F					METHOD B:	> 20% RET	LINED ON #4 A
MOLD DIAMETER (in)	4.001	-	TY	PE PROCTO)R			20% OR LES	S RETAINED O
MOLD HEIGHT (in)	4.569			STANDARD					
MOLD VOLUME (cn.ft)	0.0332	:			I		METHOD C:	> 20% RET.	INFD ON 3/8"
		5.	5 -lbf. RAMN	AER WITH 1	2 INCH DRC)P		< 30% RET.	VINED ON 3/4"
WATER CONTENT		COARSE	TOTAL	TOTAL W	EIGHT BEF	ORE PROCE	ESSING AND	PERCENT	RETAINED
	-	FRACTION	SAMPLE					-	7
Wt Tare & Soil	(W1)		257.11	TO	TAL WEIGHT	, WET (COA	RSE & FINE)	38406.00	-
Wt Tare & Soil	(W2)	ê.	206.49	TO	TAL WEIGHT	, DRY (COA	RSE & FINE)	28920.68	-
Wt Tare	(W3)		52.15	W	IGHT RETAIL	NED ON #4	SIEVE (WET)	0.00	1
Wt Moisture	(W4 = W1-W2)	0.00	50.62	W	EIGHT RETAI	NED ON 3/8*	SIEVE (WET)		
Wt Dry Soil	(WS=W2-W3)	0.00	154.34	Ŵ	EIGHT RETAI	NED ON 3/4"	SIEVE (WET)		
Water Content (dec)	(wc = W4/W5)		0.3280	PE	CENT RETAI	NED ON #4	SIEVE (DRY)	0.00%	
Water Content (%)	(W4/W5)*100		32.80%	PE	RCENT RETAI	NED ON 3/8"	SIEVE (DRY)	0.00%	7
				PE	RCENT RETAI	NED ON 3/4"	SIEVE (DRY)	0.00%]
POINT RESULTS (FINE)		1	2	3	4	5	6	7	1
· .		:							
Wt. Soil & Mold	(W1)	3760.70	3807.80	3807.30	3720.40]
Weight of Mold	(W2)	2020.00	2020.00	2020.00	2020.00	1			7
Wt. Of Wet Soil	(W3=W1-W2)	1740.70	1787.80	1787.30	1700.40	1	1	1	7
Wet Density, wd (pcf)	(W3/453.6*Vm)	115.44	118.56	118.53	112.76				1
						· .		· ·	-
WATER CONTENTS									
Wt Tare & Soil	(W4)	1850.79	1157.80	1895.21	1809.37	T	1	T	٦
Wt Tare & Sail	(WD)	1523.28	034 78	1507 43	1525 73				-
W4 Tane		100.00	79 77	1302.43	109 20	<u> </u>			-1
We have	(110)	109.28	76.77	100.00	108.56				- .
	(w7=w4-w5)	327.51	223.02	392.78	283.04				-
we Dry Soil	(W8=W5-W6)	1414.00	856.01	1396.37	1417.35		1	1	4
						r	1	·	7
water Content (%)	(₩7/₩8)+100	23.16%	26.05%	28.13%	20.01%	<u> </u>	L		4
Dry Density (pcf)	(wd/(1+wc))	93.7	94.1	92.5	94.0	L	<u> </u>	1	
MAXIMUM DRY DENSIT	ſY (pcf)		94.5	DE	SCRIPTION	Olive Brown	, SILTY CLA	Y, trace med	ium to
OPTIMUM MOISTURE C	CONTENT (%)		25.0			fine sand.			
Corrected Maximum Dry	Density (pcf)								
Corrected Optimum Moist	ure (%)			1	USCS	СН	1.		
Specific Gravity And Abso	rption of Coars	e Aggregate -	ASTM C 127	-88	•••		-		
Walaha at O					r	1			٦
Weight of Oven Dry Samp	we (gm)	A			 			50	-{
Weight of Saturated-Surfa	ce-Dry (gm)	В				-	PL	23	-
Absorption of Oversize Pa	ue ut Water (g rticles (%)	m) C [(B-A)/A]*100]	MC	27 32.80%	
Bulk Specific Gravity		A/(B-C)	[]			тесн
AVERAGE ABSORPTION	N			1					DATE 5
AVERAGE BIT & SPECT	FIC GRAVITY			1					CHECK
	C GIGITTI I		L	J					



).							3)						X	· •
<u>`````````````````````````````````````</u>							······································						<u> </u>		FLOW	PUMP #
							FLEXIB	LE WALL I	PERMEAB	ILITY						
								ASTM D	5084							
						M	ETHOD D	, CONSTAI	NI RATE (JF FLOW						
PROJECT	TLE	GENESIS	PLUM POI	T ENERG	Y/AR	1	BOARD #	10		OMMENTS	The sampl	e was remo	ded to 94.1% of the Maxi	mum Dr	y]	
PROJECT N	UMBER	013-3205				1	CELL#	10		1. A.	Density an	d OPTM +	4.9% (using ASTM D 69	8).		
SAMPLE ID		TP-4	-	•	-	Flow P	ump Speed	8	$f_{i,j} = f_{i,j}$							
SAMPLE TY	PE	Bulk		- -]	Technician	PWM		•						
Comple Date	R_141_1		<u> </u>			Somple Do	ta Final							11		
Sample Data,	, 1010ai	3.001	B-Value, f	1.00		Height, inc	thes	3.044					Trimmings		Sample	
Diameter, inc	ches	2.790	Cell Pres.	85.0		Diameter,	inches	2.798		WATER C	ONTENTS	i	Initial	_	Final	
Area, cm ³		39.44	Bot. Pres.	80.0		Area, cm ²		39.67		Wt Soil &	Tare, i	g	555.99		621.36	
Volume, cm ³	1	300.65	Top Pres.	80.0		Volume, ci	m ³	306.71		Wt Soil &	Tare, f	g .	428.08		470.95	
Mass, g		555.99	Tot. B.P.	80.0		Mass, g		578.68		Wt Tare		g	0.00		43.42	
Moisture Con	ntent, %	29.88	Head, max.	97.07		Moisture (Content, %	35.18		Wt Moistu	re Lost	g	127.91		150.41	
Dry Density,	pcf	88.85	Head, min.	97.07		Dry Densi	y, pcf	87.09		Wt Dry So	11	g	428.08		427.55	
Spec. Gravit	y .	2.719	Max. Grad	. 12.55		Volume So	lids, cm	157.44		Water Con	itent	%	29.88%	1	33.10%	ł
Volume Solid	ds, cm ³	157.44	Min. Grad.	12.55		Volume Vo	pids, cm	149.27								
Volume Void	ls, cm'	143.21	4			Void Ratio	,	0.95		DESCIDENT	MON					
Void Ratio	-	0.91	-			Saturation	, 70	100.9%	1	Olive Brow		TAV trace	medium to fine sand.]	
Saturation, 9		89.3%	Ĺ	•)							
		Flow Pum	p Rate	1.40E-04	cm ³ /sec		USCS	СН]							j
											r	 т	· ·			
		T	TIM	E FUNCTIO	DNS, SECO	DNDS	1.	1 .	dP		XX	Carlord	Dermoshility			
	DATE	DAY	HOUR	MIN	TEMP	dt	di,acc	at	at,acc	Keading (nei)	Head (cm)	Gradient	(cm/sec)			
	5114/01	27025	1	15	10			(sec)		1 38	97.07	12.55	2.9E-07			
	5/14/01	37025	10	15	19	5	5	300	300	1.38	97.07	12.55	2.9E-07		-	
	5/14/01	37025	10	20	19	5	10	300	600	1.38	97.07	12.55	2.9E-07			
	5/14/01	37025	10	30	19	5	15	300	900	1.38	97.07	12,55	2.9E-07	•		
	5/14/01	37025	10	35	19	5	20	300	1200	1.38	97.07	12.55	2.9E-07	. •		
	5/14/01	37025	10	40	19	5	25	300	1500	1.38	97.07	12.55	2.9E-07	•		
	5/14/01	37025	10	45	19	5	30	300	1800	1.38	97.07	12.55	2.9E-07	•		
	*TRANSC	CRIBED FR	OM ORIGI	NAL DATA	SHEETS					PER	MEABILI	TY REPOR	TED AS ** 2.9E-07 cm	n/sec **		
		•													DATE	5/14/01
															CHECK	#
															REVIEW	NUN

Coldor Accoriates Inc







	τ	JNCONSOL	IDATED /	UNDRAINI AS	ED COMPR STM D 2850	ESSIVE ST	RENGTH	OF SOILS		
PRO PR	JECT TITLE OJECT NO.	GENESIS/PL	UM POINT E 013-3205	NERGY/AR		SAM SAMPI	PLE ID LE DEPTH	TP	-4	
MACHIN STRAIN	E SPEED (in/min) RATE (%/min)	0.06			CELL PRI SAMPLE I CONFINIT	SSURE (psi) RESSURE (ps IG PRESSURE	i) 2, σ3 (psi)	10.0 0.0 10.0		
	INITIAL SAM	PLE DATA					CORRE	CTED SAMPI	E DATA	
	HEIGHT(in)	6.011	(cm)	15.268			HEIGHT (in)	cied grave e	5.981	
	DIAMETER(in)	2.790	(cm)	7.087			DIAMETER	(in)	2.797	
	AREA(in')	6.11	(cm²)	39.44			AREA (in')	- ·	6.14	
	VOLUME(in ⁻)	36.75	(cm')	602.21			VOLUME (II	1)	36.75	
	WEIGHT (g)		28.1							
	SPECIFIC GRAV	VITY	2.719				W	ATER CONTE	NT	
	WET DENSITY	(pcf)	115.3				WT SOIL &	TARE, WET (g	1195.15	
	DRY DENSITY,	(pcf) calc	90.0				WT SOIL &	TARE, DRY(g)	951.74	
	VOLUME OF SO	OLIDS (cm ³)	319.32				WT TARE (g	¢	84.42	
	VOLUME OF V	OIDS (cm ³)	282.89				WT MOISTU	JRE (g)	243.41	
	VOID RATIO		0.886				WT DRY SO	0L(g)	867.32	
	% SATURATIO	N	80.1	1			% MOISTUP	Œ	28.06	
	T	ACCUM.	AXIAL	e	CORRECTED	DEVIATOR	(ơ,)	$(\sigma_1' + \sigma_3')$	(σ ₁ - σ ₃)	
	TIME	DEFLECT	LOAD	% STRAIN	AREA	STRESS	devstr+cp	2	2	
	(min)	(inch)	(lbs)	(in/in)	(in ²)	(psf)	(psf)	(P)	(Q)	
	0.0	0.000	17	0.0	6.14	0.00	1440.00	1440.00	0.00	
	0.1	0.005	32	0.0	615	725.80	2165.80	1802.90	362.90	
	0.2	0.009	41	0.1	6.15	936.05	2376.05	1908.03	468.03	
	0.2	0.012	48	0.2	6.16	1099.31	2539.31	1989.66	549.66	
	0.3	0.015	54	0.2	6.16	1239.03	2679.03	2059.52	619.52	
N	0.4	0.025	72	0.4	6.17	1657.07	3097.07	2268.53	828.53	
	0.8	0.050	105	0.8	6.20	2417.11	3857.11	2648.56	1208.56	
	1.3	0.075	120	1.2	6.22	2893.00	4333.00	2880.50	1446.50	
	2.1	0.125	149	2.1	6.27	3396.46	4836.46	3138.23	1698.23	
	2.5	0.150	156	2.5	6.30	3542.00	4982.00	3211.00	1771.00	
	2.9	0.175	162	2.9	6.33	3663.41	5103.41	3271.71	1831.71	-
	3.3	0.200	167	3.3	6.36	3761.00	5201.00	3320.50	1880.50	
	4.2	0.250	176	4.2	6.41	3930.80	5370.80	3405.40	1965.40	
	5.0	0.300	183	5.0	6.47	4052.55	5492.55	3466.27	2026.27	,
	5.8	0.350	190	5.8	6.58	41/1.5/	5684.11	3562.05	2085.78	
	7.5	0.450	199	7.5	6.64	4293.02	5733.02	, 3586.51	2146.51	
	8.3	0.500	204	8.3	6.70	4361.85	5801.85	3620.93	2180.93	
	9.2	0.550	207	9.1	6.76	4386.15	5826.15	3633.08	2193.08	
	10.0	0.600	211	10.0	6.83	4430.38	5870.38	3655.19	2215.19	
	10.8	0.650	214	10.8	6.89	4452.15	5892.15	3666.08	2226.08	
	11.7	0.700	218	12.6	0.95	4493.40	5052 60	3606.73	2240.73	
	13.3	0.730	221	13.3	7.02	4510.44	5950.44	3695.22	2255.22	
	14.2	0.850	226	14.1	7.16	4527.53	5967.53	3703.76	2263.76	
	15.0	0.900	229	15.0	7.23	4543.44	5983.44	3711.72	2271.72	
	15.8	0.950	231	15.8	7.30	4538.46	5978.46	3709.23	2269.23	
	16.7	1.000	233	16.6	7.37	4532.70	5972.70	3706.35	2266.35	
)
	L	1		•	NORMAL STRE	SS @ FAILURE	5983.44			
	TIME TO FAILUR	E (min)	14.2]						
	DEFLECTION @	FAILURE (in)	0.850				Failure	()	TECH	DA
	% STRAIN @ FAI	LURE	14.1	J			Sketch		DATE	5/19/

	ECT TITLE JECT NO. SPEED (in/min) ATE (%/min) INITIAL SAM HEIGHT(in) DIAMETER(in) AREA(in") VOLUME(in") WEIGHT (g) % MOISTURE SPECIFIC GRAV WET DENSITY (DRY DENSITY, VOLUME OF SO VOLUME OF VO VOLUME OF VO VOLUME OF VO VOLUME OF VO VOLUME OF VO VOLUME OF VO	GENESIS/PL 0.06 1.00 PLE DATA 6.012 2.790 6.11 36.76 /TTY (pcf) (pcf) calc (pcf) (pcf) (pcf	UM POINT E 013-3205 (cm) (cm) (cm ³) (cm ³)	15.270 7.087 39.44 602.31	CELL PRE SAMPLE F CONFININ	SAM SAMPI SSURE (psi) RESSURE (psi) G PRESSURI	(PLE ID LE DEPTH SI) C, σ3 (psi) CORRE HEIGHT (in) DIAMETER AREA (in") VOLUME (in W	25.0 0.0 25.0 ECTED SAMPI (in) a [*])	2-4 LE DATA 5.964 2.801 6.16 36.76	
	SPEED (in/min) ATE (%/min) INITIAL SAM HEIGHT(in) DIAMETER(in) AREA(in') VOLUME(in') WEIGHT (g) % MOISTURE SPECIFIC GRAV WET DENSITY (DRY DENSITY (DRY DENSITY, VOLUME OF SO VOLUME OF VO VOLUME OF VO VOID RATIO % SATURATIO TIME	0.06 1.00 PLE DATA 6.012 2.790 6.11 36.76 /TTY (pcf) (pcf) calc DLIDS (cm ³) N	(cm) (cm) (cm ³) 1111.58 28.0 2.719 115.2 90.0 319.31 283.00 0.886	15.270 7.087 39.44 602.31	CELL PRE SAMPLE F CONFININ	SSURE (psi) RESSURE (ps G PRESSURI	si) C, σ ₃ (psi) CORRE HEIGHT (in) DIAMETER AREA (in [*]) VOLUME (in W	25.0 0.0 25.0 CTED SAMPI (in) a ⁻)	LE DATA 5.964 2.801 6.16 36.76	
	INITIAL SAM HEIGHT(in) DIAMETER(in) AREA(in") VOLUME(in") WEIGHT (g) % MOISTURE SPECIFIC GRAV WET DENSITY (DRY DENSITY, VOLUME OF SO VOLUME OF VO VOLUME OF VO VOID RATIO % SATURATIO!	PLE DATA 6.012 2.790 6.11 36.76 /TTY (pcf) (pcf) calc DLIDS (cm ³) DIDS (cm ³)	(cm) (cm ³) (cm ³) (cm ³) (cm ³) 1111.58 28.0 2.719 115.2 90.0 319.31 283.00 0.886	15.270 7.087 39.44 602.31			CORRE HEIGHT (in) DIAMETER AREA (in*) VOLUME (iu) W	CTED SAMPI (in) a [*]) ATER CONTE	LE DATA 5.964 2.801 6.16 36.76	
	HEIGHT (in) DIAMETER (in) AREA (in*) VOLUME (in*) WEIGHT (g) % MOISTURE SPECIFIC GRAV WET DENSITY (DRY DENSITY (DRY DENSITY, VOLUME OF SO VOLUME OF VO VOID RATIO % SATURATIO TIME	6.012 2.790 6.11 36.76 /TTY (pcf) (pcf) calc 0LIDS (cm ³) DIDS (cm ³)	(cm) (cm ³) (cm ³) (cm ³) (cm ³) 1111.58 28.0 2.719 115.2 90.0 319.31 283.00 0.886	15.270 7.087 39.44 602.31			HEIGHT (in) DIAMETER AREA (in') VOLUME (in W	(in) a ⁻) ATER CONTE	5.964 2.801 6.16 36.76	
	WEIGHT (g) % MOISTURE SPECIFIC GRAV WET DENSITY (DRY DENSITY, VOLUME OF SO VOLUME OF VO VOID RATIO % SATURATION TIME	/TTY (pcf) (pcf) calc)LIDS (cm ³) DIDS (cm ³) N	1111.58 28.0 2.719 115.2 90.0 319.31 283.00 0.886		•		W	ATER CONTE	INT	
	SPECIFIC GRAV WET DENSITY (DRY DENSITY, VOLUME OF SO VOLUME OF VO VOID RATIO % SATURATION TIME	VITY (pcf) (pcf) calc DLIDS (cm ³) DIDS (cm ³) N	2.719 115.2 90.0 319.31 283.00 0.886				W	ATER CONTE	NT	
	WET DENSITY (DRY DENSITY, VOLUME OF SO VOLUME OF VO VOID RATIO % SATURATION	(pcf) (pcf) calc DLIDS (cm ³) DIDS (cm ³) N	115.2 90.0 319.31 283.00 0.886				1100 0000		A 1 A	
	DRY DENSITY, VOLUME OF SO VOLUME OF VO VOID RATIO % SATURATION	(pcf) calc OLIDS (cm ³) OIDS (cm ³) N	90.0 319.31 283.00 0.886				WI SOIL &	TARE, WET (g	1195.23	
	VOLUME OF VO VOLUME OF VO VOID RATIO % SATURATIO	DIDS (cm ³)	283.00 0.886				WT SOIL &	TARE, DRY(g)	952.18	
	VOID RATIO % SATURATION TIME	N	0.886				WT MOISTI	U IRE (e)	243.05	
	% SATURATION	N					WT DRY SO)IL (g)	867.02	
	TIME		86.0				% MOISTUR	Œ	28.03	
		ACCUM.	AXIAL	e	CORRECTED	DEVIATOR	(σ ₁)	(σ ₁ '+σ ₃ ')	(σ1 - σ3)	
	(11111)	(inch)	(lbe)	% SIKAIN (in/in)	AREA (in)	STRESS (nef)	devstr+cp	2		
Ē	0.0	0.000	5	0.0	6.16	0.00	3600.00	3600.00	0.00	
Ľ	0.1	0.003	26	0.0	6.17	490.44	4090.44	3845.22	245.22	
	0.1	0.006	39	0.1	6.17	793.65	4393.65	3996.82	396.82	
L	0.2	0.009	49	0.1	6.17	1026.56	4626.56	4113.28	513.28	
F	0.2	0.012	57	0.2	6.18	1212.60	4812.60	4206.30	606.30	
F	0.5	0.025	04 81	0.2	6.10	13/3.13	49/3.13 5368 43	4287.57	087.57	
	0.8	0.050	112	0.8	6.21	2479.36	6079.36	4839.68	1239.68	
	1.3	0.075	132	1.2	6.24	2930.45	6530.45	5065.23	1465.23	
Γ	1.7	0.100	146	1.7	6.27	3239.79	6839.79	5219.90	1619.90	
F	2.1	0.125	157	2.1	6.29	3477.78	7077.78	5338.89	1738.89	
F	2.5	0.150	167	2.5	6.32	3690.84	7290.84	5445.42	1845.42	
F	3.3	0.175	1/3	2.9	6.33	3008 19	7508 19	5500.00	1928.29	
	4.2	0.250	194	4.2	6.43	4232.52	7832.52	5716.26	2116.26	
	5.0	0.300	202	5.0	6.49	4373.39	7973.39	5786.70	2186.70	
	5.8	0.350	210	5.8	6.54	4511.15	8111.15	5855.58	2255.58	
F	6.7	0.400	216	6.7	6.60	4602.18	8202.18	5901.09	2301.09	
ŀ	7.5	0.450	222	7.5	6.66	4690.88	8290.88	5945.44	2345.44	
F	9.2	0.500	233	9.1	6.78	4777.25	8440.06	6020.03	2388.02	
F	10.0	0.600	238	10.0	6.85	4900.92	8500.92	6050.46	2450.46	
E	10.8	0.650	242	10.8	6.91	4939.00	8539.00	6069.50	2469.50	
Ľ	11.7	0.700	246	11.6	6.97	4975.53	8575.53	6087.76	2487.76	
F	12.5	0.750	250	12.5	7.04	5010.50	8610.50	6105.25	2505.25	
F	13.3	0.800	254	13.3	7.11	5043.91	8643.91	6121.96	2521.96	
F	15.0	0.850	257	14.1	7.25	5086.21	8686.21	6143.11	2543.11	
F	15.8	0.950	264	15.8	7.32	5095.49	8695.49	6147.74	2547.74	
F	16.7	1.000	268	16.6	7.39	5123.07	8723.07	6161.54	2561.54	
F										
т	TIME TO FAILURE	E (min)	15.0	•	NORMAL STRES	S @ FAILURE	8686.21			
D	DEFLECTION @ F	AILURE (in)	0.900				Failure	$\left(\cdot \right)$	TECH	DA
•	% STRAIN @ FAIL	URE	15.0				Sketch		DATE	5/19/01
								(/	CHECK	H _

1

PRO	JECT TITLE	GENESIS/PL	UM POINT E	NERGY/AR		SAM	PLE ID	TP	-4	
PR	DJECT NO.		013-3205			SAMPL	E DEPTH	-		1
					CELL PRE	SSURE (psi)		40.0		
IACHIN	E SPEED (in/min)	0.06			SAMPLE P	RESSURE (ps	i)	0.0		
TRAIN I	RATE (%/min)	1.00			CONFININ	G PRESSURE	, σ ₃ (psi)	40.0		
	INITIAL SAM	PLE DATA	-	- 1			CORRE	CTED SAMPL	E DATA	
	HEIGHT(in)	6.014	(cm)	15.276			HEIGHT (in)		5.950	1
	DIAMETER(in)	2.790	(cm)	7.087			DIAMETER	(in)	2.805	l
	VOLUME(in')	0.11	(cm*)	39.44			VOLIME (in	n -1	0.18	
	WEIGHT (g)	50.77	1113.10	002.31	1		(0 2 0 M L (1	.,	30.17	J
	% MOISTURE		28.0	•						
	SPECIFIC GRAV	TTY	2.719				W	ATER CONTE	NT	
	WET DENSITY	(pcf)	115.3				WT SOIL &	TARE, WET (g	1196.19	
	DRY DENSITY,	(pcf) calc	90.1				WT SOIL &	TARE, DRY(g)	952.91	
	VOLUME OF VOLUME OF VOLUME	DIDS (cm ³)	282.73				WT MOISTI	URE (0)	243.28	
	VOID RATIO		0.884				WT DRY SO)IL (g)	868.31	
	% SATURATIO	N	86.2				% MOISTUR	Æ	28.02	
	·	ACCUM.	AXIAL	e	CORRECTED	DEVIATOR	(ơ ₁)	$(\sigma_{1}' + \sigma_{3}')$	(σ1-σ3)	
	TIME	DEFLECT	LOAD	% STRAIN	AREA	STRESS	devstr+cp	2	2	ł
	(min)	(inch)	(lbs)	(in/in)	(in ²)	(psf)	(psf)	(P)	(Q)	
	0.0	0.000	37	0.0	6.18	675.46	5760.00	5760.00	0.00	
	0.1	0.005	51	0.0	6.19	1001.04	6761.04	6260.52	500.52	l
	0.2	0.009	61	0.1	6.19	1233.23	6993.23	6376.61	616.61	
	0.2	0.012	69	0.2	6.19	1418.67	7178.67	6469.33	709.33	
	0.3	0.015	76	0.2	6.19	1580.67	7340.67	6550.34	790.34	
	0.4	0.025	93	0.4	6.21	1972.55	7732.55	6746.27	986.27	
	1.3	0.030	142	1.2	6.25	3083.70	8843.70	7301.85	1541.85	
	1.7	0.100	158	1.7	6.28	3437.37	9197.37	7478.69	1718.69	
	2.1	0.125	173	2.1	6.31	3765.13	9525.13	7642.56	1882.56	
	2.5	0.150	183	2.5	6.34	3976.37	9736.37	7748.18	1988.18	
	2.9	0.175	191	2.9	6.36	4140.42	9900.42	7830.21	2070.21	İ.,
	4.2	0.200	210	42	6.45	4280.39	10040.39	8015.80	2255.80	
	5.0	0.300	219	5.0	6.50	4671.72	10431.72	8095.86	2335.86	
	5.8	0.350	228	5.8	6.56	4828.37	10588.37	8174.18	2414.18	
	6.7	0.400	235	6.7	6.62	4938.02	10698.02	8229.01	2469.01	ĺ
	7.5	0.450	242	7.5	6.68	5044.95	10804.95	8282.48	2522.48	
	0.3	0.500	248	0.3	6.80	5127.01	10007.01	8353.59	2593.59	
	10.0	0.600	258	10.0	6.86	5244.60	11004.60	8382.30	2622.30	l
	10.8	0.650	263	10.8	6.93	5300.09	11060.09	8410.05	2650.05	
	11.7	0.700	268	11.6	6.99	5353.64	11113.64	8436.82	2676.82	ł
	12.5	0.750	272	12.5	7.06	5384.86	11144.86	8452.43	2692.43	1
	13.3	0.800	276	13.3	7.13	5414.52 5447.64	111/4.52	8481 32	2721.32	l
	14.2	0.830	283	14.1	7.27	5449.39	11209.39	8484.69	2724.69	l.
	15.8	0.950	287	15.8	7.34	5474.60	11234.60	8497.30	2737.30	
	16.7	1.000	290	16.6	7.41	5478.83	11238.83	8499.41	2739.41	
	L	.I			NORMAL STREE	S @ FAILURE	11209.39			
	TIME TO FAILUR	E (min)	15.0	1			E-B		TECH	<u> </u>
	DEFLECTION @									



trace medium to fine sand. Sample Data	LL PL PI Gs	50 23 27 2.719
trace medium to fine sand. Sample Data	LL PL PI Gs	50 23 27 2.719
trace medium to fine sand. Sample Data	LL PL PI Gs	50 23 27 2.719
trace medium to fine sand. Sample Data	LL PL PI Gs	50 23 27 2.719
Sample Data	PL PI Gs	23 27 2.719
Sample Data	PI Gs	27 2.719
Sample Data	Gs	2.719
Sample Data		
Sample Data		
Campic Data	Instig	Final
Total Heights (in)	0.750	0.687
Height of solids (in)	0.397	0.397
Height of voids (in)	0.353	0.290
Height of water (in)	0.293	0.290
Void ratio	0.887	0.729
Degree of saturation	83.0%	100.0%
Dry unit wt (pcf)	89.9	98.1
Wet unit wt (pcf)	114.2	124.5
		. 1 A
LENGTH OF DRAINAGE	PERCENT	COEFFICIENT OF
PATH (DOUBLE DRAINAGE)	INITIAL	CONSOLIDATION
H (in) H^2 (cm^2)	COMPRESSION	(ft^2/day)
0.000 0.000	- '	· · · ·
0.375 0.907	-	-
0.375 0.905	·	
0.374 0.902	-	•
0.373 0.899	-	-
0.372 0.893	95.8	1.2
0.368 0.872	51.8	1.4
0.357 0.822	63.7	1.3
0.342 0.755	44.3	0.6
0.334 0.722	-	• • • •
0.335 0.725	-	•
0.338 0.739	- '	• • • •
	TECH	DU/BWA
	DATE	5/0/01
	CUPCY	17
	DEVIEW	1. Drs
	Height of solids (in) Height of voids (in) Height of voids (in) Height of water (in) Void ratio Degree of saturation Dry unit wt (pcf) Wet unit wt (pcf) Wet unit wt (pcf) H (in) H^2 (cm^2) 0.000 0.000 0.375 0.907 0.375 0.902 0.373 0.899 0.372 0.893 0.368 0.872 0.357 0.822 0.342 0.755 0.334 0.722 0.338 0.739	Height of solids (in) 0.397 Height of voids (in) 0.353 Height of water (in) 0.293 Void ratio 0.887 Degree of saturation 83.0% Dry unit wt (pcf) 89.9 Wet unit wt (pcf) 114.2 LENGTH OF DRAINAGE PERCENT PATH (DOUBLE DRAINAGE) INITIAL H (in) H^2 (cm^2) COMPRESSION 0.000 0.000 - 0.375 0.907 - 0.375 0.902 - 0.374 0.902 - 0.372 0.893 95.8 0.368 0.872 51.8 0.357 0.822 63.7 0.342 0.755 44.3 0.334 0.725 - 0.338 0.739 -

-t---

Golder Associates Inc.

.






\square	~ ********		TR	IAXIAL CO	MPRESSIO	N TEST (AS	TM D-47	ISOL	IDATED UN	DRAINED	WITH POR	E PRESSUI	RE		_)_	- -
PROJECT TITL	.E	GENES	IS/PLUM P	OINT ENER	GY/AR	INITIAL S	AMPLE DA	TA	cm	in	corrected		CORRECT	ED SAMP	LE DATA	
PROJECT NUM	IBER		013-	-3205		HEIGHT			15.273	6.013	6.013		DRY DEN	SITY, calc	(pcf)	93.5
SAMPLE ID		TP	- 4		•	DIAMETE	DIAMETER 7.087 2.790 2.739 VOLUME		VOLUME	OF SOLIÌ	S	319.97				
SAMPLE TYPE	L I		B	ulk		AREA	AREA 39.44 6.11 5.89 VOLUME OF		OF VOID	S	260.44					
DEPTH INTER	VAL			-		VOLUME			602.41	36.76	35.42		VOID RAT	OI		0.814
MACHINE SPE	ED (in/min)	0.006				WEIGHT (g)		1113.10		1120.10					
STRAIN RATE	(%/min)	0.10				% MOISTU	JRE	1. 1.	27.9		28.75					
CELL PRESSU	RE (nsi)	80.0				SPECIFIC	GRAVITY	· ·	2.72				WATER C	ONTENT	(% MOISTUR	(E)
SAMPLE PRES	SURE (nei)	70.0				MOIST DE	NSITY (pcf)	115.3				WT SOIL &	& TARE, I	MOIST (g)	1120.10
FFF CONSOL	DATION					DRY DEN	SITY. cale (, pcf)	90.1				WT SOIL &	& TARE, I	DRY (g)	870.00
PRESSURE G	(nsi)	10.0				VOLUME	OF SOLIDS		319.97				WT TARE	(g)	-	0.00
PPESSUPE C.	(nef)	1440.0				VOLUME	OF VOIDS		282.44				WT MOIST	TURE (g)		250.10
EINAL PD VA		0.00				VOID RAT	10		0.883				WT DRY S	OIL (g)		870.00
FINAL D VA	LUE	3.74				SATURAT	ION		86.1				% MOISTI	JRE		28.75
150 (minutes)		3.74														
	ACCUM.	AXIAL	PORE	PWP change	C ·		CORR.	CORR.	DEV.	SIGMA 1	SIGMA 1	SIGMA 3	EFF.PRN		$\left[\frac{(\sigma_1 - \sigma_2)}{2}\right]$	
TIME	DEFLECT.	LOAD	PRESS.	DU (psf)	% STRAIN	(1-e)	AREA	HEIGHT	STRESS	devstr+cp	EFF.	EFF.	SIR KAIIU	(D)		
(MIN)	(inches)	(ibs)	(pst)=U	(acc)	(%)	1.00	(in 2) 5 80	6.013		1440.0	1440.0	1440.0		1440.0	0.0	0.00
0.0	0.000	35	70.8 72 4	230.4	0.00	1.00	5.89	6.010	439.8	1879.8	1649.4	1209.6	1.36	1429.5	219.9	0.52
0.5	0.005	44	73.0	316.8	0.10	1.00	5.90	6.007	659.4	2099.4	1782.6	1123.2	1.59	1452.9	329.7	0.48
1.5	0.009	50	73.5	388.8	0.15	1.00	5.90	6.004	805.5	2245.5	1856.7	1051.2	1.77	1454.0	402.8	0.48
2.0	0.012	- 55	74.0	460.8	0.20	1.00	5.90	6.001	927.1	2367.1	1906.3	979.2	1.95	1442.8	463.6	0.50
2.5	0.015	59	74.9	590.4	0.25	1.00	5.91	5.998	1024.2	2464.2	1873.8	849.6	2.21	1361.7	512.1	0.58
4.2	0.025	69	75.8	720.0	0.42	1.00	5.91	5.988	1265.9	2705.9	1985.9	720.0	2.76	1353.0	633.0	0.57
8.3	0.050	83	76.0	748.8	0.83	0.99	5.94	5.963	1600.1	3040.1	2291.3	691.2	3.31	1491.2	800.0	0.47
12.5	0.075	90	76.0	748.8	1.25	0.99	5.96	5.938	1762.4	3202.4	2453.0	691.2	3.55	15/2.4	881.2	0.42
16.7	0.100	93	76.0	748.8	1.00	0.98	5.99	5.915	1827.1	3207,1	2518.5	601.2	3.64	1600.0	913.5	0.41
20.8	0.125	93	76.0	724.4	2.00	0.96	6.04	5 863	1835.4	3275.4	2541.0	705.6	3.60	1623.3	917.7	0.40
25.0	0.150	94	75.9	734.4	2.49	0.97	6.07	5.838	1827.6	3267.6	2533.2	705.6	3.59	1619.4	913.8	0.40
29.2	0.200	95	76.0	745.9	3.33	0.97	6.09	5.813	1843.4	3283.4	2537.5	694.1	3.66	1615.8	921.7	0.40
41.7	0.250	97	75.9	734.4	4.16	0.96	6.15	5.763	1874.4	3314.4	2580.0	705.6	3.66	1642.8	937.2	0.39
50.0	0.300	99	75.7	705.6	4.99	0.95	6.20	5.713	1904.6	3344.6	2639.0	734.4	3.59	1686.7	952.3	0.37
58.3	0.350	102	75.7	705.6	5.82	0.94	6.25	5.663	1957.0	3397.0	2691.4	734.4	3.66	1712.9	978.5	0.36
66.7	0.400	104	75.6	691.2	6.65	0.93	6.31	5.613	1985.4	3425.4	2734.2	748.8	3.65	1741.5	992.7	0.35
75.0	0.450	106	75.5	676.8	7.48	0.93	6.37	5.563	2012.9	3452.9	2776.1	763.2	3.64	1769.7	1006.5	0.34
83.3	0.500	108	75.4	662.4	8.32	0.92	6.42	5.513	2039.7	3479.7	2817.3	777.6	3.62	1074.9	1019.8	0.32
91.7	0.550	110	75.3	648.0	9.15	0.91	6.48	5.403	2065.0	3505.0	2657.0	- 192.0 906.4	3.01	1824.0	1032.0	0.31
100.0	0.600	112	75.2	633.0	9.98	0.90	6.60	5 363	2115.0	3555.0	2035 8	870.8	3.58	1878.3	1057.5	0.29
108.3	0.000	114	75.0	604.8	11.64	0.85	6.67	5.313	2138.5	3578.5	2973.7	835.2	3.56	1904.4	1069.2	0.28
125.0	0.750	118	75.0	604.8	12.47	0.88	6.73	5.263	2161.2	3601.2	2996.4	835.2	3.59	1915.8	1080.6	0.28
133.3	0.800	120	74.9	590.4	13.30	0.87	6.79	5.213	2183.0	3623.0	3032.6	849.6	3.57	1941.1	1091.5	0.27
141.7	0.850	122	74.8	576.0	14.14	0.86	6.86	5.163	2204.1	3644.1	3068.1	864.0	3.55	1966.0	1102.0	0.26
150.0	0.900	124	74.7	561.6	14.97	0.85	6.93	5.113	2224.3	3664.3	3102.7	878.4	3.53	1990.5	1112.1	0.25
158.3	0.950	126	74.5	532.8	15.80	0.84	7.00	5.063	2243.7	3683.7	3150.9	907.2	3.47	2029.0	1121.8	0.24
166.7	1.000	128	74.5	532.8	16.63	0.83	7.07	5.013	2262.3	3702.3	3169.5	907.2	3.49	2038.4	1131.2	0.24
	1		I		L		DEVIATO	DIC STOPS	6	ł	FFFFOTI	FDDINCH	TE STOFE	ļ	TECH	NA/DU/LA
		DU	10	740.0	1		JEVIAIO	RIC SIKES	1017 1	1	DATIO	e fruitur Fatt ide	3 24		DATE	6/7/01
1		@ FAILUE	CC.	/48.8	1		WFAILUR		104/.1	1	MIIO @ I	AILUKE	3.04		CHECKED	724
1															DEVIEWED	
															REVIEWED	INM

								<u>88</u>								
)		TR	IAXIAL CO	MPRESSIO	N TEST (AS	STM D-476	NSOL	IDATED UN	DRAINED	WITH POR	E PRESSU	RE			
PROJECT TITL	E	GENES	SIS/PLUM F	OINT ENER	GY/AR	INITIAL S	AMPLE DA	TA	cm	in	corrected		CORRECT	ED SAMPL	E DATA	
PROJECT NUM	BER		013	-3205		HEIGHT			15.268	6.011	5.946		DRY DEN	SITY, calc (pcf)	98.5
SAMPLE ID		TP	- 4		-	DIAMETE	R		7.087	2.790	2.684		VOLUME	OF SOLIDS		319.97
SAMPLE TYPE			В	uik		AREA			39.44	6.11	5.66		VOLUME	of voids		231.24
DEPTH INTERV	VAL			-		VOLUME			602.21	36.75	33.64		VOID RAT	OI		0.723
MACHINE SPE	ED (in/min)	0.003				WEIGHT (g)	1	1109.73		1117.73					
STRAIN RATE	(%/min)	0.05				% MOISTI	JRE		27.6	1	28.47					
CELL PRESSUI	RE (psi)	95.0				SPECIFIC	GRAVITY	2.	2.72	1.1			WATER C	ONTENT (9	6 MOISTUR	E)
SAMPLE PRES	SURE (psi)	70.0				MOIST DE	NSITY (pcf) 1. 1. 1.	115.0				WT SOIL	& TARE, M	OIST (g)	1117.73
EFF. CONSOLI	DATION					DRY DEN	SITY, calc (pcf)	90.1				WT SOIL	& TARE, DE	RY (g)	870.00
PRESSURE. 01	(psi)	25.0				VOLUME	OF SOLIDS		319.97	1. A.			WT TARE	(g)	-	0.00
PRESSURE, 01	(psf)	3600.0				VOLUME	OF VOIDS		282.24				WT MOIST	TURE (g)		247.73
FINAL "B" VA	LUE	1.00				VOID RAT	10	- 1	0.882	1			WT DRY S	OIL (g)		870.00
tes (minutes)		7.86				SATURAT	ION		84.9				% MOIST	JRE		28.47
										1						
	ACCUM.	AXIAL	PORE	PWP change	e m mm u hi	11 - 5	CORR.	CORR.	DEV.	SIGMA 1	SIGMA 1	SIGMA 3	EFF.PRN		$\frac{(\alpha_1 - \alpha_2)}{2}$	
TIME	DEFLECT.		PRESS.		76 SIKAIN (%)	(1-0)	AKCA	Gin	SIKESS (nel)	uevsu+cp	EFF.	err.	SIR KAILO		(M)	
		(105)	70.8	(acc)	0.00	1.00	5.66	5.946	0.0	3600.0	3600.0	3600.0	1.00	3600.0	0.0	0.00
1.0	0.003	28	71.8	144.0	0.05	1.00	5.66	5.943	203.5	3803.5	3659.5	3456.0	1.06	3557,8	101.8	0.71
2.0	0.006	41	73.8	432.0	0.10	1.00	5.66	5.940	534.0	4134.0	3702.0	3168.0	1.17	3435.0	267.0	0.81
3.0	0.009	55	75.0	604.8	0.15	1.00	5.67	5.937	889.6	4489.6	3884.8	2995.2	1.30	3440.0	444.8	0.68
4.0	0.012	62	75.7	705.6	0,20	1.00	5.67	5.934	1067.0	4667.0	3961.4	2894.4	1.37	3427.9	533.5	0.66
5.0	0.015	66	76.1	763.2	0.25	1.00	5.67	5.931	1168.0	4768.0	4004.8	2836.8	1.41	3420.8	584.0	0.65
8.3	0.025	78	77.3	936.0	0.42	1.00	5.68	5.921	1470.2	5070.2	4134.2	2664.0	1.55	3399.1	735.1	0.64
16.7	0.050	94	79.4 90.0	1238.4	0.84	0.99	5./1	5.870	21364	5407.0 5736 A	4282.0	2301.0	2.00	3233.5	933.9	0.00
23.0	0.075	112	81.8	1584.0	1.68	0.98	5.75	5.846	2302.5	5902.5	4318.5	2016.0	2.14	3167.2	1151.2	0.69
41.7	0.125	119	82.6	1699.2	2.10	0.98	5.78	5.821	2467.1	6067.1	4367.9	1900.8	2.30	3134.3	1233.5	0.69
50.0	0.150	123	83.1	1771.2	2.52	0.97	5.80	5.796	2555.7	6155.7	4384.5	1828.8	2.40	3106.7	1277.9	0.69
58.3	0.175	127	83.5	1828.8	2.94	0.97	5.83	5.771	2643.5	6243.5	4414.7	1771.2	2.49	3093.0	1321.8	0.69
66.7	0.200	131	83.9	1886.4	3.36	0.97	5.85	5.746	2730.5	6330.5	4444.1	1713.6	2.59	3078.8	1365.2	0.69
83.3	0.250	137	84.2	1929.6	4.20	0.96	5.91	5.696	2853.0	6453.0	4523.4	1670.4	2.71	3096.9	1426.5	0.68
100.0	0.300	143	84.5	1972.8	5.05	0.95	5.96	5.646	2973.0	6573.0	4600.2	1627.2	2.83	3113.7	1486.5	0.66
116.7	0.350	148	84.7	2001.0	5.89	0.94	6.01	5.390	3066.5	0000.3 6724.0	4004.9	1598.4	2.92	3131.0	1553.2	0.65
133.3	0.400	152	04.0	2016.0	0.75	0.93	6.12	5.540	3223 4	6823 4	4/10.0	1584.0	2.90	31957	1611.7	0.63
166.7	0.400	161	84.7	2001.6	8.41	0.92	6.18	5.446	3287.3	6887.3	4885.7	1598.4	3.06	3242.1	1643.7	0.61
183.3	0.550	164	84.6	1987.2	9.25	0.91	6.23	5.396	3326.5	6926.5	4939.3	1612.8	3.06	3276.0	1663.2	0.60
207.0	0.621	169	84.6	1987.2	10.44	0.90	6.32	5.325	3396.7	6996.7	5009.5	1612.8	3.11	3311.1	1698.3	0.59
216.7	0.650	171	84.4	1958.4	10.93	0.89	6.35	5.296	3423.5	7023.5	5065.1	1641.6	3.09	3353.4	1711.8	0.57
239.3	Q.718	175	84.3	1944.0	12.08	0.88	6.43	5.228	3469.1	7069.1	5125.1	1656.0	3.09	3390.5	1734.5	0.56
250.0	0.750	178	84.1	1915.2	12.61	0.87	6.47	5.196	3514.6	7114.6	5199.4	1684.8	3.09	3442.1	1757.3	0.54
266.7	0.800	180	84.1	1915.2	13.45	0.87	6.54	5.146	3524.8	7124.8	5209.6	1684.8	3.09	3447.2	1762.4	0.54
283.3	0.850	182	83.9	1880.4	14.30	0.80	6.60	5,0%	3534.2	7154.2	52047.8	1743.0	3.06	3480.7	1707.1	0.53
300.0	0.900	165	83.7	1872 2	16 16	0.85	6.75	1 085	3585 3	7185 3	5356.4	1771 2	3.02	3563.8	1792.6	0.52
333.3	1,000	190	83.3	1800.0	16.82	0.83	6.80	4,946	3599.6	7199.6	5399.6	1800.0	3.00	3599.8	1799.8	0.50
333.5																
		DU		-•			DEVIATO	RIC STRES	S		EFFECTIV	E PRINCIP	LE STRESS		TECH	NA/PWM
		Ø FAILUF	E	2001.6	1		@ FAILUR	E	3287.3		RATIO @ H	AILURE	3.06		DATE	6/7/01
		-			•				· ·		_	· .		C	HECKED	DA
			· · ·				•	-	:	-				RI	EVIEWED	Num

			TR	IAXIAL CO	MPRESSIO	N TEST (A	STM D-4'	ISOL	IDATED UN	DRAINED	WITH POR	E PRESSU	RE		_)_	
PROJECT TITI	E	GENE	SIS/PLUM I	POINT ENER	RGY/AR	INITIAL S	AMPLE DA	TA	cm	in	corrected		CORRECT	ED SAMPL	E DATA	
PROJECT NUN	IBER		013	-3205		HEIGHT			15.270	6.012	5.907		DRY DEN	SITY, calc (pcf)	96.6
SAMPLE ID		TP	-4		-	DIAMETE	R		7.087	2.790	2.710		VOLUME	OF SOLIDS		317.76
SAMPLE TYPE	3		B	ulk		AREA			39.44	6.11	5.77	•	VOLUME	OF VOIDS		240.54
DEPTH INTER	VAL			-		VOLUME			602.31	36.76	34.07		VOID RATIO		0.757	
MACHINE SPE	ED (in/min)	0.0006				WEIGHT ((g)		1112.57		1102.57					
STRAIN RATE	(%/min)	0.010				% MOIST	URE	~	28.8	1	27.61					
CELL PRESSU	RE (psi)	110.0				SPECIFIC	GRAVITY	Y	2.72	1			WATER C	ONTENT (9	MOISTUI	RE)
SAMPLE PRES	SURE (psi)	70.0				MOIST DE	ENSITY (pcf)	115.3	1			WT SOIL	& TARE, M	OIST (g)	1102.57
EFF. CONSOLI	DATION					DRY DEN	SITY, calc (pcf)	89.5				WT SOIL	& TARE, DI	₹Y (g)	864.00
PRESSURE, 03	(psi)	40.0				VOLUME	OF SOLIDS		317.76				WT TARE	(g)		0.00
PRESSURE, 03	(psf)	5760.0				VOLUME	OF VOIDS		284.54	1			WT MOIS	TURE (g)		238.57
FINAL "B" VA	LUE	0.98				VOID RAT	O		0.895	1			WT DRY S	SOIL (g)		864.00
ten (minutes)		28.27				SATURAT	ION		87.4				% MOIST	URE		27.61
	1.000		DODE	I MUD alaman			0000	CODD	1 DEU		000111	000141.0				
THE	ACCUM.	AXIAL	PORE	DU (mf)	C CTDAIN	(1.4)	ADEA	UEICHT	DEV.	SIGMA I	SIGMA I	SIGMA 3	CTD DATIO	$\left(\frac{\sigma_{1}+\sigma_{2}}{2}\right)$	$\left(\frac{\sigma_1 - \sigma_2}{2}\right)$	
(MIN)	(inches)	(lbs)	(nsi)=U	(acc)	(%)	(1-6)	(in 2)	(in)	(nsf)	(a)	(g.dl)	(a.dli)	(a,'/ a,')	m	(0)	
0.0	0.000	25	70.5	0.0	0.00	1.00	5.77	5.907	0.0	5760.0	5760.0	5760.0	1.00	5760.0	0.0	0
5.0	0.003	67	74.7	604.8	0.05	1.00	5.77	5.904	1048.1	6808.1	6203.3	5155.2	1.20	5679.2	524.0	0.58
10.0	0.006	87	76.7	892.8	0.10	1.00	5.77	5.901	1546.3	7306.3	6413.5	4867.2	1.32	5640.4	773.2	0.58
15.0	0.009	94	77.4	993.6	0.15	1.00	5.78	5.898	1720.1	7480.1	6486.5	4766.4	1.36	5626.4	860.0	0.58
20.0	0.012	105	78.7	1180.8	0.20	1.00	5.78	5.895	1993.3	7753.3	6572.5	4579.2	1.44	5575.8	996.6	0.59
25.0	0.015	111	79.4	1281.6	0.25	1.00	5.78	5.892	2141.7	7901.7	6620.1	4478.4	1.48	5549.2	1070.8	0.60
41.7	0.025	146	84.1	1058 4	0.42	1.00	5.82	5.857	2005.4	8320.7 8755 4	6707.0	4101.0	1.62	5200.3	1280.3	0.62
125.0	0.075	167	86.7	2332.8	1.27	0.99	5.84	5.832	3500.2	9260.2	6927.4	3427.2	2.02	5177.3	1750.1	0.67
158.3	0.095	178	88.1	2534.4	1.61	0.98	5.86	5.812	3758.4	9518.4	6984.0	3225.6	2.17	5104.8	1879.2	0.67
216.7	0.130	191	89.5	2736.0	2.20	0.98	5.90	5.777	4053.2	9813.2	7077.2	3024.0	2.34	5050.6	2026.6	0.68
250.0	0.150	197	90.0	2808.0	2.54	0.97	5.92	5.757	4185.2	9945.2	7137.2	2952.0	2.42	5044.6	2092.6	0.67
291.7	0.175	203	90.5	2880.0	2.96	0.97	5.94	5.732	4312.4	10072.4	7192.4	2880.0	2.50	5036.2	2156.2	0.67
333.3	0.200	208	90.9	2937.6	3.39	0.97	5.97	5.707	4414.2	10174.2	7236.6	2822.4	2.56	5029.5	2207.1	0.67
416.7	0.250	218	91.3	2995.2	4.23	0.96	6.02	5.657	4614.6	10374.6	7379.4	2764.8	2.67	5072.1	2307.3	0.65
500.0	0.300	220	91.5	3024.0	5.08	0.95	6.13	5.507	4/03.4	10669.9	7630 A	2/30.0	2.74	5117.7	2381.7 2454 A	0.63
620.0	0.350	237	91.5	3024.0	6.30	0.94	6.16	5.535	4959.6	10719.6	7695.6	2721.0	2.80	5215.8	24.79.8	0.62
666.7	0.400	246	91.2	2980.8	6.77	0.93	6.19	5.507	5144.0	10904.0	7923.2	2779.2	2.85	5351.2	2572.0	0.58
750.0	0.450	253	90.9	2937.6	7.62	0.92	6.24	5.457	5258.7	11018.7	8081.1	2822.4	2.86	5451.8	2629.4	0.56
833.3	0.500	255	90.8	2923.2	8.46	0.92	6.30	5.407	5256.2	11016.2	8093.0	2836.8	2.85	5464.9	2628.1	0.56
983.3	0.590	262	90.6	2894.4	9.99	0.90	6.41	5.317	5326.0	11086.0	8191.6	2865.6	2.86	5528.6	2663.0	0.54
1166.7	0.700	270	90.4	2865.6	11.85	0.88	6.54	5.207	5391.9	11151.9	8286.3	2894.4	2.86	5590.4	2696.0	0.53
1241.7	0.745	273	90.2	2836.8	12.61	0.87	6.60	5.162	5410.8	11170.8	8334.0	2923.2	2.85	5628.6	2705.4	0.52
1428.3	0.875	285	90.0	2808.0	14.81	0.85	6.80	5.032	5529.1 5522 A	11289.7	8481.7	2952.0	2.8/	5742.6	2/04.9	0.51
1561.7	0.937	288	88.8	2635.2	15.86	0.83	6.86	4.970	5524.6	11284.6	8649.4	3124.8	2.65	5742.5	2762 3	0.50
												J 147.0		5007.1	2100.3	0.40
· · ·		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1							1						
				N			1. A. A.									
-		<u> </u>		L	·											
		DU		-			DEVIATO	RIC STRES	S		EFFECTIV	E PRINCIP	LE STRESS		TECH	NA/PWM
		Ø FAILUR	Œ	2937.6			Ø FAILUR	E	5258.7		RATIO Ø F	AILURE	2.86		DATE	6/7/01
l														C	CHECKED	The
	1.1		1 N N				•	. <u>6</u>						RI	SVIEWED	Jun



hasociales Inc.

ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

PROJECT TITLE	GENESIS/I	PLUM POINT F	NERGY/AR		SA	MPLE ID	TP-5	
ROJECT NO.		013-3205			SAM	PLE TYPE	B	ulk
ÆMARKS					SAMPL	E DEPTH		-
				Hygroscopic I	Moisture For	Sieve Sample	· · ·	
WATER CONTENT	(Delivered	Moisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (g	gm)	(w1)				Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (g	gm)	(w2)				Tare Weigh	it (gm)	
Weight of Tare (gm)		(w3)				Moisture C	ontent (%)	
Weight of Water (gm)		(w4=w1-w2)		Total Weight	Of Sample Us	sed For Sieve	Corrected For H	Iygroscopic Mo
Weight of Dry Soil (gr	n)	(w5=w2-w3)		j		Weight Of S	Sample (gm)	356.77
Moisture Content (%)		(w4/w5)*100	•			Tare Weig	ht (gm)	84.41
				L	(W6)	Total Dry V	Veight (gm)	272.36
				• • • •				
SIEVE ANALYSIS				Cumulative	<i>a</i>	0751	-	
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV.	E	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)	1		
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"		· · · · · · · · · · · · · · · · · · ·			2.0"	coarse gravel	
	1.5"					• 1.5"	coarse gravel	
	1.0"		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			1.0"	coarse gravel	
	0.75*					0.75"	fine gravel	
	0.50*					0.50"	fine gravel	
	0.375"	-				0.375"	fine gravel	
	#4					#4	coarse sand	
1	#8	0.00	0.00	0.00	100.00	#8	coarse sand	
	#16	0.28	0.28	0.10	99.90	#16	medium sand	
	#30	12.55	12.55	4.61	95.39	#30	medium sand	
	#50	64.63	64.63	23.73	76.27	#50	fine sand	
	#100	157.94	157.94	57.99	42.01	#100	fine sand	
	#200	197.27	197.27	72.43	27.57	#200	fines	
	PAN					PAN		
% COBBLES	0.00							,
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	: (C)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	m (m)	LL	-
% C SAND	0.02	little	5 to 12%	< 10%	fine (c-m)		PL	-
% M SAND	14.10	some	12 to 30%	< 10%	coarse (m-f)		PI	
% F SAND	58.31	and	30 to 50%	< 10%	coarse and fir	ne (m)	Gs	-
% FINES	27.57			< 10%	coarse and m	edium (f)		
% TOTAL	100.00			> 10%	equal amount	s each (c-f)		
		· · · · · · · · · · · · · · · · · · ·						
DES	CRIPTION	Brown, FINE	TO MEDIU	M SAND, son	ne clayey			
		silt.						
	USCS	(SM)					TECH	PWM/T
							DATE	5/18/01
							CHECK	
and the second							REVIEW	PW

CONSTANT HEAD PERMEABILITY TEST ASTM D 2434

PROJECT TITLE PROJECT NUMBER REMARKS	GENESIS/PLUM POINT ENERGY/AR 013-3205 -	SAMPLE ID SAMPLE TYPE SAMPLE DEPTH	TP-5 - Bulk	

		SECONDS	(ml)	ТЕМР. °С	Q (ml/sec)	_
	1.	600	30	21.0	0.05	
	2.	600	30	21.0	0.05	+
	3.	600	30	21.0	0.05	*
	4.	600	31	21.0	0.05	*

INITIAL UNIT WEIGHT DETERMINATION

APPARATUS & WET SAMPLE (g): APPARATUS WEIGHT (g): WET SAMPLE WEIGHT (g):

7435.0

SAMPLE LENGTH (in): SAMPLE DIAMETER (in): SAMPLE AREA (in²): SAMPLE AREA (cm²): SAMPLE VOLUME (in³): SAMPLE VOLUME (ft³): WET DENSITY IN (pcf): DRY DENSITY IN (pcf):

3612.1	ŀ
3822.9	
11.9	
4.0	
12.57	
81.07	l

149.16

0.086

97.6

89.1

INITIAL MOISTURE CONTENT

WET SAMPLE & TARE (g):	324.70
DRY SAMPLE & TARE (g):	300.75
WEIGHT OF TARE (g):	51.64
WEIGHT OF WATER (g):	23.95
DRY SAMPLE WEIGHT (g):	249.11
MOISTURE CONTENT (%):	9.61

FINAL DIMENSIONS	
SAMPLE LENGTH (in):	
SAMPLE DIAMETER (in):	
AVERAGE Q VALUE (ml/sec):	
AVERAGE TEMP (°C):	
TEMPERATURE CORRECTION:	

HEAD OF WATER (in):

HYDRAULIC GRADIENT (i):

L	4.0	
	0.05	
	21.0	
	0.976	
Γ	5.7	

0.48

11.8

10

K VALUE CORRECTED FOR 20 DEGREES C

1.3E-03 cm/sec

		TECH TH
		DATE 5/9/01
	C	HECK
	RE	VIEW PUM

CARBONATE CONTENT ASTM D 4373

PROJECT TITLE PROJECT NUMBER

5

ŀ

GENESIS/PLUM POINT ENERGY/AR

REMARKS

013-3205

SAMPLE ID	TP - 5 .	•	-
SPECIMEN	CaCO3	CaCO ₃	CaCO ₃
NUMBER	%	%	%
1	0	•	•
2	0	_	
AVERAGE	0	•	

SAMPLE ID	-	-	-
SPECIMEN	CaCO3	CaCO3	CaCO ₃
NUMBER	%	%	%
1	-	•	-
2	-	•	-
AVERAGE	-	-	-

SAMPLE ID	-	-	
SPECIMEN	CaCO3	CaCO ₃	CaCO ₃
NUMBER	%	%	%
1	-	•	
2	-	•	-
AVERAGE	-	- -	•

SAMPLE ID	-	-	-
SPECIMEN	CaCO ₃	CaCO ₃	CaCO3
NUMBER	%	%	%
1	•	-	•
2	-	•	•
AVERAGE	•	•	•

ΤJ

5/15/01

PUN

TECH DATE

CHECK

REVIEW

GENESIS/PLUM POINT ENERGY/AR SUMMARY OF SOIL DATA

										Grain Size								
			Soil	Natural		Atte	rberg			Distribution	1	Comp	action		1997 - A.			Additional
Sample	Sample	Sample	Classi-	Moisture		L	mits		% Finer	% Finer	% Finer	Maximum	Optimum		Unit W	eight	Permeability	Tests
Identification	Туре	Depth	fication	%					No. 4	No. 200	.005	Dry Density	Moisture		Moisture	Dry	(cm/sec)	Conducted
					L.L.	P.L.	P.I.	L.I.	Sieve	Sieve	mm	(lb/cuft)	%	Gs	%	(lb/cuft)		(See Notes)
B-1	UD	3.0-5.0'	CL	29.1	45	26	19	0.16	100.0	98.2	-	-	~	2.66	29.1	84.4	1.4E-04	U
B-4	UD	3.0-5.0'	CL	33.8	. 41	21	20	0.63	100.0	99.4	-	•	•	2.67	33.8	86.8	6.9E-08	U
B-7	UD	3.0-5.0'	CL	31.9	44	23	21	0.42	100.0	99.4	-	-	-	2.69	31.9	80.1	6.7E-04	U,C
B-10	UD	3.0-5.0'	ML	30.6	NP	NP	NP	NP	100.0	98.9	37.0	-	•	4	30.6	87.3	6.8E-07	-
B-21	UD	4.0-5.0'	СН	38.8	58	23	35	0.45	100.0	96.6	-	-	-	2.70	38.8	77.7	1.1E-04	T :
B-26	UD	3.0-5.0'	CL	19.2	26	16	10	0.35	99.5	57.4	-	-	-	-	19.2	91.1	2.6E-04	U
B-29	UD	4.0-5.0'	CL	23.3	38	19	19	0.23	100.0	74.1	-	•	-	2.68	23.3	101.0	7.8E-08	-
B-33	UD	3.0-5.0'	SC	10.4	22	13	9	-0.34	100.0	21.0	•	•	-	2.65		-	-	•
B-41	UD	3.0-5.0'	CL	35.4	45	21	24	0.60	100.0	95.0	43.0	-	•	2.67	-	-		т
B-43	UD	3.0-5.0'	CL	34.3	44	21	23	0.59	100.0	99.0	-	-	-	2.67	34.3	85.1	1.0E-06	U
B-44	ໜ	3.0-5.0'	CL	30.5	44	21	23	0.42	100.0	98.8		-	-	2.68	30.5	83.2	2.0E-04	T
B-51	UD	3.0-5.0'	СН	35.7	61	31	30	0.16	100.0	95.4	-	-		2.68	35.7	84.9	3.7E-08	U,C
B-54	UD	7.0-10.0'	СН	44.2	74	26	48	0.39	100.0	98.0	-	-	-	2.69	48.3	71.7	2.6E-07	T
B-55	UD	3.0-5.0'	CL	32.4	33	23	10	0.96	100.0	93.7	-	-		2.68	32.4	89.1	4.1E-07	U

ABBREVIATIONS: LIQUID LIMIT (LL) PLASTIC LIMIT (PL) PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SPECIFIC GRAVITY (Gs) MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST

- U = UNCONFINED COMPRESSION TEST
- C = CONSOLIDATION TEST
- **DS = DIRECT SHEAR TEST**
- **O** = ORGANIC CONTENT

P = pH





ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLETD	B-1	T _	-
PROJECT NO.		013-3205			SAM	PLE TYPE	<u>_</u>	<u> </u>	-1
REMARKS					SAMPI	EDEPTH	3.0	- 5.0'	
•				Hygroscopic	Moisture For	Sieve Sample			
WATER CONTENT	(Delivered M	(loisture)				Wet Soil & '	Tare (gm)		-
Wt Wet Soil & Tare (g	m)	(w1)	350.75			Dry Soil &	Fare (gm)		
Wt Dry Soil & Tare (g	m)	(w2)	271.71	1		Tare Weight	: (gm)		
Weight of Tare (gm)	- ·	(w3)	0.00	1		Moisture Co	ntent (%)		-
Weight of Water (gm)		(w4 = w1 - w2)	79.04	Total Weight	Of Sample Us	sed For Sieve	Corrected For I	Ivgrosconic M	
Weight of Dry Soil (gn	1)	(w5 = w2 - w3)	271.71	1	· · · · · ·	Weight Of S	ample (gm)	128.50	Ĩ
Moisture Content (%)		(w4/w5)*100	29.09	1		Tare Weigh	it (gm)	51.95	-
				1	(W6)	Total Dry W	eight (gm)	76.55	-
				.					_
SIEVE ANALYSIS				Cumulative					
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE	, L		
$\int_{0}^{\infty} dx = \int_{0}^{\infty} dx $		+Tare		{(wt ret/w6)*100}	(100-%ret)				
	12.0"			Í		12.0"	cobbles		
	3.0"					3.0"	coarse gravel		
	2.5"		· · · · ·			2.5"	coarse gravel		
	2.0"					2.0"	coarse gravel		
	1.5"					1.5"	coarse gravel		
	1.0"					1.0"	coarse gravel		
	0.75					0.75"	fine gravel		
	0.50"					0.50*	fine gravel		
<u>A</u>	5.375	To the other participants there do into a neuron of the second second second second second second second second	a, men men men kan dari gan dari bahan yang bahan yang kan dari yang kan dari yang kan dari yang kan dari yang Kan sekera men kan dari yang			0.375"	fine gravel		
	#4	ter senere en anter e				#4	coarse sand		
	#10	0.00	0.00	0.00	100.00	#10	medium sand		
	#20	0.03	0.03	0.04	99.96	#20	medium sand		
	#40	0.08	0.08	0.10	99.90	#40	fine sand		
	#60	0.22	0.22	0.29	99.71	#60	fine sand		
and the second	#100	0.52	0.52	0.68	99.32	#100	fine sand		
	#200	1.36	1.36	1.78	98.22	#200	fines		
	PAN			·		PAN			
% COBBLES	0.00								
% C GRAVEL	0. 00	Descri	ptive Terms	> 10%	mostly coarse	(c)		and the second second	
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	m (m)	LL.	45	
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	26	
% M SAND	0.10	some	12 to 30%	< 10%	coarse (m-f)	· · .	PI	19	
% F SAND	1.67	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	2.658	
% FINES	98.22			< 10%	coarse and me	dium (f)			
% TOTAL	100.00			> 10%	equal amounts	each (c-f)			
					·				
DESC	CRIPTION	Dark Olive Br	own, SILTY	CLAY, trace fi	ne sand.				
	1999 - A.					41			
							·		
	USCS	CL					TECH	TJ	
							DATE	5/2/01	
							CHECK	1 pm	
·							REVIEW	par	1

							C)
					FLE	XIBLE W	ALL TRIA	XIAL PE D 5084	RMEABI	LITY					/
				METHO	DD C, FAI	LING HE	AD W/IN	CREASIN	G TAILW	ATER PI	ESSURE				
PROJECT T	ITLE	GENESIS/	PLUM POIN	T ENERGY	/AR	7	Using Pip	ettes Only	NO	7 00	MMENTS	r			
PROJECT N	UMBER	013-3205				Using	r Pipettes &	Burrettes	YES						
SAMPLE ID		B-1		3.0	- 5.0'	BOARD#	8	TECH	KBG						1. 1. 1. 1.
SAMPLE TY	PE	UD		· · · · · ·	1. 	CELL#	8	DATE	5/2/01			L			
Sample Data	Initial									1				· · · · · · · · · · · · · · · · · · ·	
Height, inche	S THEFT	1.957	1				Sample Da	ta, Final			Water Con	tents	Initial	Final	
Diameter, inc	hes	2.824	1	B-Value,f	1.00	(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,	Height, inc	hes	1.952]	Wt soil&ta	re, i	350.75	418.68	
Area, cm ²		40.41	1	Cell Pres	85.00		Diameter,	inches	2.824		Wt soil&ta	re, f	271.71	323.53	
Volume, cm [^]	3	200.87		Bot. Pres.	80.50		Area, cm ²	2	40.41		Wt Tare		0.00	52.01	
Mass, g		350.75]	Top Pres.	80.00]	Volume, cr	n^3	200.35		Wt Moistu	re Lost	79.04	95.15	
Moisture Con	tent, %	29.09		Head, cm	35.17	and the second	Mass, g		366.92	- 14 - 14 - 14 - 14 - 14 - 14 - 14 - 14	Wt Dry So	il	271.71	271.52	
Dry Density,	pcf	84.41	1	Max. Grad.	11.86		Moisture C	Content %	35.04	-	Water Con	tent	29.09%	35.049	6
Spec. Gravity		2.658		Min. Grad.	9.06	4	Dry Densit	y, pcf	84.62				Dense Off MY C		
Volume Solid	s, cm^3	102.22		Max. E.S.	5.00	4	Saturation		97.0%	- DES	CRIPTION	Dark Olive	Brown, SILTY C	LAI, ITACE	
Volume Void	s, cm^3	98.65	4	Min. E.S.	4.50	J	Inflow Volui	me per (1 cc)	5.40	-		nne sand.			
Void Ratio		0.97	4				Outflow Volu	me per (1 cc)	5.40	1	USCS	- CT	1		
Saturation		80.1%	1								0303		J		
TI	ME FUNCT	ION	REA	DINGS		TIM	IE IN MINU	TES & SEC	CONDS			VO	LUME	PERMEAB	BILITY
DATE	HOUR	MIN	Inflow	Outflow	Temp.	dt	dt	dt, acc	Head	(H1/H2)	Gradient	Inflow	Outflow	@ 20 Deg	rees C
			(cc)	(cc)		(min)	(sec)	(sec)	(cm)	(inc.)		(cc)	(cc)	(cm/se	ж)
5/2/01	9	52	0.00	25.00	19.5	0.0	0	0	58.79		11.86	0.00	0.00	0.0	
5/2/01	9	53	1.10	23.90	19.5	1.0	60	60	56.70	1.04	11.44	5.94	5.94	1.66E-0	4
5/2/01	9	54	2.10	22.90	19.5	1.0	60	120	54.79	1.03	11.05	5.40	5.40	1.56E-0	4 .
5/2/01	9	55	2.90	22.00	19.5	1.0	60	180	53.18	1.03	10.73	4.32	4.80	1.37E-0	4
5/2/01	9	56	3.80	21.20	19.5	1.0	60	240	51.56	1.03	10.40	4.80	4.32	1.416-0	4
5/2/01	9	57	4.50	20.50	19.5	1.0	00	300	50.23	1.03	10.15	3.70	3.70 A 32	1.202-0	4 A 4
5/2/01		58	5.30	19.70	19.5	1.0	60	420	40.71 A7 A7	1.03	9.02	3.24	3.78	1.17E-0	4 *
5/2/01		59	5.90	19.00	19.5	1.0	60	420	46 33	1.05	0 34	3.24	3.24	1.11E-0	4 *
5/2/01	10		7 20	17.60	19.5	1.0	60	540	44.90	1.03	9.06	3.78	4.32	1.43E-0	4 . *
5/2/01	10	1	1.20	17.00	1.1.5										
						1.00									
	1 · · ·				1	1									
											•				
	Inflow Per		0.072000		I	1		L			PE	RMEABILT	IY REPORTED	AS 1.4E-04	4 cm/sec
	Outflow R	ate	0.074000												
	Outflow/I	aflow Ratio	1.03	1									DA	TE 5/	2/01
			••••••••••••••••••••••••••••••••••••••	-									CHE	СК	7A
*TRANSCH	IBED FRO	M ORIGINA	L DATA SH	IEETS									REVI	EW PL	VM



DESCRIPTION	LL	PL	PI	SAMPLE ID
Dark Olive Brown, SILTY CLAY, trace	45	26	19	B - 1
medium to fine sand.				
	SAMPL	E TYPE	UD	3.0 - 5.0'
USCS CL				

SAMPLE DATA Wet Density (pcf) Dry Density (pcf) Moisture Content

116.7	
90.4	
29.1%	

TIME TO FAILURE (min) STRAIN @ FAILURE (%) TYPE OF FAILURE

	7.7	
	7.7	
	SHEAR	

-	UNCONFINED COMPRESSIVE STRENGTH (psf)	3370.7
	SHEAR STRENGTH (psf)	1685.3

013-3205 GENESIS/PLUM POINT ENERGY/AR

TECH	DA
DATE	5/3/01
CHECK	DA
REVIEW	Jury

UNCONFINED COMPRESSIVE STRENGTH OF SOILS

ASTM D 2166

PROJECT	TITLE	GENESIS/PLUM P	OINT ENERGY/AR		SAMPLE ID		B - 1	•
PROJECT	NO.	013-	3205		SAMPLE TY	PE	UD	
REMARKS					SAMPLE DE	PTH	3.0 - 5.0'	
N 1	-							
SAMPLE D	ATA	4 - F		WATER CO	NTENT	BEFORE		AFTER
Height (in)		6.000		1		SHEAR		SHEAR
Diameter (in)		2.817				(entire)		(partial)
Height/Diame	ter Ratio	2.13		Tare No.		SO-8		SO-8
Area (in ²)	• 1	6.23		Wt. Wet Soil &	Tare (gm)	1146.36	1	350.75
Volume (ft ³)		0.0216		Wt. Dry Soil &	Tare (gm)	888.02		271.71
Weight (gm)		1146.36		Wt. Tare (om)		0.00		0.00
Wet Density (ncfi	116 73	1	Wt Mojeture ((m)	259.34		70.04
Dray Donaity (po1)	110.75		Wt. Moisture (gill)	436.34		/9.04
Marking Construction		90.42		WE DTY Soll (gm)	888.02		271.71
Machine Spee	d (in/min)	0.06		Moisture (%)		29.09%		29.09%
Strain rate (%	min)	1.00		· ·				
TIME	DEFLECT	FORCE	% STRAIN	Ac	COMPRESS	IVE STRESS		
(min)	(inch)	(lbs)	(in/in)	(in ²)	(psf)	(psi)		
0.0	0.000	0	0.00	6.23	0.00	0.00		
0.2	0.010	20	0.17	6.24	449.79	3.12		
0.3	0.020	37	0.33	6.25	861.23	5.98		
0.5	0.030	49	0.50	6.20	1119.57	9.31	TIME TO FAIL LIPE (min)	7.67
0.7	0.040	50	0.07	6.28	1537.40	10.68	STRAIN @ FAILURE (%)	7.67
1.2	0.030	81	1.17	6.31	1838.22	12.77	TYPE OF FAILURE	SHEAR
1.7	0.100	95	1.67	6.34	2167.45	15.05		
2.0	0.120	103	2.00	6.36	2332.18	16.20		
2.5	0.150	113	2.50	6.39	2545.55	17.68	1	
3.5	0.210	128	3.50	6.46	2853.89	19.82		
4.3	0.260	137	4.33	6.51	3028.17	21.03	FAILURE	
5.2	0.310	144	5.17	6.57	3155.17	21.91	SKETCH	
6.0	0.360	151	6.00	6.63	3279.47	22.77		Л
6.8	0.410	155	6.83	6.69	3336.50	23.17		
7.7	0.460	158	7.67	6.75	3370.00	23.41	4 1 /	
8.7	0.520	153	8.07	6.84	2833 21	10.68	 /	
9.2	0.550	135	10.17	6.80	2200.10	15.28		
11.0	0.610	65	11.00	7.00	1330.43	9.24		
11.3	0.680	56	11.33	7.03	1143.13	7.94		
11.7	0.700	45	11.67	7.06	926.57	6.43		
13.3	0.800	3	13.33	7.19	65.08	0.45		
							<u>الاسمار الاسمار الاسمار الاسمار الاسمار المار الم</u>	
		UNCONFINE	D COMPRESSI	VE STRENGTH	3370.66	23.41		
			SHE	AR STRENGTH	1685.33	11.70]	
Deschart	D. 1 011 -	011 0011]		18	1	
Descriptio	Dark Olive B	rown, SILTY	LAY, IFACE			43	TECH	DÅ
123000 -	medium to fi	ne sand.			PL	10	IECH	50/01
]	P	19	J DATE	24
USC	S CL						CHECK	Va
							REVIEW	INM_





PROJECT TITLE	GENI	ESIS/PLUM PO	INT ENER	GY/AR	SA	MPLE ID	B-4	•
DEMADES		013-3205			SAM	LE TYPE		E AI
NUMPARAS				Uvgracanic)	SAMPL	E DEPIN	3.0	5.0
WATER CONTENT	Delivered 1	(aisture)		Hygroscopic N	TOISIULE LOL	Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (on	n) Denteren N	(w1)	510.63			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (on	n)	(11)	381.54			Tare Weigh	ht (gm)	
Weight of Tare (gm)	,	(w3)	0.00			Moisture C	Content (%)	
Weight of Water (gm)		(w4 = w1 - w2)	129.09	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	Iygroscopic Mo
Weight of Dry Soil (gm)	(w5 = w2 - w3)	381.54			Weight Of	Sample (gm)	324.79
Moisture Content (%)		(w4/w5)*100	33.83	1		Tare Weig	tht (gm)	84.66
					(W6)	Total Dry	Weight (gm)	240.13
				-	•		-	
SIEVE ANALYSIS		•		Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"			ļ		12.0*	cobbles	
	3.0"			ļ		3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"			<u> </u>		2.0"	coarse gravel	
	1.5"					1.5	coarse gravel	
	1.0"	}				0.75"	fine gravel	
	0.75					0.50"	fine gravel	
-	0.30					0.375"	fine gravel	
	#4					#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.05	0.05	0.02	99.98	#20	medium sand	
	#40	0.13	0.13	0.05	99.95	#40	fine sand	
	#60	0.30	0.30	0.12	99.88	#60	fine sand	
	#100	0.50	0.50	0.21	99.79	#100	fine sand	
	#200	1.35	1.35	0.56	99.44	#200	fines	
	PAN					PAN		
% COBBLES	0.00							
% C GRAVEL	0.00	- Descri	ptive Terms	> 10%	mostly coarse	(C)		41
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mosuy mediu	m (m)	LL DI	21
% C SAND	0.00	Inttle	5 to 12%	< 10%	1111C (C-111)		PL	20
70 M SAND	0.05	some	12 10 30 % 30 to \$0 %	< 10%	coarse and fir	e (m)	Ge	2.673
A F SAND	0.51	- and	30 10 30 76	< 10%	coarse and m	edium (f)	03	
% TOTAL	100.00	-		> 10%	equal amount	s each (c-f)		
	100.00							
DESC	CRIPTION	Olive Brown.	SILTY CLA	Y, trace mediu	ım	1		
22.00		to fine sand.						
]		
	USCS	CL					TECH	DA
							DATE	5/3/01
							CHECK	-
							KE VIE W	1 10/1

<u>f</u>

					N	FLEXIE IETHOD I	BLE WALL ASTM I D, CONSTA	PERMEA) 5084 NT RATE	BILITY OF FLOW				•	FLOW FU
ROJECT TITLE ROJECT NUMBER	GENESIS 013-3205	PLUM POI	NT ENERG	Y/AR]	BOARD	# #9		COMMENTS	5				
AMPLE ID AMPLE TYPE	B-4 UD	•	•	3.0 - 5.0'	Flow P	ump Speed Technician	i 9 KBG							
unple Data, Initial					Sample Da	ıta, Final				<u>.</u>			A CLUB COMMAND	
eight, inches	2.581	B-Value, f	1.00		Height, in	ches	2.553					Trimmings	Sa	mple
iameter, inches	2.873	Cell Pres.	85.0		Diameter,	inches	2.846	1. J.	WATER (CONTENT	S	Initial	F	inal
rea, cm²	41.82	Bot. Pres.	80.0		Area, cm ²	•	41.04		Wt Soil &	Tare, i	g	510.63	55	8.85
'olume, cm3	274.19	Top Pres.	80.0		Volume, c	m ³	266.14	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	Wt Soil &	Tare, f	g	381.54	43	2.51
lass, g	510.63	Tot. B.P.	80.0		Mass, g		507.91		Wt Tare		g	0.00	51	.06
foisture Content, %	33.83	Head, max.	128.02		Moisture (Content, %	33.12	· · ·	Wt Moistu	ire Lost	g	129.09	12	6.34
bry Density, pcf	86.83	Head, min.	128.02		Dry Densi	ty, pcf	89.46		Wt Dry Sc	bil	g	381.54 /	38	1.45
pec. Gravity	2.673	Max. Grad.	19.74		Volume So	lids, cm'	142.73		Water Co	ntent	%	33.83%	33.	12%
olume Solids, cm	142.73	Min. Grad.	19.74		Volume Vo	oids, cm ³	123.42	-						
olume Voids, cm ³	131.46	4			Void Ratio	•	0.86	- -						
oid Ratio	0.92				Saturation	, %	102.4%		DESCRIP	TION			-	· · · · · · · · · · · · · · · · · · ·
ituration, %	98.2%]							Olive Brow	wn, SILTY	CLAY, tra	ace medium to fine sand.		
	Flow Pum	p Rate	5.70E-05	cm ³ /sec		USCS	CL		L	• • • • • •				
		TIM	E FUNCTIO	ONS, SECO	ONDS	· .		dP		1	1		1	
DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability		
				(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)		
-	37015	15	30	20.9	0	0	0	0	1.82	128.02	19.74	6.9E-08		
5/4/01	37015	15	35	20.9	5	5	300	300	1.82	128.02	19.74	6.9E-08		
5/4/01 5/4/01		1 15	40	20.9	5	10	300	600	1.82	128.02	19.74	6.9E-08		
5/4/01 5/4/01 5/4/01	37015	1.5				15	300	900	1.82	128.02	19.74	6.9E-08	•	
5/4/01 5/4/01 5/4/01 5/4/01	37015 37015	15	45	20.9	5	15	500			1				
5/4/01 5/4/01 5/4/01 5/4/01 5/4/01	37015 37015 37015	15 15 15	45 50	20.9 20.9	5	20	300	1200	1.82	128.02	19.74	6.9E-08	•	
5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01	37015 37015 37015 37015 37015	15 15 15 15	45 50 55	20.9 20.9 20.9	5 5 5	20 25	300 300	1200 1500	1.82 1.82	128.02 128.02	19.74 19.74	6.9E-08 6.9E-08	•	
5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01	37015 37015 37015 37015 37015 37015	15 15 15 15 16	45 50 55 0	20.9 20.9 20.9 20.9 20.9	5 5 5 5	20 25 30	300 300 300 300	1200 1500 1800	1.82 1.82 1.82	128.02 128.02 128.02	19.74 19.74 19.74	6.9E-08 6.9E-08 6.9E-08	• • •	



	DESCRIPTION		LL	PL	PI	SAMPLE ID
Olive Brown, Si	LTY CLAY, tra	e medium	41	21	20	B-4
to fine sand.						
		•	SAMPL	E TYPE	UD	3.0 - 5.0'
USCS	CL			· · · ·		

SAMPLE DATA Wet Density (pcf) Dry Density (pcf) Moisture Content

118.2	
88.3	
33.8%	

TIME TO FAILURE (min) STRAIN @ FAILURE (%) TYPE OF FAILURE

13.2	
13.0	
SHEAR	

-1

UNCONFINED COMPRESSIVE STRENGTH (psf)	1562.7
SHEAR STRENGTH (psf)	781.4

013-3205	TECH DA
GENESIS/PLUM POINT ENERGY/AR	DATE 5/3/01
	CHECK DA
	REVIEW JUM

UNCONFINED COMPRESSIVE STRENGTH OF SOILS

ASTM D 2166

L								
PROJECT	TITLE	GENESIS/PLUM P	OINT ENERGY/AR		SAMPLE ID		B-4	
PROJECT	NO.	013-	3205		SAMPLE TY	PE	UD	
REMARKS		015			SAMPLE DE	Срти	3.0 - 5.0'	
		L		1	orwat ME DI		510 - 510	
SAMPLED	АТА			WATER CO	NTENT	BEFODE		AFTER
Height (in)		6.081		WAIERCO		SUFAD		AFTER
Diamatan (in)		0.081				SHEAR		SHEAR
Diameter (m)		2.852				(entire)	1	(partial)
Height/Diame	ter Ratio	2.13		Tare No.		<u>SQ-8</u>		-
Area (In')		6.39		Wt. Wet Soil &	: Tare (gm)	1205.46		510.63
Volume (ff [*])		0.0225		Wt. Dry Soil &	: Tare (gm)	900.71		381.54
Weight (gm)		1205.46		Wt. Tare (gm)		0.00		0.00
Wet Density (pcf)	118.16		Wt. Moisture (gm)	304.75		129.09
Dry Density (pcf)	88.29	-	Wt. Dry Soil (g	;m)	900.71		381.54
Machine Spee	d (in/min)	0.06		Moisture (%)		33.83%		33.83%
Strain rate (%	/min)	0.99				· · · · ·		
TIME	DEFLECT	FORCE	% STRAIN	Ac	COMPRESS	SIVE STRESS	1	
(min)	(inch)	(lbs)	(in/in)	(in²)	(psf)	(psi)	1	
0.0	0.000	0	0.00	6.39	0.00	0.00		
0.3	0.020	4	0.33	6.41	86.84	0.60		
0.8	0.050	9	0.82	6.44	190.83	1.33		
1.2	0.070	12	1.15	6.46	262.59	1.82		
1.5	0.090	15	1.48	6.48	336.23	2.33	TIME TO FAILURE (min)	13.20
1.8	0.110	18	1.81	6.51	409.41	2.84	STRAIN @ FAILURE (%)	12.99
2.2	0.130	22	2.14	6.53	480.24	3.33	TYPE OF FAILURE	SHEAK
2.5	0.150	25	2.4/	6.55	614.61	3.81		
3.3	0.170	128	3.27	6.60	704.69	4.89		
3.7	0.220	35	3.62	6.63	762.30	5.29		
4.5	0.270	42	4.44	6.69	895.16	6.22	FAILURE	
5.2	0.310	46	5.10	6.73	988.32	6.86	SKETCH	
5.8	0.350	50	5.75	6.78	1072.76	7.45		7
7.3	0.440	59	7.23	6.89	1237.22	8.59] \ /	
8.2	0.490	63	8.06	6.95	1311.89	9.11		
9.8	0.590	71	9.70	7.07	1438.20	9.99	4 1 7.	
10.7	0.640	74	10.52	7.14	1485.73	10.32		
11.5	0.690	76	11.35	7.21	1520.75	10.00		
13.2	0.790	80	12.79	7.34	1560.40	10.84	$+$ $ $ $ $ \backslash	
15.5	0.010	68	15.46	7.56	1293.32	8.98	1 入`	\backslash
17.2	1.030	55	16.94	7.69	1024.38	7.11	1 / \	Y
		UNCONFINE	D COMPRESSI	VE STRENGTH	1562.72	10.85		
			SHE	AR STRENGTH	781.36	5.43		
							7	
Description	n Olive Brown,	SILTY CLAY	, trace medium	1	LI	41		
	to fine sand.				PI	21	тесн	DA
					P	20	DATE	5/3/01 DA
USC	S CL						CHECK	- JH
1							REVIEW	[wint



ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE II	B-7	
PROJECT NO.		013-3205			SAM	PLE TYPE		UD
REMARKS		· · · · · · · · · · · · · · · · · · ·			SAMPI	E DEPTE	3.0	- 5.0'
		· · ·		Hygroscopic	Moisture For	Sieve Samol	e	
WATER CONTENT (Delivered	Moisture)				Wet Soil d	& Tare (gm)	
Wt Wet Soil & Tare (gr	n)	(w1)	341.72]		Dry Soil	& Tare (gm)	
Wt Dry Soil & Tare (gn	n)	(w2)	259.17			Tare Weig	ght (gm)	
Weight of Tare (gm)		(w3)	0.00			Moisture	Content (%)	
Weight of Water (gm)		(w4 = w1 - w2)	82.55	Total Weight	Of Sample Us	sed For Siev	e Corrected For I	Hygroscopic M
Weight of Dry Soil (gm)	(w5=w2-w3)	259.17	1	• , .	Weight Of	f Sample (gm)	254.70
Moisture Content (%)		(w4/w5)*100	31.85	1		Tare Wei	ght (gm)	108.09
				1 .	(W6)	Total Dry	Weight (gm)	146.61
	5. C							
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIE	VE	
0.00		+Tare	2	{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"	-	•			2.5"	coarse gravel	
	2.0"			· · · · · · · · · · · · · · · · · · ·		2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"					0.50"	fine gravel	
	0.375*					0.375"	fine gravel	
	#4					#4	coarse sand	*-
	#10					#10	medium sand	
	#20	0.00	0.00	0.00	100.00	#20	medium sand	
	#40	0.07	0.07	0.05	99.95	#40	fine sand	
	#60	0.15	0.15	0.10	99.90	#60	fine sand	
	#100	0.36	0.36	0.25	99.75	#100	fine sand	
	#200	0.89	0.89	0.61	99.39	#200	fines	
	PAN					PAN		
% COBBLES	0.00				· · · · · · · · · · · · · · · · · · ·			
% C GRAVEL	0.00	Descrip	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediur	n (m)	LL	44
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	23
% M SAND	0.05	some	12 to 30%	< 10%	coarse (m-f)		. PI	21
% F SAND	0.56	and	30 to 50%	< 10%	coarse and find	e (m)	Gs	-
% FINES	99.39			< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
DESC	RIPTION	Brown, SILTY	CLAY, tra	ce medium to	fine sand.			
	USCS	CL					TECH	DA/NA
							DATE	5/15/01
							CHECK	- M
							REVIEW	F ~



)							<u></u>									N.
1					FLE	XIBLE W	ALL TRI	AXIAL P	ERMEAB	ILITY				1.	-	
							ASTM	D 5084			•					
				метно	D C, FAI	LING HE	AD W/IN	CREASIN	IG TAILV	VATER P	RESSUR	E				
PROJECT	TITLE	GENESIS	PLUM PO	INT ENERG	Y/AR]	Using Pip	ettes Only	YES] co	MMENTS	F				7
PROJECT	NUMBER	013-3205				Using	, Pipettes &	Burrettes	NO							с. 1
SAMPLE I	ID	B-7		3.0	-5.0'	BOARD#	10] тесн	DA	1						
SAMPLE 1	туре	UD] CELL #	10] DATE	5/17/01]						
Sample Da	to Initial						ändelad hain <u>eter 4</u>		<u></u>		, provinci di Litari di Ch		Initial		Final	
Height, incl	hes	1.946	1				Sample De	ata Final			Water Ca	ntente	Trimming		ruuu Partial Sam	nle
Diameter, i	inches	2.840		B-Value f	0.99	3	Height inc	thes	1 925	1	Wt soil&	are i	341 72	i 1	307 00	Τ
Area, cm ²	2	40.87		Cell Pres	85.00	1	Diameter.	inches	2.842		Wt soil&	are, f	259.17	· ·	300.23	-
Volume, cn	m^3	202.01		Bot. Pres.	80.50	1	Area. cm^	2	40.93	1	Wt Tare		0.00		41.42	
Mass, g		341.72		Top Pres.	80.00	1	Volume, c	m^3	200.11	1	Wt Moist	ure Lost	82.55	1: 1	96.86	
Moisture Co	ontent, %	31.85		Head, cm	35.17	1	Mass, g	· · · ·	356.16	1	Wt Dry S	oil	259.17	1	258.81	
Dry Density	y, pcf	80.06		Max. Grad.	11.99		Moisture C	Content %	37.43	1	Water Co	ntent	31.85%		37.43%	
Spec. Gravi	ity	2.693		Min. Grad.	4.25		Dry Densit	ty, pcf	80.82]						
Volum e Sol	lids, cm^3	96.23		Max. E.S.	5.00		Saturation		93.4%] DESC	RIPTION	Brown, S	SILTY CLA	Y, tra	ce medium	
Volume Vo	oids, cm^3	105.77		Min. E.S.	4.50	1.0	Inflow Volu	me per (1 cc)	1.00]		to fine sai	nd.			
Void Ratio		1.10					Outflow Volu	ime per (1 cc)	1.00]						
Saturation		78.0%]								USCS	CL				
TIM	AE FUNCT	ION	REA	DINGS		TIME	IN MINU	TES & SEC	ONDS		[vo	LUME	P	ERMEABI	LITY
DATE	HOUR	MIN	Inflow	Outflow	Temp.	dt	dt	dt, acc	Head	(H1/H2)	Gradient	Inflow	Outflow	6	20 Degre	es C
			(00)	(cc)		(min)	(sec)	(sec)	(cm)	(inc.)		(cc)	(cc)		(cm/sec))
5/17/01	11	17	0.00	25.00	19.4	0.0	0	0	58.62	ľ.	11.99	0.00	0.00		0.0	
5/17/01	11	17	4.80	20.00	19.4	0.3	15	15	49.62	1.18	10.15	4.80	5.00		6.37E-04	
5/17/01		18	9.10	15.80	19.4	0.3	15	30	41.82	1.19	8.55	4.30	4.20		6.54E-04	
5/17/01		18	12.50	12.40	19.4	0.3	15	45	35.58	1.18	7.28	3,40	3.40		6.18E-04	
5/17/01		18	15.00	9.30	19.4	0.3	15	60	29.88	1.19	0.11	3.10	3.10		0.0/E-04	
5/17/01		10	20.60	0.50	19.4	0.3	15	15	24.93	1.20	5.10	2.00	2.80		0.94E-04	
5/1//01	1	13	20.00	4.40	19.4	0.5	15	~	20.00	1.20	4.25	2.40	2.10		0.335-04	
						$\sqrt{2}$ and $\sqrt{2}$										
														1 1		1.1
						1.1	A.		· · ·							
											· · ·					
	Inflow Ra	ite	0.228889								PERME	ABILTIY	REPORTE	D AS	6.7E-04	cm/s
	Outflow I	late	0.228889	-								•				
	Outflow/I	aflow Ratio	1.00										Ð	ATE	5/17/	/01
TTD A NO			-										CH	ECK		
TRANS	CRIBED FI	KUM UKI	JINAL DAT	A SHEETS									KEV.	TEM	- jw	5



						ONE-DIME	NSIONAL	CONSOLI	DATION	- · · ·			
							ASIMI) 2435					
PROJECT NA	AME	GENESIS/P	LUM POINT	ENERGY/AR]	DESCRIPTIC	DN	Brown, SILT	Y CLAY, tra	ace medium t	o fine sand.	1 1	. 44
PROJECT NI	JMBER		013-3205		1							PI	23
SAMPLE ID		B- 7		•]	CLASSIFICA	TION	CL		-		I PI	21
SAMPLE DE	ртн		3.0 - 5.0'			CONSOLIDO	METER No.	1				G	2.693
SAMPLE TY	PE		UD]								
							•						
								· .		_	Sample Data	Initial	Final
Sample Data		Trimmings	Before	After		Diameter (in)		· · · · ·	2.500		Total Heights (in)	0.745	0.685
			Test	Test	· ·	Height of sam	ple (in)		0.745		Height of solids (in)	0.384	0.384
Tare plus we	t soil, g	341.72	184.35	181.75		Area of samp	le (in^2)		4.909	1	Height of voids (in)	0.361	0.301
Tare plus dry	soil, g	259.17	157.92	157.92		Volume of sa	mple (in ³)		3.657		Height of water (in)	0.329	0.296
Tarc, g		0.00	74.8	74.8	ļ	Water Conten	t (Avg) from	Frimmings	31.8%	1	Void ratio	0.941	0.785
water, g		82.55	26.43	23.83	4	Sample Wt (w	vet, g)		109.55	4	Degree of saturation	91.0%	98.4%
Dry sou, g		259.17	83.12	83.12	ł	Sample Wt (d	ry, g)		83.12		Dry unit wt (pcf)	86.6	94.2
water Conten	Ľ.	51.9%	51.8%	28.7%	J	Water Wt (g)		I	26.43		Wet unit wt (pcf)	114.1	121.2
										•			
PRESSURE	H100	MACHINE	DIAL	FITTING	SAMPLE	HEIGHT OF	VOID	CHANGE IN	STRAIN	LENGT	H OF DRAINAGE	PERCENT	COEFFICIENT OF
(ksf)	DIAL	/ STONE	CHANGE	TIME (sec)	HEIGHT	VOIDS	RATIO	HEIGHT		PATH (DO	UBLE DRAINAGE)	INITIAL	CONSOLIDATION
	READING	CORR.	(in)	t90	(in)	Hv	e	(accum)	%	H (in)	H^2 (cm^2)	COMPRESSION	(ft^2/day)
0.125	0.0009	0.0000	0.0000	-	0.745	0.3611	0.9408	0.0000	0.0	0.000	0.000		-
0.125	0.0011	0.0002	0.0000	•	0.745	0.3611	0.9408	0.0000	0.0	0.372	0.895	•	-
0.250	0.0015	0.0003	0.0003	38	0.745	0.3608	0.9399	0.0003	0.0	0.372	0.895	4.5	1.8
0.500	0.0041	0.0006	0.0026	264	0.742	0.3585	0.9340	0.0026	0.4	0.372	0.892	51.9	0.3
1.000	0.0084	0.0013	0.0062	101	0.739	0.3549	0.9246	0.0062	0.8	0.370	0.885	48.9	0.7
2.000	0.0169	0.0022	0.0138	34	0.731	0.3473	0.9049	0.0138	1.9	0.367	0.871	56.8	2.0
4.000	0.0314	0.0035	0.0270	34	0.718	0.3342	0.8706	0.0270	3.6	0.362	0.847	47.9	2.0
16,000	0.0000	0.0051	0.0438	34	0.699	0.3154	0.8216	0.0458	6.1	0.354	0.810	53.0	1.9
4 000	0.0899	0.0070	0.0820	265	0.663	0.2792	0.7272	0.0820	11.0	0.341	0.748	28.7	0.2
1,000	0.0007	0.0000	0.0818	-	0.603	0.2793	0.7277	0.0818	11.0	0.332	0.709	-	-
0.250	0.0004	0.0013	0.0710	-	0.007	0.2830	0.7512	0.0782	10.5	0.333	0.713		-
	0.0722	0.0005	0.0710	-	0.0/4	0.2901	0.7559	0.0710	9.5	0.335	0.725	•	-
						· ·		11			LI	TECH	DH/PWM
		1	FINAL DIAL	READING =	0.0600							DATE	5/9/01
						-						CHECK	the
												REVIEW	INM



	DESCRIPTION		LL	PL.	PI	SAMPLE ID
Brown, SILTY	CLAY, trace m	edium to	44	23	21	B - 7
fine sand.					1. 1. A. A.	
		•	SAMPI	.Е ТҮРЕ	UD	3.0 - 5.0'
USCS	CL			-		· .

SAMPLE DATAWet Density (pcf)116.7Dry Density (pcf)89.2STRAIN @ FAILURE (%)5.1Moisture Content30.9%TYPE OF FAILURESHEAR

UNCONFINED COMPRESSIVE STRENGTH (psf)	1766.2
SHEAR STRENGTH (psf)	883.1

DA

5/16/01

TECH

DATE

CHECK REVIEW

013-3205 GENESIS/PLUM POINT ENERGY/AR

UNCONFINED COMPRESSIVE STRENGTH OF SOILS

ASTM D 2166

PROJECT PROJECT I REMARKS	TITLE NO.	GENESIS/PLUM I 013	POINT ENERGY/AR -3205		SAMPLE ID SAMPLE TY SAMPLE DE	B - 7 UD 3.0 - 5.0'		
SAMPLE D	ATA			WATER CO	DNTENT	BEFORE		AFT
leight (in)		5.700	1			SHEAR		SHEA
Diameter (in)		2.863	1			(entire)		(narti
leight/Diame	ter Ratio	1.99		Tare No.		SO-8		(Part f
rea (in ²)	· · ·	6.44		Wt. Wet Soil A	& Tare (gm)	1124 61		242
(olume (ft ³)		0.0212	1	Wt Dry Call	Tare (am)	950 10		105
Veight (~~~)		0.0414		We Tree (e rare (gm)	0.00		197.4
veigni (gm)		1124.61	-	wt. Lare (gm)	, ,	0.00		51.8
ver Density (pci)	116.70	4	Wt. Moisture (gm)	265.42		44.9
Dry Density (pcf)	89.16		Wt. Dry Soil (gm)	859.19		145.
fachine Spee	d (in/min)	0.06		Moisture (%)		30.89%		30.89
train rate (%	/min)	1.05						· .
TIME	DEFLECT	FORCE	% STRAIN	Ac	COMPRESS	VE STRESS	•	······································
(min)	(inch)	(lbs)	(in/in)	(in²)	(psf)	(psi)		
0.0	0.000	0	0.00	6.44	0.00	0.00		
0.2	0.010	5	0.18	6.45	120.58	0.84		
0.3	0.020	13	0.35	6.46	282.41	1.96		
0.5	0.030	19	0.53	6.47	431.66	3.00		
0.7	0.040	25	0.70	6.48	549.06	3.81	TIME TO FAILURE (min)	4.8
0.8	0.050	29	0.88	0.49	640.77	4.45	STRAIN @ FAILURE (%)	5.0
1.2	0.070	37	1.23	0.52	1079.35	7.4	I ITE OF FAILURE	SHE
2.0	0.100	49	2.11	6.59	1078.33	8.50		
2.6	0.120	20	2.11	6.61	1409 57	0.70		
3.5	0.150	77	1.03	6.69	1653.94	11.49		
4.2	0.250	<u><u> </u></u>	4.39	6.73	1740.05	12.08	FAILURE	
4.8	0.290	83	5.09	6.78	1766.24	12.27	SKETCH	
6.0	0.360	73	6.32	6.87	1519.27	10.55		77
7.0	0.420	49	7.37	6.95	1021.50	7.09		
7.5	0.450	44	7.89	6.99	910.62	6.32		
9.2	0.550	38	9.65	7.13	767.99	5.33		
10.8	0.650	37	11.40	7.27	726.71	5.05		
12.5	0.750	38	13.16	7.41	734.26	5.10		
14.2	0.850	42	14.91	7.57	808.84	5.62		
15.8	0.950	46	16.67	7.73	849.20	5.90		N
16.7	1.000	45	17.54	7.81	830.73	5.77		V
16.8	1.010	45	17.72	7.82	828.03	5.75		
<u> </u>		UNCONFIN	ED COMPRESSI	VE STRENGTH	1766.24	12.27		~
			SHE	AR STRENGTH	883.12]		
				1.			1	
Description	n Brown, SILT	Y CLAY, tra	ce medium to		LL	44		
	fine sand.				PL	23	TECH	DA
					PI	21	DATE	5/16/
USCS	S CL						CHECK	L
		-					REVIEW	1



Golder Associates Inc.



