October 2, 2008
L - 72,070

REPORT OF SOILS EXPLORATION
ZION SOLUTIONS
ZION NUCLEAR POWER PLANT
INDEPENDENT SPENT FUEL STORAGE INSTALLATION

PREPARED FOR:
SARGENT & LUNDY LLC
55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603

PREPARED BY:
TESTING SERVICE CORPORATION
457 EAST GUNDERSEN DRIVE
CAROL STREAM, ILLINOIS 60188
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TABLE OF CONTENTS

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1.0 INTRODUCTION

Presented in this report are the results of the soils investigation performed to determine the general subsurface conditions for the proposed construction of an Independent Spent Fuel Storage facility. The proposed structure will be constructed at the Zion Nuclear Power Plant in Zion, IL.

This work was performed in general accordance with Technical Specification Subsurface Investigation Specification Z-5701 prepared by Sargent and Lundy and dated July 29, 2008.

2.0 FIELD WORK

A total of two(2) soil borings (I-20 and I-21) were performed for this project with each of them being extended to a depth of 100.0 feet. Boring I-20 was subsequently converted into a seismic cross hole survey source hole. Additionally, two (2) boreholes were drilled and completed with 3" PVC casing for cross hole seismic testing.

Upon completion of the drilling and testing, ground surface elevations as well as Northing and Easting coordinates were determined for the drilling locations using a Trimble R8 GPS. The vertical and horizontal data shown on the Boring Location Plan was retrieved from a National Geodetic Survey data base located approximately 1.2 miles south of Zion, Illinois.

The boreholes were initially advanced by 4 1/4" hollow stem auger methods to the ground water table and then completed by rotary wash methods using bentonite and potable water in accordance with ASTM D 5783. Upon completion, each borehole was sealed with cement-bentonite grout placed by tremie methods.

Soil samples were collected at I-20 on 2.5 foot intervals for the entire 100 foot depth. At location I-20 the sampling interval was 2.5 feet for the first 10 feet and 5.0 feet thereafter. Standard Penetration Tests (SPT) - N Values (ASTM D 1586), were determined using an automatic hammer which allows a 140 pound weight to free fall from a 30 inch drop to drive the sampler. The samples were collected using standard split spoon procedures during SPT since granular soils and/or very stiff clays prevented the use of Shelby tube samplers. Liners were not used with the split spoon samplers.

Dynamic energy measurements have not been made on this automatic hammer. However, Pile Driving Analyzer's (PDA