VOLCT TITLE ROUECT NO. GENESISPILIM POINT ENERGY/AR BADDES SAMPLE DEPTH B-10 AS RECEIVED WATER CONTENT The No. Bygenecopic Moisture Por Site Sample Dy Said & Tau (ga) 42.45 UD AS RECEIVED WATER CONTENT The No. Bygenecopic Moisture Por Site Sample Dy Said & Tau (ga) 42.45 UD Wate of the (ga) (W) 51.85 For Site Sample Tool Weight of Sample Use of Autors in Control of Digmenople Moisture Weight of War (ga) 42.45 UD Wate of the (ga) (W) 51.85 Tool Weight of Sample Use of Autors in Control of Digmenople Moisture Weight of War (ga) 42.54 USE of Autors in Control of Digmenople Moisture Weight of Sam (ga) 20.7 Mater Autors in Control of Digmenople Moisture Weight of Sam (ga) 20.7 Tool Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sam (ga) 20.7 Tool Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sample Use Autors in Control of Digmenople Moisture Weight of Sample Use Autors in Control of Digmenople Moisture Digmenople Moisture Digmenople Moisture Digmenople Moisture Digmenople Moisture Por Autors in Control of Digmenople Moisture Por Autors in Control of Digmenople Moisture Por Autors in Control of Dig			A	AS STM C11	STM GRA 17, C136,	IN SIZE ANAL D421, D422, D1	YSIS 140 and D221	7	ile il gente dani 1	<u></u>			
ADJECT NO. Distance number numbe	ROJECT TITLE	GENESIS/PI	UM POINT F	ERGY/AD			SAMDI E TO		D 10	_			
SAMPLE 51172 SAMPLE 5127 AS RECEIVED WATER CONTENT Hyproscopic Moisture Vers Suit & Trac (ga) 42.40 Nu. We, Sait & Trac (ga) (VU) 51.85 Moisture 42.40 Nu. We, Sait & Trac (ga) (VU) 51.85 Moisture 0.13 Weigh at Trac (ga) (VU) 51.85 Moisture 0.13 Weigh at Trac (ga) (VV) 51.85 Moisture 20.60 Weigh at Trac (ga) (VV) 51.85 Moisture 20.60 Weigh at Trac (ga) (VV) 71.84 Weigh at Trac (ga) 20.44 Weigh at Trac (ga) (VV-172.152.16) 1.07 Trace Weigh (ga) 20.47 Weigh at Trac (ga) (VV-Trace) Weight of Sample Work for Size Anapyee 1.07 Coshien 3.0° 1.0° 1.0° Coshien 3.0° Coshien 3.0° 1.0° 1.0° Coshien 3.0° Coshien 3.0° 1.0° 1.0° Coshien 3.0° Coshien 3.0° 1.0° 1.0°	ROJECT NO. A12 2006			A ALLA			SAMPLE ID		D-10		1		
SAMPLE DEPT II SAMPLE DEPT II <th< td=""><td>1</td><td></td><td></td><td></td><td>SAMPLE I IF</td><td></td><td colspan="4"></td></th<>	1				SAMPLE I IF								
AS RECEIVED WATER CONTENT Hyperscopic Molstare We sold A Tan (pp) 42.45 Wr. We Sold A Tan (pp) 42.40		the second					SAMPLE DEP	1H	3.0	5.0			
The No. For Siere Sample Dy Set & Trangerow 24.00 W: Dy Set & Trangerow 22.67	AS RECEIVED	WATER C	ONTENT	· ·	Hygrosc	opic Moisture	Wet Soil & Tare (g	m)	42.45				
Wi, Wi, Soli & Time (gap) (Wi) Soli & Time (gap) Time Weight (gap) 177 Weigh of Yam (gap) (Wi) 0.00 Total Weight of Sample Used For Since Analysis (Corrects / PET Byrguescopic Moleture Weight of War (gap) 0.00 Total Weight of Sample Used For Since Analysis (Corrects / PET Byrguescopic Moleture Weight of War (gap) 0.00 Total Weight of Sample Used For Since Analysis (Corrects / PET Byrguescopic Moleture Weight of War (gap) 0.01 1.04 Weight of War (gap) (Wi ~ HV.W. VI) 0.02 1.04 4.07 1.04 Weight of War (gap) (Wi ~ HV.W) 0.03 1.04 4.07 1.04 Weight of Marcrial Sieve (Wi ~ HVm) 0.05 1.04 4.07 1.04 1.57 <t< td=""><td>Tare No.</td><td></td><td></td><td>-</td><td>For Siev</td><td>e Sample</td><td>Dry Soil & Tare (g</td><td>m)</td><td>42.40</td><td>· ·</td><td></td></t<>	Tare No.			-	For Siev	e Sample	Dry Soil & Tare (g	m)	42.40	· ·			
W. Dy Stat Ture (gn) (W2) (W2)<	Wt. Wet Soil & Tare (a	m)	(W1)	551.85		-	Tare Weight (gm)		3.17				
Weight of The (gn) (V+V) 0.00 Total Weight of Nample Used For Stars Analytic Carsted For Expression E Molisture Weight of Varian (Stars) Weight of Varian (Stars) Stars) Stars Stars) S	Wt. Dry Soil & Tare (g	em)	(₩2)	422.66			Moisture Content (
Weight of Vacuer (gan) (vik-with vitage) (12)	Weight of Tare (gm)		(W3)	0.00	Total We	ight of Sample Used	For Sieve Analy	sis Corrected	d For Hygro	sconic Moie	fune		
Weight of Dy Sid grap Weight Side Control of Plants (eq.) Control Plants (eq.) Plus #4 Material Sleve (We/Wy)100 30.57 Total Vergit (eq.) Control Plants (eq.)	Weight of Water (gm)		(W4=W1-W2)	129,19		Weight + Tare Refor	· Senarating On The	A Sieve (am)	268.40		ture .		
Notice::::::::::::::::::::::::::::::::::::	Weight of Dry Soil (gm	1)	(W5=W2-W3)	422.66	1		Ta	w Weight (gm)	43.17				
Plus #4 Material Sieve (100 107 / 201 - 200 - 100	Moisture Content (%)	•	(W4/W5)+100	30.57	Total Weight (gm) 93.17								
TARE WEIGHT 0.00 12.0° 12.0° 0.00 97.855100 12.0° 0.00 3.0° 2.5° 0.00 3.0° 2.5° 0.00 0	Plus #4 Materia	al Sieve	(14113) 100	50.57	(Wt+Tare)	((())+ Tom)()(()+100)	A DASSING	ar weight (gin)	224.34	(110)			
International (0,0) 12.0 12.0 12.0 10,0 <th1< td=""><td>TARE WEIGHT</td><td></td><td>ה</td><td>12 01</td><td>(WC+Tale)</td><td>(((WH=1ate)/WO)=100)</td><td>77A351NG</td><td>1 10 00</td><td></td><td></td><td></td></th1<>	TARE WEIGHT		ה	12 01	(WC+Tale)	(((WH=1ate)/WO)=100)	77A351NG	1 10 00					
3.0° 3.0° <th< td=""><td></td><td>0.00</td><td></td><td>12.0</td><td></td><td></td><td></td><td>12.0</td><td>cooples</td><td></td><td></td></th<>		0.00		12.0				12.0	cooples				
2.5° 2.5° 2.5° 2.5° 2.5° cores gravel 1.5° 1.5° 2.0° 2.0° 2.0° 2.0° cores gravel 1.5° 0.75° 1.6° 0.75° 1.6° 0.5° 0.5° 0.50° 0.50° 0.50° 0.50° 0.50° 0.50° 1.6° 0.50° 0.50° 0.50° 1.0° 0.375° 1.6° 0.50° 9.050° free gravel 0.50° 1.6° 0.50° 1.6° 0.50° Specific Gravity (seamed) 2.650 Weight of Sample Used For Hydrometer Test 5.01 Specific Gravity (seamed) 1.15° 6.2378 100 100.00 Tase watter 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) 6.24378 100.00 100.00 Tase watter 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) 6.06 9.99 #40 100 medium and #100 0.01 0.01 100.00 #40 100 100				3.0"				3.0"	coarse gravel				
2.0° Corres gravel 1.5° 1.0° corres gravel 0.75° 0.50° 0.50° 0.57° 0.50° 0.50° 0.375° 0.50° 0.50° 0.375° 0.375° 0.50° 0.375° 0.50° file gravel 0.375° 0.375° file gravel 0.375° file gravel 0.375° 0.00 Mechanical Weight of Sample Wei or Dy (gra) 0.00 Mechanical Rydomeer Bub Nuber 10° Mechanical No file state 10° Mechanical No file state 10° 0.01 0.01 100.00 100 0.03 99.9 file file file state 100 0.03 99.9 file file file state 100 0.	1			2.5"			ļ	2.5"	coarse gravel				
1.5" 1.5" caste gravel 0.75" 0.50" 0.50" 0.50" 0.375" 0.50" 0.50" 0.50" 0.375" file gravel 0.37" file gravel 9.375" 14 0.37" file gravel 9.375" file gravel 0.37" file gravel 9.37" file gravel 53.01 53.01 9.38 file gravel file gravel 63.01 9.30" fole gravel file gravel 63.01 9.30" fole file gravel file gravel 60				2.0"				2.0"	coarse gravel				
1.0° 0.75° 0.75° 0.75° file gravel 0.575° 0.50° 0.50° file gravel 0.50° file gravel 0.575° 64 0.50° file gravel 0.50° file gravel Specific Gravity (seasured) 2.650 Weight of Sample Used For Hydrometer Test Specific Gravity (seasured) 2.650 Weight of Sample Weight				1.5"		-	· · · · ·	1.5"	coarse gravel				
0.50° 0.50° 0.50° 0.50° 0.50° 0.50° 0.50° fibe gravel 0.375° fd 0.375° fibe gravel 0.375° fibe gravel 0.375° fd 0.375° fibe gravel 0.375° fibe gravel Specific Gavity (assumed) 2.650 Weight of Sample Used For Hydrometer Test Specific Gavity (assumed) 2.500 Caculated Dry W: used in test (gn) 53.54 1 Dispersion Period 1 Minual % Pass #4 Sieve For Whole Sample 100.00 53.94 1 caculated Dry W: used in test (gn) 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cumul W: Comm W: Rectained % PASSING #0 medium and #00 0.03 0.03 99.9 #00 fibe and #00 0.03 0.03 99.9 #00 fibe and #00 0.03 0.03 99.9 #00 fibe and #01 0.61 0.61 0.61 98.9 #200 DATE				1.0"				1.0"	coarse gravel				
0.50° 0.375° 0.90° for gravel 0.375° for gravel 0.375° for gravel 44 0.375° for gravel 0.375° for gravel Specific Gravity (assumed) 2.650 Weight of Sample Used For Hydrometer Test Specific Gravity (assumed) 2.650 Weight of Sample Wight Of Sample Wight Of Sample Wight Of Sample Wight Of Sample Weight Of Sample Wight Of Sam				0.75"				0.75"	fine gravel				
0.375" 0.375" free gravel 44 corre said HYDROMETER ANALYSIS Weight of Sample Used For Hydrometer Test Specific Gravity (casamed) 2.650 Weight of Sample Wei or Dry (gn) Calculated Dry WL, used In est (gn) (24378 54.01 55.94 Out Dispersing Agers (nit) 100.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cural WL Retained 70 medium and #0 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cural WL Retained 70 medium and #0 0.00 HYDROMETER CALCULATIONS HYDROMETER CALCULATIONS The RADING TER CALCULATIONS HYDROMETER CALCULATIONS The RADING TER CALCULATIONS DATE Sido 0.15 0.0 45.00 22.00 0.013 5.00 45.00 8.9 1 1.00 5.01 0.05.0 11.4 1.00 Sido 0.13 5.00 45.00 8.9 1 0.00 5.01 0.15.00 35.0 12.4 1.00 Sido 0.13 5.00 12.0 0.013 5.00 12.4 0.01 <td co<="" td=""><td>and the second second</td><td>1. J. A. 1. /td><td></td><td>0.50"</td><td></td><td></td><td></td><td>0.50"</td><td>fine gravel</td><td></td><td></td></td>	<td>and the second second</td> <td>1. J. A. 1. /td> <td></td> <td>0.50"</td> <td></td> <td></td> <td></td> <td>0.50"</td> <td>fine gravel</td> <td></td> <td></td>	and the second second	1. J. A. 1.		0.50"				0.50"	fine gravel			
#4 #4 concers and HYDROMETER ANALYSIS Weight of Sample Used For Hydrometer Test Specific Gravity vount Dispersion Periced 54.01 Veight of Sample Wei or Dry (gm) Calculated Dry WL used in set (gm) Pydrometer Bub Number 54.01 Veight of Sample Wei or Dry (gm) Calculated Dry WL used in set (gm) Pydrometer Bub Number 54.01 Veight of Sample Wei or Dry (gm) Calculated Dry WL used in set (gm) Pydrometer Bub Number 54.01 Veight of Sample Wei or Dry (gm) Calculated Dry WL used in set (gm) Pydrometer Bub Number 54.01 Veight of Sample Wei or Dry (gm) Calculated Dry WL used in set (gm) Pydrometer Bub Number 54.01 Veight of Sample Wei or Dry (gm) Calculated Dry WL used in set (gm) Pydrometer Bub Number TARE WEIGHT 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Comm VL Camal WL Comm VL Pydrometer Bub Number 99.9 #00 file sand #00 0.00 HYDROMETER CALCULATIONS For HyDROMETER CALCULATIONS HYDROMETER CALCULATIONS Marculater BEADING EFFECTIVE S14:001 9.0 0.013 5.00 6.00 for Marculaterad Marculater Marculater Marculaterad Marculaterad Ma				0.375"				0.375"	fine gravel				
HYDROMETER ANALYSIS Weight of Sample Used For Hydrometer Test Specific Garviy (casumed) 2.650 Weight of Sample Wei or Dry (gn) 54.01 Specific Garviy (casumed) Calculated Dry WL used in test (gn) 53.94 Out Dispersion Paried Horizon Paried Specific Garviy (gn) 54.01 Out Dispersion Paried 100.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cumul WL Cumul WL Wit+Tare) Realand % PASSING #0 0.00 No Cumul WL Free With Tare) Realand % PASSING #0 0.00 0.00 0.00 A Size For Whole Sample 100.00 Cumul WL Cumul WL Cumul WL Size A Size For Whole Sample fize A Size				#4			· · · ·	#4	coarse sand				
Opcific Gravity (testo) 125.00 Weight of Sample Wei or Dry (gm) 54.01 Out Dispersing Agent (m) 125.00 Calculated Dry W. used in test (gm) 62.4378 Imple of Dispersion Period 1 Minute % Pass #4 Sizee For Whole Sample 100.00 TARE WEIGHT 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cumul W. Cumul W. 700 medium sand 700 medium sand #40 0.03 0.03 99.9 #60 fnee sand #00 0.08 0.08 99.5 #100 fnee sand #00 0.08 0.08 99.5 #100 fnee sand #100 0.08 0.08 99.5 #100 fnee sand #100 9.43 (min) R T K C C C LENGTH A 514/01 9.47 2.00 50.0 22.00 0.013 5.00 8.9 1.00 514/01 9.50 5.00 43.0 22.00 0.013 5.00 </th <th>HYDROMETE Specific Gravity</th> <th>(assumed)</th> <th>IS 2.650</th> <th></th> <th></th> <th>Weight of Sample</th> <th>e Used For Hyd</th> <th>lrometer Te</th> <th>st</th> <th></th> <th></th>	HYDROMETE Specific Gravity	(assumed)	IS 2.650			Weight of Sample	e Used For Hyd	lrometer Te	st				
Data Dispersion Device 125.00 Calculated Dry W. used in text (gn) 53.94 Colspan="2">Calculated Dry W. used in text (gn) 53.94 6243778 Calculated Dry W. used in text (gn) 53.94 6243778 Calculated Dry W. used in text (gn) 624378 TARE weight of Dispersion Period I MYDROMETER BACKSEEVE (Percent Passing #10 - #200 Sieves) Cumul W. Cumul W. VI-100 medium sand #40 0.03 9.9 #40 fine sand HYDROMETER CALCULATIONS HYDROMETER CALCULATIONS File THE BATE TRAGE for Machine sand <th colspa<="" td=""><td>Specific Gravity</td><td>(tested)</td><td></td><td></td><td></td><td>Weight of Sample Wet</td><td>or Dry (gm)</td><td>54.01</td><td>1 .</td><td></td><td></td></th>	<td>Specific Gravity</td> <td>(tested)</td> <td></td> <td></td> <td></td> <td>Weight of Sample Wet</td> <td>or Dry (gm)</td> <td>54.01</td> <td>1 .</td> <td></td> <td></td>	Specific Gravity	(tested)				Weight of Sample Wet	or Dry (gm)	54.01	1 .			
• Dispersion Device Mechanical I Minute Hydrometry Bub Number 9 Pass #4 Sieve For Whole Sample 624378 100.00 TARE WEIGHT 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cumul Wt. Cumul Wt. 710 Feasing #10 - #200 Sieves) Cumul Wt. 720 0.01 0.01 100.0 740 0.03 0.99.9 #40 fine sand 760 0.05 0.03 99.9 #60 fine sand 760 0.061 0.61 98.9 700 fine sand 700 0.61 0.61 98.9 700 fine sand 7100 0.08 0.99.9 #100 fine sand 7101 9.45 ((((in))) R T K Cc C LENGTH A 5/14/01 9.45 (((in)) R T K Cc C LENGTH A 5/14/01 9.45 ((0.0) 35.0 0.33 5.00 38.0 1.01 1.00 5/14/01	Count Dispersing Are	ent (ml)	125.00	• •		Calculated Dry Wt. use	d in test (em)	53.94	l				
Image: Construction of the state of the state for Whole Sample Output of Dispersion Period I Minute N Para #4 Size For Whole Sample OUtput TARE WEIGHT 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cumul WL Cumul WL P10 medium sand #0 0.01 0.01 100.0 #20 medium sand #20 field #40 0.03 99.9 #40 file sand #60 0.05 99.9 #60 file sand #60 0.06 99.9 #60 file sand #60 0.06 99.9 #60 file sand #60 file sand #60 0.01 1.00 file sand #60 file sand #60 0.05 99.9 #60 file sand #60 fil	a Dispersion Device		Mechanical	and the second second		Hydrometer Bulh Num	624378	્યું છે.					
Description Deprivative Field 1 milling Practice Processing #10 - #200 Silvers) TARE WEIGHT 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Silvers) Cumul WL Retained #00 flo medium sand #40 0.01 0.01 100.0 #20 medium sand #60 0.05 0.05 99.9 #40 flo medium sand #60 0.05 0.05 99.9 #60 flo medium sand #700 0.08 0.08 99.9 #60 flo medium sand #700 0.05 0.05 99.9 #60 flo medium sand #700 0.05 0.08 0.08 99.9 #60 flo medium sand #700 0.05 0.05 99.9 #60 flo medium sand #60 bATE TIME ET READING TEMP TEMP COR. HYD.COR. READING EFFECTIVE 5/14/01 9:47 2.00 0.013 5.00 38.00 10.1 1.00	a enoth of Dispersion B	eriod	1 Minute			K Dres #4 Siave For W	•						
TARE WRIGHT 0.00 HIDROME LER DACKSLE VE (Pertent Passing MD - #200 Sleves) Cumul WL Cumul WL #10 0.01 0.01 100.0 #20 medium sand #20 0.01 0.01 100.0 #20 medium sand #40 0.03 0.03 99.9 #60 fine sand #60 0.05 0.05 99.9 #60 fine sand #200 0.61 0.61 98.9 #200 fine sand #200 0.61 P.9.9 #100 fine sand #200 0.61 P.9.9 #200 fine sand #200 0.61 P.9.9 #200 fine sand 5/14/01 9.47 2.00 50.0 22.00 0.013 5.00 38.0 10.1 1.00 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 38.00 10.1 1.00 50.00 22.0 <td></td> <td>(<u> </u></td> <td></td> <td></td> <td>VETEVE O</td> <td>Demonst Deadlers #1</td> <td>0 #200 Sterred</td> <td></td> <td>· · ·</td> <td></td> <td></td>		(<u> </u>			VETEVE O	Demonst Deadlers #1	0 #200 Sterred		· · ·				
Current Wi. Retained % PASSING #10 Retained #10 medium sand #20 0.01 0.01 100.01 100.01 100.0.01 100.01 100.01 100.01 100.01 100 0.03 99.9 #00 feed files sand #100 0.05 99.9 #00 feed files sand #100 0.08 99.9 #00 files sand #100 0.08 99.9 #100 files sand #100 0.08 0.013 5.00 file Miles file <	TARE WEIGHT	0.00	HIDROM	IER BAC	VOILAT (1	rercent Passing #1	0 - #200 Sieves)					
Image: constraint of the stand						Cumul Wt.		-					
#10					(Wt+Tare)	Retained	% PASSING						
#20 0.01 0.01 100.0 #20 medium and #40 0.03 0.03 99.9 #40 files sand #60 0.08 0.08 99.9 #60 files sand #700 0.08 0.08 99.9 #100 files sand #700 0.08 0.08 99.9 #100 files sand #700 0.61 0.61 98.9 #200 files sand #700 files sand #100 files sand #100 files sand #701 9:45 (min) R T K Cc C LENOTH A 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 24.00 12.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 14.0 14.0 <td></td> <td></td> <td></td> <td>#10</td> <td></td> <td></td> <td></td> <td>#10</td> <td>medium sand</td> <td></td> <td></td>				#10				#10	medium sand				
#40 0.03 0.03 99.9 #40 fine sand #60 0.05 0.05 99.9 #60 fine sand 200 0.61 0.61 98.9 #100 fine sand DATE TIME ET READING TEMP COR HYD.COR. READING EFFECTIVE 5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:45 5.00 43.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:05 30.00 25.0 22.00 0.013 5.00 24.00 12.4 1.00 5/14/01 10:15 30.00 25.0 22.00 0.013 5.00 12.9 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 <t< td=""><td></td><td></td><td></td><td>#20</td><td>0.01</td><td>0.01</td><td>100.0</td><td>#20</td><td>medium sand</td><td></td><td></td></t<>				#20	0.01	0.01	100.0	#20	medium sand				
#60 0.05 0.05 99.9 #60 file sand #100 0.08 0.08 99.9 #100 file sand #200 0.61 0.61 98.9 #200 file sand #200 0.61 0.61 98.9 #200 file sand DATE TIME ET READING TEMP TEMP.COR. HYD.COR. READING EFFECTIVE 5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:15 30.00 29.0 22.00 0.013 5.00 12.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 12.9 1.00 <t< td=""><td></td><td></td><td></td><td>#40</td><td>0.03</td><td>0.03</td><td>99.9</td><td>#40</td><td>fine sand</td><td></td><td></td></t<>				#40	0.03	0.03	99.9	#40	fine sand				
#100 0.08 0.08 99.9 #100 fire sand #200 0.61 0.61 0.61 98.9 #200 fires DATE TIME ET READING TEMP TEMP, COR. HYD.COR. READING EFFECTIVE 5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 45.00 8.9 1.00 5/14/01 9:50 5.00 43.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 24.00 12.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 12.4 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 14.00 14.0 1.00 5/14/01 9:45		i		#60	0.05	0.05	99.9	#60	fine sand				
#100 0.61 0.61 98.9 #200 fines HYDROMETER CALCULATIONS DATE TIME ET READING TEMP TEMP.COR. HYD.COR. READING EFFECTIVE 5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 45.00 8.9 1.00 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 21.00 12.4 1.00 5/14/01 10:45 60.00 22.00 20.013 5.00 21.00 13.5 1.00 5/14/01 13:55 250.00 22.0 20.013 5.00 13.5 1.00 5/14/01 13:55 250.00 22.0 20.013 5.00 13.5 1.00				#100	0.08	0.08	99.9	#100	fine sand				
HYDROMETER CALCULATIONS DATE TIME ET READING TEMP TEMP.COR. HYD.COR. READING EFFECTIVE 5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 45.00 8.9 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:15 30.00 29.0 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 12.4 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 12.4 1.00 5/14/01 13:55 250.00 22.0 20.00 0.013 5.00 14.00 1.00 5/15/01 9:45 1440.00 19.			, •	#200	0.61	0.61	98.9	#200	fines				
DATE TIME ET READING TEMP TEMP.COR. HYD.COR. READING EFFECTIVE 5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 45.00 8.9 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:15 30.00 29.0 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 21.00 12.4 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 14.0 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 14.00 14.0 1.00 5/15/01 9:45 1440.00 19.0 21.50 <td></td> <td></td> <td>HYDROME</td> <td>TER CALC</td> <td>ULATION</td> <td>IS</td> <td></td> <td></td> <td></td> <td></td> <td></td>			HYDROME	TER CALC	ULATION	IS							
5/14/01 9:45 (min) R T K Cc C LENGTH A 5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 45.00 8.9 1.00 5/14/01 9:50 5.00 43.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 21.00 12.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 12.4 1.00 5/14/01 13:55 250.00 22.0 0.013 5.00 17.00 13.5 1.00 5/14/01 13:55 250.00 22.0 2.00 0.013 5.00 17.00 13.5 1.00 5/15/01 9:45 1440.00 19.0 21.50 <td< td=""><td>DATE</td><td>TIME</td><td>ET</td><td>READING</td><td>TEMP</td><td>TEMP.COR.</td><td>HYD.COR.</td><td>READING</td><td>EFFECTIVE</td><td></td><td></td></td<>	DATE	TIME	ET	READING	TEMP	TEMP.COR.	HYD.COR.	READING	EFFECTIVE				
5/14/01 9:47 2.00 50.0 22.00 0.013 5.00 45.00 8.9 1.00 5/14/01 9:50 5.00 43.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:15 30.00 29.0 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 24.00 12.4 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 11.00 12.9 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 14.00 14.0 1.00 5/15/01 9:45 1440.00 19.0 21.50 0.014 5.00 14.00 14.0 1.00 0.0281 83.4 \$ C	5/14/01	9:45	(min)	R	Т	K	Cc	С	LENGTH	A			
5/14/01 9:50 5.00 43.0 22.00 0.013 5.00 38.00 10.1 1.00 5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:15 30.00 29.0 22.00 0.013 5.00 24.00 12.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 21.00 12.4 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 17.00 13.5 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 14.00 14.0 1.00 5/15/01 9:45 1440.00 19.0 21.50 0.014 5.00 14.00 14.0 1.00 0.0281 83.4 \$COARSE GRAVEL 0.00 0.00 0.006 ML 0.000 0.0016 56.5 \$COARSE SAND 0.00	5/14/01	9:47	2.00	50.0	22.00	0.013	5.00	45.00	8.9	1.00]		
5/14/01 10:00 15.00 35.5 22.00 0.013 5.00 30.50 11.4 1.00 5/14/01 10:15 30.00 29.0 22.00 0.013 5.00 24.00 12.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 21.00 12.9 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 14.0 12.9 1.00 5/15/01 9:45 1440.00 19.0 21.50 0.014 5.00 14.0 1.00 GRAIN SIZE PERCENTAGES Particle Diameter % PASSING % COBBLES 0.00 0.014 5.00 14.0 1.00 0.0189 70.4 % FINE GRAVEL 0.00 0.00 0.026 38.9 % FINE SAND 1.08 0.006 NP LL NP D 0.01 DATE 5/7/01 0.0013 26.0 % TOTAL SAMPLE 100.00 100.00 NP PL TECH SW DATE 5/7//01 10.0	5/14/01	9:50	5.00	43.0	22.00	0.013	5.00	38.00	10.1	1.00			
5/14/01 10:15 30.00 29.0 22.00 0.013 5.00 24.00 12.4 1.00 5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 21.00 12.9 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 17.00 13.5 1.00 5/15/01 9:45 1440.00 19.0 21.50 0.014 5.00 14.00 1.00 GRAIN SIZE PERCENTAGES Particle Diameter % PASSING % COBBLES 0.00 0.014 5.00 14.00 1.00 OLICE Diameter % PASSING % COBBLES 0.00 0.013 5.4 % COARSE GRAVEL 0.00 0.00 USCS ML 0.016 56.5 % COARSE SAND 0.00 0.006 ML ME ML 0.0031 31.5 % FINES 98.87 0.000 NP PL 0.0013 26.0 % TOTAL SAMPLE 100.00 NP PL DATE ST//01 DATE	5/14/01	10:00	15.00	35.5	22.00	0.013	5.00	30.50	11.4	1.00			
5/14/01 10:45 60.00 26.0 22.00 0.013 5.00 21.00 12.9 1.00 5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 17.00 13.5 1.00 5/15/01 9:45 1440.00 19.0 21.50 0.014 5.00 14.00 14.0 1.00 GRAIN SIZE PERCENTAGES Particle Diameter % PASSING % COBBLES 0.00 0.014 5.00 14.00 14.0 1.00 0.0281 83.4 % COARSE GRAVEL 0.00 0.00 0.000 USCS ML 00 0.00 0.016 56.5 % COARSE SAND 0.000 0.006 NP LL NP NP 1.0 0.0031 31.5 % FINE SAND 1.08 100.00 NP PL DATE 5/7/01 0.0013 26.0 % TOTAL SAMPLE 100.00 100.00 DATE 5/7/01	5/14/01	10:15	30.00	29.0	22.00	0.013	5.00	24.00	12.4	1.00			
5/14/01 13:55 250.00 22.0 22.00 0.013 5.00 17.00 13.5 1.00 5/15/01 9:45 1440.00 19.0 21.50 0.014 5.00 17.00 13.5 1.00 GRAIN SIZE PERCENTAGES Particle Diameter % PASSING % COBBLES 0.00 0.014 5.00 14.00 14.0 1.00 0.0281 83.4 % COARSE GRAVEL 0.00 0.00 USCS ML Description Olive Brown, CLAYEY SILT, trace fine sand. 0.016 56.5 % COARSE SAND 0.00 USCS ML ML 0.0062 38.9 % FINE SAND 1.08 NP PL 0.0013 26.0 % TOTAL SAMPLE 100.00 MP PL DATE 5/7/01 CHECK DATE 5/7/01 DENEM % DATE 5/7/01 DATE 5/7/01	5/14/01	10:45	60.00	26.0	22.00	0.013	5.00	21.00	12.9	1.00			
5/15/01 9:45 1440.00 19.0 21.50 0.014 5.00 14.00 14.0 1.00 GRAIN SIZE PERCENTAGES Particle Diameter % PASSING % COBBLES 0.00 0.014 5.00 14.00 14.0 1.00 0.0281 83.4 % COARSE GRAVEL 0.00 0.00 0.000	5/14/01	13.55	250.00	22.0	22.00	0,013	5.00	17.00	13.5	1.00			
GRAIN SIZE PERCENTAGES Particle Diameter % PASSING © COBBLES 0.00 0.0281 83.4 % COBBLES 0.00 0.0189 70.4 % FINE GRAVEL 0.00 0.0086 44.5 % MEDIUM SAND 0.06 0.0031 31.5 % FINES 98.87 0.0013 26.0 % TOTAL SAMPLE 100.00	5/15/01	0.45	1440.00	10.0	21.50	0.014	5.00	14.00	14.0	1.00			
Particle Diameter % PASSING % COBBLES 0.00 0.0281 83.4 \$ COBBLES 0.00 0.0189 70.4 \$ FINE GRAVEL 0.00 0.0116 56.5 \$ COARSE SAND 0.00 0.0086 44.5 \$ MEDIUM SAND 0.06 0.0031 31.5 \$ FINES 98.87 0.0013 26.0 \$ TOTAL SAMPLE 100.00	5/15/01	7.43	CPAN CT	F DEDCE	NTACES	0.017	1 3.00	1	1 1.0	1.00	L		
Particle Diametry % PASSING % COBLES 0.00 0.0281 83.4 \$ COARSE GRAVEL 0.00 0.0189 70.4 \$ FINE GRAVEL 0.00 0.0116 56.5 \$ COARSE SAND 0.00 0.0086 44.5 \$ MEDIUM SAND 0.06 0.0031 31.5 \$ FINES 98.87 0.0013 26.0 \$ TOTAL SAMPLE 100.00	Destinte Pris		GRAUN SI	ETERCE	0.00	Decorintian	Olive Brown Cl	AVEV CIT T	trace fine -	bre	1		
0.0251 83.4 % COARSE GRAVEL 0.00 0.0189 70.4 \$ FINE GRAVEL 0.00 0.0116 56.5 \$ COARSE SAND 0.00 0.0086 44.5 \$ MEDIUM SAND 0.06 0.0062 38.9 \$ FINE SAND 1.08 0.0031 31.5 \$ FINES 98.87 0.0013 26.0 \$ TOTAL SAMPLE 100.00	Particle Diameter	TOBBLES		0.00	Description	LATEI SILT, trace fine sand.							
0.0189 70.4 \$ FINE GRAVEL 0.00 0.00 0.0116 56.5 \$ COARSE SAND 0.00 0.0086 44.5 \$ MEDIUM SAND 0.06 0.0062 38.9 \$ FINE SAND 1.08 0.0031 31.5 \$ FINES 98.87 0.0013 26.0 \$ TOTAL SAMPLE 100.00	0.0281	83.4	CUARSE GRAV	<u>بال</u>	0.00								
0.0110 56.5 \$ COARSE SAND 0.00 0.0086 44.5 \$ MEDIUM SAND 0.06 0.0062 38.9 \$ FINE SAND 1.08 0.0031 31.5 \$ FINES 98.87 0.0013 26.0 \$ TOTAL SAMPLE 100.00	0.0189	70.4	FINE GRAVEL		0.00	0303	ML	J					
0.0080 44.5 5 MEDIUM SAND 0.00 NP LL 0.0062 38.9 \$ FINE SAND 1.08 NP PL 0.0031 31.5 \$ FINES 98.87 NP PI TECH SW 0.0013 26.0 \$ TOTAL SAMPLE 100.00 DATE 5/7/01 CHECK 5/7/01	0.0116	56.5	COARSE SAND		0.00		NID	lr r					
0.002 38.9 \$ FINE SAND 1.05 NP PL 0.0031 31.5 \$ FINES 98.87 NP PI TECH SW 0.0013 26.0 \$ TOTAL SAMPLE 100.00 DATE 5/7/01 CHECK 5/7/01	0.0086	44.5	MEDIUM SAND		1.00		ND	PI					
0.001 31.5 \$ FINES 50.07 0.0013 26.0 \$ TOTAL SAMPLE 100.00 DATE 5/7/01 CHECK 51 DEVICENT 11 CHECK 51 DEVICENT 12 DATE 5/7/01	0.0062	38.9	FINE SAND		1.00		NP	DI		TECH	SW		
U.U.I.S ZO.O PITUTAL SAMPLE TUU.UU DATE SINU CHECK	0.0031	31.5	* PINES		100.00			1		DATE	5/7/01		
CHECK TO THE DESIGN OF A	0.0013	26.0	TOTAL SAMPL	3	100.00	1				CUPCE	H		
										DEVIEW	Din		

ļ

fen

i. e															FLOW	PUMP	
							FLEXI	ACTN	PERMEAI	SILITY							
						,	AFTUOD	ASIMI CONSTA		OFFOR							
· .								, CONSTA	NI KAIE	OF FLOW		:					
PROJECT T	ITLE	GENESIS	PLUM POI	NT ENERG	GY/AR	7	BOARD	6] c	OMMENTS						1	
PROJECT N	UMBER	013-3205				1	CELL	# 6									
SAMPLE ID	1	B-10	-	- 1	3.0 - 5.0	Flow Pump Speed 8											
SAMPLE TY	PE	UD				Technician KBG			1		1						
						· · · ·		-	2		L					i	
•	- 1.5																
ample Data,	Initial		-		-	Sample D	ata, Final										
leight, inche	5	2.930	B-Value, f	0.98		Height, in	ches	2.945]				Trimmings		Sample		
Diameter, inc	thes	2.831	Cell Pres.	85.0		Diameter,	inches	2.853].	WATER (ONTENT	S	Initial		Final		
lrea, cm ²		40.61	Bot. Pres.	80.0		Area, cm ²	•*	41.24		Wt Soil &	Tare, i	g	551.85		604.63		
Volume, cm ³	cm ³ 302.23 Top Pres. 80.0		Volume, c	m ³	308.52]	Wt Soii &	Tare, f	g	422.66		465.65					
lass, g	, g 551.85 Tot. B.P. 80.0			Mass, g		561.68]	Wt Tare	-	g	0.00		43.13	l			
foisture Content, % 30.57 Head, max.		37.28		Moisture	Content, %	32.89		Wt Moistu	re Lost	g	129.19		138.98				
ry Density,	ty, pcf 87.26 Head, min. 37.28]	Dry Density, pcf 85.49			1	Wt Dry Soil g 422.66					422.52				
pec. Gravity	(assumed)	2.650	Max. Grad.	4.98		Volume Solids, cm ³ 159.49			1	Water Content % 30.57%					32.89%		
olume Solids	s, cm ³	159.49	Min. Grad.	4.98	·	Volume Voids, cm ³ 149.02											
olume Voids	, cm ³	142.74	· ·			Void Ratio) .	0.93									
oid Ratio		0.89				Saturation	, %	93.3%	DESCRIPTION								
aturation, %		90.5%],				Olive Brown, CLAYEY SILT, trace fine sand.										
				·													
		Flow Pum	p Rate	1.40E-04	cm ³ /sec		USCS	ML									
r				· · · · · ·				1.14									
			TIME	E FUNCTIO	ONS, SECO	NDS		· .	dP						1		
	DATE	DAY	HOUR	MIN	TEMP	🕤 dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability				
					(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)				
	5/2/01	37013	15	0	20.2	0	0	0	0	0.53	37.28	4.98	6.8E-07				
	5/2/01	37013	15	5	20.2	5	5	300	300	0.53	37.28	4.98	6.8E-07				
	5/2/01	37013	15	10	20.2	5	10	300	600	0.53	37.28	4.98	6.8E-07				
	5/2/01	37013	15	15	20.2	5	15	300	900	0.53	37.28	4.98	6.8E-07	•			
• • • • • •	5/2/01	37013	15	20	20.2	5	20	300	1200	0.53	37.28	4.98	6.8E-07				
	5/2/01	37013	15	25	20.2	5	25	300	1500	0.53	37 28	4 08	6 9E-07	•			
										1 0.00 1	J/.20	4.70	0.00/01/	-			

PERMEABILITY REPORTED AS ** 6.8E-07 cm/sec **

DATE 5/2/01 CHECK DA

REVIEW /un

5




İ.	FLEXIBLE WALL TRIAXIAL PERMEABILITY													
				METHOI	C, FA	LLING	A HEAD V	STM D : V/INCR	5084 EASING T	AILWAT	ER PRESS	SURE		
PROJECT T	TTLE	GENESIS/	PLUM POI	NT ENERGY	Y/AR	U	sing Pipel	tes Only	NO] co	MMENTS	[· .	· · ·	
CANDLE IN	UNDER	D 11	***	4.0	F A1	ROADDA 6 TECH KRC			4			1. e		
SAMPLE ID		D-21		4.0 -	5.0	OFIL		DATE	ELLIAT					
SAMPLE I	IFE					JCELL #	L	DATE	5/4/01]	۰.	L		
Sample Data	, Initial		_										•	
Height, inche	3	2.965]				Sample)	Data, Fin	al	1	Water Con	tents	Initial	Final
Diameter, inc	ches	2.861]	B-Value,f	0.98] · ·	Height, i	nches	2.954]	Wt soil&ta	re, i	539.46	602.28
Area, cm ²		41.48] · ·	Cell Pres	85.00		Diameter	r, inches	2.838		Wt soil&ta	re, f	388.80	444.95
Volume, cm'	`3	312.36		Bot. Pres.	82.00].	Area, cn	n*2	40.81		Wt Tare		0.00	56.43
Mass, g		539.46		Top Pres.	80.00		Volume,	cm^3	306.21].	Wt Moistu	re Lost	150.66	157.33
Moisture Cor	ntent, %	38.75		Head, cm	140.68	1	Mass, g		546.24		Wt Dry So	il .	388.80	388.52
Dry Density,	pcf	77.67]	Max. Grad.	22.19		Moisture	Content %	40.49		Water Con	tent	38.75%	40.49%
Spec. Gravity	y	2.704		Min. Grad.	17.66		Dry Den	sity, pcf	79.23					· · ·
Volume Solid	is, cm ³	143.79		Max. E.S.	5.00	! .	Saturatio	n	96.9%	DES	CRIPTION	Olive Brown	I, SILTY CLA	Y, trace medium
Volume Void	is, cm^3	168.57		Min. E.S.	3.00	J.	Inflow Volu	me per (1 cc)	4.10		•	to fine sand.		
Void Ratio		1.17					Outflow Yola	ane per (1 cc)	4.10	J				
Saturation		89.4%	J							· .	USCS	СН		
TIM	E FUNCI	TION	REAL	DINGS		TIME	IN MIN	UTES & S	SECONDS			VOI	LUME	PERMEABILITY
DATE	HOUR	MIN	Inflow	Outflow	Temp.	dt	dt	dt, acc	Head	(H1/H2)	Gradient	Inflow	Outflow	@ 20 Degrees C
			(cc)	(cc)		(min)	(sec)	(sec)	(cm)	(inc.)		(00)	(CC)	(cm/sec)
5/4/01	8	26	0.00	25.00	19.8	0.0	0	0	166.51		22.19	0.00	0.00	0.0
5/4/01	8	27	2.70	23.00	19.8	1.0	60	60	161.85	1.03	21.57	11.07	8.20	2.22E-04
5/4/01	8	28	5.50	20.70	19.8	1.0	60	120	156.79	1.03	20.90	11.48	9.43	2.49E-04
5/4/01	8	29	6.90	19.70	19.8	1.0	60	180	154.42	1.02	20.58	5.74	4.10	1.20E-04
5/4/01	8	30	8.80	18.20	19.8	1.0	60	240	151.04	1.02	20.13	7.79	6.15	1.73E-04
5/4/01	8	31	10.40	16.90	19.8	1.0	60	300	148.17	1.02	19.75	6.56	5.33	1.51E-04
5/4/01	8	32	12.00	15.50	19.8	1.0	60	360	145.19	1.02	19.35	6.56	5.74	1.59E-04
5/4/01	8	33	13.50	14.40	19.8	1.0	60	420	142.61	1.02	19.01	6.15	4.51	1.40E-04
5/4/01	8	34	14.70	13.40	19.8	1.0	60	480	140.43	1.02	18.72	4.92	4.10	1.21E-04
5/4/01	8	35	15.90	12.50	19.8	1.0	60	540	138.34	1.02	18.44	4.92	3.69	1.17E-04
5/4/01	8	36	17.10	11.50	19.8	1.0	60	600	136.16	1.02	18.15	4.92	4.10	1.25E-04
5/4/01	8	37	18.20	10.70	19.8	1.0	60	660	134.28	1.01	17.90	4.51	3.28	1.09E-04
5/4/01	8	38	19.20	9.90	19.8	1.0	60	720	132.49	1.01	17.66	4.10	3.28	1.05E-04
	Inflow 1	Rate	0.109333		L		L	· ·			PER	MEABILTT	Y REPORTE	DAS 1.1E-04 cm/sec
	Outflow	Rate	0.085986											Landrey and and a
	Outflow	Inflow Ratio	0.79	1									n	ATE 5/4/01
													СН	ECK DA
*TRANSCI	RIBED F	ROM ORIG	INAL DAT	A SHEETS									REV	IEW PUM
here and the second second second second second second second second second second second second second second														

and a







PRO. PRO	JECT TITLE OJECT NO.	GEN	ESIS/PLUM 013-3205	POINT ENER	GY/AR	SAM SAMP	PLE ID LE DEPTH	B-: 4.0 -	21 5.0'	
ACHIN TRAIN I	E SPEED (in/min) RATE (%/min)	0.06 1.01			CELL PRE SAMPLE F CONFININ	SSURE (psi) RESSURE (p G PRESSURI	si) Ε, σ ₃ (psi)	10.0 0.0 10.0		
•	INITIAL SAM	PLE DATA					CORRE	CTED SAMPL	E DATA	· · · ·
	HEIGHT(in)	5.964	(cm)	15.149	1		HEIGHT (in)		5.953	1
	DLAMETER(in)	2.856	(cm)	7.254	1		DIAMETER	(in)	2.859	
	AREA(in [*])	6.41	(cm ²)	41.33			AREA (in*)		6.42	
	VOLUME(IN')	38.21	(cm ³)	626.10	J.		VOLUME (in	n")	38.21	
	& MOISTUDE		1155.14							
	SPECIFIC GRAV	TTY	2 704	•			J	ATER CONFE		
	WET DENSITY	(DCf)	115.2				WT SOIL &	TAPE WET (1222.56	1
	DRY DENSITY,	(pcf) calc	86.6			•	WT SOIL &	TARE, DRY(e)	947.87	
	VOLUME OF SO	LIDS (cm ³)	321.35				WT TARE (z)	80.81	1
	VOLUME OF VO	DIDS (cm ³)	304.76				WT MOISTL	JRE (g)	285.69	
	VOID RATIO	· ·	0.948				WT DRY SO	IL (g)	867.06	
	% SATURATION	N	93.9				% MOISTUP	Œ	32.95	
	T	ACCUM.	AXIAL	e	CORRECTED	DEVLATOR	(σ ₁)	$(\sigma_1' + \sigma_2')$	$(\sigma_1 - \sigma_2)$	
	TIME	DEFLECT	LOAD	% STRAIN	AREA	STRESS	devstr+cp	2	2	
	(min)	(inch)	(ibs)	(in/in)	(in²)	(psf)	(psf)	(P)	(Q)	
	0.0	0.000	0	0.0	6.42	0.00	1440.00	1440.00	0.00	
	0.1	0.003	4	0.1	6.42	89.70	1529.70	1484.85	44.85	
	0.1	0.006	12	0.1	6.42	268.97	1708.97	1574.48	134.48	
	0.2	0.009	20	0.2	6.43	448.05	1888.05	1664.03	224.03	
	0.3	0.015	29	0.3	6.43	649.02	2089.02	1764.51	324 51	
	0.4	0.025	41	0.4	6.45	916.04	2356.04	1898.02	458.02	
	0.8	0.050	57	0.8	6.47	1268.16	2708.16	2074.08	634.08	
	1.3	0.075	69	1.3	6.50	1528.65	2968.65	2204.32	764.32	
	1.7	0.100	78	1.7	6.53	1720.70	3160.70	2300.35	860.35	
	2.1	0.125	85	2.1	6.56	1867.13	3307.13	2373.56	933.56	
	2.5	0.150	.90	2.5	6.58	1968.50	3408.50	2424.25	984.25	
	2.9	0.175	95	2.9	0.01	2008.92	3508.92	24/4.40	1034.40	
	4.2	0.250	104	4.2	6.70	2235.58	3675.58	2557.79	1117.79	
	5.0	0.300	107	5.0	6.76	2279.94	3719.94	2579.97	1139.97	
	5.8	0.350	110	5.9	6.82	2323.17	3763.17	2601.59	1161.59	
	6.7	0.400	113	6.7	6.88	2365.28	3805.28	2622.64	1182.64	
	7.5	0.450	115	7.5	6.94	2385.51	3825.51	2632.76	1192.76	
	8.3	0.500	116	8.4	7.01	2384.44	3824.44	2632.22	1192.22	
	9.2	0.550	118	9.2	7.07	2403.35	3843.35	2041.08	1201.68	
	10.8	0.650	120	10.1	7.20	2398.94	3838.94	2639.47	1199.47	
	11.7	0.700	121	11.7	7.27	2396.17	3836.17	2638.09	1198.09	
	12.5	0.750	122	12.6	7.34	2393.03	3833.03	2636.51	1196.51	
	13.3	0.800	123	13.4	7.41	2389.51	3829.51	2634.75	1194.75	
	14.2	0.850	124	14.3	7.48	2385.61	3825.61	2632.80	1192.80	
	15.0	0.900	125	15.1	7.56	2381.34	3821.34	2630.67	1190.67	
	15.8	0.950	120	15.9	7.03	2370.09	3810.09	2628.34	1188.54	
	10.7	1.000	127	10.0		2371.00	5011.00	2023.05	1105.05	
			· · · · · · · · · · · · · · · · · · ·	•	NORMAL STRES	S @ FAILURE	3843.35			
	TIME TO FAILURE	(min)	9.2							
	DEFLECTION @ FA	ILURE (in)	0.550				Failure		TECH	
	% STRAIN @ FAIL	IIRE I	9.2				Sketch		DATE	

PRO. PRO	JECT TITLE DJECT NO.	GEN	ESIS/PLUM 1 013-3205	POINT ENER	GY/AR] SAN	IPLE ID	B-3	21 5.0'
		.			1	GANE	Le Verin	4.0 -	-
ACHIN		0.04	1 A A		CELL PRI	ESSURE (psi)		40.0	
TRAIN I	ATE (%/min)	0.06			SAMPLE	PRESSURE (P	si)	0.0	
	(ALE (%min)	0.99			CONFINI	IG PRESSUR	E, 03 (psi)	40.0	
•	INITIAL SAM	IPLE DATA					CORRI	ECTED SAMPL	E DATA
	HEIGHT(in)	6.038	(em)	15.337	1		HEIGHT (in)	5.978
	DIAMETER(in)	2.866	(cm)	7.280			DIAMETER	(in)	2.880
	AREA(in')	6.45	(cm ²)	41.62			AREA (in")		6.52
	VOLUME(in')	38.95	(cm ³)	638.32			VOLUME (i	n")	38.95
	WEIGHT (g)		1121.94		-				
	% MOISTURE		38.8						
	SPECIFIC GRAV	VITY	2.704		•		H	ATER CONTE	NT
	WEI DENSILI	(pcr)	109.7	1			WT SOIL &	TARE, WET (g	1173.35
	VOLUME OF SC	(pcr) calc	79.1				WT SOIL &	TARE, DRY(g)	861.02
	VOLUME OF V		299.05	1			WT TARE (g)	55.08
	VOID RATIO		1 134	ł			WT DBY SC	URE (g)	312.33
	% SATURATIO	N	92.4	ł			% MOISTIN		28 75
				1			~	· • ·	30.75
	TIME	ACCUM.	AXIAL	e	CORRECTED	DEVIATOR	(ơ _l)	$(\sigma_1' + \sigma_3')$	(σ ₁ - σ ₃)
	(min)	DEFLECT	LUAD	% STRAIN	AREA	STRESS	devstr+cp	2	2
			(105)	(ill/ill)	(111-)	(pst)	(psf)	(P)	(Q)
	0.0	0.000	10	0.0	6.52	0.00	5760.00	5760.00	0.00
	0.1	0.005	15	0.0	6.52	220.89	5980.89	5025 59	110.44
	0.2	0.009	20	0.1	6.53	441 33	6201 33	5925.56	220.67
	0.2	0.012	30	0.2	6.53	661.67	6421 67	6090.83	330.83
	0.3	0.015	35	0.2	6.53	771.56	6531.56	6145.78	385.78
	0.4	0.025	46	0.4	6.54	1012.37	6772.37	6266.18	506.18
	0.8	0.050	68	0.8	6.57	1490.32	7250.32	6505.16	745.16
	1.3	0.075	81	1.2	6.60	1767.83	7527.83	6643.91	883.91
	1.7	0.100	88	1.7	6.63	1912.55	7672.55	6716.27	956.27
	2.1	0.125	90	2.1	6.65	1947.78	7707.78	6733.89	973.89
	2.5	0.150	91	2.5	6.68	1961.10	7721.10	6740.55	980.55
	2.9	0.175	91	2.9	6.71	1952.77	7712.77	6736.39	976.39
	3.5	0.200	91	3.3	6.74	1944.44	7704.44	6732.22	972.22
	5.0	0.250	92	5.0	6.86	1948.58	7713.14	6736 57	974.49
	5.8	0.350	94	5.8	6.92	1956.94	7716.94	6738.47	978.47
	6.7	0.400	95	6.6	6.98	1960.37	7720.37	6740.19	980.19
	7.5	0.450	96	7.5	7.04	1963.44	7723.44	6741.72	981.72
	8.3	0.500	97	8.3	7.10	1966.14	7726.14	6743.07	983.07
	9.2	0.550	98	9.1	7.17	1968.48	7728.48	6744.24	984.24 ·
	10.0	0.600	99	9.9	7.23	1970.45	7730.45	6745.22	985.22
	10.8	0.650	100	10.8	7.30	1972.05	7732.05	6746.02	986.02
	11.7	0.700	101	11.6	7.37	1973.29	7733.29	6746.64	986.64
	12.5	0.750	102	12.4	7.44	1974.16	7734.16	6747.08	987.08
	14.2	0.850	105	14.1	7.51	19/4.00	7752 70	0/4/.33	987.33
	150	0.850	105	14.1	7.56	1993.19	7751 29	6756.69	990.89
	15.8	0.950	107	15.7	7.73	1992.60	7752.60	6756.30	996.30
	16.7	1.000	108	16.6	7.81	1991.46	7751.46	6755.73	995.73
						0.01	1073.55		-
	TIME TO FAIL UP	E (min) [15.0		NORMAL STRES	S @ FAILURE	1/53.79		
	DEFLECTION @ F	AILURE (In)	0.900				Failure	()	TECH





ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-26	-
PROJECT NO.		013-3205			SAME	'LE TYPE	t	D
REMARKS					SAMPL	E DEPTH	3.0	- 5.0'
•				Hygroscopic 1	Moisture For S	Sieve Sample	3	
WATER CONTENT	(Delivered)	Moisture)				Wet Soil &	t Tare (gm)	
Wt Wet Soil & Tare (g	m)	(w1)	525.91	1		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (g	m)	(w2)	441.21			Tare Weig	ht (gm)	
Weight of Tare (gm)		(w3)	0.00	1		Moisture (Content (%)	
Weight of Water (gm)		(w4=w1-w2)	84.70	Total Weight	Of Sample He	ed For Sieve	: Corrected For F	Iveroscopia
Weight of Dry Soil (gn	1)	(w5=w2-w3)	441.21	1	pro Ot	Weight Of	Sample (gm)	354 05
Moisture Content (%)		(w4/w5)*100	19.20	1		Tare Weig	tht (gm)	85 55
					(WA)	Total Dru	Weight (am)	260 40
			· · · ·		(40)	Diy		1
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	Æ	
0.00		+Tare		{(wt ret/w6)*1001	(100-%ret)			
	12.0"	T	-	1001		12.0"	cobbles	
•	3.0"			tł		3.0"	COArse gravel	
	2.5"			<u>├</u>		2.5	COArse gravel	
	2.0"			tł		2.0"	COarse gravel	
	1.5"	+		<u> </u>		1.5"	COARSE gravel	
	1.0"	+				1.0"	COarse gravel	
	0.75"	+		<u>├</u>		0.76"	fine gravel	
	0.50"	0.00	0.00	0.00	100.00	0.75	fine gravel	
	0 375"	1.02	1.02	0.00	00.00	0.30	fine gravel	
· ·	U.375 ₩A	1.00	1.00	0.40	00.62	0.5/5	tine gravel	
	#10	2.05	2.20	1 10	09.00	#4	modium and	
	#10	4 51	4.93 A 51	1.10	02 22	#10	medium sand	
	#20	4.51	16.05	1.0/	90.33	#40	fine and	
	#40	10.05	10.03	16.60	92 21	#40	fine sand	
	#00	74.95	74.00	27.67	70.42	#00	fine sand	
	#100	114.60	11/ 40	47.57	14.43	#100	HUC SANG	•
	#200 DAN	114.09	114.09	42.3/	57.45	#200	mes	
4 COBBI ES	PAN	- T				PAN		
% C GDAVET	0.00		wine Terre	× 10.00	maaile	(a)		
& E CDAVET	0.00			> 10%	mostly coarse	(0)		24
& C SAND	0.47		U 10 3%	> 10%	mosuy mediur	u (m)		16
	0.03		J 10 12%	< 10%	inc (c-m)		PL	10
	4.80	some	12 10 30%	< 10%	coarse (m-f)	(PI	10
A F SAND	10.00	- and	30 10 30%	< 10%	coarse and fin	- (m) 	Gs	L
	57.43	-		< 10%	coarse and me			
	100.00			> 10%	equal amounts	each (c-f)		
	DIDITITAL	Deans OT m	CLAY	madium to Cu	Loged			
DES	KIPTION	Brown, SILTY	ULAY, and	measure to fire	- sand,			
		urace fine grave	ci.					
	TICCO						THE CAN	DAAT
	USCS						TECH	DAIN
							OUTOUT	5415/
							CHECK	L It

					ELE	VIDIEW	ATT TOT	A WIAT DI	DIFEND	T 10137					-> -	
					FLE	XIBLE W	ALL IKI	AXIAL PI	CKMEAD	TLLA						
						-	ASTM	D 5084								
				METHO	D C, FAL	LING HE	AD W/IN	CREASIN	G TAILY	VATER P	RESSURI	€.		-		
PROJECT	TITLE	GENESIS/	PLUM POI	NT ENERG	Y/AR	Using Pipettes Only YES				cor	MMENTS	-				٦
PROJECT	UMBER	013-3205		k 10 . .		Using Pipettes & Burrettes NO				1	-					
SAMPLE II)	B-26		3.0 -	5.0'	BOARD#	11	TECH	DA							
SAMPLE T	YPE	UD				CELL#	11	DATE	5/17/01							
	V - 147 - 1					aren en internet de Sta				· · ·			Tuttal		Final	
Sample Data	a, Initial	0.050					Coursela Da	to Elmal			Wetre Co	· · · · · · ·	Initiai Thimmines		Finai D1 Com	-1-
leight, inch	es	2.950		-	0.05	1	Sample Da	ata, Finai	2.062	1	Water Co	ntents	Trimmings		Artial Sam)ie T
Diameter, in	ches	2.821		B-Value,r	0.95	4	Height, inc	ines	2.902		WI SOHOL	are, 1	441 21	1.	402 22	-
Area, cm 2	A-1	40.32		Cell Pres	00.60		Area om	nenes	40.38		Wi Solloci	are, i	0.00		51 45	-
Volume, cm	3	525.01		Dol. Fics.	80.00	-	Volume of	∽ m^3	303.81		Wt Moiet	re i ort	84 70		123 03	-
Mass, g Moieture Co	ntent 4	10 20		Head cm	35 17		Mase o		565 24	1	Wt Dry S	nil	441.21		440 87	-
Dry Density	ncf	91.12		Max Grad	7.71		Moisture (Content %	28.11	1	Water Co	ntent	19.20%		28.11%	1
Spec. Gravit	, j~i v	2.650		Min. Grad.	4.74		Dry Densit	tv. pcf	90.62	· · ·	114021 00			·		
Volume Soli	ds. cm^3	166.50		Max. E.S.	5.00		Saturation	.,, p	90.3%	DESC	RIPTION	Brown, S	ILTY CLAY	, and r	nedium to	٦.
Volume Voi	ds, cm ³	135.65		Min. E.S.	4.50	1	Inflow Yolu	me per (1 cc)	1.00			fine sand,	trace fine gi	ravel.		
Void Ratio		0.81					Outflow Vol	ume per (1 co	1.00	1			_			
Saturation		62.4%					•		.	•	USCS	CL	J			
TIM	E FUNCT	ION	REAL	DINGS	-	TIME	IN MINU	TES & SEC	ONDS			VO	LUME	P	ERMEABII	ITY
DATE	HOUR	MIN	Inflow	Outflow	Temp.	dt	dt	dt, acc	Head	(H1/H2)	Gradient	Inflow	Outflow	6	20 Degree	es C
			(cc)	(cc)	•	(min)	(sec)	(sec)	(cm)	(inc.)		(cc)	(cc)		(cm/sec)	
5/17/01	11	23	0.00	25.00	19.4	0.0	0	0	58.00		7.71	0.00	0.00		0.0	
5/17/01	11 :	23	1.20	23.80	19.4	0.3	15	15	55.81	1.04	7.42	1.20	1.20		2.40E-04	
5/17/01	11	24	2.40	22.60	19.4	0.3	15	30	53.62	1.04	7.13	1.20	1.20		2.49E-04	
5/17/01	- 11	24	3.60	21.60	19.4	0.3	15	45	51.62	1.04	6.86	1.20	1.00		2.38E-04	
5/17/01	_11	24	4.70	20.40	19.4	0.3	15	60	49.52	1.04	6.58	1.10	1.20		2.59E-04	
5/17/01	11	24	5.80	19.40	19.4	0.3	15	75	47.61	1.04	6.33	1.10	1.00		2.46E-04	
5/17/01	11	25	6.80	18.40	19.4	0.3	15	90	45.78	1.04	6.09	1.00	1.00		2.43E-04	
5/17/01	11	25	7.80	17.40	19.4	0.3	15	105	43.96	1.04	5.84	1.00	1.00		2.53E-04	
5/17/01	11	25	8.80	16.40	19.4	0.3	15	120	42.13	1.04	5.60	1.00	1.00		2.64E-04	
5/17/01	11	25	9.70	15.50	19.4	0.3	15	135	40.49	1.04	5.38	0.90	0.90		2.48E-04	* .
5/17/01	11	26	10.60	14.60	19.4	0.3	15	150	38.85	1.04	5.16	0.90	0.90		2.58E-04	1
5/17/01 5/17/01		26 26	11.50 12.40	13.70 12.90	19.4 19.4	0.3	15	165	37.21	1.04 1.04	4.95 4.74	0.90	0.90		2.69E-04 2.65E-04	*
	Inflow Ra	l	0.068889		L	1	<u>]</u>	<u> </u>	!		PERME	ABILTIY	REPORTEI	DAS	2.6E-04	cm/
	Outflow	Rate	0.067222]												
	Outflow/	Inflow Rati	0.98										D	ATE [5/17/	01
													CHI	ECK	kh	,



	DESCRIPTION		LL	PL	PI	SAMPLE ID
Brown, SILTY	CLAY, and medi	um to fine	26	16	10	B - 26
sand, trace fine	gravel.					
			SAMPL	E TYPE	UD	3.0 - 5.0'
USCS	CL	,			,	

SAMPLE DATA Wet Density (pcf) Dry Density (pcf)

Moisture Content

124.9	
111.6	
12.0%	

TIME TO FAILURE (min) STRAIN @ FAILURE (%) TYPE OF FAILURE

 	the state of the s
 3.0	
3.1	
SHEAR	-

TECH

DATE

CHECK REVIEW DA

5/16/01

UNCONFINED COMPRESSIVE STRENGTH (psf)	4125.6
SHEAR STRENGTH (psf)	2062.8

013-3205 GENESIS/PLUM POINT ENERGY/AR

		UNCON	FINED CC	MPRESSI ASTM D	VE STREN 2166	GTH OF S	SOILS			
OJECT I	TTLE	GENESIS/PLUM P	OINT ENERGY/AR		SAMPLE ID		B - 26			
ROJECT N	ю.	013-	-3205		SAMPLE TY	/PF	UD			
REMARKS					SAMPLE DI	СРТН	3.0 - 5.0'			
		L								
SAMPLE D	ATA	· · ·		WATER CO	NTENT	BEFORE		AFTER		
Height (in)		5.822	1			SHEAR		SHEAR		
Diameter (in)		2.850				(entire)		(nartial)		
Height/Diamet	er Ratio	2.04		Tare No.		SO-8	14	(Prest crast)		
Area (in ²)		6 19		Wt Wet Soil &	Tare (gm)	1218 71		211.26		
Volume (\mathbf{ft}^3)		0.0016	4	Wt. Wet Soll 8	Toro (gm)	1210./1		311.30		
		0.0215	4	Wt. Dry Son &	Tate (gill)	1088.58		283.03		
weight (gm)		1218.71	-	wt. 1 are (gm)		0.00		51.66		
wet Density (p	oct)	124.95		Wt. Moisture (gm)	130.13		27.73		
Dry Density (p	cf)	111.61		Wt. Dry Soil (g	gm)	1088.58		231.97		
Machine Speed	l (in/min)	0.06		Moisture (%)		11.95%		11.95%		
Strain rate (%/	min)	1.03								
TIME	DEFLECT	FORCE	% STRAIN	Ac	COMPRESS	SIVE STRESS				
(min)	(inch)	(lbs)	(in/in)	(in²)	(psf)	(psi)				
0.0	0.000	0	0.00	6.38	0.00	0.00				
0.2	0.010	10	0.17	6.39	218.80	1.52				
0.3	0.020	27	0.34	6.40	610.52	4.24				
0.5	0.030	44	0.52	6.41	97/8.42	0.79	THE TO PAU UDP (min)	3.00		
0.7	0.040	00	0.09	6.42	1541.47	9.52	STRAIN @ FAILURE (%)	3.00		
1.2	0.030	00 -	1.20	6.46	2207.83	15.33	TYPE OF FAILURE	SHEAR		
1.7	0.100	133	1.72	6.49	2950.60	20.49				
2.0	0.120	154	2.06	6.51	3399.46	23.61	1			
2.5	0.150	178	2.58	6.55	3903.42	27.11				
3.0	0.180	189	3.09	6.58	4125.62	28.65				
3.5	0.210	179	3.61	6.62	3891.54	27.02	FAILURE			
4.2	0.250	121	4.29	6.67	2610.99	18.13	SKETCH			
5.0	0.300	80	5.14	6.73	1716.34	11.92		1		
5.8	0.350	79	6.01	6.79	1671.80	11.61	4 11 1			
7.5	0.450	76	7.73	6.91	1585.15	11.01	4 []]]]			
9.2	0.550	60	9.45	7.04	1217.05	8.40	4 // 1/			
10.0	0.600	62	12.99	7.11	1160.96	8.70				
14.3	0.750	57	14.60	7.47	1120.43	7.78				
15.0	0.900	58	15.46	7.55	1107.99	7.69				
15.8	0.950	56	16.32	7.62	1065.75	7.40	1	N		
16.7	1.000	57	17.18	7.70	1065.66	7.40				
					(125.62	20.68		\mathcal{I}		
		UNCONFINI	LU COMPRESSI Shif	AR STRENGTH	2062.81	14.33				
			511E				-			
Description	Brown, SILT	Y CLAY, and	medium to fine	1	LI	26	-	r		
	sand, trace f	ne gravel.			PI	16	TECH DA			
		_			P	I 10	DATE	5/16/01		
USCS	CL	T					CHECK	the		
							REVIEW	12M		





ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

PROJECT TITLE	GENE	SIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-29	-
PROJECT NO.		013-3205			SAME	LE TYPE	t t	D
REMARKS					SAMPL	E DEPTH	4.0	5.0'
				Hygroscopic 1	Moisture For S	Sieve Sample		
WATER CONTENT (Delivered M	oisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (gr	n)	(w1)	626.74			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gn	n)	(w2)	508.16			Tare Weigh	nt (gm)	
Weight of Tare (gm)		(w3)	0.00		an an an an an an an an an an an an an a	Moisture C		
Weight of Water (gm)		(w4=w1-w2)	118.58	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	lygroscopic N
Weight of Dry Soil (gm)	(w5=w2-w3)	508.16			Weight Of	Sample (gm)	338.54
Moisture Content (%)		(w4/w5)*100	23.34 `			Tare Weig	ht (gm)	86.37
					(W6)	Total Dry	Weight (gm)	252.17
				0 14				
SLEVE ANALYSIS		Nr. D.	(1) ()	Cumulative	~	0001	· · ·	
Tare weight	1 - A - 1 - 1	wt Ret	(wt-lare)	(% Retained)	% PASS	SIEV	E	
0.00	10.05	+ l'are		{(wt ret/w6)*100}	(100-%ret)	10.07		
	12.0*					12.0"	cobbles	
4	3.0"					3.0"	coarse gravel	
	2.5"	 				2.5*	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"		· · · · · · · · · · · · · · · · · · ·			1.5"	coarse gravel	
	1.0"					1.0*	coarse gravel	
	0.75"		-			0.75"	fine gravel	
	0.50"					0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
	#4		· .			#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.14	0.14	0.06	99.94	#20	medium sand	
	#40	6.07	6.07	2.41	97.59	#40	fine sand	
	#60	21.45	21.45	8.51	91.49	#60	fine sand	
	#100	36.92	36.92	14.64	85.36	#100	fine sand	
	#200	65.21	65.21	25.86	74.14	#200	fines	
	PAN					PAN		
% COBBLES	0.00						-	
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	m (m)	LL	38
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	19
% M SAND	2.41	some	12 to 30%	< 10%	coarse (m-f)		PI	19
% F SAND	23.45	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	2.683
% FINES	74.14	1		< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
		Destroy Old C	VOLAN	ma fine cord				
DESC	RIFTION	Brown, SILT	I CLAY, SC	ome nue sand.				
	USCS	CT				l	TECH	DA/N
	0303						DATE	5/16/0
							174 1 0.	

D							- Ŷ		•						1	and the
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					· · ·						· · ·			FLOW	V PUMP #
						FLEXIB	LE WALL I	PERMEAB	ILITY					•		
							ASIM D	SUB4	DE ELOW							
					M	ethod d	, CUNSTAF	(I RAIE (JF FLOW		•					
PROJECT TITLE	GENE	SIS/PLUM POI	NT ENERG	Y/AR]	BOARD #	8	CC	OMMENTS	,						
PROJECT NUMBER	013-320	5				CELL#	8									
SAMPLE ID	B-29		•	4.0 -5.0'	Flow P	ump Speed	9									
SAMPLE TYPE	UD					Technician	DA	-			2. 		· · · ·			I
							· · ·									
Sample Data, Initial				1	Sample Da	ta, Final		l				Talmaninas			Sample	
Height, inches	2.95	B-Value, f	1.00		Height, inc	hes	2.9/3		WATED	ONTENTS		Initial			Final	
Diameter, inches	2.87	Cell Pres.	85.0	.	Diameter,	inches	42.00		WALER C	Tore i	'	626.74		· • •	684.35	ľ
Area, cm ²	41.7	7 Bot. Pres.	80.0		Area, cm.		44.07		We Soll &	Tore f	8 a	508.16			559.77	
Volume, cm	313.	Top Pres.	80.0	4	Volume, ci		632.91		Wt Tore	1440, 1	б. а	0.00	•	· .	51.91	
Mass, g	626.	4 10t. B.P.	122 (6	1	Mass, g	Sentent (K.	24.52		We Moletu	re Lost	5 a	118.58			124.58	· ·
Moisture Content, 9	23.3	4 Head, max	133.65	4	Moisture C	v. nef	99.77		Wt Dry So		5 g .	508.16			507.86	
Spec Gravity	2 65	Max. Grad	17.70		Volume So	lids, cm ³	189.40	n an an Fairt	Water Con	tent	%	23.34%		1	24.53%	
Volume Solide em ³	190	Min Grad	17 70	1	Volume Vo	ids. cm ³	128.42									•
Volume Volde cm ³	124			1	Void Ratio		0.68	$(1,\ldots,n_{n-1})$								÷
Void Ratio	0.6	<u> </u>			Saturation	. %	97.1%		DESCRIP	TION						
Saturation. %	95.2	%						8	Brown, SI	LTY CLAY	, some fin	e sand.		•		
	L.,							-								
	Flow I	ump Rate	5.70E-05]cm ³ /sec		USCS	CL				1 -					1
						• -										
											1		الاليوب فستنظر ي	<u> </u>	1	
		TIN	Æ FUNCTI	ONS, SECO	ONDS	· .		dP	4		· · .	_				•
DA	TE DA	Y HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permea	bility			
				୯୯୨	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/s	(29)			, ÷
5/17	/01 370	28 10	20	19.3	-0.5	0	0	0	1.9	133.65	17.70	7.85	-08			
5/17	/01 370	28 10	25	19.3	5	5	300	300	1.9	133.65	17.70	7.8E	-00			
5/17	/01 370	8 10	30	19.3	5	10	300	600	1.9	133.65	17.70	7.88	-00			
5/17	/01 370	28 10	35	19.3	5	15	300	900	1.9	133.65	17.70	7.85	-00			
5/17	/01 370	28 10	40	19.3	5	20	300	1200	1.9	133.65	17.70	7.8E	-00	•		
5/17	/01 370	28 10	45	19.3	5	25	300	1500	1.9	133.65	17.70	7.00	-00	•		
5/17	/01 370	28 10	50	19.3	5	30	300	1800	1.9	133.05	17.70	/.00			1	

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

.

PERMEABILITY REPORTED AS ** 7.8E-08 cm/sec **

DATE 5/17/01 CHECK H REVIEW /2070





				·		•		
PROJECT TITLE	GENI	ESIS/PLUM PC	DINT ENER	GY/AR	SAM	PLE ID	B-33	•
PROJECT NO.		013-3205			SAMPL	E TYPE	U)
REMARKS		· · · · · · · · · · · · · · · · · · ·			SAMPLE	DEPTH	3.0 -	5.0'
		· · · · ·		Hygroscopic 1	Moisture For	Sieve Samp		
WATER CONTENT	(Delivered N	Moisture)				Wet Soil	& Tare (gm)	
Wt Wet Soil & Tare (gm)	(w1)	431.42	4 • • •		Dry Soil	& Tare (gm)	
Weight of Toro (arr)	gm)	(w2)	397.90	4		Tare Wei	ght (gm)	
Weight of Water (gm)	н на на на на на на на на на на на на на	(w)	22.46	Total Waight	Of Comple II	Moisture	Content (%)	an Thur
Weight of Dry Soil (g	/ 	(w4 = w1 - w2)	320.38	10tal weight	Of Sample U	Weight O	ve Corrected F	207
Moisture Content (4)	, un	$(w_{3} - w_{2} - w_{3})$	10.44	1		Toro Wo	isht (gra	- 197.
Moisture Content (W)		(44/45) 100[10.44	1 .	(WG)	Total Dra	Weight (am)	320
				L	(40)	Ittal Dij	Weight (gin)	520.
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIE	VE	
0.00		+ Tare	({(wt ret/w6)*100}	(100-%ret)			
	12.0"				(100 1010)	12.0"	cobbles	
	3.0"		· · · · · · · · · · · · · · · · · · ·			3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0*					2.0"	coarse gravel	
	1.5*		,			1.5"	coarse gravel	
	1.0*					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50*		-			0.50"	fine gravel	
	0.375"			·		0.375"	fine gravel	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.21	0.21	0.07	99.93	#10	medium sand	
	#20	9.24	9.24	2.88	97.12	#2 0	medium sand	
	#40	114.00	114.00	35.58	64.42	#40	fine sand	
	#60	208.11	208.11	64.96	35.04	#60	fine sand	
	#100	244.86	244.86	76.43	23.57	#100	fine sand	
	#200	253.07	253.07	78.99	21.01	#200	fines	
• .	PAN	-p				PAN		
% COBBLES	0.00	-	_					
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)	r	
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	m (m)		<u></u>
% C SAND	0.07	little	5 to 12%	< 10%	nne (c-m)			13
70 M SAND	35.52	some	12 to 30%	< 10%	coarse (M-I)	a (m)		9
7 F SAND & EINES	43.41	and	30 10 20%	< 10%	coarse and m	e (III) dium (fi	GS	
% TOTAL	100.00	-		> 10%	equal amount	seach (c-f)		
N IOIAL	100.00	4		- 1070	adom antomic			
חדר	CRIPTION	Olive Brown	MEDIUM	O FINE SAND), some			
DEA		silty clay.	arranger h ty trik. I					
	USCS	SC					TECH	
							DATE	5
							CHECK	ŀ
							DEVIEW	

.

		SPEC	IFIC GRA ASTM CNOMETI	VITY OF S D-854 ER METHO	SOILS			
PROJECT TITLE	GEN	ESIS/PLUM PO	INT ENERGY	//AR				
PROJECT NUMBE		013-3	205		SA	MPLE ID	B-33	-
					SAM	PLE TYPE [UD	
TESTED FOR		PER	M		SAMPI	E DEPTH	3.0 - 5	.0'
HYGROSCOPIC MC	DISTURE O	F MATERL	AL PASSING	G THE #4 S	IEVE			
Weight Soil and Tare, I	initial (gm)		(WI)	43.37		AIR	REMOV	AL
Weight Soil and Tare, I	Final (gm)		(W2)	43.22		1	METHOD	
Weight Of Tare (gm)			(W3)	3.23			VACUUM	
Weight Of Moisture (gr	m)		(₩4=Ŵ1-₩2)	0.15		•		
Weight Of Dry Soil (g	m)	((W5=W2-W3)	39.99				
Hygroscopic Moisture	in (%)	(HM=((W4/W5)*100)	0.4%				
Trial				1	2			
Pycnometer Number				16	4	<u> </u>		
Weight Pycnometer Fre	nty (am)		MA	171.44				
Weight of Soil & Pyon	meter (am)		(1411)	276.51				
Weight of Soil. Water	& Pycnomete	r (gm)	Mb	734.87				
Observed Temperature	(Tb), for (M	b) In Degrees (2	23.0				
	<u>`````````````````````````````````````</u>	<u> </u>						
Observed Temperature	(Ta), for (Ma	a) In Degrees C	3	22.50				
Weight of Pycnometer	& Water (gm)	(Ma @ Ta)	669.70				
Relative Density of Wa	ter @ (Ta)	ц. с. <u>.</u>		0.99768				
Relative Density of Wa	ter @ (Tx)			0.99757				
Correction Factor due t	o Temperatu	re @Tx	(K)	0.9993				
Weight of Soil (gm)			n trati- 1	105.07				
Weight of Dry Soil (gn	1)		(Mo)	104.68			1	
Weight of Pycnometer	& Water (gm)	(Ma)	669.65				
SPECIFIC CRAVIT	v						G	s Average
G @ 20 degrees $C =$	- : [Mo/(Mo+	·(Ma - Mb))]	*(K)	2.651				2.651
	[1,20, (1,20 .		(
•								
	Temp. (C)	Rel. Density	Corr. (K)	Temp. (C)	Rel. Density	Corr. (K)		
•	16.00	0.99897	1.0007	23.50	0.99743	0.9992		
	10.00	0.00860	1,0007	24.00	0.99732	0.9990		2
Correction Values	17.00	0.99871	1.0005	25.00	0.99707	0.9988		
Due To Temperatura	18.00	0.99862	1.0004	25.50	0.99694	0.9987		
was to remperature	18.50	0.99853	1,0003	26.00	0.99681	0.9986		
	19.00	0.99843	1.0002	26.50	0.99668	0.9984		
	19.50	0.99833	1.0001	27.00	0.99654	0.9983		
	20.00	0.99823	1.0000	27.50	0.99640	0.9982		
	20.50	0.99812	0.9999	28.00	0.99626	0.9980		
	21.00	0.99802	0.9998	28.50	0.99612	0.9979		
	21.50	0.99791	0.9997	29.00	0.99597	0.9977		
	22.00	0.99780	0.9996	29.50	0.99582	0.9976		
	22.50	0.99768	0.0003	50.00	0.950/	0.3374	TECH	KBG
	23.00	0.33131	0.9995				DATE	5/4/01
							CHECK	L
							REVIEW	1.51





			ASTM C	ASTM GR	AIN SIZE ANALY	YSIS 40 and D2217				
PPC CT TITLE	GENESIS/PLU	M POINT ENE	GY/AR]			P. 41	1	7
CT NO.	013	-3205			 A state of the sta	SAMPLE ID		15-41	L	4
	L			1.1		SAMPLE TYPE		L		1
		1 K	1.00			SAMPLE DEPT	n	3.0	- 5.0'	1
AS RECEIVED V	VATER CONT	TENT		Hygrosco	pic Moisture	Wet Soil & Tare (am)	······	50 20	r	
Tare No.			-	For Sieve	Sample	Dry Soil & Tare (gm)	· .	49.55	la de la come	
Wt. Wet Soil & Tare (gm)	2	(WD	274.27	1		Tane Weight (am)		3 21		
Wt. Dry Soil & Tare (gm)		(W2)	224.78	1		Moisture Content /4		3.64	ł	
Weight of Tare (gm)		(W3)	84.81	Total Weig	tht of Sample Used Fo	r Sieve Analysie Co	rrected For W	vgrosconie M	0isture	
Weight of Water (gm)		(W4=W1-W2)	49.49	1	Weight + Tare.	Before Separating On T	The #4 Sieve (em)	717.90]	
Weight of Dry Soil (gm)		(W5=W2-W3)	139.97	1			Fare Weight (am)	234.15	1	
Moisture Content (%)	•	(W4/W5)*100	35.36	1 .		-	'oral Weight (gill)	466 76	(WO	
Plus #4 Material	Sieve			(Wt+Tare)	(((Wi-Tare)/W6)+100)	SPASSING	oran u cikin (kui)	400.70	1(10)	
TARE WEIGHT	0.00	1	12.0"		(((#***********************************	#FA35011G	1 12 01	ashhlar		
	0.00	8	2 0				14.0"	COODICS		
	· · · · · · · · · · · · · · · · · · ·		3.0"				3.0"	coarse gravel		
			4.3"				2.5"	coarse gravel		
			2.0*				2.0"	coarse gravel		
			1.5"			· · · · · ·	1.5"	coarse gravel		
			1.0"				1.0"	coarse gravel		
			0.75"				0.75"	fine gravel		
			0.50"				0.50"	fine gravel		
			0.375"				0.375"	fine gravel		
			#4	0.00	0.0	100.0	#4	coarse sand		
TARE WEIGHT	d 0.00	1 Minute	ER BACKS	EVE (Perce	Mydrometer Bulb Number % Pass #4 Sieve For Who nt Passing #10 - #20	vle Sample 10 Sieves)	624378	મ્		
1					Cumul Wt.		1.00			
				(Wt+Tare)	Retained	% PASSING	1			
							1			
			#10	0.00	0.00	100.0	#10	medium sand		
			#10	0.00	0.00 0.02	100.0 100.0	#10 #20	medium sand medium sand		
			#10 #20 #40	0.00 0.02 0.20	0.00 0.02 0.20	100.0 100.0 99.6	#10 #20 #40	medium sand medium sand fine sand		
		•	#10 #20 #40 #60	0.00 0.02 0.20 0.98	0.00 0.02 0.20 0.98	100.0 100.0 99.6 98.2	#10 #20 #40 #60	medium sand medium sand fine sand fine sand		
			#18 #29 #49 #60 #100	0.00 0.02 0.20 0.98 2.09	0.00 0.02 0.20 0.98 2.09	100.0 100.0 99.6 98.2 96.1	#10 #20 #40 #60 #100	medium sand medium sand fine sand fine sand fine sand		
			#10 #20 #40 #60 #100 #200	0.00 0.02 0.98 2.09 2.69	0.00 0.02 0.20 0.98 2.09 2.69	100.0 100.0 99.6 98.2 96.1 95.0	#10 #20 #40 #60 #100 #200	medium sand medium sand fine sand fine sand fine sand fines		
		HYDROME	#10 #29 #40 #60 #100 #200 TTER CALC	0.00 0.02 0.98 2.09 2.69 ULATIONS	0.00 0.02 0.20 0.98 2.09 2.69	100.0 100.0 99.6 98.2 96.1 95.0	#10 #20 #60 #100 #200	medium sand medium sand fine sand fine sand fine sand fines		
DATE	TIME	HYDROME ET	#10 #20 #40 #100 #200 TTER CALC READING	0.00 0.02 0.20 2.09 2.69 ULATIONS TEMP	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR.	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR.	#10 #20 #40 #60 #100 #200 READING	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE		
DATE 5/18/01	TIME 9:20	HYDROME ET (min)	710 720 740 760 7100 7200 TTER CALC READING R	0.00 0.02 0.98 2.09 2.69 ULATIONS TEMP T	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc	#10 #20 #40 #60 #100 #200 READING C	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH	A	
DATE 5/18/01 5/18/01	TIME 9:20 9:22	HYDROME ET (min) 2.00	710 720 740 760 7200 TTER CALC READING R 51.0	0.00 0.02 0.98 2.09 2.69 ULATIONS TEMP T 22.00	0.00 0.02 0.98 2.09 2.69 TEMP.COR. K 0.013	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8	A 1.00	
DATE 5/18/01 5/18/01 5/18/01	TIME 9:20 9:22 9:25	HYDROME ET (min) 2.00 5.00	710 720 740 760 7200 TTER CALC READING R 51.0 43.0	0.00 0.02 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00	0.00 0.02 0.20 2.09 2.69 TEMP.COR. K 0.013 0.013	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.00	#10 #20 #60 #100 #200 READING C 46.00 38.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1	A 1.00 1.00	-
DATE 5/18/01 5/18/01 5/18/01 5/18/01	TIME 9:20 9:22 9:25 9:35	HYDROME ET (min) 2.00 5.00 15.00	#10 #20 #40 #60 #200 TTER CALC READING R 51.0 43.0 35.0	0.00 0.02 0.20 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00	0.00 0.02 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.00 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4	A 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01	TIME 9:20 9:22 9:25 9:35 9:50	HYDROME ET (min) 2.00 5.00 15.00 30.00	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0	0.00 0.02 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00	0.00 0.02 0.20 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.00 5.00 5.00 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0	A 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01	TIME 9:20 9:22 9:25 9:35 9:35 9:50 10:20	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0	0.00 0.02 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00 22.00	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00 25.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2	A 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0	0.00 0.02 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00	0.00 0.02 0.20 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2	A 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0	0.00 0.02 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00	0.00 0.02 0.20 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8	A 1.00 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI2	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 21.50 TTAGES	0.00 0.02 0.20 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8	A 1.00 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/13/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI2 % COBBLES	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 20.00 20	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter 0.0279	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20 * PASSING 84.9	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI \$ COBBLES \$ COARSE GRAVEL	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 20 0.98 0.02 0.98 0.02 0.98 0.09 0.98 0.09 0.00	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/13/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter 0.0279 0.0189	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20 * PASSING 84.9 70.1	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI 5 COBBLES 5 COARSE GRAVEL 5 FINE GRAVEL	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 20 0.02 0.02 0.98 0.02 0.98 0.02 0.98 0.09 0.00	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/13/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter 0.0279 0.0189 0.0116	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20 % PASSING 84.9 70.1 55.4	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI 5 COBBLES 5 COARSE GRAVEL 5 FINE GRAVEL 5 COARSE SAND	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 22.00 20 0.02 0.02 0.02 0.03 0.03 0.03 0.03 0.000 0.00	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter 0.0279 0.0189 0.0116 0.0084	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20 % PASSING 84.9 70.1 55.4 48.0	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI 5 COBBLES 5 COARSE GRAVEL 5 FINE GRAVEL 5 FINE GRAVEL 5 COARSE SAND 5 MEDIUM SAND	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 20.00 0.00	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter 0.0279 0.0189 0.0116 0.0084 0.0060	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20 % PASSING 84.9 70.1 55.4 48.0 46.1	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI 5 COBBLES 5 COARSE GRAVEL 5 FINE GRAVEL 5 COARSE SAND 5 MEDIUM SAND 5 FINE SAND	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 20.00 0.00 0.0	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00	#10 #20 #40 #60 #100 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00 AY, trace fine	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter 0.0279 0.0189 0.0116 0.0084 0.0060 0.0031	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20 % PASSING 84.9 70.1 55.4 48.0 46.1 35.1	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI 5 COBBLES 5 COARSE GRAVEL 5 FINE GRAVEL 5 COARSE SAND 5 FINE SAND 5 FINES	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 20.00 20.00 20.00 20.00 20.00 20.00 20.00 20.00 20.00 20.00 20.00 20.00 21.50 TAGES 0.00 0.0	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.	#10 #20 #40 #60 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00 AY, trace fine	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/18/01 5/19/01 Particle Diameter 0.0279 0.0189 0.0116 0.0084 0.0060 0.0031 0.0013	TIME 9:20 9:22 9:25 9:35 9:50 10:20 13:30 9:20 % PASSING 84.9 70.1 55.4 48.0 46.1 35.1 27.7	HYDROME ET (min) 2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SI 5 COBBLES 5 COARSE GRAVEL 5 FINE GRAVEL 5 FINE GRAVEL 5 COARSE SAND 5 FINES 5 TOTAL SAMPLE	710 720 740 760 7200 TTER CALC READING R 51.0 43.0 35.0 31.0 30.0 24.0 20.0 ZE PERCEN	0.00 0.02 0.20 0.98 2.09 2.69 ULATIONS TEMP T 22.00 23.00 24.65 0.00 0	0.00 0.02 0.20 0.98 2.09 2.69 TEMP.COR. K 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	100.0 100.0 99.6 98.2 96.1 95.0 HYD.COR. Cc 5.00 5.01 6 CL 45 21 24	#10 #20 #40 #60 #200 READING C 46.00 38.00 30.00 26.00 25.00 19.00 15.00 AY, trace fine	medium sand medium sand fine sand fine sand fine sand fines EFFECTIVE LENGTH 8.8 10.1 11.4 12.0 12.2 13.2 13.2 13.8 sand.	A 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0]







)	-	TR	IAXIAL CO	MPRESSIO	N TEST (AS	STM D-4767	55_	IDATED UN	DRAINED	WITH POR	E PRESSU	RE			
PROJECT TITL	E	GENES	IS/PLUM P	OINT ENER	GY/AR	INITIAL S	AMPLE DA	TA	cm	in	corrected	1	CORRECT	ED SAMPL	E DATA	
PROJECT NUM	BER		013-	3205		HEIGHT			15.105	5.947	5.786		DRY DEN	SITY, calc (pcf)	86.9
SAMPLE ID		В-	41			DIAMETE	R		7.221	2.843	2.792		VOLUME	OF SOLIDS		302.74
SAMPLE TYPE			τ	JD		AREA			40.96	6.35	6.12		VOLUME	OF VOIDS		277.91
DEPTH INTERV	AL		3.0	- 5.0'		VOLUME			618.65	37.75	35.43		VOID RAT	O		0.918
MACHINE SPE	ED (in/min)	0.006				WEIGHT (g) ·		1108.95		1090.95					
STRAIN RATE	(%/min)	0.10				% MOISTL	IRE		37.1		34.92					
CELL PRESSUE	(rei)	80.0				SPECIFIC	GRAVITY		2.67				WATER C	ONTENT (9	6 MOISTUR	(E)
CAMPI & PRESS	STIDE (nei)	70.0				MOIST DE	NSITY (pcf	1	111.9				WT SOIL	& TARE. M	OIST (g)	1090.95
FEE CONSOL		70.0				DRY DEN	SITY. calc ()	, ncf)	81.6	1111			WT SOIL	& TARE. DE	(g)	808.62
PRESSURE a		10.0				VOLUME	OF SOLIDS		302.74				WT TARE	(g)		0.00
PRESSURE O	(nef)	1440.0				VOLUME	OF VOIDS	· · ·	315.91				WT MOIS	TURE (g)		282.33
ETNAL PD VAL		1.00				VOID PAT	10		1.043				WT DRY	OIL (a)	-	808.62
TUAL D TAL	LUE	21				SATURAT	ION		95.1				% MOIST	JRE		34.92
030 (mmaricas)		<u><u></u></u>														L
	ACCUM.	AXIAL	PORE	PWP change	e		CORR.	CORR.	DEV.	SIGMA 1	SIGMA 1	SIGMA 3	EFF.PRN	$\left(\frac{\sigma_1 + \sigma_2}{2}\right)$	$\frac{(\alpha_1 - \alpha_2)}{2}$	
TIME	DEFLECT.	LOAD	PRESS.	DU (psf)	% STRAIN	(1-e)	AREA	HEIGHT	STRESS	devstr+cp	EFF.	EFF.	STR RATIO	<i>(</i> P)	(0)	
(MIN)	(inches)	(108)	(psi) = 0	(acc)	(*)	1.00	(m 2) 6 12	5 786		1440.0	1440.0	1440.0	1.00	1440.0	0.0	0.00
0.5	0.003	31	71.9	216.0	0.05	1.00	6.13	5.783	340.8	1780.8	1564.8	1224.0	1.28	1394.4	170.4	0.63
1.0	0.006	43	72.4	288.0	0.10	1.00	6.13	5.780	624.8	2064.8	1776.8	1152.0	1.54	1464.4	312.4	0.46
1.5	0.009	47	72.9	360.0	0.16	1.00	6.13	5.777	713.7	2153.7	1793.7	1080.0	, 1.66	1436.9	356.9	0.50 ·
2.0	0.012	50	73.2	403.2	0.21	1.00	6.14	5.774	790.8	2230.8	1827.6	1036.8	1.76	1432.2	395.4	0.51
2.5	0.015	53	73.5	446.4	0.26	1.00	6.14	5.771	849.0	2289.0	1842.6	993.6	1.85	1418.1	424.5	0.53
4.2	0.025	58	74.1	532.8	0.43	1.00	6.15	5.761	971.6	2411.6	1878.8	907.2	2.07	1393.0	485.8	0.55
8.3	0.050	60	75.0	724.4	0.80	0.99	6.18	5.730	1142.2	2582.2	1919.8	705.6	2.4/	1335.7	630.1	0.58
16.7	0.075	74	75.9	792.0	1.73	0.98	6.23	5.686	1324.1	2764.1	1972.1	648.0	3.04	1310.0	662.0	0.60
20.8	0.125	17	76.1	820.8	2.16	0.98	6.26	5.661	1394.2	2834.2	2013.4	619.2	3.25	1316.3	697.1	0.59
25.0	0.150	80	76.3	849.6	2.59	0.97	6.29	5.636	1447.6	2887.6	2038.0	590.4	3.45	1314.2	723.8	0.59
29.2	0.175	82	76.4	864.0	3.02	0.97	6.31	5.611	1498.2	2938.2	2074.2	576.0	3.60	1325.1	749.1	0.58
33.3	0.200	84	76.4	864.0	3.46	0.97	6.34	5.586	1539.2	2979.2	2115.2	576.0	3.67	1345.6	769.6	0.56
41.7	0.250	89	76.6	892.8	4.32	0.96	6.40	5.536	1617.6	3057.6	2164.8	547.2	3.96	1350.0	820.5	0.55
50.0	0.300	91 04	76.6	892.8	5.18	0.95	0.40	5.480	1700.0	3101.0	2208.2	547.2	4.04	1402.2	855.0	0.52
58.3	0.350	94	/0.0	892,8	6.05	0.94	6.52	5.396	1748 0	3199.0	2257.1	547.2	4.20	1421.6	874.4	0.51
75.0	0.400	97	76.5	878 4	7 78	0.93	6.64	5.336	1773.9	3213.9	2335.5	561.6	4.16	1448.5	886.9	0.50
83.3	0.500	100	76.5	878.4	8.64	0.91	6.70	5.286	1795.9	3235.9	2357.5	561.6	4.20	1459.6	898.0	0.49
91.7	0.550	101	76.4	864.0	9.51	0.90	6.77	5.236	1802.3	3242.3	2378.3	576.0	4.13	1477.2	901.2	0.48
100.0	0.600	103	76.3	849.6	10.37	0.90	6.83	5.186	1818.8	3258.8	2409.2	590.4	4.08	1499.8	909.4	0.47
108.3	0.650	104	76.2	835.2	11.23	0.89	6.90	5.136	1832.6	3272.6	2437.4	604.8	4.03	1521.1	916.3	0.46
116.7	0.700	106	76.1	820.8	12.10	0.88	6.97	5.086	1841.6	3281.6	2460.8	619.2	3.97	1540.0	920.8	0.45
125.0	0.750	108	76.0	806.4	12.96	0.87	7.04	5.036	1862.4	3302.4	2496.0	633.6	3.94	1504.8	931.2	0.43
133.3	0.800	109	75.9	792.0	13.83	0.80	7.11	4.980	1880.4	3320.4	2528.4	676.9	3.90	1566.2	940.2	0.42
141.7	0.850	112	75.7	748.8	14.09	0.85	7.10	4.930	1009.0	3340 3	2500.4	691.2	3.75	1641.3	950.1	0.39
158.3	0.950	114	75.5	734.4	16.42	0.84	7.33	4.836	1914.2	3354.2	2619.8	705.6	3.71	1662.7	957.1	0.38
166.7	1.000	115	75.4	720.0	17.28	0.83	7.40	4.786	1913.9	3353.9	2633.9	720.0	3.66	1677.0	957.0	0.38
		<u> </u>										D DD DIG	I D OTDEGO		TEOU	NA (DA (BUD)
		DU		050 A	1		DEVIATO	RIC STRES	5	1	EFFECTIV	E PRINCIP	LE SIKESS		DATE	5/21/01
		Ø FAILUI		8/8.4			@ FAILUR	CL.	1/95.9	I	KATIU ØI	AILUKE	4.20		THECKED	DA DA
														וס	VIEWED	PLIA
1														~		1 9/1-1

Stree.

Celder According Inc.

) —		тр		MPRESSIO	N TEST (A)	STM D_476		IDATED IN	DRAINED	WITH POP	E PRESSI	RE		_)	
PROIECT TITI	B	CENEO		MINT ENER	GY/AP	INITIAL S		() C	COM COM	in	Corrected		COPPECI		EDATA	
PROJECT MIL	000	ULINE	013/1 LOIM 1	2205	UIIAK	UEICUT		11.	14 023	11	5 712	· · ·	DBY DEN		10 DAIA (mf)	00.5
PROJECT NUM	DEK	D	41	-5205 T		DIAMETER	D		14.923	3.073	3.715		VOLUME	OF COLIDE		210.15
SAMPLE ID		В-	. 41	10		DIAMEIE	K .		1.251	2.037	2.181		VOLUME	OF YOIDS		310.13
SAMPLE TYPE						AREA			41.30	0.41	0.10		VOLUME	OF VOIDS		201.04
DEPTH INTER	VAL		3.0	- 5.0'		VOLUME			617.19	37.60	34.80		VOID RA	10		0.842
MACHINE SPE	ED (in/min)	0.003				WEIGHT (g)		1121.70		1094.70					
STRAIN RATE	(%/min)	0.05				% MOIST	JRE		35.4		32.15					
CELL PRESSUI	RE (psi)	95.0				SPECIFIC	GRAVITY		2.67				WATER C	ONTENT (% Moistui	<u>(E)</u>
SAMPLE PRES	SURE (psi)	70.0				MOIST DE	NSITY (pcf)	113.4				WT SOIL	& TARE, M	OIST (g)	1094.70
EFF. CONSOLI	DATION					DRY DEN	SITY, calc (pcf)	83.8				WT SOIL	& TARE, D	RY (g)	828.40
PRESSURE, 03	(psi)	25.0				VOLUME	OF SOLIDS	r till i	310.15				WT TARE	(g)		0.00
PRESSURE. 01	(psf)	3600.0				VOLUME	OF VOIDS		307.04				WT MOIS	FURE (g)		266.30
FINAL "B" VA	LUE	0.99				VOID RAT	Oľ		0.990			· · · ·	WT DRY S	SOIL (g)		828.40
t ₅₀ (minutes)		7.9				SATURAT	ION		95.5				% MOIST	URE		32.15
	ACCUM.	AXIAL	PORE	PWP change	c		CORR.	CORR.	DEV.	SIGMA 1	SIGMA 1	SIGMA 3	EFF.PRN	(<u>a'</u> +a')	(a1 - a1)	T
TIME	DEFLECT.	LOAD	PRESS.	DU (psf)	% STRAIN	(1-e)	AREA	HEIGHT	STRESS	devstr+cp	EFF.	EFF.	STR RATIO			
(MIN)	(inches)	(lbs)	(psi)=U	(acc)	(%)	1.00	(in 2)	(in)	(psf)	(σ ₁)	(σ ₁ -dU)	(03-0U)	$(\sigma_1, \sigma_3, \sigma_3)$	(P)		
0.0	0.000	35	70.5	0.0	0.00	1.00	6.10	5.713	0.0	3000.0	3000.0	3000.0	1.00	3499.1	201 3	0.00
1.0	0.003	00 73	73.5	405.2	0.05	1.00	6.10	5.710	902.7	4102.7	3007.0	3000.6	1,10	3458 7	4401	0.65
2.0	0.006	/3 92	74.0	720.0	0.11	1.00	6.11	5.704	1133.5	4733 5	4013.5	2880.0	1.30	3446.7	566.7	0.64
5.0	0.009	63 60	76.2	820.8	0.10	1.00	6 11	5.701	1297.7	4897.7	4076.9	2779.2	1.47	3428.1	648.9	0.63
5.0	0.012	95	76.8	907.2	0.26	1.00	6.12	5.698	1421.8	5021.8	4114.6	2692.8	1.53	3403.7	710.9	0.64
8.3	0.025	109	78.3	1123.2	0.44	1.00	6.13	5.688	1734.2	5334.2	4211.0	2476.8	1.70	3343.9	867.1	0.65
16.7	0.050	128	80.4	1425.6	0.88	0.99	6.16	5.663	2180.4	5780.4	4354.8	2174.4	2.00	3264.6	1090.2	0.65
25.0	0.075	141	81.8	1627.2	1.31	0.99	6.18	5.638	2462.0	6062.0	4434.8	1972.8	2.25	3203.8	1231.0	0.66
33.3	0.100	150	82.7	1756.8	1.75	0.98	6.21	5.613	2655.1	6255.1	4498.3	1843.2	2.44	3170.8	1327.6	0.66
41.7	0.125	156	83.4	1857.6	2.19	0.98	6.24	5.588	2791.0	6391.0	4533.4	1742.4	2.60	3137.9	1395.5	0.67
50.0	0.150	160	83.9	1929.6	2.63	0.97	6.27	5.563	2882.0	6482.0	4552.4	1670.4	2.73	3111.4	1441.0	0.67
58.3	0.175	165	84.2	1972.8	3.06	0.97	6.29	5.538	2972.0	6572.0	4599.2	1627.2	2.83	3113.2	1480.0	0.00
66.7	0.200	168	84.5	2016.0	3.50	0.96	6.32	5.513	3038.3	6638.3	4622.3	1584.0	2.92	3103.1	1519.1	0.60
83.3	0.250	173	84.8	2059.2	4.38	0.90	0.38	5.403	3123.0	6723.0	4004.4	1512.0	3,05	3102.0	1597 7	0.66
100.0	0.300	1//	85.0	2066.0	5.25	0.95	6.60	5.415	31/5.5	6903 7	4067.5	1312.0	3.10	3000 5	1601.9	0.66
110.7	0.350	180	85.0	2088.0	7.00	0.03	6.56	5 313	3213.4	6813.4	4701.3	1512.0	3.13	3118.7	1606.7	0.65
153.5	0.450	183	84.9	2073.6	7.88	0.92	6.62	5.263	3207.1	6807.1	4733.5	1526.4	3.10	3129.9	1603.5	0.65
166 7	0.500	184	84.7	2044.8	8.75	0.91	6.69	5.213	3206.7	6806.7	4761.9	1555.2	3.06	3158.6	1603.4	0.64
183.3	0.550	185	84.6	2030.4	9.63	0.90	6.75	5.163	3193.1	6793.1	4762.7	1569.6	3.03	3166.1	1596.5	0.64
200.0	0.600	186	84.5	2016.0	10.50	0.89	6.82	5.113	3193.8	6793.8	4777.8	1584.0	3.02	3180.9	1596.9	0.63
216.7	0.650	186	84.4	2001.6	11.38	0.89	6.88	5.063	3164.7	6764.7	4763.1	1598.4	2.98	3180.7	1582.3	0.63
233.3	0.700	186	84.3	1987.2	12.25	0.88	6.95	5.013	3135.5	6735.5	4748.3	1612.8	2.94	3180.5	1567.7	0.63
250.0	0.750	187	84.1	1958.4	13.13	0.87	7.02	4.963	3116.5	6716.5	4758.1	1641.6	2.90	3199.9	1558.3	0.63
266.7	0.800	188	84.1	1958.4	14.00	0.86	7.09	4.913	3095.3	6695.3	4736.9	1641.6	2.89	3189.2	1547.6	0.63
283.3	0.850	188	84.0	1944.0	14.88	0.85	7.17	4.863	3073.8	6673.8	4729.8	1656.0	2.86	3192.9	1536.9	0.63
300.0	0.900	189	83.9	1929.6	15.75	0.84	7.24	4.813	3058.1	6658.1	4728.5	1670.4	2.83	3199.5	1529.1	0.63
316.7	0.950	190	83.8	1915.2	16.63	0.83	7.32	4.763	3046.0	6646.0	4730.8	1684.8	2.81	3207.8	1523.0	0.63
333.3	1.000	191	83.8	1915.2	17.50	0.82	7.40	4.713	3043.3	6643.3	4728.1	1684.8	2.81	3206.4	1521.6	0.63
	1	DU		·			DEVIATO	RIC STRES	S		EFFECTIV	E PRINCIP	LE STRESS		TECH	NA/DA/PWI
		@ FAILUI	RE	2102.4	J .		@ FAILUR	Æ	3203.7		RATIO @ H	AILURE	3.14		DATE	5/21/01
														0	CHECKED	402
1														R	EVIEWED	JUNA

			TR	IAXIAL CO	MPRESSIO	N TEST (A	STM D-476	<u>n . / Jl</u>	IDATED U	NDRAINED	WITH POP	E PRESSU	RE			
ROJECT TITL	Æ	GENES	SIS/PLUM P	OINT ENER	RGY/AR	INITIAL S	AMPLE DA	TA	cm	in	corrected	7	CORRECT	TED SAMPL	E DATA	
PROJECT NUM	IBER		013	-3205		HEIGHT			15.159	5.968	5.767	1	DRY DEN	SITY, calc (pcf)	95.4
AMPLE ID		B -	- 41		-	DIAMETE	R		7.239	2.850	2.761	1	VOLUME	OF SOLIDS		323.96
AMPLE TYPE	t		L	JD		AREA		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	41.16	6.38	5.99	1	VOLUME	OF VOIDS		241.93
EPTH INTER	VAL		3.0	- 5.0'		VOLUME			623.89	38.07	34.53	1	VOID RAT	CIO .		0.747
ACHINE SPE	ED (in/min)	0.00016			1	WEIGHT ((g)		1154.16		1109.16					free and the second sec
TRAIN RATE	(%/min)	0.003				% MOISTU	URE		33.4]	28.18	1				
ELL PRESSU	RE (psi)	110.0				SPECIFIC	GRAVITY		2.67]	· .	•	WATER C	ONTENT (9	MOISTU	RE)
AMPLE PRES	SURE (psi)	70.0				MOIST DE	INSITY (pcf		115.4]			WT SOIL	& TARE, M	OIST (g)	1109.16
FF. CONSOL	DATION					DRY DEN	SITY, calc (pcf)	86.5				WT SOIL	& TARE, DI	RY (g)	865.31
RESSURE, 03	(psi)	40.0				VOLUME	OF SOLIDS	1	323.96				WT TARE	(g)		0.00
RESSURE, 03	(psf)	5760.0				VOLUME	OF VOIDS		299.93]			WT MOIS	TURE (g)		243.85
'INAL "B" VA	LUE	1.00				VOID RAT	O		0.926	ъ.			WT DRY S	SOIL (g)		865.31
so (minutes)		148				SATURAT	ION		96.3]			% MOIST	URE		28.18
	ACCUM.	AXIAL	PORE	PWP change	c		CORR.	CORR.	DEV.	SIGMA 1	SIGMA 1	SIGMA 3	EFF.PRN	$(\sigma_1' + \sigma_2')$	(a1 - a1)	1
TIME	DEFLECT.	LOAD	PRESS.	DU (psf)	% STRAIN	(1-e)	AREA	HEIGHT	STRESS	devstr+cp	EFF.	EFF.	STR RATIO	2		
(MIN)	(inches)	(lbs)	(psi)=U	(acc)	(%)	1.00	(in 2)	(in)	(psf)	(σ1)	(ơ1-dU)	(03-dU)	(σ_1' / σ_3')	(P)	(Q)	(1)
18.8	0.000	40	72 5	288.0	0.00	1.00	5.99	5.101	576.0	5760.0	5760.0	5760.0	1.00	5760.0 \$760.4	0.0	0
75.0	0.012	94	76.5	864.0	0.21	1.00	6.00	5.755	1655.9	7415.9	6551.9	4896.0	1.34	5723.9	827.0	0.50
93.8	0.015	104	77.4	993.6	0.26	1.00	6.00	5.752	1894.9	7654.9	6661.3	4766.4	1.40	5713.8	947.4	0.52
187.5	0.030	131	80.9	1497.6	0.52	0.99	6.02	5.737	2535.8	8295.8	6798.2	4262.4	1.59	5530.3	1267.9	0.59
312.5	0.050	152	84.1	1958.4	0.87	0.99	6.04	5.717	3027.6	8787.6	6829.2	3801.6	1.80	5315.4	1513.8	0.65
468.8	0.075	172	86.0	2232.0	1.30	0.99	6.07	5.692	3489.1	9249.1	7017.1	3528.0	1.99	5272.5	1744.5	0.64
800.0	0.128	206	88.6	2402.4	2.22	0.98	6.10	5.037	4081.0	9641.0	7378.0	3297.0	2.24	5338.1	2040.5	0.60
987.5	0.158	216	89.6	2750.4	2.74	0.97	6.16	5.609	4467.3	10727.3	7476.9	3009.6	2.35	5243.3	2128.0	0.62
1281.3	0.205	231	90.0	2808.0	3.55	0.96	6.21	5.562	4777.8	10537.8	7729.8	2952.0	2.62	5340.9	2388.9	0.59
1550.0	0.248	246	90.6	2894.4	4.30	0.96	6.26	5.519	5086.1	10846.1	7951.7	2865.6	2.77	5408.6	2543.0	0.57
1900.0	0.304	252	90.9	2937.6	5.27	0.95	6.32	5.463	5171.1	10931.1	7993.5	2822.4	2.83	5408.0	2585.6	0.57
2125.0	0.340	257	90.8	2923.2	5.90	0.94	6.36	5.427	5250.2	11010.2	8087.0	2836.8	2.85	5461.9	2625.1	0.56
3106.3	0.497	272	90.3	2851.2	8,62	0.91	6.55	5.270	5428.0	11188.0	8336.8	2908.8	2.87	5622.8	2714.0	0.53
3437.3	0.550	272	90.3	2851.2	9.54	0.90	6.62	5.217	5373.4	11133.4	8282.2	2908.8	2.85	5595.5	2686.7	0.53
5925.0	0.948	270	88.0	2520.0	16.44	0.84	7.17	4 819	4021 3	10683.3	8163.3	3240.0	2 52	5701.6	2070.4	0.52
6250.0	1.000	262	87.6	2462.4	17.34	0.83	7.24	4.767	4711.1	10471.1	8008.7	3297.6	2.43	5653.2	2355.6	0.52
									-							
	1															
														•		
	1													· · ·		
								h.								
	1															
									<u>.</u>							
												1.1				
	1	DU	1				DEVIATO	RIC STRES	S		EFFECTIV	E PRINCIP	LE STRESS		TECH	NA/DA/PW
		@ FAILUI	Æ	2851.2]		@ FAILUR	E	5428.0		RATIO @ F	AILURE	2.87		DATE	5/21/01
							-	1		L				C	HECKED	74
														DE	VIEWED	





.

	AS	AST 5TM D 421,	M GRAI D 2217, 1	N SIZE AN D 1140, C	ALYSIS 117, D 422	2, C 136		
PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SAN	IPLE ID	B-43	-
PROJECT NO.		013-3205			SAMPI	E TYPE	U	D
REMARKS					SAMPLE	DEPTH	3.0 -	5.0'
				Hygroscopic	Moisture For	Sieve Samp	le	
WATER CONTENT	(Delivered N	Moisture)				Wet Soil	& Tare (gm)	
Wt Wet Soil & Tare (g	m)	(w1)	564.31	1 .		Dry Soil	& Tare (gm)	
Wt Dry Soil & Tare (g	m)	(w2)	420.21	1		Tare Wei	abt (am)	
Weight of Tare (gm)		(w3)	0.00	1	× .	Moisture	Content (%)	
Weight of Water (gm)		(w4 = w1 - w2)	144.10	Total Weight	Of Sample II	ad Eor Sie	Content (70)	or Uversee
Weight of Dry Soil (or	nÌ	(w5 = w2 - w3)	420 21	1 xotar weight	Of Sample Us	Weish O	f Samula (am	or Hygroscop
Moisture Content (%)	,	(11/11/5)*100	24 20			weight O	r Sample (gm	4/1.41
		(#4/#5)*100[34.29			lare we	ignt (gm)	115.43
				1	(W6)	Total Dry	Weight (gm)	355.98
SIEVE ANALYSIS		•	· · ·	Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIE	VE	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"	·				3.0"	coarse gravel	
•	2.5"					2.5"	coarse gravel	
	2.0*					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75*	1				0.75"	fine gravel	
	0.50"	1				0.50"	fine gravel	
	0.375"			<u>├</u> }		0 375"	fine gravel	
	#4					0.575 #A	COSTOR BONA	
	#10	0.00	0.00	0.00	100.00	#10	madium and	
	#20	0.02	0.00	0.00	00.00	#10	medium and	
	#40	0.05	0.05	0.01	99.99 00.06	#40	fine and	
	#40	0.13	0.15	0.04	99.90	#40	nne sand	
	#00	0.45	0.43	0.12	99.88	#0U	nne sand	
	#100	1.20	1.20	0.34	99.66	#100	rine sand	
	#200	3.47	3.47	0.97	99.03	#200	fines	
	PAN	-				PAN		
COBBLES	0.00	-	. –					
6 C GRAVEL	0.00	Descrip	ptive Terms	> 10%	mostly coarse	(c)	r	
6 F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	44
6 C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	21
6 M SAND	0.04	some	12 to 30%	< 10%	coarse (m-f)		PI	23
& F SAND	0.93	and	30 to 50%	< 10%	coarse and find	e (m)	Gs	2.671
% FINES	99.03			< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
DES	CRIPTION	Olive Brown, S fine sand.	SILTY CLAY	(, trace medium	1 to			
							F	
	USCS	CL					TECH	SW
	.5						DATE	5/7/01
							CHECK	- Jan-
							REVIEW	PLOM

ţ

(porte

(Second

÷

									1 							
					•		FLEXIB	LE WALL	PERMEAE	BILITY					FLO	W PUMP A
								ASTM I	5084					•		
						N	ETHOD D	, CONSTA	NT RATE	OF FLOW			_			
	_					- · ·		-					•			
PROJECT TITLE	: [GENESIS/	PLUM POIN	T ENERG	Y/AR		BOARD	8] 0	OMMENTS					· .	7
PROJECT NUMB	ER (013-3205		· .	1]	CELL	8								
SAMPLE ID	1	B-43	•	-	3.0 -5.0'	Flow P	ump Speed	6]	•			· · · · · ·			1
SAMPLE TYPE		UD]	Technician	KBG								
			-													
Sample Data, Initi	ial .		,			Sample Da	ta, Final		•							
Height, inches	Ļ	2.962	B-Value, f	0.98		Height, in	ches	2.920					Trimmings		Sample	
Diameter, inches	ŀ	2.843	Cell Pres.	85.0		Diameter,	inches	2.849	l a terr	WATER (CONTENT	S -	Initial		Final	•
Area, cm ³	-	40.96	Bot. Pres.	80.0		Area, cm ²	•	41.13		Wt Soil &	Tare, i	g	564.31		614.67	
Volume, cm	ŀ	308.13	Top Pres.	80.0		Volume, c	m'	305.04		Wt Soil &	Tare, f	g	420.21		470.98	
Mass, g	ŀ	564.31	Tot. B.P.	80.0		Mass, g		563.96		Wt Tare		g	0.00		50.95	· · .
Moisture Content,	,%	34.29	Head, max.	104.81		Moisture (Content, %	34.21		Wt Moistu	re Lost	g	144.10		143.69	
Dry Density, per	ŀ	85.10	Head, min.	104.81		Dry Densi Volumo Se	y, pcf	85.96		Wt Dry So	il .	g	420.21,		420.03	
Spec. Gravity	,	2.671	Max. Grad.	14.13		volume So	alas, cm	157.30		Water Con	ntent	%	34.29%		34.21%	I
Volume Solids, cn	n .3	157.30	Min. Grad.	14.13	I	Volume Vo	oids, cm	147.74								
Volume volus, ch	╹╵┝	150.83				Void Ratio	~	0.94								
Soturation %	ŀ	0.70				Saturation	, 70	97.3%		DESCRIP	FION OV TWO	N 434 -				1
Saturation, 7	L	73.370	1							Olive Brow	A, SILTY (CLAY, trace	medium to fine sand.			
	,	Flow Pum	n Rate	5.90F-04	cm ³ /sec		USCS		1						·	18 - A.
	-		,				0000		1					· .		
			TIM	E FUNCTIO	ONS, SECO	ONDS			dP						1	
D	ATE	DAY	HOUR	MIN	ТЕМР	dt	dt,acc	dt	dt.acc	Reading	Head	Gradient	Permeability			
					ന	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)			
5/	/3/01	37014	12	20	20	0	0	0	0	1.49	104.81	14.13	1.0E-06			
5/	3/01	37014	12	25	20	5	5	300	300	1.49	104.81	14.13	1.0E-06	-		· • .
5/	3/01	37014	12	30	20	5	10	300	600	1.49	104.81	14.13	1.0E-06			
5/	3/01	37014	12	35	20	5	15	300	900	1.49	104.81	14.13	1.0E-06	•		
5/	3/01	37014	12	40	20	5	20	300	1200	1.49	104.81	14.13	1.0E-06			
5/	3/01	37014	12	45	20	5	25	300	1500	1.49	104.81	14.13	1.0E-06	•		
5/.	3/01	37014	12	50	20	5	30	300	1800	1.49	104.81	14.13	1.0E-06	٠		
*TR	ANSCR	IBED FR	OM ORIGIN	AL DATA	SHEETS				· .	PER	MEABILI	TY REPOR	TED AS ** 1.0E-06 c	m/sec **	-	
															DATE	5/3/01
															CHECK	the
															REVIEW	King



	DESCRIPTION		LL	PL	PI	SAMPLE ID
Olive Brown, SI	LTY CLAY, tra	ce medium	44	21	23	B - 43
to fine sand.					14 A.	
		•	SAMPL	е түре	UD	3.0 - 5.0'
USCS	CL					

SAMPLE DATAWet Density (pcf)118.1Dry Density (pcf)87.9STRAIN @ FAILURE (%)6.2Moisture Content34.3%TYPE OF FAILURESHEAR

UNCONFINED COMPRESSIVE STRENGTH (psf) 2978.2 SHEAR STRENGTH (psf) 1489.1

TECH

DATE

CHECK

DA

5/3/01

DA

WY

013-3205 GENESIS/PLUM POINT ENERGY/AR

UNCONFINED COMPRESSIVE STRENGTH OF SOILS

ASTM D 2166

PROJECT	TITLE	GENESIS/PLUM P	OINT ENERGY/AR		SAMPLE ID)	B - 43]
PROJECT	NO.	013-	-3205	1 .	SAMPLE T	YPE	LID	
REMARKS	6			1 .	SAMPLE D	ЕРТН	3.0 - 5.0'	
				J				1
SAMPLE D	ATA	۰.	• .	WATER CO	ONTENT	BEFORE		AFTED
Height (in)		6.153	1			SHEAR		STUDIO
Diameter (in)		2.868	1 .			(ontino)		SHEAR
Height/Diame	ter Ratio	2.15	•	Tere No		(entre)	1	(partial)
Area (in ²)		6.46		We Wet Soil	Tere ()	50-8		-
Volume (ft ³)	-	0.40	4	WL WELSON	c Tare (gm)	1232.38		564.31
Naight (mm)		0.0230	4	Wt. Dry Soil a	c Tare (gm)	917.68	4	420.21
weight (gm)		1232.38		Wt. Tare (gm)		0.00		0.00
wet Density (pcf)	118.06		Wt. Moisture ((gm)	314.70		144.10
Dry Density (pcf)	87.91		Wt. Dry Soil (gm)	917.68		420.21
Aachine Spee	ed (in/min)	0.06		Moisture (%)		34.29%		34.29%
Strain rate (%	/min)	0.98						
TIME	DEFLECT	FORCE	% STRAIN	Ac	COMPRESS	IVE STRESS		
(min)	(inch)	(lbs)	(in/in)	(in²)	(psf)	(psi)		
0.0	0.000	0	0.00	6.46	0.00	0.00		
0.3	0.020	17	0.32	6.48	375.71	2.61		
0.5	0.030	27	0.49	6.49	592.48	4.11		
1.0	0.060	47	0.97	6.52	1041.19	7.23		· .
1.3	0.080	58	1.30	6.55	1283.97	8.92	TIME TO FAILURE (min)	6.33
1.8	0.110	74	1.79	6.58	1614.32	11.21	STRAIN @ FAILURE (%)	6.17
2.2	0.130	83	2.11	6.60	1806.45	12.54	TYPE OF FAILURE	SHEAR
2.5	0.150	91	2.44	0.02	1983.12	13.77		
3.2	0.170	99	2.70	0.04	2140.16	14.80		
3.7	0.220	115	3.09	6 70	2463.30	17.11		
5.0	0.299	133	4.86	6.70	2405.17	10.56	FAILUPE	
6.3	0.380	142	6.17	6.89	2978.15	20.68	SKETCH	
7.2	0.430	139	6.99	6.95	2873.57	19.96		
8.3	0.500	124	8.12	7.03	2529.19	17.56		
9.3	0.560	107	9.10	7.11	2168.02	15.06		
10.3	0.620	88	10.07	7.18	1756.90	12.20		
11.7	0.699	72	11.36	7.29	1424.75	9.89		
12.5	0.750	73	12.19	7.36	1431.42	9.94	'/	
13.3	0.800	74	13.00	7.43	1436.40	9.98		
15.0	0.900	80	14.63	7.57	1525.46	10.59		
15.8	0.950	82	15.44	7.64	1548.45	10.75		
17.5	1.050	85	17.06	7.79	1570.79	10.91		
	L	INCONFINE	DCOMPDESS	VE STRENCTU	7979 15	20.59	L.(
		UNCOMPLIAE.	- COMPRESSI		1490.00	20.08		
			SHE	AR STRENGTH	1489.08	10.34		
Description	Olive Brown.	SILTY CLAY,	trace medium	I	LL	44		
	to fine send				PI	21	ТЕСИ	DA
	-v inc saliu.				1 L.		LECH DUTT	6/2/01
		r			PI	2	DATE	10
USCS							CHECK	Ja
							REVIEW	PWM

Golder Associates Inc.




ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

ł

ROJECT TITLE	GEN	ESIS/PLUM PO	DINT ENER	GY/AR	Q.A	MPLEID	R-44	
PROJECT NO.		013-3205			SAM			
REMARKS					SAM	TE TITE		5.01
\$			· · · · · · · · · · · · · · · · · · ·	Hygroscopic	Moisture For 9	Sieve Sample	3.0	3.0
WATER CONTENT	(Delivered)	Moisture)			Moisture Por 2	Wet Soil &	Tare (am)	· · · · · · · · · · · · · · · · · · ·
Wt Wet Soil & Tare (g	m)	(w1)	357.09			Dry Soil &	Tare (gill)	
Wt Dry Soil & Tare (g	m)	(w2)	273.56	1		Tare Weig	ht (am)	······
Weight of Tare (gm)		(w3)	0.00	1		Moisture C	ontent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	83.53	Total Weight	Of Sample IIs	ed Eor Sieve	Corrected For L	
Weight of Dry Soil (gr	n)	(w5 = w2 - w3)	273.56	- Count of Cright	Of Sample Os	Weight Of	Sample (am)	A21 24
Moisture Content (%)	•	(w4/w5)*100	30.54	1		Tare Weig	Sample (gill)	441.34
• •		(1	(W6)	Total Dev 1	Weight (gm)	226.25
					(#0)	Total Diy	weight (gill)	550.55
SIEVE ANALYSIS	and the second		· ·	Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIFV	E	
0.00		+Tare	({(wt ret/w6)+100}	(100-%ret)	- UILI T		
	12.0"					12.0"	cobbles	
	3.0"					3 0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"		w			2.0"	coarse gravel	
	1.5"					1.5"	COALSE BLANCI	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"					0.75	fine gravel	
	0 375*					0.30	fine gravel	
	#4					U.375 #A	Inc graver	
	#10	0.00	0.00	0.00	100.00	#10	medium and	
	#20	0.07	0.07	0.00	00.00	#20	medium sand	
	#40	0.30	0.07	0.02	00.01	#40	fine cand	
	#60	0.72	0.72	0.05	99.91	#40 #60	fine cand	
	#100	1.51	1.51	0.45	00 55	#100	fine cand	
	#200	3.00	3.00	1 10	08.91	#200	fines	
	PAN		5.33		20.01	PAN	11105	
% COBBLES	0.00	T				TUN		<u></u>
% C GRAVEL	0.00	Descri	otive Terms	> 104	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	(m)	IJ	44
% C SAND	0.00	little	5 to 12.95	< 10%	fine (c-m)	. ()	PI	21
% M SAND	0.09	some	12 to 30%	< 10%	coarse (m-f)		PT	23
% F SAND	1.10	and	30 to 50%	< 10%	coarse and fine	: (m)	Ge	2,679
% FINES	98.81	-	50 W 90 N	< 10%	coarse and me	tium (f)	03	A10/7
% TOTAL	100.00	1		> 10%	equal amounte	each (c-f)		
	100.00			- 1070	- Joor amounts	····· (···)		
DESC	CRIPTION	Olive Brown.	SILTY CLAY	(, trace medium	1 to fine			
2200		sand.		,				
	USCS	CL					TECH	DA/JC
	2000						DATE	5/2/01
							CHECK	Horse
							REVIEW	Plus

)*.								134						
					FLE	XIBLE W	ALL TR		CRMEABI	JTY				
							ASTM	D 5084						
				METHO	DD C, FAL	LING HE	AD W/IN	CREASIN	G TAILW	ATER P	RESSURE			•
PROJECT T	ITLE	GENESIS/	PLUM POIN	T ENERGY	/AR	1	Using Pir	ettes Only	NO	7 cc	OMMENTS			
PROJECT N	UMBER	013-3205				Using	Pipettes &	Burrettes	YES	1				
SAMPLE ID		B-44		3.0	- 5.0'	BOARD#	7] ТЕСН	KBG]				
SAMPLE TY	PE	Bulk				CELL#	7	DATE	5/2/01]		[
Sample Data.	Initial				·							· ·		
Height, inches	5	1.952	1				Sample Da	ata, Final			Water Con	tents	Initial	Final
Diameter, incl	hes	2.857	1	B-Value,f	0.97]	Height, inc	ches	1.962]	Wt soil&ta	re, i	357.09	419.54
Area, cm ²		41.36]	Cell Pres	85.00		Diameter,	inches	2.826		Wt soil&ta	re, f	273.56	324.42
Volume, cm [*]	3	205.06]	Bot. Pres.	80,50]	Area, cm ²	2	40.47		Wt Tare		0.00	51.16
Mass, g		357.09]	Top Pres.	80.00	1	Volume, c	m^3	201.67		Wt Moistur	e Lost	83.53	95.12
Moisture Con	iteni, %	30.54		Head, cm	35.17		Mass, g		368.78		Wt Dry So		273.56	273.26
Dry Density,	pcf	83.24	1	Max. Grad.	11.65		Moisture (Content %	34.81	1 ·	Water Con	ent	30.54%	34.81%
Spec. Gravity		2.676		Min. Grad.	7.71	4	Dry Densu Securities	ry, per	84.04	DEC	NOTION	Olive Deere	EU TY CLA	V trace medium
Volume Solid	s, cm ² 3	102.23	-	Max. E.S.	3.00	-	Samanon		5 10	DES	CRIPTION	to fine cand	I, SILI I CLA	T, trace medium
Void Pario	s, cm 5	102.84	-	мш. с.э.	4.30	1	Outflow Volu	ume per (1 cc)	5.10	1		to mic said.	•	
Saturation		81.2%					Country Volt	And per (1 cc)	5.10	1	USCS	CL.	1	
			1				1.1					L		
TIM	ME FUNCTI	ON	REAL	DINGS		TIM	E IN MINU	ITES & SEC	CONDS			VO	LUME	PERMEABILITY
DATE	HOUR	MIN	Inflow	Outflow	Temp.	dt	dt	dt, acc	Head	(H1/H2)	Gradient	Inflow	Outflow	@ 20 Degrees C
		1	(00)	(cc)		(min)	(sec)	(sec)	(cm)	(inc.)		(cc)	(cc)	(cm/sec)
5/2/01	11	10	0.00	25.00	19.7	0.0	0	0	58.07		11.65	0.00	0.00	0.0
5/2/01	11	11	1.60	23.60	19.7	1.0	60	60	55.34	1.05	11.11	8.16	7.14	2.14E-04
5/2/01		12	3.00	22.30	19.7	1.0	60	120	52.89	1.05	10.61	7.14	0.03	2.02E-04
5/2/01		13	4.30	21.00	19.7	1.0	60	180	JU.52	1.05	10.14	6.12	0.03	1.058-04
5/2/01	11	14	6.00	19.00	19.7	1.0	60	300	46.04	1.05	9.70	7 14	5.61	2 148-04
5/2/01	11	16	8.00	17 70	10.7	1.0	60	360	44.15	1.05	8.86	5.61	5.01	1.88E-04 +
5/2/01		17	9.10	16.50	19.7	1.0	60	420	42.06	1.05	8.44	5.61	6.12	2.16E-04 *
5/2/01	1 11	18	10.20	15.70	19.7	1.0	60	480	40.33	1.04	8.09	5.61	4.08	1.87E-04 *
5/2/01	11	19	11.30	14.70	19.7	1.0	60	540	38.42	1.05	7.71	5.61	5.10	2.16E-04 *
											• .			
							· ·		14			1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		
						1.1			1. 					
								1.1						
		L					I	<u></u>					L	
	inflow Rat	C i	0.106722					100 A.			PE	CMEABILT	Y REPORTE	DAS 2.016-04 [cm/se
		flow Dotto	0.09/2/8										T	ATE 5/2/01
	Ontriow/ID	URUW KALIO	0.91	1									CH	ECK 74
TRANSCO		MORICINA	L DATA SH	EETS									REV	TEW Linn
			ATA GAL											

Sum.

. .





at the second second second second second second second second second second second second second second second



PRO PR	JECT TITLE	GEN	ESIS/PLUM	POINT ENER	GY/AR] SAM	PLE D	B	44
		L	015-5405		1	SAMP	LE DEPTH	3.0 -	5.0'
					CELL PR	ESSURE (psi)		10.0	٦
HIN	E SPEED (in/min)	0.06			SAMPLE	PRESSURE (p	si)	0.0	1
AIN I	RATE (%/min)	1.00			CONFINI	NG PRESSUR	E, σ3 (psi)	10.0]
	INITIAL SAM	PLE DATA					COPPI	CTED SAMP	E DATA
	HEIGHT(in)	5.999	(cm)	15.237	1		HEIGHT (in)	5.989
	DIAMETER(in)	2.838	(cm)	7.209			DIAMETER	(in)	2.840
	AREA(in ⁻)	6.33	(cm ²)	40.81			AREA (in")		6.34
	VOLOME(III)	37.95	(cm ³)	621.86			VOLUME (i	п)	37.95
	& MOISTURE		25.0						
	SPECIFIC GRAV	/TTY	2.676				u	ATTED CONTR	
	WET DENSITY	(pcf)	121.6				WT SOIL &	TARE WET (1296 17
	DRY DENSITY,	(pcf) calc	96.6				WT SOIL &	TARE, DRY(g)	1047.13
	VOLUME OF SC	DLIDS (cm ³)	359.64				WT TARE (g)	85.69
	VOLUME OF VO	OIDS (cm ³)	262.23				WT MOIST	JRE (g)	249.04
	VOID RATIO	N	0.729				WT DRY SC)IL (g)	961.44
	# SATUKATIO		1.56				% MOISTUI	KE .	25.90
		ACCUM.	AXIAL	e	CORRECTED	DEVIATOR	(o)	$(\sigma_{1}' + \sigma_{3}')$	(σ ₁ - σ ₃)
	TIME	DEFLECT	LOAD	% STRAIN	AREA	STRESS	devstr+cp	2	2
		0.000	(IDS)	(in/in)	(in²)	(pst)	(psf)	(P)	(Q)
	0.0	0.000	12	0.0	6.34	90.86	1440.00	1440.00	0.00
	0.1	0.006	15	0.1	6.34	158.92	1598.92	1519.46	79.46
	0.2	0.009	20	0.2	6.35	272.30	1712.30	1576.15	136.15
	0.2	0.012	37	0.2	6.35	657.74	2097.74	1768.87	328.87
	0.3	0.015	42	0.3	6.35	770.75	2210.75	1825.38	385.38
	0.4	0.025	55	0.4	6.36	1063.67	2503.67	1971.84	531.84
	1.3	0.050	80	0.8	6.39	1622.64	3062.64	2251.32	811.32
	1.7	0.100	110	1.7	6.44	2279.41	3719.41	2472.33	1032.33
	2.1	0.125	122	2.1	6.47	2536.78	3976.78	2708.39	1268.39
	2.5	0.150	130	2.5	6.50	2703.25	4143.25	2791.62	1351.62
	2.9	0.175	138	2.9	6.53	2868.20	4308.20	2874.10	1434.10
	3.3	0.200	145	3.3	6.55	3009.66	4449.66	2944.83	1504.83
	4.2	0.250	150	4.2	6.61	3223.28	4663.28	3051.64	1611.64
	5.8	0.350	174	5.8	6.73	3552.42	4031.14	3145.57	1776.21
	6.7	0.400	181	6.7	6.79	3669.45	5109.45	3274.73	1834.73
	7.5	0.450	187	7.5	6.85	3762.81	5202.81	3321.40	1881.40
	8.3	0.500	193	8.3	6.91	3853.89	5293.89	3366.95	1926.95
	9.2	0.550	198	9.2	6.98	3922.07	5362.07	3401.03	1961.03
	10.0	0.600	203	10.0	7.04	3988.34	5428.34	3434.17	1994.17
	11.7	0.700	207	11.7	7.17	4032.40	5515.06	3430.23	2010.23
	12.5	0.750	214	12.5	7.24	4096.27	5536.27	3488.13	2048.13
	13.3	0.800	216	13.3	7.31	4096.64	5536.64	3488.32	2048.32
	14.2	0.850	216	14.2	7.38	4057.24	5497.24	3468.62	2028.62
	15.0	0.900	214	15.0	7.45	3979.21	5419.21	3429.60	1989.60
	15.8	0.950	208	15.8	7.53	3825.43	5265.43	3352.71	1912.71
	10./	1.000	204	10.7	7.00	5/11./9	5151./9	3295.90	1855.90
				*	ORMAL STRE	SS @ FAILURE	5536.64		
	TIME TO FAILURE	C (min)	13.3				Fellun	$\left(\prod \right)$	TROUT
	DEFLECTION (2) FA	AILUKE (ID)	0.000				FAILURE		I ECH

PRO	JECT TITLE	GEN	ESIS/PLUM P	OINT ENER	GY/AR	SAM	PLE ID	B	44
FR	JECT NO.		013-3205			SAMPL	EDEPTH		5.0'
					CELL PRE	SSURE (psi)		40.0	
HIN	E SPEED (ln/min)	0.06			SAMPLE P	RESSURE (ps	i)	0.0	
UN F	RATE (%/min)	1.05			CONFININ	G PRESSURE	, σ ₃ (psi)	40.0	
	INITIAL SAM	PLE DATA					CORRE	ECTED SAMPL	E DATA
	HEIGHT(in)	5.723	(cm)	14.536			HEIGHT (in))	5.653
	DIAMETER(in)	2.844	(cm)	7.224			DIAMETER	(in)	2.862
	AREA(in*)	6.35	(cm²)	40.98			AREA (in*)		6.43
	VOLUME(in')	36.36	(cm ³)	595.76			VOLUME (in	a~)	36.36
	WEIGHT (g)		1085.46		-				
	% MOISTURE		24.6	•					
	SPECIFIC GRAV	ITY	2.676				W	ATER CONTE	INT
	WET DENSITY (pci)	01.2				WT SOIL &	TARE, WET (g	055 40
	VOLUME OF SO	(LIDS (cm ³)	325 56				WT TAPE (IARD, DEI(g)	84.04
	VOLUME OF VO	DIDS (cm ³)	270.20				WT MOISTI	JRE (g)	214.03
	VOID RATIO		0.830				WT DRY SO)IL (g)	870.54
	% SATURATIO	N	79.3				% MOISTUR	RE	24.59
	,				CONDECTO	DEVELOP			
	TIME	ACCUM.	AXIAL	C % STD AIN	ARFA	DEVIATOR STRESS	(0 ₁) devetator	$(\sigma_1' + \sigma_3')$	(01-03)
	(min)	(inch)	(lbs)	(in/in)	(ln ²)	(nsf)	(Dsf)	(P)	(0)
	0.0	0.000	13	0.0	6.43	0.00	5760.00	5760.00	0.00
	0.1	0.003	37	0.1	6.43	537.10	6297.10	6028.55	268.55
	0.1	0.006	51	0.1	6.44	849.96	6609.96	6184.98	424.98
	0.2	0.009	61	0.2	6.44	1073.07	6833.07	6296.53	536.53
	0.2	0.012	69	0.2	6.44	1251.25	7011.25	6385.63	625.63
	0.3	0.015	75	0.3	6.45	1384.59	7144.59	6452.29	692.29
	0.4	0.025	90	0.4	6.46	1716.56	7476.56	6618.28	858.28
	0.8	0.050	121	0.9	6.49	2397.07	8157.07	6958.54	1198.54
	1.3	0.075	142	1.3	6.52	2850.55	8610.55	7185.28	1425.28
	1.7	0.100	158	1.7	6.55	3189.93	8949.93	7354.90	1594.96
	2.1	0.125	171	2.2	6.57	3400.47	9220.47	7490.23	1/30.23
	2.5	0.150	181	2.0	6.60	3820.27	9425.03	7670 13	1910.13
	2.9	0.175	105	35	6.65	3932.70	9692.70	7726.35	1966.35
	4.2	0.250	207	4.4	6.72	4154.05	9914.05	7837.03	2077.03
	5.0	0.300	215	5.2	6.79	4285.84	10045.84	7902.92	2142.92
	5.8	0.350	222	6.1	6.85	4393.47	10153.47	7956.74	2196.74
	6.7	0.400	227	7.0	6.91	4456.72	10216.72	7988.36	2228.36
	7.5	0.450	232	7.9	6.98	4518.01	10278.01	8019.00	2259.00
	8.3	0.500	238	8.7	7.05	4597.77	10357.77	8058.89	2298.89
	9.2	0.550	242	9.6	7.12	4634.71	10394.71	8077.36	2317.36
	10.0	0.600	246	10.5	7.18	4670.09	10430.09	8095.04	2335.04
	10.8	0.650	250	11.4	7.26	4703.90	10463.90	8111.95	2351.95
	11.7	0.700	253	12.2	7.33	4716.49	104/0.49	8113.43	2338.23
	12.5	0.750	25/	13.1	7.40	4/4/.5/	10408 16	8129.09	23/3.09
	13.3	0.800	263	14.0	7.55	4756 10	10526.30	8143.15	2383.15
	14.4	0.830	205	14.9	7.63	4774.00	10534.00	8147.00	2387.00
	15.0	0.950	269	16.6	7.71	4780.53	10540.53	8150.27	2390.27
	16.7	1.000	272	17.5	7.79	4785.89	10545.89	8152.94	2392.94
					NORMAL STRE	SS @ FAILURE	10534.00		L
	TIME TO FAILUR	E (min)	15.0]		G MILURE		<u>ا ا ا ا</u>	
	DEFLECTION @ F	AILURE (in)	0.900]			Failure	$\left(\right)$	TECH
	% STRAIN @ FAIL	LURE	15.7	1			Sketch	1-1	DATE
	-		the state of the s						





ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

l

1

DO TROT TITT F	CIENT			CTULD 1					
PROJECT MILL	GEN	LSIS/PLUM P	OINT ENER	GY/AR	SA	MPLE ID	B-51	<u> </u>	_
DEMARKS		013-3205		4	SAME	PLE TYPE	·	JD	_
REMARKS				TT	SAMPL	E DEPTH	3.0	- 5.0'	
WATED CONTENT	Mallana d N			Hygroscopic	Moisture For S	Sieve Sample			
WATER CONTENT	(Delivered N	loisture)				Wet Soil &	Tare (gm)		
wt wet Soil & Tare (çm)	(w1)	564.31	4		Dry Soil &	Tare (gm)		
Wt Dry Soll & Tare (g	çm)	(w2)	417.12	4		Tare Weigh	it (gm)		
Weight of Tare (gm)		(W3)	0.00			Moisture C	ontent (%)		
Weight of Water (gm)	>	(w4 = w1 - w2)	147.19	Total Weight	Of Sample Us	ed For Sieve	Corrected For I	Lygroscopic M	loisture
Weight of Dry Soll (gr	n)	$(w_3 = w_2 - w_3)$	417.12	-		Weight Of	Sample (gm)	299.22	_
Moisture Content (%)		(w4/w5)*100	35.29	4 .		Tare Weig	ht (gm)	85.72	
				1	(₩6)	Total Dry V	Weight (gm)	213.50	
STRUE ANTAL MOTO				a					
SIEVE ANALISIS				Cumulative			_		
		wi Ket	(WI-Tare)	(% Retained)	% PASS	SIEV	E .		
0.00	10.07	+ lare		{(wt ret/w6)*100}	(100-%ret)	10.01			
а.	12.0"			<u> </u>	-	12.0"	cobbles		
	3.0"					3.0"	coarse gravel		
	2.5"					2.5"	coarse gravel		
	2.0*	· · ·				2.0"	coarse gravel		
	1.5"					1.5"	coarse gravel		
	1.0"					1.0"	coarse gravel		
	0.75"			 		0.75"	fine gravel		
	0.50"			<u> </u>		0.50"	fine gravel		
	0.375"			<u> </u>		0.375"	fine gravel		
in the state of t	#4	0.00	0.00	0.00	100.00	#4	coarse sand		
	#10	0.03	0.03	0.01	99.99	#10	medium sand		
	#20	0.90	0.90	0.42	99.58	#20	medium sand		
	#40	2.93	2.93	1.37	98.63	#40	fine sand		
	#60	5.08	5.08	2.38	97.62	#60	fine sand		
	#100	7.29 ·	7.29	3.41	96.59	#100	fine sand		
	#200	9.86	9.86	4.62	95.38	#200	fines		
	PAN					PAN			
% COBBLES	0.00								
% C GRAVEL	0.00	Descri	iptive Terms	> 10%	mostly coarse	(c)			
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediun	n (m)	LL	61	
% C SAND	0.01	little	5 to 12%	< 10%	fine (c-m)		PL	31	_
% M SAND	1.36	some	12 to 30%	< 10%	coarse (m-f)		PI	30	
% F SAND	3.25	and	30 to 50%	< 10%	coarse and fine	e (m)	Gs	-	
% FINES	95.38			< 10%	coarse and me	dium (f)			н. ₁ . н
% TOTAL	100.00			> 10%	equal amounts	each (c-f)			
DES	CRIPTION	Olive Brown, fine sand.	SILTY CLAY	Y, trace medium	m to				
	USCS	СН					TECH	JC/TJ	5
							DATE	5/1/01	
							CHECK	Im	-
							REVIEW	100	7

							AND A VALUE WINES			0.44	W PUM
					FLEAID	A STM D 609	MEADILITY 4				
					METHOD D	CONSTANT F	ATE OF FLOW			•	
ROJECT TITLE	GENESIS	PLUM POIN	T ENERG	Y/AR	BOARD #	9	COMMENTS				٦.
OJECT NUMBER	013-3205				CELL#	. 9.					
MPLE ID	B-51	•	-	3.0 -5.0'	Flow Pump Speed	10				,	
AMPLE TYPE	UD				Technician	KBG					
					· · · · · · · · · · · · · · · · · · ·						
mple Data, Initial		.			Sample Data, Final						
eight, inches	2.953	B-Value, f	0.98		Height, inches	2.963			Trimmings	Sample	
ameter, inches	2.840	Cell Pres.	85.0		Diameter, inches	2.846	WATER CO	NTENTS	Initial	Final	
rea, cm ²	40.87	Bot. Pres.	80.0		Area, cm ²	41.04	Wt Soil & Ta	re, i g	566.05	622.55	-
olume, cm	306.54	Top Pres.	80.0		Volume, cm	508.88	Wt Soll & Ta	ire, f g	417.12	468.90	-
ass, g	36 70	Hood mor	80.0 140.82		Mass, g	3/0.83	Wt 1are	g Tort a	148.03	51.94	-
ev Density nof	84.91	Head, min.	149.82		Dry Density, ncf	84.27	Wt Dry Soil	LUGL g	417.12	416.96	-
pec. Gravity	2.683	Max. Grad.	19.91		Volume Solids, cm ³	155.47	Water Conte	nt %	35.70%	36.85%	-
olume Solids, cm ³	155.47	Min. Grad.	19.91		Volume Voids, cm ³	153.41					I
olume Voids, cm ³	151.07	1		•	Void Ratio	0.99					
oid Ratio	0.97	1			Saturation, %	100.2%	DESCRIPTIO	ON			
turation, %	98.6%]				•	Olive Brown,	SILTY CLAY	, trace medium to fine sa	nd.	
	Flow Pum	n Rate	3.00E-05	cm ³ /sec	USCS	СН					

1		1 I.MI	FUNCIN	JNS, SECO	ND2			ar]		1.1	
DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability
1. S.				(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)
5/3/01	37014	10	15	19.6	0	0	0	0	2.13	149.82	19.91	3.7E-08
5/3/01	37014	10	20	19.6	5	5	300	300	2.13	149.82	19.91	3.7E-08
5/3/01	37014	10	25	19.6	5	10	300	600	2.13	149.82	19.91	3.7E-08
5/3/01	37014	10	30	19.6	5	15	300	900	2.13	149.82	19.91	3.7E-08 •
5/3/01	37014	10	35	19.6	5	20	300	1200	2.13	149.82	19.91	3.7E-08 *
5/3/01	37014	10	40	19.6	5	25	300	1500	2.13	149.82	19.91	3.7E-08 *
5/3/01	37014	10	45	19.6	5	30	300	1800	2.13	149.82	19.91	3.7E-08 *

***TRANSCRIBED FROM ORIGINAL DATA SHEETS**

PERMEABILITY REPORTED AS ** 3.7E-08 cm/sec **

DATE 5/3/01

REVIEW /wm

DA

CHECK



UNCONFINED COMPRESSIVE STRENGTH OF SOILS STRESS-STRAIN - ASTM D 2166 1400 1200 COMPRESSIVE STRESS (psf) 1000 800 600 400 200 0 0 2 4 10 12 6 8 14 16 18 20 22 24 AXIAL STRAIN (%)

DESCRIPTION LL PL SAMPLE ID PI Ollve Brown, SILTY CLAY, trace medium 61 31 30 B - 51 to fine sand. SAMPLE TYPE UD 3.0 - 5.0' USCS СН

SAMPLE DATAWet Density (pcf)113.4Dry Density (pcf)83.5STRAIN @ FAILURE (%)2.4Moisture Content35.7%TYPE OF FAILURESHEAR

UNCONFINED COMPRESSIVE STRENGTH (psf)	1230.2
SHEAR STRENGTH (psf)	615.1

TECH

DATE

CHECK REVIEW DA

5/2/01

DA

wM

013-3205 GENESIS/PLUM POINT ENERGY/AR

UNCONFINED COMPRESSIVE STRENGTH OF SOILS

ASTM D 2166

l

PROJECT TITLE PROJECT NO. REMARKS Consistent unit reserving 013-3285 SAMPLE ID SAMPLE DATA SAMPLE DET UD SAMPLE DATA UD 3.0 - 5.0" SAMPLE DATA Height (in) 6.274 1.267 WATER CONTENT 6.464 BEFORE SIEAR (cuttrey) SHEAR SHEAR (cuttrey) SHEAR	ANGON									
PROJECT NO. REMARKS 013-3285 SAMPLE TYPE SAMPLE DETH UD SAMPLE DATA Height (m) 043-50' 34-50' SAMPLE DATA Height (m) 6474 WATER CONTENT BEFORE SIEAR SIEAR SIEAR State (m) 0.64 W. TER CONTENT BEFORE SIEAR SIEAR SIEAR Volume (th) 0.6214 W. Wet Soil & Tare (gm) 0.00 0.00 0.00 Vulume (th') 0.0214 W. Tere (gm) 0.00 0.00 0.00 Vulume (th') 0.0214 W. Tere (gm) 0.00 0.00 0.00 Vulume (th') 0.021 W. Tere (gm) 0.00 0.00 0.00 Statin atte (%/min) 0.06 0.00 6.44 0.00 0.00 Statin atte (%/min) 0.05 110.025 777.78 5.26 1.1 0.030 110 0.25 6.43 92.41 7.45 1.2 0.130 57 2.30 6.44 113.42 5.43 1.3 0.030 1.15 6.44	PROJECT T	TTLE	GENESIS/PLUM P	OINT ENERGY/AR		SAMPLE I	D	B - 51		
REMARKS SAMPLE DEPTH 3.8 - 5.9' SAMPLE DATA Height (in) 6.274 WATER CONTENT BEFORE SIEAR AFTER Generation Diameter (in) 2.867 (entire) (gartial) Height (fin) 2.867 (entire) (gartial) Volume (fr) 0.0214 Wt. Dry Soil & Tare (grn) 888.69 417.12 Volume (fr) 0.0224 Wt. Dry Soil & Tare (grn) 888.69 417.12 Weight (grn) 113.58 Wt. Dry Soil (grn) 888.69 417.12 Machine Speed (in/min) 0.06 Moisture (gm) 888.69 417.12 Mu Dept LeCT FORCE % STRAIN Ac COMPRESSIVE STRESS 417.13 Machine Speed (in/min) 0.96 113 6.44 6.49 461.75 3.31 0.40 0.420 1.5 52.1 6.41 123.42 7.23 0.5 0.200 1.271 6.54 92.271 6.41 123.41 2.59 1.10 0.660 3.4 6.59 121.423	PROJECT N	0.	013-	3205		SAMPLE T	YPE	UD		
SAMPLE DATA WATER CONTENT BEFORE AFTER Height (in) 2.367 SIEAR	REMARKS					SAMPLE D	EPTH	3.0 - 5.0'		
SAMPLE DATA WATER CONTENT BEFORE AFTER Height (in) 6.74 SHEAR SHEAR SHEAR Diameter (in) 2.867 Tare No. SQ-4 (entire) (gartia) Area (in ¹) 6.46 Wt. Wet Soil & Tare (gm) 1285.99 (soil & Tare (gm) 1285.99 (diffe) Woldme (R ¹) 0.0214 Wt. Moisture (gm) 117.30 0.00 6.00 Dy Density (pcf) 113.38 Wt. Moisture (gm) 317.30 144.33 144.33 Machine Speed (in/min) 0.06 0.06 6.00 6.00 6.00 Stain rate (//mmin) 0.44 6.22 6.23 79.78 5.36 1.0 0.060 0 0.00 6.46 0.40 6.46 0.3 0.200 5.22 6.43 3.21 6.44 3.22 7.32 1.1 0.060 0 0.00 6.66 0.60 6.00 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.	•				1					
Height (in) 6.274 Diameter (in) 6.274 Diameter (in) 6.274 Lasor Volume (th) 6.21 Area (in) 6.44 Height/Diameter Ratio Area (in) 6.44 Height/Diameter Ratio Area (in) 6.44 Height/Diameter Ratio Area (in) 6.44 Height/Diameter Ratio Area (in) 6.44 Hu Dry Soil & Tare (gm) 1205.99 Wt Dry Soil & Tare (gm) 1205.99 Wt Dry Soil & Tare (gm) 1317.30 Wt Moisture (gm) 317.30 Wt Dry Soil (gm) 317.30 HME TO PALLURE (min) 2.20 SIEAR SEC UN UNCONFINED COMPRESSIVE STRENGTH SIEAR STRENGTH H 31 PL	SAMPLE DA	ATA			WATER CO	NTENT	BEFORE		AFTER	
Diameter (in) Height/Diameter Ratio Area (in ²) Volume (it ²) Volume (it ²) Vel Density (pcf) Machine Speed (in/min) 0.66 Urg Density (pcf) 13.38 Dry Density (pcf) 13.38 Dry Density (pcf) 0.66 Urg Density (pcf) 13.38 Dry Density (pcf) 0.66 Urg Density (pcf) 13.38 Dry Density (pcf) 0.66 Urg Density (pcf) 0.66 Urg Density (pcf) 0.66 Urg Density (pcf) 0.66 Urg Density (pcf) 0.66 Urg Density (pcf) 0.66 Urg Density (pcf) 0.66 Urg Density (pcf) 0.66 Urg Density (pcf) 0.66 0.60 0.73 0.50	Height (in)		6.274		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		SHEAR		SHEAR	
Height/Diamster Ratio Area (in ¹) Volume (if ¹) Volume (if ²) Volume (i	Diameter (in)		2.867				(entire)		(partial)	
Ara (in ²) 6.44 Wt. Wet Soil & Tare (gm) 1285.99 Weight (gm) 1285.99 Wt. Dry Soil & Tare (gm) 888.69 Weight (gm) 113.38 Wt. Dry Soil (gm) 317.30 Wt. Bonsity (pc) 83.55 Wt. Dry Soil (gm) 888.69 Machine Speed (n/min) 0.06 0.06 148.53 TIME DEFLECT FORCE % STRAIN Ac COMPRESSIVE STRESS (min) (tach) (bb) (bn/m) 3.70% 35.70% Stain atte (Vmim) 0.60 0 0.46 6.46 0.00 0.3 0.020 15 0.32 6.48 342.42 2.38 0.4 0.05 6.52 757.78 5.26 1.3 0.460 42 1.27 6.44 135.01 7.85 STRAIN @ PAILURE (min) 2.39 2.2 0.130 55 2.27 6.41 135.02 7.85 STRAIN @ PAILURE (min) 2.39 3.3 0.230 3.6 6.66 1682.06 7.88 STRAIN @ PAILURE 317 3.4 0.240 <td>Height/Diamet</td> <td>er Ratio</td> <td>2.19</td> <td></td> <td>Tare No.</td> <td></td> <td>SQ-8</td> <td>] -</td> <td>-</td>	Height/Diamet	er Ratio	2.19		Tare No.		SQ-8] -	-	
Volume (ft ¹) 0.0224 Wt. Dry Soil & Tare (grn) 888.69 Weight (grn) 113.38 Wt. Tare (grn) 0.00 145.39 Wet Density (pcf) 113.38 Wt. Moisture (grn) 317.30 148.83 Dry Density (pcf) 83.55 Wt. Dry Soil (grn) 888.69 147.12 Machine Speed (in/min) 0.06 Wt. Dry Soil (grn) 888.69 35.70% Stain rate (Wimin) 0.06 (u/n) (u/n) (gr) (gr) 35.70% 0.0 0.000 0 0.00 6.46 0.00 0.00 0.3 6.0200 15 0.32 6.48 342.42 2.38 0.5 0.030 21 0.48 6.49 461.75 3.21 1.4 0.060 34 0.95 6.52 757.78 5.26 1.3 0.110 52 1.75 6.37 113.482 7.85 3.2 0.150 57 2.39 6.61 123.917 8.43 3.4 0.230 3.6 6.70 738 5.46 3.2	Area (in ²)		6.46		Wt. Wet Soil &	Tare (gm)	1205.99	1 . 1	566.05	
Weight (gm) 1295.59 Wt. Tare (gm) 0.00 0.00 Wet Density (pcf) 113.38 Wt. Tare (gm) 317.30 40.00 148.33 Dry Density (pcf) 83.55 Wt. Dry Soil (gm) 888.69 347.04 417.12 Machine Speed (in/min) 0.96 95 STRAIN Ac COMPRESSIVE STRESS 417.12 TIME DEFLECT FORCE % STRAIN Ac COMPRESSIVE STRESS 417.12 0.0 0.000 0.000 6.46 0.00 0.00 33.70% 1.0 0.060 34 0.95 6.52 757.78 5.36 1.3 0.110 52 1.75 6.57 113.042 7.85 STRAIN @ PAILURE (min) 2.50 2.2 0.130 56 2.07 6.59 121.452 8.43 TYPE OF FAILURE (min) 2.50 3.3 0.230 3.6 3.67 6.70 782.17 5.41 5.43 3.4 0.230 3.6 6.77 63.41 15.65 7.33 5.43 3.5 0.230 3.6	Volume (ft ³)		0.0234		Wt. Dry Soil &	: Tare (gm)	888.69	1	417.12	
Wet Density (pcf) 113.38 Wt. Moisture (gm) 317.30 148.93 Dry Density (pcf) 83.55 Wt. Moisture (gm) 317.30 888.69 Machine Speed (in/min) 0.06 0.06 35.70% 357.0% Strain rate (%/min) 0.06 0.00 6.46 0.00 0.00 6.46 0.4 0.000 0 0.00 6.46 0.00 0.00 0.00 0.3 0.620 15 0.32 6.48 342.42 2.38 7.45 0.5 0.030 21 0.44 6.49 461.75 3.31 7.45 53.66 1.4 0.110 52 1.75 6.57 113.82 8.43 TME TO FAILURE (min) 2.59 1.4 0.110 52 1.75 6.57 113.432 8.43 TYPE OF FAILURE (%) 3.79 2.4 0.150 57 2.39 6.61 1052.06 7.38 53.66 3.7 0.220 4.62 6.77 43.01 3.01 54.67 53.151 3.69 3.64 4.2	Weight (gm)		1205.99		Wt. Tare (gm)		0.00		0.00	
Dry Density (pcf) 1232 Machine Speed (in/min) 0.06 Strain rate (Wmin) 0.06 Machine Speed (in/min)	Wet Density (n	cf)	113.38		Wt. Moisture (em)	317,30	-	148.93	
Description Description Description Description Description Description Diversity of the server Dive	Dry Density (p	cf)	81.55		Wt. Dry Soil (900)	888.69		417.12	
Answin Speec (us min) Coverts District (V/y) SALE /2 SALE /2 Strain rate (%/min) 0.96 0.96 (inch) (in	Machina Snach	(in/min)	0.06		Moisture (%)		35.70%	1	35.70%	
Statum new (verturi) 0.09 Verturi	Strain rate (0/ /		0.00		Moisiule (70)		55.707	1 l	55.7078	
TIME DEFLECT FORCE % STRAIN (la/n) Ac COMPRESSIVE STRESS (psi) (psi) (la/n) (la/n) (la/n) (psi) (psi) (psi) 0.0 0.000 0 0.00 6.46 0.00 0.00 0.3 0.020 15 0.32 6.48 342.42 2.38 0.5 0.030 21 0.48 6.49 661.75 3.21 1.3 0.080 42 1.27 6.54 922.71 6.41 TIME TO FAILURE (min) 2.39 2.2 0.130 56 2.07 6.59 1214.52 8.43 TYPE OF FAILURE 3HEAR 2.5 0.150 57 2.39 6.61 1230.17 8.54 3.3 0.220 40 3.50 6.65 1062.06 7.38 3.4 0.230 30 3.58 6.71 633.94 4.40 4.4 0.230 20 4.62 6.37 35.41 1.36	Strain rate (%)	minj	0.90			·				
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	TIME	DEFLECT	FORCE	% STRAIN	Ac	COMPRES	SIVE STRESS			
0.0 0.000 0 0.00 6.46 0.00 0.00 0.3 0.020 15 0.32 6.48 342.42 2.38 0.5 0.030 21 0.48 6.49 461.75 3.21 1.0 0.060 34 0.95 6.52 757.78 5.26 1.3 0.080 42 1.27 6.54 922.71 6.41 TIME TO FAILURE (min) 2.39 2.2 0.130 56 2.07 6.59 1214.52 8.43 TYPE OF FAILURE (%) 2.39 2.4 0.150 57 2.39 6.61 1230.17 8.54 3.2 0.190 49 3.03 6.66 1062.06 7.38 3.7 0.220 40 3.50 6.69 88.81 5.56 3.8 0.230 36 3.67 6.70 1782.17 5.43 4.4 0.240 33 3.83 6.71 699.35 4.86 4.5 0.270 25 4.39 6.75 515.1 3.69	(min)	nin) (inch) (lbs) 0.0 0.000 0		(in/in)	(in ²)	(psf)	(psi)			
0.3 0.020 15 0.53 0.48 542.42 2.38 0.5 0.030 21 0.48 6.49 461.75 3.21 1.0 0.060 34 0.95 6.52 757.78 5.26 1.13 0.0800 42 1.27 6.54 922.71 6.41 TIME TO FAILURE (min) 2.39 2.2 0.130 56 2.07 6.59 1214.52 8.43 TYPE OF FAILURE 739 2.5 0.150 57 2.39 6.61 1230.17 8.54 2.3 0.170 53 2.71 6.64 1158.87 8.05 3.3 0.230 36 3.67 6.70 782.17 5.43 4.0 0.240 33 3.83 6.71 699.35 4.86 4.42 0.250 30 3.98 6.72 633.94 4.40 4.4 0.270 25 4.30 6.77 334.01 3.01 5.2 0.310 17 4.94 6.79 358.34 2.49	0.0	0.000	0	0.00	6.46	0.00	0.00			
0.3 0.030 21 0.48 0.49 401.75 3.21 1.0 0.060 34 0.95 6.52 757.78 5.26 1.3 0.080 42 1.27 6.54 922.71 6.41 TIME TO FAILURE (min) 2.39 2.2 0.130 56 2.07 6.59 1214.52 8.43 TYPE OF FAILURE (%) 2.39 2.4 0.170 53 2.71 6.64 1158.87 8.05 3.2 0.190 49 3.03 6.66 1062.06 7.38 3.7 0.220 40 3.50 6.69 888.81 5.96 4.4 0.240 33 3.83 6.71 693.394 4.40 4.2 0.250 30 3.98 6.72 633.94 4.40 4.5 0.270 25 4.30 6.75 531.51 3.69 5.7 0.340 14 5.42 6.83 224.81 1.198 6.5 0.390 10 6.22 6.48 211.28 1.477 <tr< td=""><td>0.3</td><td>0.020</td><td>15</td><td>0.32</td><td>6.48</td><td>342.42</td><td>2.38</td><td></td><td></td></tr<>	0.3	0.020	15	0.32	6.48	342.42	2.38			
1.3 0.000 34 0.53 0.52 137.73 2.20 TIME TO FAILURE (min) 2.50 1.3 0.000 42 1.27 6.54 922.71 6.41 STRAIN @ FAILURE (min) 2.39 2.2 0.130 56 2.07 6.59 1214.52 8.43 TYPE OF FAILURE (%) 2.39 2.4 0.170 53 2.71 6.64 1158.87 8.05 3.2 0.150 57 2.39 6.61 1062.06 7.38 3.7 0.220 40 3.50 6.69 858.81 5.56 3.8 0.230 36 3.67 6.70 782.17 5.43 4.0 0.240 33 3.83 6.71 699.35 4.86 4.2 0.250 30 3.98 6.72 633.94 4.40 4.4 0.290 20 4.62 6.77 434.01 3.01 5.2 0.310 17 4.94 6.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89	0.5	0.030	21	0.48	6.49	401./3	5.41			
13 0.000 42 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.001 1.27 0.23 0.101	1.0	0.000	42	1.27	6.54	922.71	6.41	TIME TO FAILURE (min)	2.50	
12 0.1130 56 2.07 6.59 1214.52 8.43 TYPE OF FAILURE SHEAR 2.5 0.150 57 2.39 6.61 1230.17 8.54 2.8 0.170 53 2.71 6.64 1158.87 8.05 3.2 0.190 49 3.03 6.66 1062.06 7.38 3.7 0.720 40 3.50 6.69 858.81 5.56 3.8 0.230 36 3.67 6.70 782.17 5.43 4.0 0.240 33 3.83 6.71 699.35 4.86 4.2 0.250 30 3.98 6.72 633.94 4.40 4.4 0.2700 25 4.83 284.81 1.98 1.47 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.34 166.55 1.16 8.2 0.490 6	1.8	0.110	52	1.75	6.57	1130.82	7.85	STRAIN @ FAILURE (%)	2.39	
2.5 0.150 57 2.39 6.61 1230.17 8.54 2.8 0.170 53 2.71 6.64 1158.87 8.05 3.2 0.190 49 3.03 6.66 1062.06 7.38 3.7 0.220 40 3.50 6.69 858.81 5.96 3.8 0.230 36 3.67 6.70 782.17 5.43 4.0 0.240 33 3.83 6.71 699.35 4.86 4.2 0.250 30 3.98 6.72 633.94 4.40 4.5 0.270 25 4.30 6.75 531.51 3.69 4.8 0.290 20 4.62 6.77 434.01 3.01 5.2 0.310 17 4.94 6.79 358.34 2.49 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 8.8 0.530 5 8.45 7.05 101.49<	2.2	0.130	56	2.07	6.59	1214.52	8.43	TYPE OF FAILURE	SHEAR	
2.8 0.170 53 2.71 6.64 1158.87 8.05 3.2 0.190 49 3.03 6.66 1062.06 7.38 3.7 0.220 40 3.50 6.69 858.81 5.96 3.8 0.230 36 3.67 6.70 782.17 5.43 4.0 0.240 33 3.83 6.71 699.35 4.86 4.2 0.250 30 3.98 6.72 633.94 4.40 4.5 0.270 25 4.30 6.75 531.51 3.69 4.8 0.290 20 4.62 6.77 434.01 3.01 5.7 0.340 14 5.44 6.63 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.54 106.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.8 0.530 5 8.45 7.05 101.49 <td>2.5</td> <td>0.150</td> <td>57</td> <td>2.39</td> <td>6.61</td> <td>1230.17</td> <td>8.54</td> <td></td> <td></td>	2.5	0.150	57	2.39	6.61	1230.17	8.54			
3.2 0.190 49 3.03 6.66 1062.06 7.38 3.7 0.220 40 3.50 6.69 858.81 5.96 3.8 0.230 36 3.67 6.70 782.17 5.43 4.0 0.240 33 3.83 6.71 699.35 4.86 4.2 0.250 30 3.98 6.72 633.94 4.40 4.5 0.270 25 4.30 6.75 531.51 3.69 4.8 0.290 20 4.62 6.77 434.01 3.01 5.7 0.310 17 4.94 6.79 358.34 2.49 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.8 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH <td colsp<="" td=""><td>2.8</td><td>0.170</td><td>53</td><td>2.71</td><td>6.64</td><td>1158.87</td><td>8.05</td><td></td><td></td></td>	<td>2.8</td> <td>0.170</td> <td>53</td> <td>2.71</td> <td>6.64</td> <td>1158.87</td> <td>8.05</td> <td></td> <td></td>	2.8	0.170	53	2.71	6.64	1158.87	8.05		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	3.2	0.190	49	3.03	6.66	1062.06	7.38			
3.8 0.230 36 3.67 6.70 782.17 5.43 FAILURE 4.0 0.240 33 3.83 6.71 699.35 4.86 4.2 0.250 30 3.98 6.72 633.94 4.40 4.5 0.270 25 4.30 6.75 531.51 3.69 4.8 0.290 20 4.62 6.77 434.01 3.01 5.2 0.310 17 4.94 6.79 358.34 2.49 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.8 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH 615.08 4.27 Description UNCONFINED COMPRESSIVE STRENGTH	3.7	0.220	40	3.50	6.69	858.81	5.96		5.	
4.0 0.240 33 3.83 6.71 699.35 4.86 4.2 0.250 30 3.98 6.72 633.94 4.40 4.5 0.270 25 4.30 6.75 531.51 3.69 4.8 0.290 20 4.62 6.77 434.01 3.01 5.1 0.310 17 4.94 6.79 358.34 2.49 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.3 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH 1230.17 8.54 Olive Brown, SILTY CLAY, trace medium to fine sand. 11 UNCONFINED COMPRESSIVE STRENGTH JISCS CH	3.8	0.230	36	3.67	6.70	782.17	5.43	FAILURE		
4.2 0.250 30 3.98 6.72 633.94 4.40 4.5 0.270 25 4.30 6.75 531.51 3.69 4.8 0.290 20 4.62 6.77 434.01 3.01 5.2 0.310 17 4.94 6.79 358.34 2.49 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.8 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH LL OL LL OL UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH OL TECH D	4.0	0.240	33	3.83	6.71	699.35	4.86	SKETCH	7	
4.5 0.270 25 4.30 6.75 531-51 3.09 4.8 0.290 20 4.62 6.77 434.01 3.01 5.2 0.310 17 4.94 6.79 358.34 2.49 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.8 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH LL 61 PL 31 Description Olive Brown, SILTY CLAY, trace medium to fine sand. LL 61 PL 31 PL 31 PL 31 DESCRIPTION LL 61 PL 31 PL	4.2	0.250	30	3.98	6.72	633.94	4.40		-	
4.8 0.290 20 4.02 0.77 0.001 5.01 5.2 0.310 17 4.94 6.79 358.34 2.49 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.3 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH LL 61 Description 0live Brown, SILTY CLAY, trace medium LL 61 PL 31 PL 31 DA DA UNCONFINED COMPRESSIVE STRENGTH LL 61 PL 31 PL 31 PL 31 <td colsp<="" td=""><td>4.5</td><td>0.270</td><td>25</td><td>4.30</td><td>6.77</td><td>434.01</td><td>3.09</td><td></td><td></td></td>	<td>4.5</td> <td>0.270</td> <td>25</td> <td>4.30</td> <td>6.77</td> <td>434.01</td> <td>3.09</td> <td></td> <td></td>	4.5	0.270	25	4.30	6.77	434.01	3.09		
5.2 0.510 17 4.54 6.15 1.98 5.7 0.340 14 5.42 6.83 284.81 1.98 6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.8 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH LL H UNCONFINED COMPRESSIVE STRENGTH LL H UNCONFINED COMPRESSIVE STRENGTH LL H SHEAR STRENGTH LL H J UNCONFINED COMPRESSIVE STRENGTH LL H SHEAR STRENGTH J J J J LL 61 J J <td col<="" td=""><td>4.8</td><td>0.290</td><td>20</td><td>4.04</td><td>6.79</td><td>358.34</td><td>2.49</td><td></td><td></td></td>	<td>4.8</td> <td>0.290</td> <td>20</td> <td>4.04</td> <td>6.79</td> <td>358.34</td> <td>2.49</td> <td></td> <td></td>	4.8	0.290	20	4.04	6.79	358.34	2.49		
6.5 0.390 10 6.22 6.88 211.28 1.47 7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.3 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH LL 61 Description Olive Brown, SILTY CLAY, trace medium to fine sand. LL 61 PL 31 TECH DA UNCONFINED COMPRESSIVE STRENGTH LISCS CH LL 61 PL 31 PL 31 DESCRIPTION OLIVE BROWN, SILTY CLAY, trace medium to fine sand. LL 61 PL 31 PL 31 DATE 57201 CH CH	5.2	0.310	14	5.42	6.83	284.81	1.98			
7.3 0.440 8 7.01 6.94 166.55 1.16 8.2 0.490 6 7.81 7.00 128.73 0.89 8.3 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH 1230.17 8.54 LL 615.08 4.27 Description Olive Brown, SILTY CLAY, trace medium to fine sand. LL 61 UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH 1230.17 8.54 SHEAR STRENGTH 1230.17 LL 61 UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH 1230.17 LL 61 ULC 61 UNCONFINED COMPRESSIVE STRENGTH 1230.17 LL 61 JISCS CH CH	6.5	0.390	10	6.22	6.88	211.28	1.47	1 1 1 1		
8.2 0.490 6 7.81 7.00 128.73 0.89 8.8 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH 1230.17 8.54 LL 61 PL 31 Description Olive Brown, SILTY CLAY, trace medium to fine sand. LL 61 PL 31 PL 31 PI 30 CHECK DA	7.3	0.440	8	7.01	6.94	166.55	1.16			
8.8 0.530 5 8.45 7.05 101.49 0.70 UNCONFINED COMPRESSIVE STRENGTH UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH LL 615.08 TECH Description Olive Brown, SILTY CLAY, trace medium LL TECH DA USCS CH	8.2	0.490	6	7.81	7.00	128.73	0.89		1. A. A.	
UNCONFINED COMPRESSIVE STRENGTH SHEAR STRENGTH 1230.17 8.54 SHEAR STRENGTH 615.08 4.27 Description Olive Brown, SILTY CLAY, trace medium to fine sand. ILL 61 PL 31 PL 31 DATE 5/2/01 CHECK DA	8.8	0.530	5	8.45	7.05	101.49	0.70			
UNCONFINED COMPRESSIVE STRENGTH 1230.17 8.54 SHEAR STRENGTH 615.08 4.27 Description Olive Brown, SILTY CLAY, trace medium to fine sand. IISCS CH CH CHECK DA										
UNCONFINED COMPRESSIVE STRENGTH 1230.17 8.54 SHEAR STRENGTH 615.08 4.27 Description Olive Brown, SILTY CLAY, trace medium to fine sand. UISCS CH CH CHECK DA		L				1000.07		┥ . ┗		
Description Olive Brown, SILTY CLAY, trace medium to fine sand. USCS CH			UNCONFINE	D COMPRESS	IVE STRENGTH	1230.17	8.54	-		
Description Olive Brown, SILTY CLAY, trace medium to fine sand. IISCS CH				SHE	AR STRENGTH	015.08	4.27	_	, 4.	
Description Olive Brown, SILTY CLAY, trace medium to fine sand. PI 30 TECH DA DATE 5201 CHECK DA							1 (1)	7		
PL 31 TECH DA PI 30 DATE 5/2/01 CHECK DA	Description	Olive Brown,	, SILTY CLAY	, trace mediun	0	L		TECH	DA	
PI 30 DATE 5201 CHECK DA		to fine sand.		- -		P	L 31		60.01	
CHECK VA	(control of the second						30	J DATE	5201	
	USCS	б СН						CHECK	JA A	
REVIEW			· ·					REVIEW	pung	



· · · ·	ſ					NE DIME		CONCOLID	ATTON				<u>}</u>
					, i		ASTM I) 2435	ATION		•		
							· · · · · ·					¢	
DDOUROT NA	ME	CENESIS/DI	TIM DOINT	ENEDCV/AD	1	DESCRIPTIO	N	Olive Brown	SIL TY CLAN	/ trace mediu	m to fine cand	. тт	61
PROJECT NA	MC	GENESIS/FI	A13-3205	ENERGI/AR		DISCRITIO		Onve Brown,		, Hace media	in to mic sala.	EL Pl	31
SAMPLE ID	MDEK	R-51	013-3203	-		CLASSIFICA	TION	Сн				PI	30
SAMPLE ID	DTLI		3.0 - 5.0			CONSOLIDO	METER No.					Gs	2,683
SAMPLE TY	PE		UD					L					
							•						
· . · .									· · · · · ·		Sample Data	Initial	Final
Sample Data		Trimmings	Before	After		Diameter (in)			2.500		Total Heights (in)	0.751	0.701
		. –	Test	Test		Height of sam	ple (in)		0.751]	Height of solids (in)	0.358	0.358
Tare plus wet	soil, g	566.05	179.45	179.39		Area of sampl	e (in ²)		4.909	1 A.	Height of voids (in)	0.393	0.343
Tare plus dry	soil, g	417.12	151.85	151.85		Volume of sar	nple (in ³)		3,686]	Height of water (in)	0.343	0.343
Tare, g		0.00	74.55	74.55		Water Content	t (Avg) from	Trimmings	35.7%]	Void ratio	1.096	0.956
Water, g		148.93	27.6	27.54		Sample Wt (w	et, g)		104.9		Degree of saturation	87.4%	100.0%
Dry soil, g		417.12	77.3	77.3		Sample Wt (di	ry, g)		77.3		Dry unit wt (pcf)	79.9	85.6
Water Conten	£ 1	35.7%	35.7%	35.6%	ļ	Water Wt (g)			27.6]	Wet unit wt (pcf)	108.4	116.1
PRESSURE	H100	MACHINE	DIAL	FITTING	SAMPLE	HEIGHT OF	VOID	CHANGE IN	STRAIN	LENGTH	OF DRAINAGE	PERCENT	COEFFICIENT O
(ksf)	DIAL	/ STONE	CHANGE	TIME (sec)	HEIGHT	VOIDS	RATIO	HEIGHT		PATH (DO	UBLE DRAINAGE)	INITIAL	CONSOLIDATION
	READING	CORR.	(in)	t90	(in)	Hv	c	(accum)	%	H (in)	H^2 (cm^2)	COMPRESSION	(ft^2/day)
0.125	0.0012	0.0000	0.0000	-	0.751	0.3927	1.0959	0.0000	0.0	0.000	0.000	a 14 - 14	-
0.125	0.0018	0.0002	0.0004	38	0.751	0.3923	1.0949	0.0004	0.0	0.375	0.909	-	
0.250	0.0026	0.0004	0.0010	24	0.750	0.3917	1.0932	0.0010	0.1	0.375	0.908	1.3	2.9
0.500	0.0058	0.0008	0.0038	178	0.747	0.3889	1.0853	0.0038	0.5	0.374	0.904	44.7	0.4
1.000	0.0102	0.0015	0.0075	54	0.743	0.3851	1.0749	0.0075	1.0	0.373	0.896	50.8	1.3
2.000	0.0193	0.0024	0.0157	38	0.735	0.3770	1.0520	0.0157	2.1	0.370	0.882	45.6	1.8
4.000	0.0397	0.0036	0.0349	38	0.716	0.3578	0.9984	0.0349	4.6	0.363	0.849	43.3	1.7
8.000	0.0649	0.0051	0.0586	29	0.692	0.3341	0.9324	0.0586	7.8	0.352	0.800	59.9	2.1
16.000	0.0936	0.0068	0.0856	153	0.665	0.3071	0.8570	0.0856	11.4	0.339	0.743	44.3	0.4
4.000	0.0926	0.0068	0.0846	-	0.666	0.3081	0.8598	0.0846	11.3	0.333	0.715	-	
1.000	0.0875	0.0020	0.0843	-	0.667	0.3084	0.8608	0.0843	11.2	0.333	0.717	.	-
0.125	0.0797	0.0003	0.0782	-	0.673	0.3145	0.8776	0.0782	10.4	0.335	0.724	-	-
1	1						1. Sec. 1.					-	
										1.1			
										•	.	TECH	DH/PWM
			FINAL DIAL	READING =	0.0500							DATE	5/8/01
		، بالاير					. •					CHECK	A-
												REVIEW	1.m



	۵۶	AST	M GRAI	N SIZE AN	ALYSIS	C 136		
	AC	JIVI D 421 ,	D 4411,	D 1140, C	117, D422	, C 150		
PROJECT THILE	GEN	ESIS/PLUM PC	OINT ENER	GY/AR	SAM	PLE ID	<u>B-54</u>	-
PROJECT NO.		013-3205		4	SAMPL	E TYPE	<u> </u>	D
REMARKS					SAMPLE	DEPTH	7.0 -	10.0'
	•			Hygroscopic	Moisture For	Sieve Samp	le r	
WATER CONTENT	(Delivered N	(Ioisture)				Wet Soil	& Tare (gm)	
Wt Wet Soil & Tare (g	gm)	(w1)	525.30			Dry Soil a	& Tare (gm)	
Wt Dry Soil & Tare (g	gm)	(w2)	399.38			Tare Weig	ght (gm)	
Weight of Tare (gm)		(w3)	114.68	1		Moisture	Content (%)	
Weight of Water (gm)		(w4=w1-w2)	125.92	Total Weight	Of Sample Us	ed For Siev	e Corrected F	or Hygroscopic N
Weight of Dry Soil (gr	n)	(w5=w2-w3)	284.70			Weight O	f Sample (gm	399.38
Moisture Content (%)		(w4/w5)*100	44.23	1		Tare We	ight (gm)	114.68
				1	(W6)	Total Dry	Weight (gm)	284.70
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIE	VE	
0.00		+Tare	(111 1410)	{/ut mt/w6)#1001	(100-%ret)	010		
0.00	12.0"			3(4110040) 1007	(100-70101)	12.0"	cobbles	
	2.0					2.07	course grouel	
	5.0					5.0	coarse gravel	
	2.5					2.5	coarse gravel	
	2.0"					2.0	coarse gravel	
	1.5*					1.5"	coarse gravel	
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1.0"			· · · ·		1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"					0.50*	fine gravel	
	0.375"					0.375"	fine gravel	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
· · · · · · · · · · · · · · · · · · ·	#10	0.20	0.20	0.07	99.93	#10	medium sand	
	#20	0.29	0.29	0.10	99.90	#20	medium sand	
	#40	1.17	1.17	0.41	99.59	#40	fine sand	
н. - С. С. С. С. С. С. С. С. С. С. С. С. С.	#60	2.60	2.60	0.91	99.09	#60	fine sand	
	#100	4.18	4.18	1.47	98.53	#100	fine sand	
	#200	5.62	5.62	1.97	98.03	#200	fines	
· ·	PAN					PAN		
% COBBLES	0.00			· · · · · · · · · · · · · · · · · · ·				
% C GRAVEL	0.00	Descri	iptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	74
% C SAND	0.07	little	5 to 12%	< 10%	fine (c-m)		PL	26
% M SAND	0.34	some	12 to 30%	< 10%	coarse (m-f)		PI	48
% F SAND	1.56	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	-
% FINES	08.03		20 10 20 /0	< 10%	coarse and me	dium (f)		
% TOTAT	100.00	-		> 10%	equal amounte	each (c-f)		
N TOTAL	100.00			- 10/0	adaan annoning			
DEC	COTOTION	Brown CIT T	VCLAV	ce coarce to f-	e cond			
DES	CRIFTION	BIUWII, SILI	i CLAI, (M		o Jaina,			-
	TIOOO	CU				l	TECH	CW
	0505						DATE	5/7/01
							CHECK	16
							REVIEW	m
· · · · · · · · · · · · · · · · · · ·							ALC T LL IT	1 wry

(Alterna

							-)						
						A	FLEXIE AETHOD I	BLE WALL ASTM 1 D, CONSTA	PERMEAI D 5084 NT RATE	BILITY OF FLOW			•	FLO	W PUMP
PROJECT TI PROJECT N SAMPLE ID SAMPLE TY	ITLE UMBER PE	GENESIS 013-3205 B-54 UD	/PLUM POI	nt energ	Y/AR	Flow F	BOARD (CELL) CELL (Cump Speed Technician	# 2 # 2 d 8 a PWM] c	OMMENTS]
Sample Data, Height, inche	, Initial	6.190	B-Value, f	1.00	1	Sample Da Height, in	ata, Final ches	6.139	1				Trimmings	Sample	
Diameter, inc	ches	2.858	Cell Pres.	85.0	1 .	Diameter.	inches	2.824	1	WATER (ONTENT	2	Initial	Final	
Area, cm ³		41.39	Bot. Pres.	80.0	· · .	Area. cm ³	•	40.41		Wt Soil &	Tare. i	g .	1109.27	1208.36	ר
Volume, cm ³		650.74	Top Pres.	80.0	1	Volume, c	m ³	630.11	1	Wt Soil &	Tare, f	g	747.93	856.35	1
Mass, g		1109.27	Tot. B.P.	80.0	1	Mass, g		1099.96	1	Wt Tare	• -	g	0.00	108.47	1
Moisture Con	ntent, %	48.31	Head, max.	208.21	1	Moisture	Content, %	47.07	1	Wt Moistu	re Lost	g	361.34	352.01	1
Dry Density,	pcf	71.72	Head, min.	208.21	1	Dry Densi	ty, pcf	74.07	1	Wt Dry So	dl .	g	747.93	747.88	1
Spec. Gravity	y .	2.688	Max. Grad.	13.35	1	Volume Se	dids, cm ³	278.25		Water Con	itent	%	48.31%	47.07%	1
Volume Solid	ls, cm ³	278.25	Min. Grad.	13.35		Volume V	oids, cm ³	351.87]						-
Volume Void	s, cm ³	372.49]			Void Ratio		1.26							
Void Ratio		1.34				Saturation	, %	100.0%		DESCRIP	TION				
Saturation, %	6	97.0%							- 	Brown, SI	LTY CLAY	, trace coar	se to fine sand.] .
		Flow Pum	p Rate	1.40E-04	cm ³ /sec	an Ali	USCS	СН]				-		
			TIM	R FUNCTIO	ONS SECO	NDS			ap.		I I I I I I I I I I I I I I I I I I I	1			
	DATE	DAY	HOUR	MIN	TEMP	At	dt acc	1 1	dt over	Reading	Head	Gradient	Dermashility		
					CO	(min)	(min)	(sec)	(500)	(nei)	(cm)		(cm/cac)		
	5/14/01	37025	16	15	20.7	0	0	0	0	2.96	208.21	13.35	2.68.07	4	
	5/14/01	37025	16	20	20.7	5	5	300	300	2.96	208.21	13.35	2.6E-07		
	5/14/01	37025	16	25	20.7	5	10	300	600	2.96	208.21	13.35	2.68-07		
	5/14/01	37025	16	30	20.7	5	15	300	900	2.96	208.21	13.35	2.6E-07 *		
	5/14/01	37025	16	35	20.7	5	20	300	1200	2.96	208.21	13.35	2.6E-07 *		
	5/14/01	37025	16	40	20.7	5	25	300	1500	2.96	208.21	13.35	2.6E-07 *		
	5/14/01	37025	16	45	20.7	5	30	300	1800	2.96	208.21	13.35	2.6E-07 *		
	*TRANSC	RIBED FR	OM ORIGIN	AL DATA	SHEETS	· · · · · · · · · · · · · · · · · · ·				PER	MEABIL	Y REPOR	TED AS ** 2.6E-07 cm/sec **		
														DATE	5/14/01
										•				CHECK	114
														REVIEW	PWA







TRIAXIAL COMPRESSION TEST

)		TR	IAXIAL CO	MPRESSIO	N TEST (AS	TM D-4767	SOL	DATED UN	DRAINED	WITH POR	E PRESSU	RE			
PROJ	ECT TITL	E	GENES	IS/PLUM P	OINT ENER	GY/AR	INITIAL S	AMPLE DA	ТА	cm	in	corrected		CORRECT	ED SAMPL	E DATA	
PROJ	ECT NUM	BER		013-	-3205		HEIGHT			15.664	6.167	5.992		DRY DEN	SITY, calc (pcf)	84.0
SAM	PLE ID		B-	54	-	•	DIAMETE	R		7.234	2.848	2.716		VOLUME	OF SOLIDS		284.96
SAM	PLE TYPE			U	ID		AREA			41.10	6.37	5.79		VOLUME	of voids		283.83
DEPI	TH INTERV	AL		7.0 -	10.0'		VOLUME			643.79	39.29	34.71	VOID RATIO				0.996
MAC	HINE SPEI	ED (in/min)	0.00012				WEIGHT (g) (1116.04		1056.04					
STR/	IN RATE ((%/min)	0.00				% MOISTU	JRE	17	45.7		37.87					
CELI	PRESSUR	E (psi)	109.6				SPECIFIC	GRAVITY		2.69				WATER C	ONTENT (9	6 MOISTUR	(E)
SAM	PLE PRESS	SURE (psi)	70.0				MOIST DE	NSITY (pcf)		108.2				WT SOIL	& TARE, M	OIST (g)	1056.04
EFF.	CONSOLI	DATION					DRY DEN	SITY, calc (xf)	74.2				WT SOIL	& TARE, DI	RY (g)	765.97
PRES	SURE, 03	(psi)	39.6				VOLUME	OF SOLIDS		284.96				WT TARE	(g)		0.00
PRE	SURE, 03	(psf)	5702.4				VOLUME	of voids		358.83				WT MOIS	FURE (g)		290.07
FINA	L "B" VAI	LUE	1.00				VOID RAT	10		1.259				WT DRY S	SOIL (g)		765.97
t ₅₀ (11	nimutes)		124				SATURAT	ION		97.6				% MOIST	URE		37.87
		ACCUM.	AXIAL	PORE	PWP change	e		CORR.	CORR.	DEV.	SIGMA 1	SIGMA 1	SIGMA 3	EFF.PRN	$(a_1' + a_1')$	$(\sigma_1 - \sigma_2)$	•
-	TIME	DEFLECT.	LOAD	PRESS.	DU (pst)	% STRAIN	(1-e)	AREA	HEIGHT	STRESS	devstr+cp	EFF.	EFF.	STR RATIO	(D)		
ļ	(MIN)	(inches)	(lbs)	(psi)=U	(300)	(%)	1.00	(in 2) 5 70	(in) 5 992	(psi)	5702 A	(01-00) 5702 4	5702.4		5702.4	0.0	0.00
	0.0	0.000	48	73.2	331.2	0.05	1.00	5.80	5.989	571.5	6273.9	5942.7	5371.2	1.11	5656.9	285.7	0.58
1	50.0	0.006	74	75.4	648.0	0,10	1.00	5.80	5.986	1216.9	6919.3	6271.3	5054.4	1.24	5662.8	608.4	0.53
	75.0	0.009	84	76.3	777.6	0.15	1.00	5.80	5.983	1464.5	7166.9	6389.3	4924.8	, 1.30	5657.0	732.2	0.53
	100.0	0.012	94	76.8	849.6	0.20	1.00	5.80	5.980	1711.8	7414.2	6564.6	4852.8	1.35	5708.7	855.9	0.50
	125.0	0.015	97	77,4	936.0	0.25	1.00	5,81	5.977	1785.4	7487.8	6551.8	4700.4	1.37	5039.1	892.7	0.52
	250.0	0.030	119	80.1	1324.8	0.50	0.99	5.82	5.962	2325.0	8415.9	6788.7	4075.2	1.55	5431.9	1356.7	0.60
	383.3 625.0	0.040	155	85.0	2030.4	1.25	0.99	5.87	5.917	3117.6	8820.0	6789.6	3672.0	1.85	5230.8	1558.8	0.65
	833.3	0.100	164	86.8	2289.6	1.67	0.98	5.89	5.892	3397.7	9100.1	6810.5	3412.8	2.00	5111.7	1698.9	0.67
	1141.7	0.137	177	88.2	2491.2	2.29	0.98	5.93	5.855	3692.2	9394.6	6903.4	3211.2	2.15	5057.3	1846.1	0.67
	1250.0	0.150	181	88.8	2577.6	2.50	0.97	5.94	5.842	3780.9	9483.3	6905.7	3124.8	2.21	5015.3	1890.5	0.68
	1541.7	0.185	189	91.0	2894.4	3.09	0.97	5.98	5.807	3951.0	9653.4	6759.0	2808.0	2.41	4783.5	1975.5	0.73
	2475.0	0.297	202	91.0	2894.4	4.90	0.95	6.09	5.677	4168.7	9884.3	6800 3	2808.0	2.53	4806.0	2091.0	0.72
1	2623.0	0.315	202	91.0	3024.0	5.84	0.94	6.15	5.642	4189.8	9892.2	6868.2	2678.4	2.56	4773.3	2094.9	0.72
	3133.3	0.376	204	91.8	3009.6	6.28	0.94	6.18	5.616	4170.5	9872.9	6863.3	2692.8	2.55	4778.1	2085.3	0.72
	3983.3	0.478	195	91.0	2894.4	7.98	0.92	6.29	5.514	3888.9	9591.3	6696.9	2808.0	2.38	4752.4	1944.4	0.74
	4383.3	0.526	177	91.0	2894.4	8.78	0.91	6.35	5.466	3446.9	9149.3	6254.9	2808.0	2.23	4531.4	1723.4	0.84
1	4600.0	0.552	170	91.0	2894.4	9.21	0.91	6.38	5.440	3272.5	8974.9	6080.5	2808.0	2.17	4444.2	1636.2	0.88
	5475.0	0.657	157	89.9	2736.0	10.96	0.89	6.51	5.335	2921.0	8624.0	5888.0 7136.4	2900.4	1.98	4421.2 5764.2	1372.2	0.94
	5833.3	0.700	150	80.0	1510.4	11.08	0.00	0.20	3.292	2/777.7	0110.0	/150.4	4392.0	1.02	5704.2	1.372.2	0.40
											1		1 - A - A				-
							1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	1			1						
										1	- P						
			1	1				1		1.1	- · · ·		1. A.	1.1			
						1.0											
		1	1. State 1.				$(1,1) \in \mathbb{R}^{n}$									-	
			DU			7		DEVIATO	RIC STRES	S	1	EFFECTIV	E PRINCI	LE STRESS		TECH	DA/PWM
			@ FAILUI	RE	3024.0			@ FAILUR	<u>10</u>	4189.8		KATIO @ I	FAILURE	2.56		DATE	5/15/01
															(CHECKED	<u> </u>
						. 1 									R	EVIEWED	PENM





	A	AS ASTM D 42	51M GRA 21, D 2217	IN SIZE A 7, D 1140, C	INALYSIS C 117, D 4	5 22, C 13	6	
PROJECT TITLE [GENE	SIS/PLUM PC	DINT ENER	GY/AR	SA	MPLEID	B-55	-
ROJECT NO.	0	013-3205		[SAM	PLE TYPE	U	D
REMARKS					SAMPI	E DEPTH	3.0 -	5.0'
1	· · · · · · · · · · · · · · · · · · ·			Hygroscopic I	Moisture For	Sieve Sample		
WATER CONTENT	(Delivered M	loisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (g	gm)	(w1)	590.01	1		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (g	m)	(w2)	445.76]		Tare Weigh	nt (gm)	
Weight of Tare (gm)		(w3)	0.00			Moisture C	lontent (%)	
Weight of Water (gm)		(w4=w1-w2)	144.25	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	ygroscopic Mo
Weight of Dry Soil (gr	n)	(w5 = w2 - w3)	445.76 、	1. A.		Weight Of	Sample (gm)	326.44
Moisture Content (%)		(w4/w5)*100	32.36	1		Tare Weig	tht (gm)	43.02
		•			(W6)	Total Dry	Weight (gm)	283.42
SIEVE ANALYSIS		Wt Ret	(Wt-Tare)	Cumulative	% PASS	SIEV	F	
0.00		+Tare	({(wt ret/w6)*100}	(100-%ret)			
0.00	12.0"				(100 //10)	12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
•	1.5"					1.5"	coarse gravel	
	1.0					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.75					0.75	fine gravel	
	0.30					0.375"	fine gravel	
х., . , . , . , ,	0. <i>575</i> #A	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.06	0.06	0.02	99.98	#20	medium sand	
	#40	0.18	0.00	0.06	99.94	#40	fine sand	
	#60	0.27	0.27	0.10	99.90	#60	fine sand	· _
	#100	0.58	0.58	0.20	99.80	#100	fine sand	
	#200	17.94	17 94	6 33	93.67	#200	fines	
	PAN	17.34		0.55		PAN		
% COBBLES	0.00	1						<u> </u>
% C GRAVEL	0.00	Descri	intive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	m (m)	LL	33
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	23
% M SAND	0.06	some	12 to 30%	< 10%	coarse (m-f)		PI	10
% F SAND	6.27	and	30 to 50%	< 10%	coarse and fir	e (m)	Gs	2.675
% FINES	93.67	1		< 10%	coarse and me	dium (f)		
% TOTAL	100.00	1		> 10%	equal amount	s each (c-f)		
DES	CRIPTION	Olive Brown,	SILTY CLA	Y, some fine sa	nd.			
								DUTO
	USCS	CL					TECH	DA/JC
							DATE	5/1/01
. •							CHECK	the second

					-		-	0								
							FLEXI	BLE WALL ASTM 1	PERMEA	BILITY				•	FLOW	V PUMP #
							METHOD I	D, CONSTA	NT RATE	OF FLOW					4 	
PROJECT TITL	E	GENESIS	PLUM POI	NT ENERG	Y/AR]	BOARD	10] c	OMMENTS						1
PROJECT NUM	BER	013-3205					CELL	/ 10 .]							
SAMPLE ID		B-55	•	<u> </u>	3.0 -5.0	Flow 1	Pump Speed	d 8								l .
SAMPLE TYPE		UD				J	Technician	n KBG]							
				<u> </u>				- 1								
Sample Data, In	tiel		-		•	Sample D	ata, Final		_							
Height, inches		2.967	B-Value, f	1.00	1	Height, in	ches	2.969					Trimmings		Sample	
Diameter, inches		2.860	Cell Pres.	85.0		Diameter,	inches	2.767		WATER C	ONTENT	S	Initial		Final	
Area, cm ²		41.45	Bot. Pres.	80.0	· .	Area, cm ²		38.79		Wt Soil &	Tare, i	g	590.01		616.98	
Volume, cm'		312.35	Top Pres.	80.0		Volume, c	m ³	292.56		Wt Soil &	Tare, f	g	445.76		497.34	
Mass, g		590.01	Tot. B.P.	80.0	1	Mass, g		565.46		Wt Tare		g	0.00		51.78	
Moisture Conten	t, %	32.36	Head, max.	66.82	4	Moisture	Content, %	26.85	· · .	Wt Moistu	re Lost	g	144.25		119.64	
Dry Density, pcf		89.05	Head, min.	66.82		Dry Densi	ty, pcf	95.08		Wt Dry So	41	g ·	445.76		445.56	
Spec. Gravity	.	2,675	Max. Grad.	. 8.86		Volume Se	olids, cm [°]	166.64		Water Con	itent	%	32.36%		26.85%	
Volume Solids, c	m, i	166.64	Min. Grad.	8.86		Volume V	olds, cm ³	125.92								•
Volume Volds, c	ш,	145.71	1			Void Ratio	D	0.76								
Void Ratio		0.87				Saturation	, %	95.1%] .	DESCRIPT	FION					
Saturation, %		99.0%]							Olive Brow	n, SILTY	CLAY, trace	e fine sand.			
		Flow Pum	p Rate	1.40E-04	cm ³ /sec		USCS	CL								
			TIM	E FUNCTIO	ONS, SECO	NDS			dP	1		T	1			
	DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt.acc	Reading	Head	Gradient	Permeability			
					ന	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)			
	5/3/01	37014	9	10	19.5	0	0	0	0	0.95	66.82	8.86	4 1E-07			
	5/3/01	37014	9	15	19.5	5	5	300	300	0.95	66.82	8.86	4 1F-07			
	5/3/01	37014	9	20	19.5	5	10	300	600	0.95	66 82	8 94	4 1E-07			
	/3/01	37014	9	25	19.5	5	15	300	900	0.05	66 92	9.00	4.12-07			
	/3/01	37014	9	30	19.5	5	20	300	1200	0.95	66 97	0.00	4.1E-0/			÷
	/3/01	37014	9	35	19.5	5	25	300	1500	0.55	66.92	0.00	4.18-0/			
	/3/01	37014	9	40	19.5		30	300	1200	0.95	66.00	0.80	4.1E-07			
	RANSCH	IBED FR	OM ORIGIN	AL DATA	SHEETS				1000	0.75	00.82	05.60	4.1E-07			
										FER	TRADIL	I I KEPUR	1ED AS ** 4.1E-07 cm	n/sec ++	ъГ	
															DATE	5/3/01
															CHECK	7) 1

REVIEW P



DESCRIPTION	LL	PL	PI	SAMPLE ID
Olive Brown, SILTY CLAY, trace fine	33	23	10	B - 55
sand.				
	SAMPI	LE TYPE	UD	3.0 - 5.0'
USCS CL				

NOTE: Sample very soft, slumps under its' own weight.

SAMPLE DATA

Wet Density (pcf) Dry Density (pcf) Moisture Content

2	
118.1	
89.2	
32.4%	

ł

TIME TO FAILURE (min) STRAIN @ FAILURE (%) TYPE OF FAILURE

14.2	÷
14.9	
SHEAR	

UNCONFINED COMPRESSIVE STRENGTH (psf)	734.3
SHEAR STRENGTH (psf)	367.1

013-3205 GENESIS/PLUM POINT ENERGY/AR CHECK <u>J 4</u> REVIEW FW M

MAY 2001

GENESIS/PLUM POINT ENERGY/AR SUMMARY OF SOIL DATA

		-	Soil	Natural	-	Atte	rberg			Grain Size Distribution	1	Comp	action					Additional
Sample Identification	Sample Type	Sample Depth	Classi- fication	Moisture %		L	mits		% Finer No. 4	% Finer No. 200	% Finer .005	Maximum Dry Density	Optimum Moisture		Unit W Moisture	/eight Dry	Permeability (cm/sec)	Tests Conducted
					L.L.	P.L.	P.I.	L.I.	Sieve	Sieve	mm	(lb/cuft)	%	Gs	%	(lb/cuft)		(See Notes)
B-30	Bag	4.0-5.0'	(SM)	10.1	-	-	-	-	100.0	13.7	-	-	-	-	-	-	-	-
B-31	Bag	9.0-10.0'	CL	25.2	33	19	14	0.46	100.0	68.1	•	- .	-	· · • • · · · ·	-	-		
B-37	Bag	14.0-15.0'	(SM)	21.8	-	-	-	-	100.0	25.1	-	· _	-	-	-	-	-	•
B-38	Bag	4.0-5.0'	СН	38.0	80	28	52	0.19	100.0	96.8		-	-	-	-	-	-	-
B-40	Bag	4.0-15.0'	(SM)	17.9	-		-	-	100.0	12.9	7.4	-	-	-	-	-	-	
B-42	Bag	9.0-10.0'	(CL)	20.5	-	-	-	-	100.0	56.7	-	-	-	- A	-	-	-	
B-45	Bag	9.0-10.0'	(CL)	33.2	•	-		-	100.0	97.2	•	-	-				•	•
B-45	Bag	20.0-30.0'	(SM)	20.1		•	-	-	100.0	32.2		-	-	-	-	· -	-	
B-50	Bag	9.0-10.0'	(SP)	13.3	-	· -	-	-	100.0	4.2		-	-	-	-	-	-	-
B-54	Bag	4.0-5.0'	CL	33.6	38	23	15	0.69	100.0	97.1	-	-	-	-			· _	-
B-54	Bag	25.0-30.0'	(SM)	24.5	•	-		-	100.0	27.1					-		-	
B-55	Bag	19.0-30.0'	СН	47.6	56	28	28	0.71	100.0	88.1	-	-	-	-	-	-		-
B-56	Bag	9.0-20.0'	SC	33.9	32	23	9	1.18	100.0	15.2	7.2	-	-	-	-	-	_	-

ABBREVIATIONS: LIQUID LIMIT (LL)

PLASTIC LIMIT (PL) PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SPECIFIC GRAVITY (Gs) MOISTURE (Mc) NOTES: T = TRIAXIAL TEST

U = UNCONFINED COMPRESSION TEST

- C = CONSOLIDATION TEST
- DS = DIRECT SHEAR TEST
- 0 = ORGANIC CONTENT

P = pH



ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

9

'ROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-30	-
PROJECT NO.		013-3205		1 .	SAMP	LE TYPE	B	ag
REMARKS					SAMPL	E DEPTH	4.0	- 5.0'
				Hygroscopic I	Moisture For S	Sieve Sample		
WATER CONTENT	(Delivered M	loisture)		1		Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (g	m)	(w1)	417.81	. · ·		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (g	m)	(w2)	387.27	1		Tare Weigh	t (gm)	
Weight of Tare (gm)		(w3)[85.56			Moisture Co	ontent (%)	
Weight of Water (gm)		(w4=w1-w2)	30.54	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	lygroscopic Mo
Weight of Dry Soil (gn	n)	(w5=w2-w3)	301.71 `			Weight Of S	Sample (gm)	387.27
Moisture Content (%)		(w4/w5)*100	10.12			Tare Weigl	ht (gm)	85.56
	<u> </u>	•			(W6)	Total Dry V	Veight (gm)	301.71
· · · · · · · · · · · · · · · · · · ·		· · · ·						
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVI	E j	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	•
	0.50"					0.50"	fine gravel	•
	0.375"					0.375"	fine gravel	
	#4			1		#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	2.84	2.84	0.94	99.06	#20	medium sand	an an Ar An Ar
	#40	47.85	47.85	15.86	84.14	#40	fine sand	
	#60	154.85	154.85	51.32	48.68	#60	fine sand	
	#100	193.10	193.10	64.00	36.00	#100	fine sand	
•	#200	260.47	260.47	86.33	13.67	#200	fines	
	PAN	L				PAN		
% COBBLES	0.00	Т	•					
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediur	n (m)	LL	-
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	-
% M SAND	15.86	some	12 to 30%	< 10%	coarse (m-f)		PI	-
% F SAND	70.47	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	
% FINES	13.67	-		< 10%	coarse and me	dium (f)		
% TOTAL	100.00	-1		> 10%	equal amounts	each (c-f)		
	100.00					57 - 77		
DFC	CRIPTION	Brown MEDI	UM TO FIN	E SAND. some	clavey			
DE-S		silt.		00110				
· .		Jan.						
	USCS	(SM)				I	TECH	JC/TJ
							DATE	5/1/01
							CHECK	14
							REVIEW	1 un



Golder Associates Inc.



į

ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

.

FERTIN

PROJECT TITLE	GEN	ESIS/PLUM PO	DINT ENER	GY/AR	SA	MPLE ID	B-31	-
PROJECT NO.		013-3205			SAMP	PLE TYPE	I	lag
REMARKS					SAMPL	E DEPTH	9.0	10.0'
				Hygroscopic	Moisture For S	Sieve Sample) .	
WATER CONTENT (E	elivered N	loisture)				Wet Soil &	: Tare (gm)	
Wt Wet Soil & Tare (gm	i)	(w1)	363.87			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gm)	(w2)	307.63	ļ		Tare Weigl	ht (gm)	
Weight of Tare (gm)		(w3)	84.48	-		Moisture C	Content (%)	
Weight of Water (gm)		(w4 = w1 - w2)	56.24	Total Weight	Of Sample Us	ed For Sieve	Corrected For I	lygroscopic Moistu
Weight of Dry Soil (gm)		(w5 = w2 - w3)	223.15	_		Weight Of	Sample (gm)	307.63
Moisture Content (%)		(w4/w5)*100	25.20			Tare Weig	tht (gm)	84.48
					(₩6)	Total Dry	Weight (gm)	223.15
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E	
0.00		+Tare	1	{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"			l		3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	•
	1.0"					1.0"	coarse gravel	
	0.75"		·····			0.75"	fine gravel	
	0.50"			1		0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
	#4			· · · · ·		#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.52	0.52	0.23	99.77	#20	medium sand	
	#40	2.59	2.59	1.16	98.84	#40	fine sand	
	#60	7.77	7.77	3.48	96.52	#60	fine sand	
	#100	31.80	31.80	14.25	85.75	#100	fine sand	
	#200	71.09	71.09	31.86	68.14	#200	fines	
	PAN					PAN		
% COBBLES	0.00							· · ·
% C GRAVEL	0.00	Descri	ptive Terms	> 10% 1	nostly coarse ((c)		· · · · ·
% F GRAVEL	0.00	trace	0 to 5%	> 10% 1	nostly medium	1 (m)	LL	33
% C SAND	0.00	little	5 to 12%	< 10% 1	ine (c-m)		PL	19
% M SAND	1.16	some	12 to 30%	< 10% (coarse (m-f)		PI	14
% F SAND	30.70	and	30 to 50%	< 10% a	coarse and fine	(m)	Gs	-
% FINES	68.14			< 10% (coarse and med	lium (f)		
% TOTAL	100.00	1		> 10% e	equal amounts	each (c-f)		
DESCH	RIPTION	Brown, SILTY	CLAY, and	fine sand.				
	USCS	CL					TECH	JC/TJ
							DATE	5/1/01
						· ·	CHECK	Hm
							REVIEW	Twn



		ASTM D 42	1, D 2217	, D 1140, C	C 117, D 4	22, C 13	5	Manufati da serie de la composició de la composició de la composició de la composició de la composició de la co
ROJECT TITLE	GENI	SIS/PLUM PC	INT ENER	GY/AR	SA	MPLEID	B-37	I _
PROJECT NO.		013-3205			SAM	DI F TVPE	F	1 tog
REMARKS					SAMPI	FDEPTH	14.0	- 15 0'
•				Hygroscopic I	Moisture For	Sieve Sample		- 15.0
WATER CONTENT	Delivered M	foisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (g	m)	(w1)	347.73	· ·		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (g	m)	(w2)	300.92			Tare Weigh	nt (gm)	
Weight of Tare (gm)		(w3)	85.93			Moisture C	ontent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	46.81	Total Weight	Of Sample Us	ed For Sieve	Corrected For 1	Hygroscopic M
Weight of Dry Soil (gn	1)	(w5=w2-w3)	214.99		•	Weight Of	Sample (gm)	300.92
Moisture Content (%)		(w4/w5)*100	21.77	1		Tare Weig	ht (gm)	85.93
					(W6)	Total Dry	Weight (gm)	214.99
		,						
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"			· · · · · ·		2.0"	coarse gravel	
4	1.5"					1.5"	coarse gravel	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
	1.0"					1.0"	coarse gravel	
·	0.75"					0.75"	rine gravel	•
1	0.20"					0.50"	rine gravel	
	U.5/5"					0.375"	nne gravel	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#20	0.06	0.00	0.00	00.07	#20	medium sand	
	#40	0.28	0.28	0.13	99.87	#40	fine sand	
	#60	0.93	0.93	0.43	99.57	#60	fine sand	
	#100	55.91	55.91	26.01	73.99	#100	fine sand	
	#200	160.98	160.98	74.88	25.12	#200	fines	
	PAN					PAN		
% COBBLES	0.00							
% C GRAVEL	0.00	Descrip	ptive Terms	> 10% r	nostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10% r	nostly mediur	n (m)	LL	-
% C SAND	0.00	little	5 to 12%	< 10% f	ine (c-m)		PL	-
% M SAND	0.13	some	12 to 30%	< 10% c	oarse (m-f)		PI	•
% F SAND	74.75	and	30 to 50%	< 10% c	oarse and fin	e (m)	Gs	-
% FINES	25.12			< 10% c	oarse and me	dium (f)		
% TOTAL	100.00	:		> 10% e	equal amounts	each (c-f)		
DESC	CRIPTION	Brown, FINE	SAND, and c	layey silt.				
	USCS	(SM)					TECH	JC/TJ
							DATE	5/1/01
							CHECK	1h~
							DEVIEW	N.

1




		AS ASTM D 42	STM GRA	AIN SIZE A 7, D 1140, 0	NALYSIS C 117, D 4	5 22, C 13	б		
NO IE OT THE P	ſ								
RUJEUT ITILE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-38		
PROJECT NO.		013-3205		l	SAME	LE TYPE	E	Bag	
KEWIAKNS	L				SAMPL	E DEPTH	4.0	- 5.0'	
STATED CONFERENT		A - P -4		Hygroscopic	Moisture For S	Sieve Sample	-	·	
WAIER CONTENT	(Delivered)	Moisture)		4		Wet Soil &	Tare (gm)		
Wt wet Soll & Tare (gm)	(w1)	254.69	4		Dry Soil &	Tare (gm)		
Weight of True (ma)	gm)	(w2)	207.91	4		Tare Weigh	ht (gm)		
Weight of Tare (gm)	· .	(W3)	84.93			Moisture C	Content (%)		
weight of Water (gm)		(w4 = w1 - w2)	46.78	Total Weight	Of Sample Us	ed For Sieve	Corrected For 1	Hygroscopic Moi	sture
weight of Dry Soil (g	m)	(wo=w2-w3)	122.98			Weight Of	Sample (gm)	207.91	
Moisture Content (%)		(w4/w5)*100[38.04			Tare Weig	ht (gm)	84.93	
				L.:	(W6)	Total Dry	Weight (gm)	122.98	
STEVE ANALVER				Cumulating					
Tare Weight		We Det	(We Tree)		0 D400	01777	F	-	
	1	WI Kei	(wt-fare)	(%Retained)	% PASS	SIEV	E .		1
0.00	12.07	+ I are		{(wt ret/w6)*100}	(100-%ret)				
	12.0					12.0"	cobbles		
	3.0"					3.0"	coarse gravel		
	2.5					2.5"	coarse gravel		
	2.0"					2.0"	coarse gravel		
	1.5"					1.5"	coarse gravel		
	1.0"					1.0"	coarse gravel		
	0.75"	· · ·				0.75"	fine gravel	•	
	0.50*					0.50"	fine gravel		
1	0.375"			· · · · · · · · · · · · · · · · · · ·		0.375"	fine gravel		ľ
	#4	`		·		#4	coarse sand		
	#10	0.00	0.00	0.00	100.00	#10	medium sand		
	#20	0.16	0.16	0.13	99.87	#20	medium sand		
	#40	0.64	0.64	0.52	99.48	#40	fine sand		
	#60	1.41	1.41	1.15	98.85	#60	fine sand		
	#100	2.53	2.53	2.06	97.94	#100	fine sand		
	#200	3.97	3.97	3.23	96.77	#200	fines		
	PAN	- -				PAN			
% COBBLES	0.00	-							
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)			
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediun	n (m)	LL	80	
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	28	
% M SAND	0.52	some	12 to 30%	< 10%	coarse (m-f)		PI	52	
% F SAND	2.71	and	30 to 50%	< 10%	coarse and fine	e (m)	Gs	<u> </u>	
% FINES	96.77			< 10%	coarse and me	dium (f)			
% TOTAL	100.00			> 10%	equal amounts	each (c-f)			

DESCRIPTION Brown, SILTY CLAY, trace medium to fine sand.

CH JC/TJ USCS TECH 5/1/01 DATE Han CHECK REVIEW ins



÷.

				TA CDA	IN SIZE ANAT	Vore				
		A	STM C11	7, C136,	D421, D422, D1	140 and D221	7			
OJECT TITLE	GENESIS/PI	UM POINT E	NERGY/AR			SAMPLE ID		B-40	-	
OJECT NO.	013	-3205				SAMPLE TYP	E	B	a <i>d</i>	
1			1 - 4 			SAMPLE DEF	TH	4.0 -	15.0'	
AS RECEIVED	WATER C	ONTENT		Hygrose	onic Moisture	Wet Soil & Tare (a	m)	48.67		
Tare No.	•		-	For Siev	e Sample	Dry Soil & Tare (g	m)	48.49		
Wt. Wet Soil & Tare (g	m)	(WI)	225.30			Tare Weight (om)		7.22		
Wt. Dry Soil & Tare (g	(m)	(W2)	198.85			Moisture Content (%)	0.44		
Weight of Tare (gm)		(W3)	51.24	Total We	ight of Sample Used	For Sieve Analy	sis Corrected	d For Hygro	scopic Moist	ure
Weight of Water (gm)		(W4=W1-W2)	26.45		Weight + Tare, Befor	e Separating On The	#4 Sieve (gm)	439.51	-	
Weight of Dry Soil (gm) :	(W5=W2-W3)	147.61			Ta	re Weight (gm)	113.68		
Moisture Content (%)		(W4/W5)*100	17.92	•		То	al Weight (gm)	324.42	(₩6)	
Plus #4 Materia	al Sieve	7		(Wt+Tare)	(((Wt-Tare)/W6)*100)	%PASSING	-			
TARE WEIGHT	0.00		12.0"				12.0"	cobbles		
		-	3.0"				3.0"	coarse gravel		
			2.5"				2.5"	coarse gravel		
			2.0"				2.0"	coarse gravel		
			1.5"			L	1.5"	coarse gravel		
			1.0"				1.0"	coarse gravel		
			0.75"				0.75"	fine gravel		
			0.50"				0.50"	fine gravel		
			0.375"			· · · · · · · · · · · · · · · · · · ·	0.375"	fine gravel		
		1	#4			L	# 4	coarse sand		
Specific Gravity Specific Gravity nount Dispersing Age the Dispersion Device	(assumed) (tested) ent (ml)	2.650 125.00 Mechanical			Weight of Sample Wet Calculated Dry Wt. use Hydrometer Bulb Numi	or Dry (gm) d in test (gm) per	54.61 54.37 624378			
Length of Dispersion Pe	riod	1 Minute			% Pass #4 Sieve For W	hole Sample	100.00	L		
TARE WEIGHT	0.00	HYDROM	STER BAC	KSIEVE (I	Percent Passing #1	0 - #200 Sieves)			
	· ·			AUt + Tore)	Cumui Wi.	& PASSING				
			#10	0.00	0.00	100.0	#10	medium sand		
			#20	0.09	0.09	99.8	#20	medium sand		
			#40	3.03	3.03	94.4	#40	fine sand		
			#60	9.47	9.47	82.6	#60	fine sand		
			#100	28.18	28.18	48.2	/100	fine sand		
			#200	47.35	47.35	12.9	#200	fines		
		HYDROME	TER CALC	ULATION	IS					
DATE	TIME	ET	READING	TEMP	TEMP.COR.	HYD.COR.	READING	EFFECTIVE		
5/4/01	9:57	(min)	R	Т	K	Cc	C	LENGTH	A	
5/4/01	9:59	2.00	10.5	22.00	0.013	5.00	5.50	15.5	1.00	
5/4/01	10:02	5.00	10.5	22.00	0.013	5.00	5.50	15.5	1.00	
5/4/01	10:12	15.00	9.5	22.00	0.013	5.00	4.50	15.6	1.00	
5/4/01	10:27	30.00	9.5	22.00	0.013	5.00	4.50	15.6	1.00	
5/4/01	10:57	60.00	9.0	22.00	0.013	5.00	4.00	15.0	1.00	
5/5/01	14:07	1440.00	9.0	22.00	0.013	5.00	3.50	15.0	1.00	
5,5,01	9:57	CPAIN ST	E PEDCE	TACES	0.014	1 5.00	5.50	10.0	1.00	
Particle Dismater	4 PACETNO	& COBRI FC	I ERCE	0.00	Description	Light Brown FI	NE SAND.	ome clavev e	ilt.	· .
0.0370	10.1	S COARSE GRAV	EL.	0.00	2 courbeidt	Signe Diowing I I		empoy s		
0.0234	10.1	S FINE GRAVEL		0.00	USCS	(SM)				
0.0136	8.3	* COARSE SAND		0.00		hanna di sa di				
0.0096	8.3	S MEDIUM SAND)	5.57		·	LL			
0.0068	7.4	S FINE SAND		81.51		·	PL			
0.0033	7.4	* FINES		12.92		· ·]PI		TECH	TJ/DA
0.0014	6.4	S TOTAL SAMPL	6	100.00					DATE	5/3/01
									DEVIEW	Tilly

1



PROJECT TITLE	GEN	ESIS/PLUM PO	DINT ENER	GY/AR	SA	MPLETD	B-42	T
PROJECT NO.		013-3205			SAMI	DE TYPE		l
REMARKS				1	SA MOT	FDFDTD		10.01
•				Hygrosconia	Moisture Ear	E DEFIG	9.0	10.0
WATER CONTENT	C Delivered N	(oisture)		riygroscopic	moisture Por	Net Sample	Tasa (mar)	· · · · · · · · · · · · · · · · · · ·
Wt Wet Soil & Tare	(om)	/w/1)	410 67			Wet Soll &	Tare (gm)	
Wt Dry Soil & Tare	(om)	(***)	355 42	1		Dry Soll &	Tare (gm)	
Weight of Tare (om)	(D.11)	(w2)	95 27	1		Lare weigh	u (gm)	
Weight of Water (am)	(w4 = w1 = w2)	55 25	Total Wainha	Of Semala IT	Moisture C	Content (%)	1
Weight of Dry Soil (, ma	(w5 = w2 - w2)	270 15	i i otai weight	UI Sample Us	Waiely Of	Corrected For I	aygroscopic N
Moisture Content (4)	(wd/ws/*100	210.15			Weight Of	Sample (gm)	355.42
	,	("" ")' 100[20.45		auc	Tare weig	nu (gm) Noight (and)	85.27
					(00)	Total Dry	weight (gm)	270.15
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	9 PACC	SIEV	н. Н	
0.00	7	+Tare	(111-1410)	[fut net/w6\\$100]	(100-% ret)	312 9		
	12.0"			((#C 100 W0)*100)		12 0"	cobbles	
	3.0"		·····			3.0"	course gravel	
	2.5"					2.5"	COarse gravel	
	2.0"					2.0"	COaree gravel	
	1.5"		· ·			1.5"	COarse gravel	
	1.0"					1.0"	COarse gravel	
	0.75"	 	· .			0 75"	fine gravel	
	0.50"					0.75	fine gravel	
ð	0.375"					0.375"	fine gravel	
	#4					#4	coarse cand	
	#10	0.00	0.00	0.00	100.00	#10	medium cand	
	#20	0.04	0.04	0.01	99.99	#20	medium sand	
•	#40	2.60	2.60	0.96	99.04	#40	fine sand	
	#60	16.52	16.52	6.12	93.88	#60	fine sand	
	#100	56.57	56.57	20.94	79.06	#100	fine sand	
	#200	116.95	116.95	43.29	56.71	#200	fines	
	PAN					PAN		
% COBBLES	0.00	1	•		· .			
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	-
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	-
% M SAND	0.96	some	12 to 30%	< 10%	coarse (m-f)		PI	-
% F SAND	42.33	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	-
% FINES	56.71			< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
DE	SCRIPTION	Brown, SILTY	CLAY, and	fine sand.			•	
			<i></i>					
	USCS	(CL)					TECH	JC/TJ
							DATE	5/1/01
							CHECK	Hon
							REVIEW	LinA



ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136 PROJECT TITLE **GENESIS/PLUM POINT ENERGY/AR** SAMPLE ID B-45 • PROJECT NO. 013-3205 SAMPLE TYPE Bag REMARKS SAMPLE DEPTH 9.0 - 10.0 Hygroscopic Moisture For Sieve Sample WATER CONTENT (Delivered Moisture) Wet Soil & Tare (gm) Wt Wet Soil & Tare (gm) (w1) 281.80 Dry Soil & Tare (gm) Wt Dry Soil & Tare (gm) (w2) 232.57 Tare Weight (gm) Weight of Tare (gm) 84.45 (w3) Moisture Content (%) Weight of Water (gm) (w4 = w1 - w2)49.23 Total Weight Of Sample Used For Sieve Corrected For Hygroscopic Moisture Weight of Dry Soil (gm) (w5 = w2 - w3)148.12 Weight Of Sample (gm) 232.57 Moisture Content (%) (w4/w5)*100 33.24 Tare Weight (gm) 84.45 (W6) Total Dry Weight (gm) 148.12 SIEVE ANALYSIS Cumulative Tare Weight Wt Ret (%Retained) (Wt-Tare) % PASS SIEVE 0.00 +Tare {(wt ret/w6)*100} (100-%ret) 12.0" 12.0" cobbles 3.0" 3.0" coarse gravel 2.5" 2.5" coarse gravel 2.0" 2.0" coarse gravel 1.5" 1.5" coarse gravel 1.0" 1.0" coarse gravel 0.75" 0.75" fine gravel 0.50" 0.50" fine gravel 0.375" 0.375" fine gravel coarse sand #4 #4 0.00 0.00 0.00 100.00 #10 #10 medium sand #20 0.21 0.21 0.14 99.86 #20 medium sand #40 0.77 0.77 0.52 99.48 #40 fine sand 1.21 1.21 0.82 99.18 #60 #60 fine sand #100 1.83 1.83 1.24 98.76 #100 fine sand 4.20 4.20 2.84 97.16 #200 #200 fines PAN PAN % COBBLES 0.00 % C GRAVEL **Descriptive Terms** > 10% mostly coarse (c) 0.00 % F GRAVEL 0.00 0 to 5% > 10% mostly medium (m) LL trace -PL % C SAND 0.00 little 5 to 12% < 10% fine (c-m) -PI % M SAND 12 to 30% < 10% coarse (m-f) 0.52 some -% F SAND 2.32 30 to 50% < 10% coarse and fine (m) Gs and % FINES < 10% coarse and medium (f) 97.16 % TOTAL 100.00 > 10% equal amounts each (c-f) DESCRIPTION Brown, SILTY CLAY, trace medium to fine sand. TECH JC/TJ USCS (CL) 5/1/01 DATE Hen CHECK REVIEW WM



ł.

ł

PROJECT TITLE	GEN	NESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLED	B-45	
PROJECT NO.		013-3205		T	SAME	TTYPE	D-45	-
REMARKS				1	SAMP	FDFPTH	10.0	ag
•				Hygroscopic	Moisture For S	Sieve Sample	20.0	- 30.0
WATER CONTENT	(Delivered	Moisture)				Wet Soil &	Tare (am)	[]
Wt Wet Soil & Tare (gm)	(w1)	403.31	1 .		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (zm)	(w2)	350.05			Tare Weigh	t (am)	
Weight of Tare (gm)		(w3)	84.75			Moisture C	ontent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	53.26	Total Weight	Of Sample I is	ed For Sieve	Corrected For I	Jugroscopie Ma
Weight of Dry Soil (g	m)	(w5 = w2 - w3)	265.30		or sumple os	Weight Of	Sample (am)	Second Mon
Moisture Content (%)		(w4/w5)*100	20.08	1		Tore Weig	bt (cm)	330.03
			20100	1	(W6)	Total Dry N	lit (gill) Veight (gm)	04.73
			·····	I	(₩0)	Total Dry	weight (gm)	205.30
SIEVE ANALYSIS				Cumulative		· · · ·		
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	2 PACC	CIEV	F	
0.00		+Tare	((ut mt/us()=100)	(100_4	SIEV	L .	
	12.0"	T		[(wr 100 wo)-100}	(100-70101)	17.0"	achhlan	
	3.0"					2.0"	coolics	
	2.5"					3.0	coarse gravel	
	2.0"	+				2.5	coarse gravel	
	1.5"					2.0"	coarse gravel	
	1.0"					1.5"	coarse gravel	
	0.765					1.0"	coarse gravel	
	0.75			<u> </u>		0.75"	fine gravel	
	0.50					0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
· '	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.04		0.02	99.98	#10	medium sand	
	#20	1.84	1.84	0.69	99.31	#20	medium sand	
	#40	14.95	14.95	5.64	94.36	#40	fine sand	
	#60	41.66	41.66	15.70	84.30	#60	fine sand	
	#100	100.17	100.17	37.76	62.24	#100	fine sand	
	#200	179.91	179.91	67.81	32.19	#200	fines	
	PAN					PAN		
% COBBLES	0.00	_						-
% C GRAVEL	0.00	Descrip	tive Terms	> 10%	mostly coarse ((c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	1 (m)	LL	-
% C SAND	0.02	little	5 to 12%	< 10%	fine (c-m)		PL	-
% M SAND	5.62	some	12 to 30%	< 10%	coarse (m-f)		PI	-
% F SAND	62.18	and	30 to 50%	< 10%	coarse and fine	: (m)	Gs	-
% FINES	32.19			< 10%	coarse and med	lium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
DES	CRIPTION	Brown, Mediur	n to fine sand	d, and clayey s	ilt.			
	USCS	(SM)					TECH	SW
							DATE	5/1/01
							CHECK	for
							REVIEW	Plain



NUECI IIILE	GEN	ESIS/PLUM P	DINT ENER	GY/AR	SA SA	MPLE ID	B-50	-
PROJECT NO.		013-3205			SAM	PLE TYPE	E	lag
REMARKS					SAMPI	E DEPTH	9.0 -	10.0'
•	-			Hygroscopic	Moisture For	Sieve Sample)	
WATER CONTENT (Delivered	Moisture)				Wet Soil &	t Tare (gm)	
Wt Wet Soil & Tare (gi	n)	(w1)	415.16			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gr	n)	(w2)	376.27			Tare Weig	ht (gm)	
Weight of Tare (gm)		(w3)	84.32			Moisture C	Content (%)	
Weight of Water (gm)		(w4=w1-w2)	38.89	Total Weight	Of Sample Us	ed For Sieve	Corrected For I	Iygrosconic N
Weight of Dry Soil (gm	() () () () () () () () () () () () () ()	(w5=w2-w3)	291.95]		Weight Of	Sample (gm)	376.27
Moisture Content (%)		(w4/w5)*100	13.32			Tare Weig	tht (gm)	84.32
			-		(₩6)	Total Dry	Weight (gm)	291.95
SIEVE ANALYSIS	1. 2			Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	Æ	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"	1				2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"			1		1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"			1		0.75*	fine gravel	
	0.50"					0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.03	0.03	0.01	99,99	#10	medium sand	
	#20	2.48	2.48	0.85	99.15	#20	medium sand	
	#40	65.64	65.64	22,48	77.52	#40	fine sand	
	#60	152.27	152.27	52,16	47.84	#60	fine sand	
	#100	247.30	247.30	84.71	15.29	#100	fine sand	
	#200	279.63	279.63	95,78	4.22	#200	fines	
	PAN					PAN		
% COBBLES	0.00	1					· · · ·	
& C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
& F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediur	n (m)	T.I.	.
& C SAND	0.01	little	5 to 12%	< 10%	fine (c-m)		PI.	-
K M SAND	22.47	some	12 to 30%	< 10%	coarse (m-f)		PI	
6 F SAND	73.30	and	30 to 50 %	< 10%	coarse and fin	e (m)	Ge	· _
6 FINES	4 22	-	30 10 30 10	< 10%	coarse and me	dium (fi		
TOTAL	100.00	-		> 10%	equal amounte	each (c-f)		
L	100.00			- 10/01	maa amounts			
DESC	RIPTION	Brown MEDI	UM TO FIN	E SAND, trace	silt.			
			om rorma	a orizo, uace				
		$(1,1) \in \mathbb{R}^{n}$						
	USCS	(SP)					TECH	JC/TJ
	0000						DATE	5/1/01
							CHECK	Hin
								11.1



Inc.



l, i

PROJECT TITLE	GEN	ESIS/PLUM PO	DINT ENER	GY/AR	SA	MPLEID	R-54	
PROJECT NO.		013-3205			SAM	DE TYPE		L
REMARKS				1	SAMPI	F DEPTH	4.0	5 0'
3			· · ·	Hygroscopic	Moisture Ece	Sieve Samela	4.0	- 3.0
WATER CONTENT	Delivered	Moisture)		in Broscopie	MOISTURE FOR	Wet Sample	Tare (am)	[
Wt Wet Soil & Tare ((= · • • • • - • - · • - • • • • • • • • •	(w1)	124 97			Der Soil &	Tare (gill)	
Wt Dry Soil & Tare (2m)	(w2)	106.62			Dry Soli &	Tare (gm)	
Weight of Tare (gm)	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(w3)	52.05	1		Maisture C	u (gill)	
Weight of Water (gm)		$(w4 = w1 \cdot w2)$	18 35	Total Weight	Of Samala Ha	MOISIURE C	Content (%)	<u> </u>
Weight of Dry Soil (m	m)	$(w_{5} = w_{2} - w_{3})$	54 57 `		Or Sample Us	Weight Of	Corrected For F	Tygroscopic Mc
Moisture Content (%)	шу .	(w4/w5)+100	33.63			Toro Weig	Sample (gm)	100.62
Contraction (12)		(44/ 45) 100[33.03	-		Tare weig	nt (gm) Maista (suu)	52.05
				L	(W0)	Total Dry	veignt (gm)	54.57
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Det	(Wt. Tare)	(& Detained)	Ø DACC	OTT:V	R .	
0.00		Tare	(we rate)	(materialitied)	70 FA33	SIEV	E.	
0.00	12.0"			{(wt net/w6)*100}	(100-%ret)	10.0"		
	2.0		·····			12.0"	cobbles	
	3.0					3.0"	coarse gravel	· · · · ·
	2.5					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"		· · · · · · · · · · · · · · · · · · ·			1.5"	coarse gravel	
	1.0"			ļ		1.0"	coarse gravel	
	0.75"	· .	·			0.75"	fine gravel	
	0.50"	 				0.50"	fine gravel	
	0.375"	· }				0.375"	fine gravel	
	#4					#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.05	0.05	0.09	99.91	#20	medium sand	
	#40	0.16	0.16	0.29	99.71	#40	fine sand	
	#60	0.37	0.37	0.68	99.32	#60	fine sand	
	#100	0.52	0.52	0.95	99.05	#100	fine sand	
	#200	1.59	1.59	2.91	97.09	#200	fines	
	PAN					PAN		
% COBBLES	0.00							
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediun	n (m)	LL	38
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	23
% M SAND	0.29	some	12 to 30%	< 10% (coarse (m-f)		PI	15
% F SAND	2.62	and	30 to 50%	< 10%	coarse and fine	e (m)	Gs	-
% FINES	97.09			< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
DES	CRIPTION	Brown, SILTY	CLAY, tra	ce medium to fi	ne sand.			
	USCS	CL					TECH	SW
							DATE	5/1/01
							CHECK	15m
							REVIEW	pun



i

Ì.

......

PROJECT TITLE	GENI	ESIS/PLUM P	OINT ENER	GY/AR	SA	MPLE D	B-54	-
PROJECT NO.		013-3205		1.	SAME	PLE TYPE	B	ag
KEMARKS				-	SAMPL	E DEPTH	25.0	- 30.0'
				Hygroscopic]	Moisture For S	Sieve Sample		
WATER CONTENT (Delivered N	loisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (gr	n)	(w1)	515.53			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gr	n)	(w2)	431.14	4		Tare Weigh	t (gm)	
Weight of Tare (gm)		(w3)	86.35			Moisture C	ontent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	84.39	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	lygroscopic Mo
Weight of Dry Soil (gm	i) .	(w5=w2-w3)	344.79 `			Weight Of	Sample (gm)	431.14
Moisture Content (%)		(w4/w5)*100	24.48			Tare Weig	ht (gm)	86.35
					(W6)	Total Dry V	Veight (gm)	344.79
· · · · · · · · · · · · · · · · · · ·		Ал						-
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E .	
0.00	1	+Tare		{(wt ret/w6)*100}	(100-%ret)	1		
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
· · ·	2.0"					2.0"	coarse gravel	
	1.5"			х. 		1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"				· .	0.75"	fine gravel	
	0.50"					0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
	#4					#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.18	0.18	0.05	99.95	#20	medium sand	
•	#40	1.85	1.85	0.54	99.46	#40	fine sand	
· · · · · · · · · · · · · · · · · · ·	#60	21.70	21.70	6.29	93.71	#60	fine sand	
	#100	139.81	139.81	40.55	59.45	#100	fine sand	
	#200	251.44	251.44	72.93	27.07	#200	fines	
	PAN					PAN		
% COBBLES	0.00							
% C GRAVEL	0.00	Descr	iptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediur	n (m)	LL	-
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	-
% M SAND	0.54	some	12 to 30%	< 10%	coarse (m-f)		PI	•
% F SAND	72.39	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	-
% FINES	27.07	1		< 10%	coarse and me	dium (f)		
% TOTAL	100.00	1		> 10%	equal amounts	each (c-f)		
DESC	RIPTION	Brown, FINE	SAND, some	clayey silt.				
			-					
	USCS	(SM)					TECH	JC/TJ
							DATE	5/1/01
							CHECK	Hen





1

PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-55	•
PROJECT NO.		013-3205			SAMP	'LE TYPE	B	lag
REMARKS				1	SAMPL	E DEPTH	19.0	- 30.0'
•	•		4	Hygroscopic 1	Moisture For S	Sieve Sample	-	
WATER CONTENT	Delivered 1	Moisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (g	m)	(w1)	455.27			Dry Soil &	Tare (gm)	
wt Dry Soil & Tare (g	m)	(w2)	336.07		A	Tare Weigh	t (gm)	
weight of Tare (gm)		(w3)	85.42			Moisture Co	ontent (%)	
weight of Water (gm)		(w4 = w1 - w2)	119.20	Total Weight	Of Sample Us	ed For Sieve	Corrected For I	Iygroscopic M
weight of Dry Soil (gn	1)	(w5=w2-w3)	250.65 *			Weight Of S	Sample (gm)	336.07
Moisture Content (%)		(w4/w5)*100	47.56	1		Tare Weigh	nt (gm)	85.42
				L	(W6)	Total Dry V	Veight (gm)	250.65
STEVE ANALYON								
Tare Waish			AV: A	Cumulative	~ ~ ~ ~ ~			
		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVI	8	
0.00	10.07	+ lare		{(wt ret/w6)*100}	(100-%ret)	40.00		
	12.0"			┠─────┤		12.0"	cobbles	
	3.0"			}		3.0"	coarse gravel	
	2.5"			 		2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"			}	· · · · ·	1.5"	coarse gravel	
	1.0"	}		ł		1.0"	coarse gravel	
	0.75"			l		0.75"	fine gravel	
	0.50"			<u> </u>		0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	2.60	2.60	1.04	98.96	#10	medium sand	
	#20	6.68	6.68	2.67	97.33	#20	medium sand	
	#40	8.51	8.51	3.40	96.60	#40	fine sand	
	#60	9.58	9.58	3.82	96.18	#60	fine sand	
	#100	11.10	11.10	4.43	95.57	#100	fine sand	
	#200	29.88	29.88	11.92	88.08	#200	fines	
	PAN					PAN		
	0.00	┥ ↓						
	0.00	- Descrip	puve Terms	> 10% 1	nostly coarse ((C)	1	
	0.00	trace	0 to 5%	> 10% 1	nostly mediun	n (m)	LL	50
	1.04		5 to 12%	< 10% 1	nne (c-m)		PL	28
E SAND	2.36	some	12 to 30%	< 10% (coarse (m-t)		PI	28
T SAIND	8.53	- and	30 to 50%	< 10% (coarse and fine	; (M)	Gs	•
	88.08			< 10% (coarse and med	num (I)		
	100.00			> 10% (qual amounts	eacn (C-I)		
DESC	DIDTION	Plack and Pro-	CIT TY O	TAV little mod	lium to			
DESC	AIT HUN	fine sout	wii, SILIY C	LAI, IIIIC Met				·
		nne sana.						
	TIECE	Cul					TEOR	C117
	USUS						DATE	5/1/01
							CHECK	11
							DUR	



	· · · · ·		AS	TM GRA	IN SIZE ANAT	VSIS				
		A	STM C11	7, C136, I	D421, D422, D1	140 and D221	7			
ROJECT TITLE	GENESIS/PI	UM POINT EN	ERGY/AR			SAMPLE ID	•	P. 56		
OJECT NO.	013	3205	ALL O LIZER			SAMPLE ID	C	D-30 D-30		
		0200				SAMPLE IT	тн тн	9.0.	20 0'	
						OAMI LE DEL		7.0 -	20.0	1
AS RECEIVED) WATER C	ONTENT		Hygrosc	opic Moisture	Wet Soil & Tare (g	m)	49.75		
lare No.			•	For Siev	e Sample	Dry Soil & Tare (g	m)	49.70		
Vt. Wet Soil & Tare (g))	(W1)	248.98			Tare Weight (gm)		3.15		
Vt. Dry Soil & Tare (g	,m)	(W2)	199.00			Moisture Content (%)	0.11		
Veight of Tare (gm)		(W3)	51.46	Total We	ight of Sample Used	For Sieve Analy	sis Corrected	l For Hygro	scopic Moist	ture
Veight of Water (gm)		(W4=W1-W2)	49.98	· .	Weight + Tare, Befor	re Separating On The	#4 Sieve (gm)	505.95		÷.,
eight of Dry Soil (gn	u) i i i	(W5=W2-W3)	147.54			Та	re Weight (gm)	114.12		
Aoisture Content (%)	1.01	(W4/W5)*100	33.88			Tot	al Weight (gm)	391.41	(₩6)	
Plus #4 Materia	al Sieve	a		(Wt+Tare)	(((Wt-Tare)/W6)*100)	%PASSING		·	· .	
TAKE WEIGHT	0.00		12.0"				12.0"	cobbles		
			3.0"			·	3.0"	coarse gravel		
			2.5"		·		2.5"	coarse gravel		
			2.0"				2.0"	coarse gravel		
			1.5"				1.5"	coarse gravel		
			1.0"				1.0"	coarse gravel		
· ·			0.75"				0.75"	fine gravel	•	
			0.50"	,			0.50"	fine gravel		
			0.375"	0.00			0.375"	fine gravel		
			#4	0.00	0.0	100.0	#4	coarse sand		
ecific Gravity mount Dispersing Age Dispersion Device	(tested) :nt (ml) e	125.00 Mechanical			Weight of Sample Wet Calculated Dry Wt. use Hydrometer Bulb Numi	or Dry (gm) ed in test (gm) ber	55.84 55.78 624378			
TARE WEIGHT	0.00	HYDROM	ETER BAC	KSIEVE (P	* Pass #4 Sieve For w Percent Passing #1	0 - #200 Sieves	100.00			
	<u>.</u>	4			Cumul Wt.					
		- -		(Wt+Tare)	Retained	% PASSING				
			#10	0.02	0.02	100.0	#10	medium sand		
			#20	0.07	0.07	<u>99.9</u>	#20	medium sand		
			#40	2.54	2.54	95.4	#40	fine sand		
			#60	8.10	8.10	85.5	#60	fine sand		
			#100	26.90	26.90	51.8	#100	fine sand		
			#200	47.31	47.31	15.2	#200	fines		
		HYDROME	TER CALC	ULATION	S	1 100 000				·
	TIME	ET	READING	TEMP	TEMP.COR.	HYD.COR.	READING	EFFECTIVE		1
DATE	9.47	(min)	ĸ	1	K		C	LENGTH	A .	1
DATE 5/4/01	2.7/			00.00	0.010	1 00				1
DATE 5/4/01 5/4/01	9:49	2.00	10.5	22.00	0.013	5.00	5.50	15.5	1.00	
DATE 5/4/01 5/4/01 5/4/01	9:49 9:52	2.00 5.00	10.5 10.0	22.00 22.00	0.013 0.013	5.00 5.00	5.50 5.00	15.5	1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01	9:49 9:52 10:02	2.00 5.00 15.00	10.5 10.0 9.5	22.00 22.00 22.00	0.013 0.013 0.013	5.00 5.00 5.00	5.50 5.00 4.50	15.5 15.6	1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01	9:49 9:52 10:02 10:17	2.00 5.00 15.00 30.00	10.5 10.0 9.5 9.5	22.00 22.00 22.00 22.00 22.00	0.013 0.013 0.013 0.013 0.013	5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.50	15.5 15.6 15.6	1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01	9:49 9:52 10:02 10:17 10:47	2.00 5.00 15.00 30.00 60.00	10.5 10.0 9.5 9.5 9.0	22.00 22.00 22.00 22.00 22.00 22.00	0.013 0.013 0.013 0.013 0.013 0.013	5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.50 4.00	15.5 15.6 15.6 15.6	1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01	9:49 9:52 10:02 10:17 10:47 13:57	2.00 5.00 15.00 30.00 60.00 250.00	10.5 10.0 9.5 9.5 9.0 9.0	22.00 22.00 22.00 22.00 22.00 22.00 22.00 21.50	0.013 0.013 0.013 0.013 0.013 0.013 0.013	5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.50 4.00 4.00 3.00	15.5 15.6 15.6 15.6 15.6	1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01	9:49 9:52 10:02 10:17 10:47 13:57 9:47	2.00 5.00 15.00 30.00 60.00 250.00 1440.00	10.5 10.0 9.5 9.5 9.0 9.0 8.0	22.00 22.00 22.00 22.00 22.00 22.00 21.50	0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014	5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.50 4.00 4.00 3.00	15.5 15.6 15.6 15.6 15.6 15.6 15.8	1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01	9:49 9:52 10:02 10:17 10:47 13:57 9:47	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ	10.5 10.0 9.5 9.5 9.0 9.0 8.0 ZE PERCE	22.00 22.00 22.00 22.00 22.00 22.00 21.50 TAGES 0.00	0.013 0.013 0.013 0.013 0.013 0.013 0.014	5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00	15.5 15.6 15.6 15.6 15.6 15.6 15.8	1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ \$ COBBLES	10.5 10.0 9.5 9.5 9.0 9.0 8.0 ZE PERCE	22.00 22.00 22.00 22.00 22.00 22.00 21.50 ¥TAGES 0.00 0.00	0.013 0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description	5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00 NE SAND, lit	15.5 15.6 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370 0.0224	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING 9.9	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ \$ COBBLES \$ COARSE GRAVE	10.5 10.0 9.5 9.5 9.0 9.0 8.0 ZE PERCEN	22.00 22.00 22.00 22.00 22.00 21.50 YTAGES 0.00 0.00 0.00	0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description	5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00 NE SAND, lit	15.5 15.6 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370 0.0234 0.0136	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING 9.9 9.0 8.1	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ S COBBLES S COARSE GRAVEL S COARSE SAND	10.5 10.0 9.5 9.5 9.0 9.0 8.0 ZE PERCE	22.00 22.00 22.00 22.00 22.00 21.50 YTAGES 0.00 0.00 0.00	0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00	15.5 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370 0.0234 0.0136 0.0096	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING 9.9 9.0 8.1 8.1	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ \$ COBBLES \$ COARSE GRAVEL \$ COARSE GRAVEL \$ COARSE SAND \$ MEDIUM SAND	10.5 10.0 9.5 9.0 9.0 8.0 ZE PERCEN	22.00 22.00 22.00 22.00 22.00 21.50 YTAGES 0.00 0.00 0.00 0.00 4.52	0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00 NE SAND, 1ii	15.5 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370 0.0234 0.0136 0.0096 0.0068	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING 9.9 9.0 8.1 8.1 8.1 7.2	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ \$ COBBLES \$ COARSE GRAVEL \$ COARSE GRAVEL \$ COARSE SAND \$ MEDIUM SAND \$ FINE SAND	10.5 10.0 9.5 9.0 9.0 8.0 2E PERCEN	22.00 22.00 22.00 22.00 22.00 21.50 YTAGES 0.00 0.00 0.00 0.00 4.52 80.26	0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00 NE SAND, lit	15.5 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00	
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370 0.0234 0.0136 0.0096 0.0068 0.0033	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING 9.9 9.0 8.1 8.1 8.1 7.2 7.2	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ * COBBLES * COARSE GRAVE * COARSE GRAVE * FINE GRAVEL * COARSE SAND * MEDIUM SAND * FINE SAND	10.5 10.0 9.5 9.0 9.0 8.0 ZE PERCEN	22.00 22.00 22.00 22.00 22.00 21.50 TAGES 0.00 0.00 0.00 0.00 0.04 4.52 80.26 15.18	0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.50 4.00 3.00 NE SAND, 1i LL PL PL PI	15.5 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00 1.00	SW/I
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370 0.0234 0.0136 0.0096 0.0068 0.0033 0.0014	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING 9.9 9.0 8.1 8.1 7.2 7.2 5.4	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ * COBBLES * COARSE GRAVE * COARSE GRAVE * FINE GRAVEL * COARSE SAND * FINE SAND * FINE SAND * FINE SAND	10.5 10.0 9.5 9.0 9.0 8.0 ZE PERCEN	22.00 22.00 22.00 22.00 22.00 21.50 TAGES 0.00 0.00 0.00 0.00 0.04 4.52 80.26 15.18 100.00	0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00 NE SAND, 1i LL PL PL PI	15.5 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	SW/I 5/3/0
DATE 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/4/01 5/5/01 Particle Diameter 0.0370 0.0234 0.0136 0.0096 0.0068 0.0033 0.0014	9:49 9:52 10:02 10:17 10:47 13:57 9:47 % PASSING 9.9 9.0 8.1 8.1 8.1 7.2 7.2 5.4	2.00 5.00 15.00 30.00 60.00 250.00 1440.00 GRAIN SIZ \$ COBBLES \$ COARSE GRAVE \$ COARSE SAND \$ MEDIUM SAND \$ FINE SAND \$ FINE SAND \$ TOTAL SAMPLE	10.5 10.0 9.5 9.0 9.0 8.0 ZE PERCEN	22.00 22.00 22.00 22.00 22.00 21.50 TAGES 0.00 0.00 0.00 0.00 0.04 4.52 80.26 15.18 100.00	0.013 0.013 0.013 0.013 0.013 0.013 0.014 Description USCS	5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00	5.50 5.00 4.50 4.00 4.00 3.00 NE SAND, 1i LL PL PL PI	15.5 15.6 15.6 15.6 15.6 15.8 ttle silty clay	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	SW/ 5/3/



MAY 2001

 $\langle \rangle$

GENESIS/PLUM POINT ENERGY/AR SUMMARY OF SOIL DATA

			Soil	Natural		Atte	rberg			Grain Size Distribution	I	Comp	action				· · ·	Addition
Identification	Sample	Sample Denth	Classi-	Moisture &		با	mits		% Finer	% Finer	% Finer	Maximum Dry Density	Optimum		Unit V	/eight	Permeability	Tests
	1,1,1,0	Берец	IIC AULUIA	~	1.1.	P.I.	PI	T.T.	Sieve	Sieve	.005	(lb/cuft)	WIOISCUTE Q	Ge	a	(b/cuft)	(Chu/Sec)	(See Note
			1									(io/cuit)	~		<u> </u>	(100 Cutt)		(See Note
B-17	Bag	14.0-15.0'	(SM)	19.0	<u> </u>			•	100.0	32.4	-	-	-	-			-	-
B-17	Bag	34.0-40.0'	CL	32.1	.33	23	10	0.89	100.0	83.4	•	-	-		-	-		-
B-17	Bag	69.0-70.0'	(SP-SM)	21.1	-	-	-	-	98.8	7.1	-	-	- -	-	-	-	-	•
B-17	Bag	79.0-80.0'	(SP)	19.0	-	-	-	-	99.7	4.8	4.5	-		_	•		-	-
B-20	Bag	9.0-10.0'	(SP)	3.2	-	-	-	-	99.8	1.0	-	-	-	-	-	-	•	
B-21	Bag	9.0 -10.0'	(SC)	31.1	34	14	20	0.85	-	-	•		-	-	-	-	-	-
B-21	Bag	19.0-20.0'	(SC)	23.4	-	-	-	-	100.0	25.3	•	-	-	•	•	•	-	•
B-23	Bag	9.0-15.0'	(SP-SM)	6.9	-	-	-	-	99.9	8.7	-	-	-	-	-	•	-	-
B-24	Bag	4.0 -5.0'	(SP-SM)	2.1	-	-	-	-	100.0	9.5	•		-	-	-	-	-	· •
B-24	Bag	19.0-20.0'	(SP)	16.1	-	-		-	100.0	0.9	-	-	-	-	-	-	-	-
B-26	Bag	14.0-25.0'	(SM)	17.9	<u> </u>	<u> </u>	-	-	99.5	20.3	-	-	-	-	•	-	-	· •
B-26	Bag	49.0-50.0'	(SC)	29.9	-	-	-	-	89.1	43.5	32.0	-	•	-	-	-	-	
B-26	Bag	59.0-130.0	(SP)	11.9	-	-	-	-	82.3	3.0		-	-		•	•	•	•
B-27	Bag	19.0-30.0'	(CH)	39.9	-	-	-	•	99.9	93.9	36.0	-		-	-		-	• : •
B-28	Bag	19.0-20.0'	СН	57.7	65	27	38	0.80	100.0	98.6	-	-	-	-	-	-	•	•

Golder Associates Inc.

ABBREVIATIONS: LIQUID LIMIT (LL) PLASTIC LIMIT (PL) PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SPECIFIC GRAVITY (Gs) MOISTURE (Mc) NOTES: T = TRIAXIAL TEST

U = UNCONFINED COMPRESSION TEST

- C = CONSOLIDATION TEST
- **DS = DIRECT SHEAR TEST**
- **O** = **ORGANIC CONTENT**

P = pH

013-32



1

ROJECT TITLE	GEN	ESIS/PLUM PC	INT ENER	GY/AR	SA	MPLE ID	B-17	
PROJECT NO.		013-3205			SAMP	LE TYPE	B	ag
REMARKS					SAMPL	E DEPTH	14.0	15.0'
, , ,				Hygroscopic N	Moisture For S	Sieve Sample		
WATER CONTENT (Delivered I	Moisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (gn	n)	(w1)	430.52		· .	Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gn	n)	(w2)	375.43			Tare Weight	t (gm)	
Weight of Tare (gm)		(w3)	85.29			Moisture Co	ontent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	55.09	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	Iygroscopic Ma
Weight of Dry Soil (gm))	(w5 = w2 - w3)	290.14	1		Weight Of S	Sample (gm)	375.43
Moisture Content (%)		(w4/w5)*100	18.99	1		Tare Weigh	nt (gm)	85.29
				1	(W6)	Total Dry V	Veight (gm)	290.14
		·		·	·			
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE	3	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
· · · · · · · · · · · · · · · · · · ·	12.0"			1 1		12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"		•			2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"			t		0.75*	fine gravel	
	0.50"					0.50"	fine gravel	
	0.375"			<u> </u>		0.375"	fine gravel	
	#4	0.00	0.00	0.00	100.00	#A	coarse cand	
	#10	0.00	0.02	0.00	00.00	#10	medium cand	
	#20	3.66	3.66	1.26	98.74	#20	medium sand	
	#40	96.93	96.93	33.41	66 59	#40	fine cand	
	#60	150.84	150.84	51.99	48.01	#60	fine sand	
	#100	171 82	171 82	59.22	40 78	#100	fine sand	
	#200	196.20	196 20	67.65	32 35	#200	fines	
	DAN	150.25	170.27	07.05	54.35	DAN	11000	
% COBBI ES	0.00	1	4- <u>11-11-11-11-11-11</u>			TAN		
	0.00	- Desari	tive Terms	> 10∉ ·	nostly coarse	(c)		
% E GRAVEI	0.00	trace		> 10%	mostly medium	() (m)	TT	
& C SAND	0.00	little	5 to 1702	~ 10%	fine (c-m)		DI	
% M SAND	32 /0	- Intie	12 to 2004	< 10%	narse (m-f)		DI	
% E SAND	24.25	and	30 to <00	< 10%	voarse and fin	• (m)		
% FINES	37 25		30 10 30 76	< 10%	coarse and ma	dium (f)	03	L
% TOTAL	100 00	-		> 10%	volise and ille	each (c-f)		
	100.00			- 10%	rquar antounts			
DESC	יסזסדערשי	Brown MEDI	IIM TO FIND	E SAND and a	lavev silt			
DESC	ALL HON	BIOWI, MEDI		L GAILD, and C	ayoy site.			
	TIECE	(SM) T					ТЕСИ	IC/TI
	0303	(5141)					DATE	5/1/01
							CHECK	Han





AST	'M GRA	IN SIZE	ANALYSIS	
ASTM D 421,	, D 2217	, D 1140,	C 117, D 422, C	136

ł

PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-17	T -
PROJECT NO. 013-3205				SAM	LE TYPE	P	lag	
REMARKS				SAMPI	E DEPTH	34.0	- 40.0'	
	· . ·	· · · · · · · · · · · · · · · · · · ·		Hygroscopic	Moisture For	Sieve Sample		
WATER CONTENT	Delivered 3	Moisture)				Wet Soil &	Tare (gm)	[
Wt Wet Soil & Tare (gm) (w1) 434 62						Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gr	n)	(w2)	348.10	1. A.				
Weight of Tare (gm)		(w3)	78.75			ontent (%)		
Weight of Water (gm)		(w4 = w1 - w2)	86.52	Total Weight	Of Sample Us	ed For Sieve	Corrected For F	Hygroscopic M
Weight of Dry Soil (gm	ı)	(w5 = w2 - w3)	269.35		or ounpro ou	Weight Of	Sample (gm)	348 10
Moisture Content (%)	-	(w4/w5)*100	(w4/w5)*100 32.12			Tare Weig	the (gm)	78 75
					(WA)	Total Dry	Weight (gm)	260.35
			·····	.	(110)	Total Diy	weight (gin)	209.55
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	F	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"	T				12.0"	cobbles	
	3.0"					3.0"	COarse gravel	
	2.5"					2.5"	COarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	COarse gravel	
	1.0"					1.0"	COarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"			····		0.75	fine gravel	
	0.375"					0.30	fine gravel	
	#4	0.00	0.00	0.00	100.00	U.375 #A	Inc graver	
	#10	0.04	0.04	0.00	90.00	#4 #10	medium cand	
	#20	0.28	0.28	0.10	99.99	#20	medium cand	
	#40	3.51	3.51	1.30	98.70	#40	fine sand	
	#60	6.26	6.26	2.32	97.68	#60	fine sand	
	#100	10.21	10.21	3 70	96.21	#100	fine cand	
	#200	44.66	44.66	16 58	83.42	#200	fines	
	PAN			10.30	05.42	DAN	incs	
% COBBLES	0.00	1				FAIN		
% C GRAVEL	0.00	Descrit	tive Terme	> 10.02	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	() 1 (m)	TT	22
% C SAND	0.01	little	5 to 12.%	< 10%	fine (c-m)	. ()	DI	23
% M SAND	1.29	some	12 to 30%	< 10%	coarse (m-f)		PI	10
% F SAND	15.28	and	30 to 50%	< 10%	coarse and fine	(m)	Ge	
% FINES	83.42			< 10%	coarse and me	fium (f)	3	
% TOTAL	100.00			> 10%	coual amounte	each (c-f)		
L.				2 10/0	Jam millouito			
DESC	RIPTION	Brown SILTY	CLAY, som	e fine sand.				
2200				e the other				
	USCS	CL					TECH	SW
	0000						DATE	5/1/01
							CHECK	The
							DEVIEW	



PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-17	-		
2ROJECT NO. 013-3205				SAME	PLE TYPE	P	ag			
REMARKS				1	SAMPL	E DEPTH	69.0	- 70 0'		
•	· .			Hygroscopic I	Moisture For	Sieve Sample		- 70.0		
WATER CONTENT (Delivered Moisture) Wt Wet Soil & Tare (gm) (w1) 447.55				Wet Soil & Tare (am)						
				1						
Wt Dry Soil & Tare (gn	1)	(w2)	384.30	1	ht (gm)					
Weight of Tare (gm)		(w3)	84.81	1	Hygrosconic Mo					
Weight of Water (gm)		(w4 = w1 - w2)	63.25	Total Weight						
Weight of Dry Soil (gm))	(w5 = w2 - w3)	299.49		Sample (gm)	384 30				
Moisture Content (%)		(w4/w5)*100	21.12	t in the second		Tare Weig	t (gm)	84 81		
		(* * ***) -00eL			ave	Total Dry	Weight (am)	200.40		
				L	(#0)	Total Diy	Weight (gm)	233.43		
SIEVE ANALYSIS		1		Cumulative						
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	TR.	- A		
0.00		+ Tare	({/wt ret/w6*1001	(100-%ret)	ULL V				
	12.0"	T			(100- /0101)	12.0"	cobbles			
	3.0"	}		<u> </u>		3.0"	coarse gravel			
	2.5"			<u> </u>		2.5	COarse gravel			
	2.0"					2.5	COarse gravel			
	1 5"			11		1 67	coarse gravel			
	1.0"	}		<u> </u>		1.0	coarse gravel			
	0.757	}				1.0"	coarse gravel			
	0.73"			<u> </u>		0.75"	ine gravel			
	0.50"		0.00		100.00	0.50"	nne gravel			
	0.375"	0.00	0.00	0.00	100.00	0.375"	tine gravel			
	#4	3.54	3.54	1.18	98.82	#4	coarse sand			
	#10	8.85	8.85	2.96	97.04	#10	medium sand			
	#20	12.03	12.03	4.02	95.98	#20	medium sand			
	#40	32.48	32.48	10.85	89.15	#40	fine sand			
	#60	84.45	84.45	28.20	71.80	#60	fine sand			
	#100	250.21 ·	250.21	83.55	16.45	#100	fine sand			
	#200	278.21	278.21	92.89	7.11	#200	fines			
	PAN	·				PAN				
% COBBLES	0.00				1					
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)				
% F GRAVEL	1.18	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	-		
% C SAND	1.77	little	5 to 12%	< 10%	fine (c-m)		PL	-		
% M SAND	7.89	some	12 to 30%	< 10%	coarse (m-f)		PI	•		
% F SAND	82.05	and	30 to 50%	< 10%	coarse and find	e (m)	Gs	•		
% FINES	7.11			< 10%	coarse and me	dium (f)				
% TOTAL	100.00			> 10%	equal amounts	each (c-f)				
		-			-					
DESC	RIPTION	Brown, FINE	SAND, little	clayey silt, trac	e fine					
		gravel.								
	- -									
	USCS	(SP-SM)		· · · · · · · · · · · · · · · · · · ·			TECH	JC/TJ		
				,			DATE	5/1/01		
							CHECK	the second		
							REVIEW	Inn		



[]											
			A	AS STM C11	TM GRA 7, C136, 1	IN SIZE ANAI 0421, D422, D1	LYSIS 140 and D2217	7			
50	OFCT TITLE	CENESIS/DI	UM DOINT EN	FRCVIAD	<u>ini ini ini ini ini ini ini ini ini ini</u>		SAMDI E ID	<u>,</u>	B-17	1	
	OFCT NO	GENESIS/PL	2205	LKGI/AK			SAMPLE ID	r I	D-1/		
· ·	oneer no.	013-	-3205				SAMPLE I I P	с та	70.0	8 0 0	
						•	SAMPLE DEP		/3.0*	00.0	
	AS RECEIVED	WATER CO	ONTENT		Hygrosc	opic Moisture	Wet Soil & Tare (gi	m) ·	47.94		
Tan	e No.			-	For Siev	e Sample	Dry Soil & Tare (gr	n) (n	47.64		
WL.	Wet Soil & Tare (gr	m)	(W1)	118.91			Tare Weight (gm)		3.24		
Wt.	Dry Soil & Tare (gr	n)	(W2)	106.79			Moisture Content (S	6)	0.68		
Wei	ight of Tare (gm)		(₩3)	42.99	Total We	ght of Sample Use	d For Sieve Analy:	sis Corrected	l For Hygros	copic Moist	ure
We	ight of Water (gm)	2	(W4=W1-W2)	12.12		Weight + Tare, Befo	ore Separating On The	#4 Sieve (gm)	497.75		
We	ight of Dry Soil (gm)) .	(W5=W2-W3)	63.80			Tai	e Weight (gm)	113.93		
Mo	isture Content (%)		(W4/W5)*100	19.00	•	1	Tot	al Weight (gm)	381.24	(W6)	
	Plus #4 Materia	1 Sieve			(Wt+Tare)	(((Wt-Tare)/W6)*100) %PASSING				
1.1	TARE WEIGHT	0.00		12.0"				12.0"	cobbles		
				3.0"				3.0"	coarse gravel		
1				2.5"				2.5"	coarse gravel		
				2.0"				2.0"	coarse gravel		
		1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	• .	1.5"				1.5"	coarse gravel		
				1.0"			_	1.0"	coarse gravel		
				0.75"			_	0.75"	fine gravel		
1				0.50"				0.50"	fine gravel		
				0.375"	0.00	0.0	100.0	0.375"	fine gravel		
				-#4	0.97	0.3	99.7	#4	coarse sand		
1	e Dispersion Device igth of Dispersion Pe TARE WEIGHT	riod	Mechanical 1 Mimute HYDROME	TER BAC	KSIEVE (I	Hydrometer Bulb Num % Pass #4 Sieve For Y Percent Passing #	nber Whole Sample 10 - #200 Sieves	624378 99.75			
			3			Cumul Wt.					
					(Wt+Tare)	Retained	% PASSING				
				<i>w</i> 10	0.02	0.02	99.7	#10	medium sand		
				#20	0.35	0.35	99.1	#20	medium sand		
				#40	2.81	2.81	94.7	#40	fine sand		
				#60	22.03	22.03	59.9	#60	tine sand		
				#100	49.55	49.55	10.1	#100	nne sand		
-			INDO	#200	52.49	52.49	4.8	#200	10.05		
H	DATE	Th (P	HIDROME	DEADDIG	TEL	TEMP COP	HVD COP	READING	FFFFCTIVE		
	5/4/01	0.61	EI (min)	DNIILATA	T	K	Cc	C	LENGTH	A	
H	5/4/01	9:51	2.00	75	22.00	0.013	5.00	2.50	16.0	1.00	
	5/4/01	9:55	2.00	7.5	22.00	0.013	5.00	2.50	16.0	1.00	
	5/4/01	10.04	15.00	7.5	22.00	0.013	5.00	2.50	16.0	1.00	
	5/4/01	10:00	30.00	7.5	22.00	0.013	5.00	2.50	16.0	1.00	
	5/4/01	10:21	60.00	7.5	22.00	0.013	5.00	2.50	16.0	1.00	
	5/4/01	10:51	250.00	75	22.00	0.013	5.00	2.50	16.0	1.00	
	5/5/01	0.51	1440.00	7.5	21.50	0.014	5.00	2.50	16.0	1.00	
1	0.0101	9.51	GRAIN ST7	EPERCE	NTAGES						
F	Particle Diameter	% PASSING	% COBBLES		0.00	Descriptio	Brown, FINE SA	AND, trace si	lt.		
F	0.0376	4.5	* COARSE GRAVE	a	0.00						
	0.0238	4.5	S FINE GRAVEL		0.25	USC	S (SP)				
	0.0137	4.5	S COARSE SAND		0.04						
and .	0.0097	4.5	S MEDIUM SAND		5.05		-	LL			
	0.0069	4.5	S FINE SAND		89.91		•	PL			CW
	0.0034	4.5	\$ FINES		4.76		<u> </u>	I SI		TECH	5/3/01
L	0.0014	4.5	S TOTAL SAMPLE		100.00					DATE	-it
										CHECK	- the



ł

ROJECT TITLE	GENH	ESIS/PLUM PC	INT ENER	GY/AR	SA	MPLE ID	B-20	-	
PROJECT NO. 013-3205			SAMPLE TYPE			Ba	ag		
REMARKS					SAMPL	E DEPTH	9.0 -	10.0'	
•				Hygroscopic I	Moisture For	Sieve Sample			
WATER CONTENT (Delivered M	foisture)			5	Wet Soil &	Tare (gm)		
Wt Wet Soil & Tare (gm) (w1) 473.31				Dry Soil & Tare (gm)					
Wt Dry Soil & Tare (gm) (w2) 461.37			1						
Weight of Tare (gm) (w3) 85.84			85.84						
Weight of Water (gm)		(w4 = w1 - w2)	11.94	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	vgroscopic Mo	
Weight of Dry Soil (gm	ð	(w5 = w2 - w3)	375.53		or builipro or	Sample (gm)	461.37		
Moisture Content (%)		(w4/w5)*100	(w4/w5)*100 3 18		• · · · · · · · · · · · ·	Tare Weigh	nt (gm)	85.84	
	· · · · ·	((W6)	Total Dry W	Veight (gm)	375.53	
OTTAL ANAL MOTO				01					
SIEVE ANALYSIS		1174 P	(1)/2 (Tr)		0 0400	010311	-		
Tare Weight		WI Ret	(Wt-Tare)	(% Retained)	% PASS	SIEVI	3		
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)	1			
	12.0"					12.0"	cobbles		
	3.0"					3.0"	coarse gravel		
	2.5"					2.5"	coarse gravel		
	2.0"					2.0"	coarse gravel		
	1.5"			·	·	1.5"	coarse gravel		
	1.0"					1.0"	coarse gravel		
	0.75"					0.75"	fine gravel		
	0.50"					0.50"	fine gravel		
	0.375"	0.00	0.00	0.00	100.00	0.375"	fine gravel		
	#4	0.84	0.84	0.22	99.78	#4	coarse sand		
	#10	1.12	1.12	0.30	99.70	#10	medium sand		
	#20	12.84	12.84	3.42	96.58	#20	medium sand		
	#40	264.95	264.95	70.55	29.45	#40	fine sand		
	#60	353.85	353.85	94.23	5.77	#60	fine sand		
	#100	367.95	367.95	97.98	2.02	#100	fine sand		
	#200	371.81	371.81	99.01	0.99	#200	fines		
	PAN					PAN			
% COBBLES	0.00								
% C GRAVEL	0.00	Descri	iptive Terms	> 10%	mostly coarse	: (c)		r	
% F GRAVEL	0.22	trace	0 to 5%	> 10%	mostly mediu	m (m)	LL		
% C SAND	0.07	little	5 to 12%	< 10%	fine (c-m)		PL	-	
% M SAND	70.26	some	12 to 30%	< 10%	coarse (m-f)		PI		
% F SAND	28.46	and	30 to 50%	< 10%	coarse and fir	ne (m)	Gs	·	
% FINES	0.99			< 10%	coarse and me	edium (f)			
% TOTAL	100.00]		> 10%	equal amount	s each (c-f)			
DES	CRIPTION	Brown, MED	IUM TO FIN	E SAND, trace	silt, trace	1			
		fine gravel.							
	USCS	(SP)				L	TECH	JC/TJ	
	2000						DATE	5/1/01	
							CHECK	th-	
							REVIEW	Pun	

Golder Associates Inc.




PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-21	•	
RUJECT NO.		013-3205			SAM	PLE TYPE	В	ag	
KEMARKS					SAMPI	E DEPTH	19.0	- 20.0'	
	1			Hygroscopic 1	Moisture For	Sieve Sample			
WATER CONTENT	(Delivered N	loisture)		1		Wet Soil &	Tare (gm)		
Wt Wet Soil & Tare (g	gm)	(w1)	435.72]		Dry Soil &	Tare (gm)		
Wt Dry Soil & Tare (g	;m)	(w2)	369.14			Tare Weight	t (gm)		
Weight of Tare (gm)		(w3)	84.45	Moisture Content (%)					
Weight of Water (gm)		(w4 = w1 - w2)	66.58	Total Weight	Of Sample Us	sed For Sieve	Corrected For H	Iygroscopic M	
Weight of Dry Soil (gr	m)	(w5 = w2 - w3)	284.69 `			Weight Of S	Sample (gm)	369.14	
Moisture Content (%)		(w4/w5)*100	23.39			Tare Weigh	nt (gm)	84.45	
					(W6)	Total Dry W	/eight (gm)	284.69	
· · · · ·									
SIEVE ANALYSIS				Cumulative					
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE	3		
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)				
	12.0"					12.0"	cobbles		
	3.0"	· .				3.0"	coarse gravel		
	2.5"					2.5"	coarse gravel		
	2.0"					2.0"	coarse gravel		
	1.5"					1.5"	coarse gravel		
	1.0"					1.0"	coarse gravel		
	0.75"					0.75"	fine gravel		
	0.50"					0.50"	fine gravel		
	0.375*					0.375"	fine gravel		
	#4	0.00	0.00	0.00	100.00	#4	coarse sand		
	#10	0.16	0.16	0.06	99.94	#10	medium sand		
	#20	1.91	1.91	0.67	99.33	#20	medium sand		
	#40	5.80	5.80	2.04	97.96	#40	fine sand	•	
	#60	9.25	9.25	3.25	96.75	#60	fine sand		
	#100	64.96 ·	64.96	22.82	77.18	#100	fine sand		
	#200	212.71	212.71	74.72	25.28	#200	fines		
	PAN					PAN			
% COBBLES	0.00								
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)			
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medius	m (m)		-	
% C SAND	0.06	little	5 to 12%	< 10%	fine (c-m)		PL	-	
% M SAND	1.98	some	12 to 30%	< 10%	coarse (m-f)		PI	-	
% F SAND	72.68	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	-	
% FINES	25.28			< 10%	coarse and me	dium (f)			
% TOTAL	100.00			> 10%	equal amounts	each (c-f)			
DES	CRIPTION	Brown, FINE	SAND, some	clayey silt.					
	USCS	(SM)					TECH	JC/TJ	
							DATE	5/1/01	
							CHECK	- m	
							REVIEW	IWM	

Golder Associates Inc.

1



PROJECT TITLE	GENI	ESIS/PLUM PO	DINT ENER	GY/AR	SA	MPLETO	B-23	_
PROJECT NO.		013-3205			SAME	DI E TVPE		
REMARKS					SAMPI	FDFPTH	90.	15 0'
			· · · · · · · · · · · · · · · · · · ·	Hygroscopic	Maisture For	Sieve Sample		15.0
WATER CONTENT	Delivered N	loisture)				Wet Soil &	Tare (om)	
Wt Wet Soil & Tare (g	m)	(w1)	538.36			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (g	m)	(w2)	509.19			Tare Weig	tare (gui)	
Weight of Tare (gm)		(w3)	83.30			Moisture C	ontent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	29.17	Total Weight	Of Sample Ha	ed For Sieve	Corrected For J	I Ivgroscopia Ma
Weight of Dry Soil (gn	1)	(w5 = w2 - w3)	425.89		or sample os	Weight Of	Sample (am)	500 10
Moisture Content (%)	-	(w4/w5)*100	6.85			Tare Weig	the (om)	83 30
		(1	(WG)	Total Dry	Weight (gm)	425.90
					(110)	Total Diy	Weight (gill)	425.09
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E	
0.00		+Tare	({/wt.mt/w@+100}	(100-%ret)	0121	2	
	12.0"				(100 /0100)	12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.5	coarse gravel	
the second second	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"				<u>.</u>	0.75"	fine gravel	
	0.50"					0.75	fine gravel	
	0.375"	0.00	0.00	0.00	100.00	0.375"	fine gravel	
	#4	0.00	0.00	0.07	99.93	#A	coarse sand	
	#10	0.76	0.76	0.18	99.82	#10	medium sand	
	#20	7.48	7.48	1.76	98.24	#20	medium sand	
	#40	100.98	100.98	23.71	76.29	#40	fine sand	
	#60	255.90	255.90	60.09	39.91	#60	fine sand	•
	#100	321.53	321.53	75.50	24.50	#100	fine sand	
	#200	388.75	388.75	91.28	8.72	#200	fines	
	PAN		500175	71.20	0.72	PAN	11105	
% COBBLES	0.00							
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.07	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	-
% C SAND	0.11	little	5 to 12%	< 10%	fine (c-m)		PL	
% M SAND	23.53	some	12 to 30%	< 10%	coarse (m-f)		PI	-
% F SAND	67.57	and	30 to 50%	< 10%	coarse and fine	e (m)	Gs	-
% FINES	8.72			< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
		J .						
DESC	RIPTION	Brown, MEDI	UM TO FIN	E SAND, little	clayey silt.			-
-200		trace fine grav	el.					
	USCS	(SP-SM)					TECH	JC/TJ
							DATE	5/1/01
							CHECK	H
							REVIEW	AUM

Golder Associates Inc.



l

ŀ

PROJECT TITLE	GEN	ESIS/PLUM PO	DINT ENER	GY/AR	SA	MPLE ID	B-24	-
PROJECT NO.		013-3205		[]	SAM	PLE TYPE	F	1
REMARKS	-			1	SAMPI	F DEPTH	40	- 5 0'
\$				Hygroscopic	Moisture For	Sieve Sample	<u> </u>	- 3.0
WATER CONTENT	(Delivered M	(loisture)			atorstate for	Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare ((2m)	(w1)	318 64			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (zm)	(1)(2)	313 71	1 .		Tore Weig	ht (am)	
Weight of Tare (gm)		(w3)	77.59	1		Moisture (Content (%)	
Weight of Water (gm)		(w4 = w1 - w2)	4.93	Total Weight	Of Sample Lie	ed For Sieve	Corrected For I	Jugrosconia M
Weight of Dry Soil (gr	m)	(w5 = w2 - w3)	236.12 .		or bampic os	Weight Of	Sample (cm)	212 71
Moisture Content (%)		(w4/w5)*100	2.09	1		Tare Wei	the (om)	77.50
(,					(WA)	Total Dry	Weight (gm)	236.12
				L	(+0)	Total Diy	weight (gill)	230.12
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	STEX	/F	
0.00		+ Tare	({(wt ret/w6)=100}	(100-%ret)		2	
	12.0"				(100 /0100)	12.0"	cobbles	
	3.0"			· · ·		3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"		· · · · · · · · · · · · · · · · · · ·			1.5"	coarse gravel	
	1.0"					1.0	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"					0.75	fine gravel	
	0.375"					0.30	fine gravel	
	4A	0.00	0.00	0.00	100.00	41	nie graver	
	#10	0.00	0.00	0.00	00.05	#10	medium sand	
	#10	0.11	0.01	0.05	99.95	#10	medium sand	
	#20	20.57	20.67	9.75	99.01	#20	fine sand	
	#40	100.37	100 37	46 32	53.69	#40	fine cand	•
	#100	167.29	167.20	70.85	20.15	#100	fine sand	
	#200	213.60	213.60	00.45	29.15	#200	fines	
	TAN		213.00	20.40	9.54	TAN	mes	
% COBBI ES	0.00	1			- 	IUI		
% C GRAVEI	0.00	Descri	ntive Terms	> 10.95	mostly coarse	(c)		
% F GRAVEI	0.00	trace	fito 596	> 10%	mostly mediur	(c) n (m)	11.	
% C SAND	0.05	little	5 to 1296	- 10%	fine (c-m)	u (111)	PT.	
% M SAND	8 71	some	12 to 30%	< 10%	coarse (m-f)		PI	
% E SAND	81 71	and	30 to 50%	< 10%	coarse and fin	e (m)	Ge	
% FINES	Q 54		30 W 30 M	< 10%	coarse and me	dium (f)		L
% TOTAL	100.00	4		> 10%	equal amounts	each (c-f)		
% IUIAL	100.00]		> 10%	equal amounts	each (C-I)		
DES	CRIPTION	Brown, FINE	SAND, little	clayey silt.				
	USCS	(SP-SM)					TECH	SW
							DATE	5/1/01
							CHECK	- n
							REVIEW	10h



PROJECT TITLE	GEN	ESIS/PLUM PO	DINT ENER	GY/AR	GA		B-24	1	٦
PROJECT NO.		013-3205			SANAT		D-24	<u> </u>	-
REMARKS		015-5205		4	SAME	LETIPE	B	ag	4
•			· .	Thursdania	SAMPL	EDEPTH	19.0	- 20.0'	
WATER CONTENT	Delivered 1	(aistura)		Hygroscopic	Moisture For	Sieve Sample		r	
Wt Wet Soil & Tare ((Denveren M	/ioiscure)	406.00	4		Wet Soil &	Tare (gm)		_ ·
Wt Wet Soil & Tale (gm)	(W1)	426.02	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Dry Soil &	Tare (gm)		
Weight of Tree (ma)	gm)	(W2)	379.02	4		Tare Weigh	ıt (gm)		
Weight of Tare (gm)		(w3)	86.25			Moisture C	ontent (%)	1	
weight of water (gm)		(w4 = w1 - w2)	47.00	Total Weight	Of Sample Us	ed For Sieve	Corrected For I	lygroscopic M	loistur
weight of Dry Soil (g	m)	(w5=w2-w3)	292.77 -			Weight Of	Sample (gm)	379.02	
Moisture Content (%)		(w4/w5)*100	16.05			Tare Weig	ht (gm)	86.25	7
					(₩6)	Total Dry V	Weight (gm)	292.77	
SIEVE ANALYSIS				Cumulative					
Tare Weight	_	Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E		
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)		· · ·		
-	12.0"			1		12.0"	cobbles		
	3.0"					3.0"	coarse gravel		
	2.5"					2.5"	coarse gravel		
	2.0"					2.0"	coarse gravel		
	1.5"					1.5"	coarse gravel		
	1.0"					1.0	coarse gravel		
	0.75"					0.767	Coarse gravel		
	0.75					0.75	fine gravel		
	0.30					0.50"	tine gravel		
	0.3/5"		0.00	0.00		0.375"	fine gravel		
	#4	0.00	0.00	0.00	100.00	#4	coarse sand		
	#10	0.08	0.08	0.03	99.97	#10	medium sand		
and a second second second second second second second second second second second second second second second	#20	1.27	1.27	0.43	99.57	#20	medium sand		
and the second second	#40	64.60	64.60	22.07	77.93	#40	fine sand		
	#60	265.37	265.37	90.64	9.36	#60	fine sand		
	#100	287.61	287.61	98.24	1.76	#100	fine sand		
	#200	290.28	290.28	99.15	0.85	#200	fines		
	PAN					PAN			
% COBBLES	0.00								
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)			
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	•	
% C SAND	0.03	little	5 to 12%	< 10%	fine (c-m)		PL	-	
% M SAND	22.04	some	12 to 30%	< 10%	coarse (m-f)		PI	-	
% F SAND	77.08	and	30 to 50%	< 10%	coarse and fine	e (m)	Gs	-	
% FINES	0.85			< 10%	coarse and me	dium (f)			
% TOTAL	100.00	1		> 10%	equal amounts	each (c-f)			
DES	CRIPTION	Brown, MEDI	UM TO FIN	E SAND, trace	silt.				
	USCS	(SP)					TECH	SW	
	0000						DATE	5/1/01	
							CHECK	The	~
							REVIEW	n.	5
							A 44 7 A 19 1 1		



		AG	TA CD	IN SIZE A	MAX XIGTO				
		ASTM D 42	1 D 221	111 SIZE A	T 117 D	aa (112	c		
			1, D 441	, D 1140, (- 117, D 4	22, C 13	D		
PROJECT TITLE	GEN	ESIS/PLUM PO	INT ENED	CV/AP	~.		Dac		.
PROJECT NO.	GIST	013-3205	ANI ENGA		SANG	MPLE ID	B-20	-	4
REMARKS		010 0100		1	SAINI	CE LIFE		ag	4
9				Hygroscopic	SAWPL Moisture For 6	E DEFIL	1 14.0	• 25.0	
WATER CONTENT	(Delivered N	Aoisture)			MOISTURE FOR 2	Wet Soil &	Tare (gm)	r	7
Wt Wet Soil & Tare (g	gm)	(w1)	430.91			Dry Soil &	Tare (gm)		-
Wt Dry Soil & Tare (g	ļm)	(w2)	378.24	1 .	· .	Tare Weig	ht (gm)		-
Weight of Tare (gm)		(w3)	84.43	1		Moisture C	Content (%)		1
Weight of Water (gm)		(w4 = w1 - w2)	52.67	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	Iveroscopic Me	listure
Weight of Dry Soil (gr	n)	(w5=w2-w3)	293.81]		Weight Of	Sample (gm)	378.24	7
Moisture Content (%)		(w4/w5)*100	17.93]		Tare Weig	ght (gm)	84.43	1
					(W6)	Total Dry	Weight (gm)	293.81	1
							· · · · · · · · · · · · · · · · · · ·		
SIEVE ANALYSIS		•		Cumulative					
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E		
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)				
	12.0"					12.0"	cobbles		
	3.0"					3.0"	coarse gravel		
	2.5"					2.5"	coarse gravel		-
	2.0"					2.0"	coarse gravel		
	1.5"					1.5"	coarse gravel		
	1.0"					1.0"	coarse gravel		
	0.75"				·	0.75"	fine gravel		
	0.50"		0.00	0.00		0.50"	fine gravel		
	0.3/5	0.00	0.00	0.00	100.00	0.375"	fine gravel		
	#10	1.48	1.40	0.30	99.50	#4	coarse sand		
	#20	10.49	10 40	2.57	99.22	#10	medium sand		
	#40	82.21	82 21	27.98	72.02	#20	fine cand		
	#60	202.14	202.14	68.80	31.20	#60	fine sand		
	#100	226.25	226.25	77.01	22.99	#100	fine sand		
	#200	234.20	234.20	79.71	20.29	#200	fines		
	PAN			1 1		PAN	11100		
% COBBLES	0.00	1							
% C GRAVEL	0.00	Descrip	otive Terms	> 10% 1	nostly coarse ((c)			
% F GRAVEL	0.50	trace	0 to 5%	> 10%	nostly medium	n (m)	LL	-	1
% C SAND	0.27	little	5 to 12%	< 10% i	ine (c-m)	• •	PL	-	1
% M SAND	27.20	some	12 to 30%	< 10% (coarse (m-f)		PI	÷	
% F SAND	51.73	and	30 to 50%	< 10% a	coarse and fine	(m)	Gs	-	
% FINES	20.29			< 10% (coarse and med	lium (f)			
% TOTAL	100.00]		> 10% a	equal amounts	each (c-f)			
DESC	CRIPTION	Brown, MEDI	UM TO FINI	E SAND, some	clayey				
		silt.							
	USCS	(SM)	•				TECH	SW	
							DATE	5/1/01	
							REVIEW	1 an	, –

1

ŀ



		A	AS STM C11	5TM GRA 7, C136, 1	IN SIZE ANAL D421, D422, D1	YSIS 140 and D221′	7			
PROJECT TITLE	GENESIS/PI	UM POINT EN	ERGYAP]		SAMPLE ID		B-26	. 1	
OJECT NO.	012	3205	DIG LIAN			SAMPLE ID	F.	Ba		
		-5205		· .		SAMPLE IIF	ru i	40.0-	50 01	
					1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	SAMPLE DEF	In l	47.0 -	50.0	
AS RECEIVED	WATER CO	ONTENT		Hygrosc	opic Moisture	Wet Soil & Tare (g	m)	37.90		
Tare No.			•	For Siev	e Sample	Dry Soil & Tare (gi	m)	37.01		
Wt. Wet Soil & Tare (g	m)	(W1)	97.38			Tare Weight (gm)		3.20		
Wt. Dry Soil & Tare (g	m)	(W2)	86.89			Moisture Content (%)	2.63	1	
Weight of Tare (gm)		(₩3)	51.80	Total We	ight of Sample Used	For Sieve Analy	sis Corrected	l For Hygros	copic Moist	ure
Weight of Water (gm)		(W4=W1-W2)	10.49		Weight + Tare, Befor	e Separating On The	#4 Sieve (gm)	241.18		
Weight of Dry Soil (gm)	(W5=W2-W3)	35.09			Ta	re Weight (gm)	113.68		
Moisture Content (%)		(W4/W5)*100	29.89			Tot	al Weight (gm)	124.23	(₩6)	
Plus #4 Materia	al Sieve			(Wt+Tare)	(((Wt-Tare)/W6)*100)	%PASSING				
TARE WEIGHT	0.00		12.0"				12.0"	cobbles		
		•	3.0"				3.0"	coarse gravel		
			2.5"				2.5"	coarse gravel		
			2.0"				2.0"	coarse gravel		
			1.5"				1.5"	coarse gravel		
			1.0"				1.0"	coarse gravel		
			0.75"				0.75"	fine gravel		
			0.50"	0.00	0.0	100.0	0.50"	fine gravel		
			0.375"	5.14	4.1	95.9	0.375"	fine gravel	•	
			#4	13.55	10.9	89.1	#4	coarse sand		
TARE WEIGHT	eriod	1 Minute	TER BAC	KSIEVE (I	* Pass #4 Sieve For W Percent Passing #1 Cumul Wt.	nole Sample 0 - #200 Sieves	89.09			
			-	(Wt+Tare)	Retained	% PASSING				
			#10	6.29	6.29	79.2	#10	medium sand		
			#20	14.40	14.40	00.4	#20	medium sand		
			#40	20.52	20.52	50.7	#40	fine sand		
			100	20.41	20.41	44.3	#100	fine cand		
			#200	28.89	28.80	43.5	#200	fines		
		HYDROME	TER CAL	ULATION	IS	1				
DATE	TIME	ET	READING	TEMP	TEMP.COR.	HYD.COR.	READING	EFFECTIVE		
5/4/01	9:53	(min)	R	Т	K	Cc	С	LENGTH	A	
5/4/01	9:55	2.00	32.0	22.00	0.013	5.00	27.00	11.9	1.00	
5/4/01	9:58	5.00	31.5	22.00	0.013	5.00	26.50	12.0	1.00	
5/4/01	10:08	15.00	28.5	22.00	0.013	5.00	23.50	12.5	1.00	
5/4/01	10:23	30.00	27.0	22.00	0.013	5.00	22.00	12.7	1.00	
5/4/01	10:53	60.00	25.5	22.00	0.013	5.00	20.50	13.0	1.00	
5/4/01	14:03	250.00	23.0	22.00	0.013	5.00	18.00	13.3	1.00	
5/5/01	9:53	1440.00	20.0	21.50	0.014	5.00	15.00	13.8	1.00	
		GRAIN SIZ	LE PERCE	NTAGES	_	[a				
Particle Diameter	S PASSING	% COBBLES		0.00	Description	Gray, COARSE	TO FINE SA	IND, and silt	y ciay,	
0.0324	42.6	S COARSE GRAV	EL.	0.00	TIECE	innie nne gravel.				1
0.0206	41.8	S FINE GRAVEL		0.91	USCS	(30)	1			
0.0121	37.1	CUARSE SAND	2	22 47		-	lll			
0.0087	34.7	& FINE SAND		13.22			PL			
0.0031	28.4	S FINES		43.48		•	PI		TECH	SW/DA
0.0013	23.7	TOTAL SAMPL	6	100.00			-		DATE	5/3/01
					_				CHECK	the
									REVIEW	wing



PROJECT TITLE	GENE	SIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-26	4
ROJECT NO.		013-3205			SAM	LE TYPE	B	lag
REMARKS					SAMPI	E DEPTH	59.0 -	130.0'
•				Hygroscopic	Moisture For	Sieve Sample	•	
WATER CONTENT	(Delivered M	loisture)			. · · · ·	Wet Soil &	c Tare (gm)	
Wt Wet Soil & Tare (g	ym)	(w1)	1637.55			Dry Soil &	z Tare (gm)	
Wt Dry Soil & Tare (g	;m)	(w2)	1480.98			Tare Weig	ht (gm)	
Weight of Tare (gm)		(w3)	163.45		n an an an Ari	Moisture (Content (%)	
Weight of Water (gm)		(w4=w1-w2)	156.57	Total Weight	Of Sample Us	ed For Sieve	e Corrected For I	Lygroscopic 1
Weight of Dry Soil (gr	n)	(w5=w2-w3)	1317.53 -			Weight Of	Sample (gm)	1480.98
Moisture Content (%)		(w4/w5)*100	11.88			Tare Wei	ght (gm)	163.45
					(W6)	Total Dry	Weight (gm)	1317.53
1 a								
SIEVE ANALYSIS		·		Cumulative				
Tare Weight	Ľ	Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	Æ	
0.00	1	+Tare	······	{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
and the second sec	1.0"	0.00	0.00	0.00	100.00	1.0"	coarse gravel	
	0.75"	9.34	9.34	0.71	99.29	0.75"	fine gravel	
	0.50"	42.92	42.92	3.26	96.74	0.50"	fine gravel	
	0.375"	71.55	71.55	5.43	94.57	0.375"	fine gravel	
	#4	232.93	232.93	17.68	84.32	#4	coarse sand	
	#10	425.58	425.58	32.30	67.70	#10	medium sand	
	#20	024.67	024.07	47.41	32.39	#40	fine send	
	#40	1086.12	1086.12	82.44	17.50	#40	fine sand	
	#60	1255.07	1255.07	93.74	0.20	#100	fine sand	
	#100	1209.01	1209.01	90.32	3.08	#100	fines	
	7400	1279 14	1279 14	עע.סע	10,6	1 #200 DAN	lines	
& COBBLEC		12/8.10	12/0.10			FAIN	<u></u>	
& C GPAVEI	0.00	Decor	intive Terms	> 10.44	mostly coarse	(c)		
% F GRAVEI	16.07	trace	1) to 5%	> 10%	mostly mediu	m (m)	LL	· ·
% C SAND	14.67	little	5 to 12%	< 10%	fine (c-m)	()	PL	-
% M SAND	50 13	some	12 to 30%	< 10%	coarse (m-f)	•	PI	: -
% F SAND	14 55	and	30 to 50%	< 10%	coarse and fir	e (m)	Gs	-
% FINES	3.01		20.00000	< 10%	coarse and me	edium (f)		
% TOTAL	100.00			> 10%	equal amount	s each (c-f)		
	100.00	1			4	· · · ·		
DES	CRIPTION	Brown, COAL	RSE TO FINI	E SAND, some	e fine	1		
		gravel, trace s	silt.					
						J		
	USCS	(SP)					TECH	JC/T
							DATE	5/1/0
							CHECK	40~
							REVIEW	1 Alali



COLECT TITLE UECT NO. DEXT 93-2005 DEXT 93-2005 DEXT 93-2005 DEXT 93-2005 AS RECEIVED WATER CONTENT we no. Hygrescepic Moisture two no. We sold a Tars (gap) two for the We sold a Tars (gap) two for the We sold a Tars (gap) the no gap (gap) (A	AS STM C11	TM GRA 7, C136,	IN SIZE ANAL D421, D422, D1	YSIS 40 and D221	7			
UECT NO. Discussion SAMPLE TYPE SAMPLE TYPE S	ROJECT TITLE	GENESIS/DI	IM POINT F	ERCY/AD			SAMOT E TD		P 27		1
Add PLB 1712b SAMPLE DEPTH Bag Ads REGEVED WATER CONTENT Hyposcopic Molstere We cold A Tra (gn) 42.02 Ads REGEVED WATER CONTENT Hyposcopic Molstere We cold A Tra (gn) 42.02 Ads REGEVED WATER CONTENT Hyposcopic Molstere 42.02 52.0 At Tra (gn) (WV) 141.48 Tra Weigh (gn) 42.02 At Tra (gn) (WV) 11.74 Total Weigh of Sample Used For Sinx Analysis Corrector For grapprocepte Molstere Weight of Sam (gn) (WV-107).902 53.02 Tras Weight (gn) 53.03 Weight of Sam (gn) (WV-107).902 54.13 50.0 70.00 90.00 Plate of Do Sal (gn) (WV-107).902 54.33 10.0° conteg growt 1.55 Add Sam (gn) 1.2.9° 1.2.9° 1.2.9° 1.2.9° conteg growt 3.0° 5.00 1.2.9° 1.2.9° 1.2.9° conteg growt 3.0° 5.37 0.00 0.0 100.0 0.37° fog growt 3.0° 5.30° 0.00 0.00	JECT NO	012	-3705	LANGTIAK			SAMPLE ID	E .	B-4/		
AS RECEIVED WATER CONTENT are No. Hyperscopic Moleture by soil a true (pa) 0.03 0.04 0.05	VECTINO.	013	-3205				SAMPLE TYP	E	Ba	ng	
AS & ECCUVED WATER CONTENT							SAMPLE DEP	ТН	19.0 -	30.0'	
No. A. Prof. Stars.	AS RECEIVED	WATER C	ONTENT		Hygrose	onic Moisture	Wat Call & Tam for	m)	42.04		
The Stat 2 trac (gan) (W) Id.42 (W) Of Soft 2 statuge Dy Soft 2 statuge	Tare No.				For Sion	opic moisture	wet Soil & Tare (g	m)	43.04		
And Link (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (Link) (W) (U) (U) <t< td=""><td>Wt Wat Soil & Tame (a</td><td></td><td>A111</td><td>141.49</td><td>FUT SIEV</td><td>e Sample</td><td>Dry Soil & Tare (gi</td><td>mj</td><td>40.78</td><td></td><td></td></t<>	Wt Wat Soil & Tame (a		A 111	141.49	FUT SIEV	e Sample	Dry Soil & Tare (gi	mj	40.78		
Light of Tar (gu) (W) Light of Weight of Sample Used For Silver Adaptist Corrected [Per Hyproscopic Molsture Weight of Sample Used For Silver Adaptist Corrected [Per Hyproscopic Molsture Weight of Sample Used For Silver Adaptist Corrected [Per Hyproscopic Molsture Weight of Sample Used For Silver Adaptist Corrected [Per Hyproscopic Molsture Weight of Sample Used For Silver Adaptist Corrected [Per Hyproscopic Molsture Weight of Sample Used For Silver Adaptist Corrected [Per Hyproscopic Molsture Weight of Sample Used For Silver Adaptist Correct [Per Hyproscopic Molsture Weight of Sample Used For Silver Adaptist Correct [Per Hyproscopic Molsture Takes Weight of Sample Used For Hyproscopic Molsture (W+Tar) (WP-Tar)(WP)*100 \$\$ASRNG 2.0" Correct [Per Hyproscopic Molsture Weight of Sample Used For Hyproscopic Molsture Takes Weight of Sample Used For Hyproscopic Molsture 0.05" Correct [Per Hyproscopic Molsture [Per Hyproscopic Molsture] 1.0" <td>Wt Dry Soil & Tam (a</td> <td>() ()</td> <td>(W1)</td> <td>116.07</td> <td></td> <td></td> <td>Tare Weight (gm)</td> <td></td> <td>3.24</td> <td></td> <td></td>	Wt Dry Soil & Tam (a	() ()	(W1)	116.07			Tare Weight (gm)		3.24		
Construction Open State Open	Weight of Tem (am)	hui	(W2)	115.87	(T) 4 - 1 XX/-		Moisture Content (%)	6.02		
Part of Mark (gm) (W=W-W2) 2.0.1 Weight + Tare, Befors Spranding On The # A Since (gm) 401.53 Data # Material Steve (W-W2)*100 39.93 Teal Weight (gm) 15.55 Teal Weight (gm) 15.55 TARE WEIGHT 0.00 10.0° \$\$PA3SINC 700 Weight (gm) 30.9° 2.0° 2.0° 2.0° 2.0° 2.0° 2.0° 2.0° costs gravel 2.0° 2.0° costs gravel 2.0° 2.0° costs gravel 2.0° <td< td=""><td>Weight of Tare (gm)</td><td></td><td>(W3)</td><td>51.74</td><td>Total We</td><td>ight of Sample Used</td><td>For Sieve Analy</td><td>sis Corrected</td><td>For Hygro</td><td>scopic Mois</td><td>ture</td></td<>	Weight of Tare (gm)		(W3)	51.74	Total We	ight of Sample Used	For Sieve Analy	sis Corrected	For Hygro	scopic Mois	ture
Page 21 (p) Sati (ga) (W+Wrb)*100 Tare Weight (ga) 15.55 TARE WEIGHT 0.00 10.01 SPA3 Tare Weight (ga) S55.03 (Wo) TARE WEIGHT 0.00 10.01 SPA3 Tare Weight (ga) S55.03 (Wo) TARE WEIGHT 0.00 10.01 SPA3 Tare Weight (ga) S55.03 (Wo) 1.01 0.00 10.01 SPA3 SS5.03 (Wo) SS5.03 (Wo) 1.02 0.01 1.01 coare gravel 1.57 coare gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for gravel 0.597 for g	weight of water (gm)		(W4=W1-W2)	25.61		Weight + Tare, Befor	e Separating On The	#4 Sieve (gm)	491.95		
Distant Constant (5) (W4/W5/100 39.33 Total Weight of SASSINC Total Weight of SASSINC TARE WEIGHT 0.00 12.0° (W+Tard) ((W+Tard)(W)/Toto) \$\$ASSINC 2.0° cobies 1.0° 1.0° 1.0° 3.0° 2.0° cobies 3.0° cobies 1.0° 1.0° 1.0° 1.0° 0.00 0.00 0.0°	weight of Dry Soil (gm	1)	(₩5 = ₩2-₩3)	64.13	1.1		Ta	re Weight (gm)	115.55		
Plus #4 Material Siere (W+Tare) (W+Tare) (W+Tare) (W+Tare) SPASSING TARE WEIGHT 0.00 3.0° 3	Moisture Content (%)		(W4/W5)*100	39.93	<u> </u>		Tot	al Weight (gm)	355.03	(W6)	
TARE WEIGHT 0.00 12.0° 12.0° 12.0° 12.0° 12.0° 12.0° 12.0° 12.0° 12.0° 13.0°	Plus #4 Materia	al Sieve	_		(Wt+Tare)	(((Wt-Tare)/W6)*100)	%PASSING				
3.0° 2.5° 3.0° 2.6° 3.0° 2.6° 3.0° 2.6° 3.0° 2.6° 3.0° 2.6° 3.0° <th< td=""><td>TARE WEIGHT</td><td>0.00</td><td></td><td>12.0"</td><td></td><td></td><td></td><td>12.0"</td><td>cobbles</td><td></td><td></td></th<>	TARE WEIGHT	0.00		12.0"				12.0"	cobbles		
2.5° 2.0° 2.4° 2.4° 2.4° 2.4° 2.4° corres gravet 1.5° 1.6° 1.5° 2.0° corres gravet 1.5° corres gravet 0.5° 0.50° 0.50° 0.50° 0.50° 0.50° 0.50° 0.50° for gravet 0.575° 0.00 100.0 0.50° 0.50° 6.50° 0.50° 6.57° for gravet 0.57° for gravet 6.57° for gravet			•	3.0"				3.0"	coarse gravel		
2.0° 2.0° 2.0° 2.0° 2.0° 0.00000000000000000000000000000000000				2.5"				2.5"	coarse gravel		
1.5" 1.5" 1.5" course gravel 0.75" 0.75" 0.75" 0.50" file gravel 0.50" 0.50" 0.50" file gravel 0.50" 0.50" 0.50" file gravel 0.50" file gravel 0.57" 0.24 0.1 92.9 74 coarse gravel 0.50" file gravel 0.50" file gravel 0.50" file gravel 0.24 0.1 92.9 74 coarse gravel 0.50" 0.000 Digersion Period 125.00 Veight of Sample Used For Hydrometer Test "Out Digersion Device Mechanical (et al Digersion Period 1 Minute Weight of Sample Used Sore Dy (gn) 53.42 TABE WEIGHT 0.00 HYDROMETER BACKSIEVE (Percent Passing filo - #200 Silves) Cacand W: Cacand W: (W+Tare) Realaed % PASSINC #20 medium and #40 1.63 1.63 95.8 #100 file and #100 54/01 9:55 (min) R TEM				2.0"				2.0"	coarse gravel		
1.0° 1.0° coarse gravel 0.3° 0.75° 100° 0.77° file gravel 0.50° 0.375° 0.00 0.00 100.0 0.77° file gravel 0.50° 0.24 0.1 99.9 44 coarse gravel 0.57° file gravel Protein 0.24 0.1 99.9 44 coarse gravel 0.57° file gravel Protein 0.24 0.1 99.9 44 coarse gravel 0.57° file gravel 50.39° file gravel f				1.5"				1.5"	coarse gravel		
1.0 Construction 0.75* 0.69* 0.69* file gavet 0.575* 0.00 0.00 0.00 0.59* file gavet 0.59* file gavet 0.575* 0.24 0.1 99.9 74 coarse and Provide the same of the s				1.0"				1.0"	coarse gravel		
Vite Vite <th< td=""><td></td><td></td><td></td><td>0.75"</td><td></td><td></td><td></td><td>0.75</td><td>fine coval</td><td></td><td></td></th<>				0.75"				0.75	fine coval		
0.375° 0.00 0.0 0.00 0.375° file prive 0.375° 0.00 0.0 0.00				0.75	i	·····		0.75	fine gravel		
U.30 ⁻¹ U.30 U.32 U.32 U.32 U.32 ⁻¹ U.32 ⁻¹ U.32 ⁻¹ U.32 ⁻¹ Coarse and HYDROMETER ANALYSIS Weight of Sample Used For Hydrometer Test Weight of Sample Used For Hydrometer Test Weight of Sample Used For Hydrometer Test Optimized Mechanical Weight of Sample Used For Hydrometer Test Diagenion Period Mechanical Weight of Sample Used For Hydrometer Test Diagenion Period Mechanical Weight of Sample We or Dry (gn) Galaded Dy Wt. used in test (gn) Optimized Steve For Whole Sample Optimized Steve For Whole Sample Cannol Wt. Cannol Wt. (Wt + Tare) Retaiced \$95.9 #10 medium and #100 Odd 0.04 0.04 98.9 #10 file and #100 Test MP Cannol Wt. <td< td=""><td></td><td></td><td></td><td>0.30"</td><td>0.00</td><td>0.0</td><td>100.0</td><td>0.30"</td><td>nne gravel</td><td></td><td></td></td<>				0.30"	0.00	0.0	100.0	0.30"	nne gravel		
#4 U.24 U.1 99.3 #4 cease and HYDROMETER ANALYSIS Weight of Sample Used For Hydrometer Test pecific Gravity (essumed) 2.650 Weight of Sample Used For Hydrometer Test Ownou Dispension Device (at of Dispension Period) 125.00 Galantaed Do Wu used in test (gm) 53.42 Dispension Device (at of Dispension Period) 1 Minute % Pass # Steve For Whole Sample 99.93 Take watcht 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sileves) Cannal Wr. Cannal Wr. 0.00 0.47 0.477 92.0 #20 medium and #40 1.63 1.63 96.7 #40 fine sand #40 1.63 1.63 95.7 #40 fine sand #40 1.63 1.63 96.7 #40 fine sand #40 1.63 1.64 92.0 fine sand #40 1.63 1.67 1.97 96.0 fine sand <td></td> <td></td> <td></td> <td>0.3/5"</td> <td>0.00</td> <td>0.0</td> <td>100.0</td> <td>0.375"</td> <td>fine gravel</td> <td></td> <td></td>				0.3/5"	0.00	0.0	100.0	0.375"	fine gravel		
Weight of Sample Used For Hydrometer Test weight of Sample Used For Hydrometer Test weight of Sample Used For Hydrometer Test positio Gravity (essumed) 23.650 Weight of Sample Wer or Dry (gm) 53.42 Calculated Dry W: used in test (gm) 50.39 Dispersion Period 1 Mirate % Pass # Sieve For Whole Sample Cumul W: Cumul W: Realined % Pass # Sieve For Whole Sample 0.00 HYDROMETER BACKSIEVE (Percent Passing #10 - #200 Sieves) Cumul W: Realined % Pass # Sieve For Whole Sample 99.93 # 10 endum sad # 0.004 99.93 # 100 Cumul W: Cumul W: # 20 0.04 # 100 # 20 medium sad # 400 1.63 3.05				#4	0.24	0.1	99.9	#4	coarse sand		
Wi+Tare) Retained % PASSING #10 0.04 0.04 99.9 #10 medium sand #20 0.47 0.47 99.0 #20 medium sand #40 1.63 1.63 96.7 #40 file sand #60 1.97 1.97 96.0 #60 file sand #60 1.97 1.97 96.0 #60 file sand #200 3.05 3.05 93.9 #200 file sand #200 3.05 3.05 93.9 #200 file sand #200 3.05 2.08 95.8 #100 file sand #200 3.05 2.08 93.9 #20 file sand 5/4/01 9:55 (min) R T K Cc C LENGTH A 5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 25.0 12.2 1.00 5/4/01 <	5th of Dispersion Pe	eriod	1 Minute	TER BAC	KSIEVE (I	% Pass #4 Sieve For W Percent Passing #1	hole Sample 0 - #200 Sieves)	99.93			
Image: Non-Section of the stand of					(Wi+Tare)	Retained	% PASSING	1			
120 0.47 0.47 990 120 medium said 440 1.63 1.63 96.7 440 fine sand 460 1.97 1.97 96.0 460 fine sand 460 1.97 1.97 96.0 460 fine sand 460 2.08 2.08 95.8 4100 fine sand 4700 2.08 2.08 95.8 4100 fine sand 54001 9:55 (min) R T K Cc C Length A 5/4/01 9:57 2.00 45.0 22.00 0.013 5.00 40.00 9.7 1.00 5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 22.21 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 12.2 1.00 5/4/01 10:25 30.00 27.5 22.00 0.013 5.00 12.2 <t< td=""><td></td><td></td><td></td><td>#10</td><td>0.04</td><td>0.04</td><td>99.9</td><td>#10</td><td>medium sand</td><td></td><td></td></t<>				#10	0.04	0.04	99.9	#10	medium sand		
Jub 0.71 Jub Jub <td></td> <td></td> <td></td> <td>10</td> <td>0.47</td> <td>0.04</td> <td>99.0</td> <td>#20</td> <td>medium sand</td> <td></td> <td></td>				10	0.47	0.04	99.0	#20	medium sand		
HO 1.03 John HO Interant #60 1.97 1.97 96.0 #60 fine sand #100 2.08 2.08 95.8 #100 fine sand #200 3.05 3.05 93.9 #200 fine sand DATE TIME ET READING TEMP TEMP.COR. HYD.COR. READING EFFECTIVE 5/4/01 9:55 (min) R T K C C LENGTH A 5/4/01 9:57 2.00 45.0 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 22.50 12.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 12.7 1.00 5/4/01 10:25 60.00 24.5 22.00 0.013 5.00 13.2 1.00 5/4/01 14:05 <td></td> <td></td> <td></td> <td>#40</td> <td>1.63</td> <td>1.63</td> <td>96.7</td> <td>#40</td> <td>fine cand</td> <td></td> <td></td>				#40	1.63	1.63	96.7	#40	fine cand		
Viol 1.01 1.01 1.01 1.01 1.01 floo floo <th< td=""><td></td><td></td><td></td><td>#60</td><td>1.05</td><td>1.05</td><td>96.0</td><td>#60</td><td>fine sand</td><td></td><td></td></th<>				#60	1.05	1.05	96.0	#60	fine sand		
Image: Problem state Image: Problem state Image: Problem state Image: Problem state Particle Disense: % PASSING % COBBLES 0.00 0.013 5.00 10.0 10.0 10.0 State 10.0 10.00 5.00 30.05 93.9 #200 files DATE TIME ET READING TEMP TEMP.COR. HYD.COR. READING EFFECTIVE A 5/4/01 9:55 (min) R T K Cc C LENGTH A 5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 12.2 1.00 5/4/01 10:25 30.00 27.5 22.00 0.013 5.00 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 13.50 14.2 1.00				#100	2.08	2.08	95.8	#100	fine sant		
Jobs Jobs<				#700	3.05	3.05	93.0	#200	fines		
DATE TIME ET READING TEMP.COR. HYD.COR. READING EFFECTIVE 5/4/01 9:55 (min) R T K Cc C LENGTH A 5/4/01 9:57 2.00 45.0 22.00 0.013 5.00 40.00 9.7 1.00 5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 22.50 12.2 1.00 5/4/01 10:25 30.00 27.5 22.00 0.013 5.00 13.2 1.00 5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 13.2 1.00 5/4/01 14:0.05 250.00 21.0 22.00 0.013 5.00 13.2 1.00 5/5/01 9:55 14:40.00 18.5 21.50 0.014 5.00 13.7			HYDROME	TER CALC	TILATION	19	,,,,,				
Drift S Hard Res EA Restance T K Cc C LENGTH A 5/4/01 9:57 2.00 45.0 22.00 0.013 5.00 40.00 9.7 1.00 5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 25.50 12.2 1.00 5/4/01 10:25 30.00 27.5 22.00 0.013 5.00 13.2 1.00 5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 13.7 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 0.0293 79.3 © COBBLES 0.00 0.00 0.02	DATE	TDE	ET	DEADING	TEMP	TEMP COP	HYD COP	READING	FFFFCTIVE		T
J. Trol 2.33 (IIIII) R I R CC C Lenvin R 5/4/01 9:57 2.00 45.0 22.00 0.013 5.00 40.00 9.7 1.00 5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 25.50 12.2 1.00 5/4/01 10:25 60.00 24.5 22.00 0.013 5.00 22.50 12.7 1.00 5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 13.7 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 0.0293 79.3 \$ COARSE GRAVEL 0.07 0.02	5/4/01	0.65	(min)	D	T	W	Co	C	LENGTU	A	
5/4/01 10:00 5.00 39.0 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 25.50 12.2 1.00 5/4/01 10:25 30.00 27.5 22.00 0.013 5.00 22.50 12.7 1.00 5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 19.50 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 13.7 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 13.7 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 0.0293 79.3 © COARSE GRAVEL 0.07 <t< td=""><td>\$/4/01</td><td>9:55</td><td>2.00</td><td>45.0</td><td>22.00</td><td>0.013</td><td>5.00</td><td>40.00</td><td>97</td><td>1.00</td><td>1</td></t<>	\$/4/01	9:55	2.00	45.0	22.00	0.013	5.00	40.00	97	1.00	1
5/4/01 10:00 5/.00 39.0 22.00 0.013 5.00 34.00 10.7 1.00 5/4/01 10:10 15.00 30.5 22.00 0.013 5.00 25.50 12.2 1.00 5/4/01 10:25 30.00 27.5 22.00 0.013 5.00 22.50 12.7 1.00 5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 19.50 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 19.50 13.2 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 0.0293 79.3 © COARSE GRAVEL 0.00 0.008 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.014 USCS (CH) 0.014 0.014 0.014 0.014 0.014 0.014	5/4/01	5.57	2.00	40.0	22.00	0.013	5.00	24.00	10.7	1.00	
5/4/01 10:10 15:00 50:5 22:00 0.013 5.00 22:50 12.2 1.00 5/4/01 10:25 30.00 27.5 22.00 0.013 5.00 22:50 12.7 1.00 5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 19:50 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 19:50 13.2 1.00 5/5/01 9:55 1440.00 21.0 22.00 0.013 5.00 16:00 13.7 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 0.0293 79.3 \$ COARSE GRAVEL 0.00 0.00 0.018 0.008 0.018 0.028 (CH) 0.0293 0.04 5.00 12.2 1.00 1.00 1.00 1.00 1.00 0.0293 0.0120 50.6 \$ COARSE SAND 0.008<	5/4/01	10:00	5.00	39.0	22.00	0.013	5.00	25.50	12.2	1.00	
5/4/01 10:25 50.00 27.5 22.00 0.013 5.00 22.50 12.7 1.00 5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 19.50 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 16.00 13.7 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.2 1.00 GRAIN SIZE PERCENTAGES Particle Diameter % PASSING % COBBLES 0.00 0.013 5.00 13.50 14.2 1.00 0.0293 79.3 % COARSE GRAVEL 0.00 0.017 USCS (CH) 0.018 0.08 0.0120 50.6 % COARSE SAND 0.08 - LL - PL 0.0087 44.6 % MEDIUM SAND 3.15 - PL - PL 0.0013 26.8 \$ TOTAL SAMPLE 100.00 100.00 - PI TECH 5/3/4	5/4/01	10:10	15.00	30.5	22.00	0.013	5.00	20.00	12.2	1.00	
5/4/01 10:55 60.00 24.5 22.00 0.013 5.00 13.2 1.00 5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 16.00 13.7 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 GRAIN SIZE PERCENTAGES Paricle Diameter % PASSING % COBBLES 0.00 0.014 5.00 13.50 14.2 1.00 0.0293 79.3 \$ COARSE GRAVEL 0.00 0.00 6fine sand. 0.00 10.02 50.6 \$ COARSE SAND 0.08 0.08 0.08 0.08 0.08 0.008 - LL - PL - PL 0.013 26.8 \$ TOTAL SAMPLE 100.00 - PI TECH 5/3/0	5/4/01	10:25	30.00	27.5	22.00	0.013	5.00	10.50	12.7	1.00	
5/4/01 14:05 250.00 21.0 22.00 0.013 5.00 10.00 13.7 1.00 5/5/01 9:55 1440.00 18.5 21.50 0.014 5.00 13.50 14.2 1.00 GRAIN SIZE PERCENTAGES Paricle Diameter % PASSING % COBBLES 0.00 0.014 5.00 13.50 14.2 1.00 0.0293 79.3 \$ COARSE GRAVEL 0.00 0.00 fine sand. 0.00 0.0120 50.6 \$ COARSE SAND 0.08 0.08 - LL 0.0087 44.6 \$ MEDIUM SAND 3.15 - PL - 0.0031 31.7 \$ FINE S 93.88 - PI TECH SW 0.0013 26.8 \$ TOTAL SAMPLE 100.00 CHECK - PI	5/4/01	10:55	60.00	24.5	22.00	0.013	5.00	14.00	13.4	1.00	
S/S/01 9:55 1440.00 18.5 21.50 0.014 S.00 13.50 14.2 1.00 GRAIN SIZE PERCENTAGES Paricle Diameter % PASSING % COBBLES 0.00 Description Brownish Gray, SILTY CLAY, little medium to fine sand. 0.0120 50.6 % COARSE GRAVEL 0.07 USCS (CH) 0.0087 44.6 % MEDIUM SAND 3.15 - LL 0.0062 38.7 % FINE SAND 2.82 - PL 0.0031 31.7 % FINES 93.88 - PI TECH SW 0.0013 26.8 % TOTAL SAMPLE 100.00 CHECK _	5/4/01	14:05	250.00	21.0	22.00	0.013	5.00	10.00	13.7	1.00	
GRAIN SIZE PERCENTAGES Paricle Diameter % PASSING % COBBLES 0.00 0.0293 79.3 % COBBLES 0.00 0.0195 67.4 % FINE GRAVEL 0.07 0.0120 50.6 % COARSE SAND 0.08 0.0087 44.6 % MEDIUM SAND 3.15 0.0062 38.7 % FINE SAND 2.82 0.0031 31.7 % FINES 93.88 0.0013 26.8 % TOTAL SAMPLE 100.00	5/5/01	9:55	1440.00	18.5	21.50	0.014	5.00	13.30	14.2	1.00	L
Paricle Diameter % PASSING % COBBLES U.UU Description Brownish Gray, SiLTY CLAY, little medium to 0.0293 79.3 \$ COARSE GRAVEL 0.00 fine sand. 0.0195 67.4 \$ FINE GRAVEL 0.07 USCS (CH) 0.0120 50.6 \$ COARSE SAND 0.08 - LL 0.0087 44.6 \$ MEDIUM SAND 3.15 - LL 0.0062 38.7 \$ FINE SAND 2.82 - PL 0.0031 31.7 \$ FINES 93.88 - PI TECH SW 0.0013 26.8 \$ TOTAL SAMPLE 100.00 CHECK _			GRAIN SIZ	LE PERCE	NIAGES	D	Design of the Control	OIL THE OL &	/ 11a-1		1
0.0293 79.3 \$ COARSE GRAVEL 0.00 0.0195 67.4 \$ FINE GRAVEL 0.07 0.0120 50.6 \$ COARSE SAND 0.08 0.0087 44.6 \$ MEDIUM SAND 3.15 0.0062 38.7 \$ FINE SAND 2.82 0.0031 31.7 \$ FINES 93.88 0.0013 26.8 \$ TOTAL SAMPLE 100.00	Particle Diameter	% PASSING	* COBBLES		0.00	Description	Brownish Gray,	SILTY CLAY	r, litue medi	um to	1. A. A.
0.0195 67.4 \$ FINE GRAVEL 0.07 USCS (CH) 0.0120 50.6 \$ COARSE SAND 0.08 0.0087 44.6 \$ MEDIUM SAND 3.15 0.0062 38.7 \$ FINE SAND 2.82 0.0031 31.7 \$ FINES 93.88 0.0013 26.8 \$ TOTAL SAMPLE 100.00	0.0293	79.3	COARSE GRAV	EL	0.00		nne sand.				J
0.0120 50.6 \$ COARSE SAND 0.08 0.0087 44.6 \$ MEDIUM SAND 3.15 0.0062 38.7 \$ FINE SAND 2.82 0.0031 31.7 \$ FINES 93.88 0.0013 26.8 \$ TOTAL SAMPLE 100.00	0.0195	67.4	S FINE GRAVEL	1	0.07	USCS	(CH)	1			
0.0087 44.6 % MEDIUM SAND 3.15 - LL 0.0062 38.7 % FINE SAND 2.82 - PL 0.0031 31.7 % FINES 93.88 - PI TECH SW 0.0013 26.8 % TOTAL SAMPLE 100.00 DATE 5/3/0	0.0120	50.6	S COARSE SAND		0.08			1			
0.0062 38.7 \$ FINE SAND 2.82 - PL 0.0031 31.7 \$ FINES 93.88 - PI TECH SW 0.0013 26.8 \$ TOTAL SAMPLE 100.00 DATE 5/3/A	0.0087	44.6	S MEDIUM SAND		3.15			DT			
0.0031 31.7 \$ FINES 93.88 - PI TECH 5W 0.0013 26.8 \$ TOTAL SAMPLE 100.00 DATE 5/3/ CHECK	0.0062	38.7	S FINE SAND		2.82			PL			CIV
0.0013 26.8 STOTAL SAMPLE 100.00 DATE 5/3/ CHECK	0.0031	31.7	S FINES		93.88			la l		TECH	\$/3/01
CHECK	0.0013	26.8	S TOTAL SAMPLI	3	100.00					DATE	
										CHECK	1-1-





.

Golder Associates Inc.

viates Inc.

PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-28	-
ROJECT NO.		013-3205			SAME	LE TYPE	В	ag
REMARKS					SAMPL	E DEPTH	19.0	- 20.0'
•				Hygroscopic 1	Moisture For S	Sieve Sample		
WATER CONTENT (I	Delivered N	Moisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (gn	l)	(w1)	355.53			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gn)	(w2)	256.62			Tare Weigh	nt (gm)	
Weight of Tare (gm)		(w3)	85.11			Moisture C	Content (%)	
Weight of Water (gm)		(w4≕w1-w2)	98.91	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	Iygroscopic M
Weight of Dry Soil (gm)	l	(w5=w2-w3)	171.51 .			Weight Of	Sample (gm)	256.62
Moisture Content (%)		(w4/w5)*100	57.67			Tare Weig	tht (gm)	85.11
					(₩6)	Total Dry	Weight (gm)	171.51
OTOTIT ANTAT MOTO								
SIEVE ANALYSIS				Cumulative				
lare weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"	J				1.0*	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"					0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.04	0.04	0.02	99.98	#10	medium sand	
	#20	0.12	0.12	0.07	99 .93	#20	medium sand	
	#40	0.50	0.50	0.29	99.7 1	#40	fine sand	
	#60	1.02	1.02	0.59	99.4 1	#60	fine sand	
	#100	1.59	1.59	0.93	99.07	#100	fine sand	
	#200	2.43	2.43	1.42	98.58	#200	fines	
	PAN					PAN		
% COBBLES	0.00	-						
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	65
% C SAND	0.02	little	5 to 12%	< 10%	fine (c-m)		PL	27
% M SAND	0.27	some	12 to 30%	< 10%	coarse (m-f)		PI	38
% F SAND	1.13	and	30 to 50%	< 10%	coarse and find	e (m)	Gs	
% FINES	98.58	-		< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
		D	OT THE					
DESC	KIPTION	Brown and Gr	ay, SILTY C	LAI, trace me	colum to			
	·	tine sand.						
	1000						TECH	ICITI
	USCS	СН					DATE	5/1/01
							CHECK	1
							CHECK	

GENESIS/PLUM POINT ENERGY/AR SUMMARY OF SOIL DATA

Sample Identification	Sample Type	Sample Depth	Soil Ciassi- fication	Natural Moisture %		Atte	erberg imits		% Finer No. 4	Grain Size Distribution % Finer No. 200	% Finer .005	Comp Maximum Dry Density	action Optimum Moisture		Unit W Moisture	/eight Dry	Permeability (cm/sec)	Additional Tests Conducted
					L.L.	P.L.	P.I .	L.I.	Sieve	Sieve	mm	(lb/cuft)	%	Gs	%	(lb/cuft)		(See Notes)
B-1	Bag	14.0-20.0'	(CL)	-		-	-	-	100.0	83.3	15.0	-	-	-	- -	-	-	
B-2	Bag	4.0 - 5.0'	CL	38.0	47	22	25	0.62	100.0	95.6	-	- · ·	-					-
B-5	Bag	9.0-10.0'	(CH)	33.7	58	24	34	0.30	•	•	-	-	-	-	-	-	-	-
B-5	Bag	24.0-25.0'	(SM)	18.0	NP	NP	NP	NP	-	•	-	-		-	· -	-	-	•
B-5	Bag	79.0-80.0'	(CL)	-	27	16	11	-	-	-	-	-		-	-	-	-	•
B-10	Bag	19.0-20.0'	CL	48.0	38	19	19	1.54	100.0	92.0	-		-	-		-	•	
B-10	Bag	24.0-25.0'	(SP-SM)	16.4	-	-	-	-	99.4	11.5	6.2	-	-	-	-		-	-
B-11	Bag	4.0-5.0 ¹	CL	29.8	46	21	25	0.37	100.0	88.9	-	-	-	-	-		-	-
B-12	Bag	9.0-10.0'	(SM)	12.1	-	-	-	-	100.0	35.5	-		- -	-	-	-	-	-
B-13	Bag	4.0-5.0'	CL	25.8	34	20	14	0.39	100.0	78.6	-	-	-	-		-	<u> </u>	-
B-13	Bag	19.0-20.0'	(SM)	20.0	-	-	-	-	100.0	16.1	•	-	-	-	-	-		- ¹
B-14	Bag	9.0-10.0'	СН	27.1	51	21	30	0.22	100.0	93.0	-	-	-	-	-	-	-	
B-14	Bag	14.0-20.0'	(SP)	4.2	-	-	-	-	100.0	3.0	-	-	-	-	-	-		-
B-15	Bag	4.0-5.0'	CL	31.7	44	23	21	0.42	100.0	91.5	-	-	-	-	-	-	-	-
B-17	Bag	9.0-10.0'	СН	38.1	79	32	47	0.13	100.0	96.0	-	•	_	_	_	_ 1	_	

ABBREVIATIONS: LIQUID LIMIT (LL)

PLASTIC LIMIT (PL) PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SPECIFIC GRAVITY (Gs) MOISTURE (Mc) NOTES: T = TRIAXIAL TEST

U = UNCONFINED COMPRESSION TEST

- C = CONSOLIDATION TEST
- DS = DIRECT SHEAR TEST
- **O** = ORGANIC CONTENT

P = pH

Golder Associates Inc.

.^

		A	AS STM C11	STM GRA	IN SIZE ANAL	YSIS	7	-		
		A	51111 C11	L7, C150, 1	D421, D422, D1	140 and D221	/ 			
PROJECT TITLE	GENESIS/PL	UM POINT EN	ERGY/AR			SAMPLE ID		B-10	•	
VECT NO.	013	-3205				SAMPLE TYP	E	B	ag	
and the second s						SAMPLE DEP	TH	24.0 -	25.0'	
AS RECEIVED	WATER CO	ONTENT		Hygrosco	opic Moisture	Wet Soil & Tare (9	m)	46.91		
Tare No.			-	For Siev	e Sample	Dry Soil & Tare (g	m)	46.69		
Wt. Wet Soil & Tare (g	m)	(W1)	184.26		•	Tare Weight (gm)		3.21		
Wt. Dry Soil & Tare (g	m)	(W2)	165.65			Moisture Content (%)	0.51		
Weight of Tare (gm)		(W3)	52.02	Total We	ight of Sample Used	For Sieve Analy	sis Corrected	l For Hygro	scopic Moist	ture
Weight of Water (gm)		(W4=W1-W2)	18.61		Weight + Tare, Befor	e Separating On The	#4 Sieve (gm)	664.65		
Weight of Dry Soil (gm))	(₩5 = ₩2-₩3)	113.63			Ta	re Weight (gm)	236.28		
Moisture Content (%)		(W4/W5)*100	16.38			Tot	al Weight (gm)	426.21	(W6)	
Plus #4 Materia	l Sieve			(Wt+Tare)	(((Wt-Tare)/W6)*100)	%PASSING				
TARE WEIGHT	0.00		12.0"				12.0"	cobbles		
			3.0"				3.0"	coarse gravel		
			2.5"				2.5"	coarse gravel		
			2.0"				1 #1	coarse gravel		
			1.5				1.5	coarse gravel.		
			0.75				0.75"	fine gravel		
			0.50"		· · · · · · · · · · · · · · · · · · ·		0.50"	fine gravel		
			0.375"	0.00	0.0	100.0	0.375"	fine gravel		
			#4	2.38	0.6	99.4	#4	coarse sand		
				L				1.1		
A of Dispersion Pe	eriod	1 Minute HYDROME	ETER BAC	KSIEVE (P	% Pass #4 Sieve For W Percent Passing #1	hole Sample 0 - #200 Sieves)	99.44)			· · · · · · · · · · · · · · · · · · ·
					Cumul Wt.		_			
				(Wt+Tare)	Retained	% PASSING				
		*	#10	0.00	0.00	99.4	#10	medium sand		
			#20	0.44	0.44	98.6	#20	medium sand		-
			#40	15.82	15.82	70.8	#40	fine sand		
. •			#60	30.90	30.90	32.0	#60	time sand		r
			100	43.00	43.00	11.5	#200	fines		
		HYDROME	TER CAL	TULATION		L	#200			
DATE	TIME	ET	READING	TEMP	TEMP.COR.	HYD.COR.	READING	EFFECTIVE		-
5/4/01	9:49	(min)	R	Т	K	Cc	С	LENGTH	Α	
5/4/01	9:51	2.00	10.0	22.00	0.013	5.00	5.00	15.5	1.00	
5/4/01	9:54	5.00	9.0	22.00	0.013	5.00	4.00	15.6	1.00	
5/4/01	10:04	15.00	9.0	22.00	0.013	5.00	4.00	15.6	1.00	
5/4/01	10:19	30.00	8.5	22.00	0.013	5.00	3.50	15.8	1.00	
5/4/01	10:49	60.00	8.5	22.00	0.013	5.00	3.50	15.8	1.00	
5/4/01	13:59	250.00	8.0	22.00	0.013	5.00	3.00	15.8	1.00	
5/5/01	9:49	1440.00	I J.J	NTACES	0.014	5.00	2.30	10.0	1.00	
Particle Diamon	C PACETRIC	GRAIN SI	LE PERCE	0.00	Description	Light Brown, M	EDIUM TO	FINE SAND	little	
0.0370	9.0	S COARSE GRAV	EL	0.00		clayey silt, trace	fine gravel.			1. S.
0.0235	7.2	% FINE GRAVEL		0.56	USCS	(SP-SM)				
0.0136	7.2	% COARSE SAND		0.00						
0.0097	6.3	% MEDIUM SAND		28.63		•	LL			
0.0068	6.3	% FINE SAND		59.36		· · ·	PL			(DT/T) A
0.0033	5.4	% FINES		11.46			161		TECH	TJ/DA
										1 5/2/11
0.0014	4.5	S TOTAL SAMPLE	B	100.00					CHECK	5/3/01

1





	ASTM GRAIN SIZE AN	ALYSIS	
	ASTM D 421, D 2217, D 1140, C 1	17, D 422, C 136	
LE	GENESIS/PLUM POINT ENERGY/AR	SAMPLE ID B-11	•

:

KUEUT TITLE	GEN	ESIS/PLUM PC	DINT ENER	RGY/AR SAMPLE			B-11	-	
PROJECT NO.		013-3205			SAMI	PLE TYPE	B	ag	
REMARKS					4.0	- 5.0'			
•				Hygroscopic	Moisture For	Sieve Sample	-		
WATER CONTENT	(Delivered)	Moisture)	-	1		Wet Soil &	Tare (gm)		
Wt Wet Soil & Tare (g	gm)	(w1)	405.82				Tare (gm)		
Wt Dry Soil & Tare (g	ш)	(w2)	350.74			Tare Weight	t (gm)		
Weight of Tare (gm)	(w3)	(w3) 166.18			Moisture Co	ontent (%)		٦	
Weight of Water (gm)		(w4=w1-w2)	55.08	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	Iygroscopic N	Moi
Weight of Dry Soil (gr	n)	(w5=w2-w3)	184.56 -]		Weight Of S	Sample (gm)	350.74	٦
Moisture Content (%)		(w4/w5)*100	29.84	1		Tare Weigh	ut (gm)	166.18	
•				1	(W6)	Total Dry W	eight (gm)	184.56	
· ·		· · · · ·		· · · · ·					
SIEVE ANALYSIS				Cumulative					
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE	3 .		
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)		• •		
	12.0"					12.0"	cobbles		
	3.0"				· · · · ·	3.0"	coarse gravel		
	2.5"					2.5"	coarse gravel		
	2.0"					2.0"	coarse gravel		
	1.5"					1.5"	coarse gravel		
. ·	1.0"					1.0"	coarse gravel		
÷	0.75"					0.75"	fine gravel		
	0.50"					0.50"	fine gravel		
	0.375"					0.375"	fine gravel		
	#A	0.00	0.00	0.00	100.00	0.375 #A	me graver		
	#10	0.00	0.00	0.00	00.00	#4 #10	madium cand		
	#20	2 20	2 20	1.24	09.76	#10	medium sand		
	#40	6.60	6.60	1.24	90.70	#20	fice cond		
	#40	10.09	10.41	3.02	90.30	#40	fine sand		
	#00	10.41	10.41	5.04	94.30	#00	nne sand		
	#100	14.40	14.40	7.83	92.17	#100	tine sano		
	#200	20.47	20.47	11.09	88.91	#200	fines		
# 000001 PG	PAN					PAN			
% COBBLES	0.00		· _ ·						
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)			
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	46	
% C SAND	0.08	little	5 to 12%	< 10%	fine (c-m)		PL	21	_
% M SAND	3.55	some	12 to 30%	< 10%	coarse (m-f)		PI	25	
% F SAND	7.47	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	-	
% FINES	88.91			< 10%	coarse and me	dium (f)			
% TOTAL	100.00			> 10%	equal amounts	each (c-f)			
						•			
DES	CRIPTION	Brown, SILTY	CLAY, litt	le medium to fi	ne sand.				
			5						
								0111	
	USCS						TECH	SW	
							DATE	5/1/0	L
							CHECK	the second	
							REVIEW	m	7



÷

PROJECT TITLE	GEN	ESIS/PLUM P	OINT ENER	GY/AR	SA	AMPLE ID	B-12	-	
PROJECT NO.		013-3205		4	SAMPLE TYPE			Bag	
KEMAKAS					SAMPI	LE DEPTH	9.0	- 10.0'	
S CONTRACTO	M -N-1-	6-1-4		Hygroscopic	Moisture For	Sieve Sample	-		
WALER CONTENT	(Denvered N	aoisture)	110.01	4		Wet Soil &	Tare (gm)		
Wt Day Soil & Tare (sin) ma)	(w1)	448.91	-	Dry Soil & Tare (gm)				
Weight of Tore (are)	un)	(w2)	409.17	-		Tare Weigh	t (gm)		
Weight of Tare (gill)		(₩3)	81.84		040	Moisture Co	ontent (%)	<u> </u>	
Weight of Water (gill) Weight of Day Soil (or		(w4 = w1 - w2)	39.74	Total Weight	Of Sample Us	sed For Sieve	Corrected For I	Iygroscopic M	
Weight of Diy Soll (gi	ш)	$(w_3 = w_2 - w_3)$	327.33			Weight Of S	Sample (gm)	409.17	
Moisture Content (%)		(w4/w5)+100	12.14	4		Tare Weigh	it (gm)	81.84	
				1	(W6)	Total Dry W	/eight (gm)	327.33	
STEVE ANALYSIS				Cumulativo					
Tare Weight		Wr Det	(Wt. Toro)	("Poteined)	0 DASS	encur			
0.00		+Tare	(1121212)	(write here a 100)	70 FA33	SIEVE			
	12.0"			[(wr 1cp wo)-100]	(100-20101)	12.0"	cobbles		
	3.0"			<u> </u>		3.0"	CORES Gravel		
	2.5"	ł		[2.5	COarse gravel		
	2.0"			<u> </u>		2.5	COALSE GLANCI		
	1.5"			<u> </u>		1.5*	COarse gravel		
	1.0"					1.5	COarse gravel		
	0.75*			<u> </u>		1.0	fine gravel		
	0.50"					0.75	fine gravel	• •	
	0.375"					0.375*	fine gravel		
	#4	0.00	0.00	0.00	100.00	0.575 #A	COarse sand		
194 196	#10	0.24	0.24	0.07	99.93	#10	medium sand		
	#20	1.06	1.06	0.32	99.68	#20	medium sand		
	#40	13.06	13.06	3,99	96.01	#40	fine sand		
	#60	38.78	38.78	11.85	88.15	#60	fine sand		
	#100	84.25	84.25	25.74	74.26	#100	fine sand		
	#200	211.27	211.27	64.54	35.46	#200	fines		
	PAN	L				PAN			
% COBBLES	0.00	T							
% C GRAVEL	0.00	Descri	ptive Terms	> 10% 1	mostly coarse	(c)			
% F GRAVEL	0.00	trace	0 to 5%	> 10% 1	mostly mediur	n (m)	LL	-	
% C SAND	0.07	little	5 to 12%	< 10%	fine (c-m)		PL	•	
% M SAND	3.92	some	12 to 30%	< 10% (coarse (m-f)		PI		
% F SAND	60.55	and	30 to 50%	< 10% (coarse and fin	e (m)	Gs	•	
% FINES	35.46			< 10% (coarse and me	dium (f)			
% TOTAL	100.00			> 10% (equal amounts	each (c-f)			
-					•				
DES	CRIPTION	Brown, FINE	SAND, and c	layey silt.					
	USCS	(SM)					TECH	JC/TJ	
							DATE	5/1/01	
							CHECK	the	
							REVIEW	م فسلام	







	AST	M (GRAIN	SIZE	Aľ	NAL	YS	IS		
ASTM D	421,	D	2217, D	1140,	С	117,	D	422,	С	136

PROJECT TITLE GENES		ESIS/PLUM P	DINT ENER	GY/AR	SA	AMPLE ID	B-13	-
PROJECT NO.	013-3205				SAM	PLE TYPE	E	lag
REMARKS				-	SAMPI	E DEPTH	19.0	- 20.0'
•				Hygroscopic	Moisture For	Sieve Sample		
WATER CONTENT (I	Delivered N	Aoisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (gm)	(w1)	469.87	1 · · · ·		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gm)	(w2)	405.67			Tare Weight	t (gm)	
Weight of Tare (gm)		(w3)	85.10			Moisture Co	ontent (%)	
Weight of Water (gm)	•	(w4 = w1 - w2)	64.20	Total Weight	Of Sample Us	sed For Sieve	Corrected For I	Iygroscopic M
Weight of Dry Soil (gm)		(w5=w2-w3)	320.57	1		Weight Of S	Sample (gm)	405.67
Moisture Content (%)		(w4/w5)*100	20.03			Tare Weigh	ıt (gm)	85.10
					(₩6)	Total Dry W	/eight (gm)	320.57
SIEVE ANALYSIS		4.11		Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE	3	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75*	fine gravel	
	0.50*					0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
	#4					#4	coarse sand	
	#10	0.00	0.00	0.00	100.00	#10	medium sand	
	#20	0.09	0.09	0.03	99.97	#20	medium sand	
	#40	1.47	1.47	0.46	99.54	#40	fine sand	
	#60	56.45	56.45	17.61	82.39	#60	fine sand	
	#100	190.11	190.11	59.30	40.70	#100	fine sand	· · · · ·
	#200	269.07	269.07	83.93	16.07	#200	fines	
	PAN					PAN		
% COBBLES	0.00	4						
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		·····
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	m (m)	LL	
% C SAND	0.00	little	5 to 12%	< 10%	fine (c-m)		PL	•
% M SAND	0.46	some	12 to 30%	< 10%	coarse (m-f)		PI	•
% F SAND	83.48	- and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	-
% FINES	16.07	-		< 10%	coarse and me	dium (f)		
% IUIAL	100.00			> 10%	equal amounts	each (c-f)		
		[D		_t				
DESC	RIPTION	Brown, FINE	SAND, some	clayey silt.				
							100 AT	TOWT
	USCS	(SM)					TECH	JC/IJ
							DATE	0/
							DEVIEW	- Fin
							AND V AD, TY	1 1 201





L

PROJECT TITLE	GEN	ESIS/PLUM PC	DINT ENER	GY/AR	SA	MPLE ID	B-14	-	
PROJECT NO. 013-3205		013-3205		SAMPLE TYP			E Bag		
REMARKS					SAMPI	E DEPTH	9.0 -	10.0'	
•				Hygroscopic	Moisture For	Sieve Sample			
WATER CONTENT	(Delivered N	Moisture)				Wet Soil &	: Tare (gm)		
Wt Wet Soil & Tare (gm)	(w1)	397.66			Dry Soil &	: Tare (gm)		
Wt Dry Soil & Tare (g	çm)	(w2)	330.75	1	And Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual An	Tare Weig	ht (gm)		
Weight of Tare (gm)		(w3)	84.24			Moisture C	Content (%)		
Weight of Water (gm)		(w4=w1-w2)	66.91	Total Weight	Of Sample Us	sed For Sieve	Corrected For H	Iygroscopic	
Weight of Dry Soil (gi	n)	(w5=w2-w3)	246.51			Weight Of	Sample (gm)	330.75	
Moisture Content (%)		(w4/w5)*100	27.14			Tare Weig	tht (gm)	84.24	
					(W6)	Total Dry	Weight (gm)	246.51	
SIEVE ANALYSIS	· .			Cumulative					
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	Έ		
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)		•		
	12.0"					12.0"	cobbles		
	3.0"					3.0"	coarse gravel		
	2.5"					2.5"	coarse gravel		
	2.0"				-	2.0"	coarse gravel		
	1.5"		1			1.5"	coarse gravel		
	1.0"		1			1.0"	coarse gravel		
	0.75*					0.75"	fine gravel		
	0.50"					0.50"	fine gravel		
	0.375*					0.375"	fine gravel		
	#4	0.00	0.00	0.00	100.00	#4	coarse sand		
	#10	0.23	0.23	0.09	99.91	#10	medium sand		
	#20	0.85	0.85	0.34	99.66	#20	medium sand		
	#40	2.89	2.89	1.17	98.83	#40	fine sand		
	#60	5.90	5.90	2.39	97.61	#60	fine sand		
	#100	9.23	9.23	3.74	96.26	#100	fine sand		
	#200	17.33	17.33	7.03	92.97	#200	fines		
- 	PAN					PAN		-	
% COBBLES	0.00								
% C GRAVEL	0.00	Descrip	tive Terms	> 10%	mostly coarse	(c)			
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	n (m)	LL	51	
% C SAND	0.09	little	5 to 12%	< 10%	fine (c-m)		PL	21	
% M SAND	1.08	some	12 to 30%	< 10%	coarse (m-f)		PI	30	
% F SAND	5.86	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	-	
% FINES	92.97	1		< 10%	coarse and me	dium (f)			
% TOTAL	100.00	1 .		> 10%	equal amounts	each (c-f)			
DES	CRIPTION	Brown, SILTY	CLAY, litt	le medium to fi	ne sand.				
	USCS	CH					TECH	SW	
			-				DATE	5/1/0	
							CHECK	G	
							REVIEW	1.4	



regton

	PROJECT TITLE	GEN	ESIS/PLUM P	DINT ENER	GY/AR	C.	MPLEID	R-14	1	-
1	PROJECT NO.		013-3205	ALL LUISE	SAMPLE TYPE				lan	-
- Person	REMARKS		010 0200			SAMPI	E DEPTH	14.0	- 20 01	-
<i>مر</i> - ۱					Hygroscopic	Moisture For	Sieve Sample	1	1.0 - 20.0	
	WATER CONTENT	(Delivered M	(loisture)				Wet Soil &	Tare (gm)	[-
	Wt Wet Soil & Tare (gm)	(w1)	505.15			Dry Soil &	Tare (gm)		\neg
	Wt Dry Soil & Tare (gm)	(w2)	488.40	1		Tare Weigh	t (gm)		-
	Weight of Tare (gm)		(w3)	85.10			Moisture Co	ontent (%)		-
	Weight of Water (gm)) <u> </u>	(w4 = w1 - w2)	16.75	Total Weight	Of Sample Us	ed For Sieve	Corrected For I	Hygroscopic M	loistur
	Weight of Dry Soil (g	m)	(w5=w2-w3)	403.30]	-	Weight Of S	Sample (gm)	488.40	7
	Moisture Content (%))	(w4/w5)*100	4.15]		Tare Weig	ht (gm)	85.10	1
						(W6)	Total Dry V	Veight (gm)	403.30	1
	SIEVE ANALYSIS				Cumulative					
	Tare Weight	,	Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEV	E		
	0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)				
		12.0"					12.0"	cobbles		
		3.0"					3.0"	coarse gravel		
		2.5"					2.5"	coarse gravel		
		2.0"					2.0"	coarse gravel		
		1.5"					1.5"	coarse gravel		
		1.0"					1.0"	coarse gravel		
		0.75"	· · · · · · · · · · · · · · · · · · ·	·			0.75"	fine gravel		
		0.50*					0.50"	fine gravel		
		0.375"	0.00	0.00	0.00	100.00	0.375*	fine gravel		
Ç		#4	0.15	0.15	0.04	99.96	#4	coarse sand		
1 1 - 44-		#10	1.62	1.62	0.40	99.60	#10	medium sand		
		#20	20.54	20.54	5.09	94.91	#20	medium sand		
		#40	133.47	133.47	33.09	66.91	#40	fine sand		
		#00	309.24	309.24	76.68	23.32	#60	fine sand		
	•	#100	372.23	312.25	92.30	7.70	#100	fine sand		
		#200 DA M	391.42	391.42	97.05	2.95	#200	nnes		
	& CODDI ES		T			•	PAN			
	& C CDAVEL	0.00	- Desert	ative Terms	> 100	mostly scores	(a)			
	& E GDAVEI	0.00	- Descii		> 10 %	mostly madius	(C) n (m)	TT		٦
	% C SAND	0.04	little	5 to 1296	- 10%	fine (c-m)	u (m)	DL PL		-
	% M SAND	32.60	some	12 to 30 %	< 10%			DI		-
	% F SAND	63.06	and	30 to 50%	< 10.6	coarse and fire	e (m)	G		-
	% FINES	2.95		50 10 50 %	< 10%	coarse and me	dium (f)			I
1	% TOTAL	100.00	1 .		> 10%	equal amounts	each (c-f)			
			.	с., с. с. с. с. с. с. с. с. с. с. с. с. с.		- 1				
	DES	CRIPTION	Brown, MEDI	UM TO FIN	E SAND, trace	silt,				
			trace fine grav	el.						
		USCS	(SP)	· ·				TECH	JC/TJ	
								DATE	5/1/01	
								CHECK	h	
								REVIEW	Pur	2


Golder Associates Inc.



ASTM GRAIN SIZE ANALYSIS ASTM D 421, D 2217, D 1140, C 117, D 422, C 136

PROJECT TITLE	GENI	ESIS/PLUM PC	INT ENER	GY/AR	SA	AMPLE ID	B-15	-
PROJECT NO.		013-3205			SAM	PLE TYPE	E	Bag
EMARKS					SAMPI	E DEPTH	4.0	- 5.0'
•				Hygroscopic	Moisture For	Sieve Sample		
WATER CONTENT (Delivered M	loisture)				Wet Soil &	Tare (gm)	
Wt Wet Soil & Tare (gr	n)	(w1)	359.01			Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gn	n)	(w2)	290.69			Tare Weigh	t (gm)	
Weight of Tare (gm)		(w3)	75.24			Moisture Co	ontent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	68.32	Total Weight	Of Sample Us	sed For Sieve	Corrected For I	Hygroscopic M
Weight of Dry Soil (gm)	(w5 = w2 - w3)	215.45			Weight Of S	ample (gm)	290.69
Moisture Content (%)		(w4/w5)*100	31.71			Tare Weigh	it (gm)	75.24
			÷.		(W6)	Total Dry W	/eight (gm)	215.45
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE	5	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			•
	12.0"					12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"	ļ				2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"					0.50"	fine gravel	
	0.375"					0.375"	fine gravel	
and a second second second second second second second second second second second second second second second	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
· · · · · · · · · · · · · · · · · · ·	#10	0.43	0.43	0.20	99.80	#10	medium sand	
	#20	0.83	0.83	0.39	99.61	#20	medium sand	
•	#40	1.46	1.46	0.68	99.32	#40	fine sand	
	#60	2.16	2.16	1.00	99.00	#60	fine sand	
	#100	3.29	3.29	1.53	98.47	#100	fine sand	
	#200	18.36	18.36	8.52	91.48	#200	fines	
	PAN					PAN		· .
COBBLES	0.00							
C GRAVEL	0.00	Descrip	tive Terms	> 10% 1	mostly coarse	(c)		
GRAVEL	0.00	trace	0 to 5%	> 10% 1	mostly mediur	n (m)	LL	44
C SAND	0.20	little	5 to 12%	< 10%	fine (c-m)		PL	23
M SAND	0.48	some	12 to 30%	< 10%	coarse (m-f)		PI	21
SAND	7.84	and	30 to 50%	< 10%	coarse and fin	e (m)	Gs	•
TOTAL	91.48			< 10% (coarse and me	dium (f)		
	100.00	1	1	> 10%	equal amounts	each (c-f)		
DECO	DIDNICAL	Deserver OTT THE	OT AV Port	- S ac				
DESC	KIPTION	Brown, SILTY	CLAY, IIII	e fine sand.				
					1.			
	TIECE	CT					TECT	C117
	0903						TECH DATE	5/1/01
							CHECK	5/1/01
							REVIEW	- An
			-				AND TAUTT	- Purk





	AST	M GR	AIN	SIZE	AN	NALY	'S	IS			
ASTM I	D 421,	D 221	17, D	1140,	С	117,	D	422,	C 1	136	

PROJECT TITLE	GEN	ESIS/PLUM P	OINT ENER	GY/AR	SA	MPLE ID	B-17	-
PROJECT NO.		013-3205			SAM	PLE TYPE	B	ag
REMARKS				1	SAMPL	E DEPTH	9.0 -	10.0'
				Hygroscopic 1	Moisture For	Sieve Sample		
WATER CONTENT (Delivered N	loisture)				Wet Soil &	Tare (gm)	<u></u>
Wt Wet Soil & Tare (gi	m)	(w1)	358.21	1		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gr	n)	(w2)	282.74	1		Tare Weight	(gm)	
Weight of Tare (gm)		(w3)	84.67	1		Moisture Co	intent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	75.47	Total Weight	Of Sample Us	ed For Sieve	Corrected For H	Ivgrosconic M
Weight of Dry Soil (gm	i)	(w5 = w2 - w3)	198.07		•	Weight Of S	ample (gm)	282.74
Moisture Content (%)		(w4/w5)*100	38.10	1	* * · ·	Tare Weigh	t (gm)	89.67
				1	(₩6)	Total Dry W	eight (gm)	193.07
					(- cour big to	organe (gill)	175.07
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE		
0.00		+Tare	({(wt ret/wf)*100}	(100-%ret)			
	12.0"				(100 /0100)	12.0"	cobbles	
•	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.5	coarse gravel	
	1.5"		· · · ·	<u> </u>		1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	1.
	0.50"	[]				0.75	fine gravel	
	0.30			<u> </u>		0.30	fine gravel	
	0.373	0.00	0.00	0.00	100.00	0.375	nne gravei	
	#10	0.00	0.00	0.00	100.00	#4	coarse sand	
٤,	#10	0.02	0.02	0.01	99.99	#10	medium sand	
	#40	0.30	0.50	0.29	99.71	#20	medium sand	
	#40	2.18	2.18	1.13	98.87	#40	Tine sand	
	#00	3.51	3.51	1.82	98.18	#60	fine sand	
	#100	5.10	5.10	2.64	97.36	#100	fine sand	
	#200	7.78	7.78	4.03	95.97	#200	fines	
	PAN	T				PAN	·	
% COBBLES	0.00							
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly medium	n (m)	LL	79
% C SAND	0.01	little	5 to 12%	< 10%	fine (c-m)		PL	32
% M SAND	1.12	some	12 to 30%	< 10%	coarse (m-f)		PI	47
% F SAND	2.90	and	30 to 50%	< 10%	coarse and find	e (m)	Gs	-
% FINES	95.97	4.		< 10%	coarse and me	dium (f)		
% TOTAL	100.00			> 10%	equal amounts	each (c-f)		
		· · ·						
DESC	RIPTION	Brown, SILTY	CLAY, trac	e medium to fir	ne sand.			
								-
	USCS	СН	-				TECH	SW
							DATE	5/1/01
							CHECK	m
							REVIEW	PWA



<u></u>										
		A	A STM C1	STM GRA 17, C136,	AIN SIZE ANAL D421, D422, D1	YSIS 140 and D221	7			
PPOJECT TITLE	GENESIS/PI	UM POINT E	NERGY/AR		1	SAMPLE ID		B-1		
DJECT NO.	013	-3205				SAMPLE TYP	E	B	ag	
						SAMPLE DEF	TH	14.0 -	20.0'	
AS RECEIVED	WATER C	ONTENT		Hygrosc	opic Moisture	Wet Soil & Tare (g	m)	45.44		
Tare No.				For Siev	e Sample	Dry Soil & Tare (g	m)	37.47		
Wt. Wet Soil & Tare (g	m)	(W1)		4		Tare Weight (gm)	 .	3.24		
Weight of Tare (gm)		(W2) (W3)		Total We	ight of Sample Used	Moisture Content (%) sis Corrected	23.28	conic Mois	17770
Weight of Water (gm)		(W4=W1-W2)		1	Weight + Tare, Befor	e Separating On The	#4 Sieve (gm)	935.83	scopic MIGE	
Weight of Dry Soil (gm		(₩5=₩2-₩3)				Та	re Weight (gm)	220.32		
Moisture Content (%)	Sieve	(W4/W5)*100	L		///TH: M	Tot	al Weight (gm)	580.38	(₩6)	
TARE WEIGHT			12.0"	(Wt+Tare)	(((Wt-Tare)/W6)*100)	%PASSING	12.0"	cobbles		
	0.00	1	3.0"				3.0"	coarse gravel		
			2.5"				2.5"	coarse gravel		
			2.0"				2.0"	coarse gravel		
			1.5"				1.5	coarse gravel		
			0.75"				0.75"	coarse gravel		
			0.50"				0.50"	fine gravel		
			0.375"		· · · · · · · · · · · · · · · · · · ·		0.375 ^{**}	fine gravel		
			#4	0.00	0.0	100.0	#4	coarse sand		
HYDROMETE Specific Gravity Specific Gravity	(assumed) (tested)	S 2.650			Weight of Sample Weight of Sample Wet	e Used For Hyd or Dry (gm)	rometer Te 54.92	st		
Amount Dispersing Age	ent (ml)	125.00			Calculated Dry Wt. use	d in test (gm)	44.55			
Dispersion Device	ž	Mechanical			Hydrometer Bulb Numb		624378			
TARE WEIGHT	0.00	HYDROM	ETER BAC	KSIEVE (I	Percent Passing #1	0 - #200 Sieves)			
				(Wt+Tare)	Retained	% PASSING				
			#10	0.05	0.05	99.9	# 10	medium sand		
			#20	0.10	0.10	99.8	#20	medium sand		
			#40	0.15	0.31	99.7	#40	fine sand		
			#100	0.56	0.56	98.7	#100	fine sand		
			#200	7.42	7.42	83.3	#200	fines		
		HYDROME	TER CAL	CULATION	IS COD		DEADING	-		
5/29/01	13-36	(min)	READING	T	K	Cc	C	LENGTH	Α .	
5/29/01	13:38	2.00	21.5	22.50	0.013	5.50	16.00	13.7	1.00	
5/29/01	13:41	5.00	17.0	22.50	0.013	5.50	11.50	14.5	1.00	
5/29/01	13:51	15.00	15.0	22.50	0.013	5.50	9.50	14.8	1.00	
5/29/01	14:06	30.00	14.0	22.50	0.013	5.50	8.50	15.0	1.00	
5/29/01	14:50	250.00	11.5	22.00	0.013	5.50	6.00	15.2	1.00	
5/30/01	13:36	1440.00	10.5	21.50	0.014	5.50	5.00	15.5	1.00	
		GRAIN SL	LE PERCE	NTAGES						
Particle Diameter	% PASSING	% COBBLES		0.00	Description	Brown, SILTY	CLAY, some	fine sand.		
0.0348	35.9	S CUARSE GRAV		0.00	TISCS	(CL)				
0.0132	21.3	S COARSE SAND		0.11	0.000	······				
0.0094	19.1	S MEDIUM SAND		0.22		•	LL			
0.0067	16.8	S FINE SAND		16.32		· · ·	PL			
0.0033	13.5	S FINES	F	100.00		L	I. I		DATE	5/24/01
0.0014	L	La renna somre							CHECK	
									REVIEW	Party





AS	ΤМ	GRAJ	N SIZE	ANAL	YSIS	
ASTM D 42	1, D	2217,	D 1140,	C 117,	D 422,	C 136

PROJECT TITLE	GENE	SIS/PLUM P	OINT ENER	GY/AR	SA	MPLE ID	B-2	-
PROJECT NO.		013-3205			SAM	PLE TYPE	B	ag
REMARKS	· · · · · · · · · · · · · · · · · · ·			1	SAMPL	E DEPTH	4.0	- 5.0'
•			*****	Hygroscopic	Moisture For	Sieve Sample		
WATER CONTENT	Delivered M	oisture)				Wet Soil &	Fare (gm)	
Wt Wet Soil & Tare (gn	1)	(w1)	245.78	1		Dry Soil &	Tare (gm)	
Wt Dry Soil & Tare (gr	1)	(w2)	180.37	1 .		Tare Weight	(gm)	
Weight of Tare (gm)		(w3)	8.36	1		Moisture Co	ntent (%)	
Weight of Water (gm)		(w4 = w1 - w2)	65.41	Total Weight	Of Sample Us	sed For Sieve	Corrected For H	Iygroscopic M
Weight of Dry Soil (gm))	(w5 = w2 - w3)	172.01 -	1	•	Weight Of S	ample (gm)	180.37
Moisture Content (%)		(w4/w5)*100	38.03	1		Tare Weigh	t (gm)	8.36
				1	(W6)	Total Dry W	eight (gm)	172.01
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE		
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"	1				12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"				- -	1.5"	coarse gravel	
	1.0"					1.0"	coarse gravel	
	0.75"					0.75"	fine gravel	
	0.50"			·		0.50"	fine gravel	
- -	0.375"					0.375"	fine gravel	
×	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.18	0.18	0.10	99.90	#10	medium sand	
	#20	0.82	0.82	0.48	99.52	#20	medium sand	
	#40	2.44	2.44	1.42	98.58	#40	fine sand	
	#60	3.45	3.45	2.01	97.99	#60	fine sand	
	#100	4.73	4.73	2.75	97.25	#100	fine sand	
•	#200	7.61	7.61	4.42	95.58	#200	fines	
	PAN					PAN		
% COBBLES	0.00							
% C GRAVEL	0.00	Descr	iptive Terms	> 10%	mostly coarse	: (c)		
% F GRAVEL	0.00	trace	0 to 5%	> 10%	mostly mediu	m (m)	LL	47
% C SAND	0.10	little	5 to 12%	< 10%	fine (c-m)		PL	22
% M SAND	1.31	some	12 to 30%	< 10%	coarse (m-f)		PI	25
% F SAND	3.01	and	30 to 50%	< 10%	coarse and fin	xe (m)	Gs	•
% FINES	95.58			< 10%	coarse and me	edium (f)		
% TOTAL	100.00			> 10%	equal amounts	s each (c-f)		
						1		
DESC	RIPTION	Brown, SILT	Y CLAY, trac	ce medium to fi	ne sand.			
	1000					J	TECU	cw
	USCS		1				DATE	5/1/01
							DATE	11/01
							CHECK	





.





ates Inc.

		ASTM D 42	STM GRA 21, D 221'	AIN SIZE A 7, D 1140, (NALYSI C 117, D 4	S 422, C 136		
PROJECT TITLE	ESIS/PLUM P	OINT ENER	GY/AR	SA	AMPLE ID	B-10	-	
PROJECT NO.		013-3205		4	SAM	PLE TYPE	1	Bag
REMARKS					SAMPI	LE DEPTH	19.0	- 20.0'
WATED CONFERENCE	(Dallana da			Hygroscopic	Moisture For	Sieve Sample		
WATER CONTENT	(Denvered I	vioisture)	000 00			Wet Soil &	Tare (gm)	
Wt Dry Soil & Tare (μμ) ττα)	(W1)	277.82	4		Dry Soil &	l'are (gm)	
Weight of Tare (m)	(m)	(WZ)	9 25	-		Tare Weight	: (gm)	
Weight of Water (gm)		(w3)	87.40	Total Weight	Of Semale IV	Moisture Co	Correct For	
Weight of Dry Soil (or	<i>m</i>)	$(w_{5} = w_{2} - w_{3})$	192.07	10tal weight	Of Sample Us	Sed For Sieve		Hygroscopic M
Moisture Content (%)	,	$(w_2 - w_2 - w_3)$ $(w_4/w_5) + 100$	102.07			Weight Of S	ample (gm)	190.42
Monstare Content (10)		(#4/#5)*100[40.00		(THE)	Tate weigh	t (gm) Jaight (gm)	8.35
				I	(₩0)	Total Dry w	eight (gm)	182.07
SIEVE ANALYSIS				Cumulative				
Tare Weight		Wt Ret	(Wt-Tare)	(%Retained)	% PASS	SIEVE	1	
0.00		+Tare		{(wt ret/w6)*100}	(100-%ret)			
	12.0"			1 1	<u> </u>	12.0"	cobbles	
	3.0"					3.0"	coarse gravel	
	2.5"					2.5"	coarse gravel	
	2.0"					2.0"	coarse gravel	
	1.5"					1.5"	coarse gravel	
	1.0"	· · · ·				1.0"	coarse gravel	
	0.75*					0.75"	fine gravel	
	0.50"		:			0.50"	fine gravel	
	0.375"					0.375*	fine gravel	
· · · · · · · · · · · · · · · · · · ·	#4	0.00	0.00	0.00	100.00	#4	coarse sand	
	#10	0.02	0.02	0.01	99.99	#10	medium sand	
	#20	0.14	0.14	0.08	99.92	#20	medium sand	
	#40	0.53	0.53	0.29	99.71	#40	fine sand	
	#60	1.26	1.26	0.69	99.31	#60	fine sand	
	#100	3.69	3.69	2.03	97.97	#100	fine sand	
	#200	14.64	14.64	8.04	91.96	#200	fines	
<i>«</i> совруже 1	PAN					PAN		
% COBBLES	0.00	-						
% C GRAVEL	0.00	Descri	ptive Terms	> 10%	mostly coarse	(c)		
C CAND	0.00	- trace	0 10 5 %	> 10%	mostly mediui	n (m)		
& M SAND	0.01	Intie	5 10 12%	< 10%	nne (c-m)		PL	19
& E SAND	0.28	some	12 10 50%	< 10%	coarse (m-1)		PI Ca	19
% FINES	01.05		50 10 50 %	< 10%	coarse and ma		Gs	L
% TOTAL	100.00	-		> 10%	soual amounts	each (c-f)		
	100.00			> 10 %	Maat dilloonis			
DES	CRIPTION	Brown, SILTY	CLAY, littl	e fine sand.				
	USCS	CL					TECH	SW
							DATE	5/1/01
							CHECK	the
			:				REVIEW	1 in



1

Golder Associates Inc.

al cur

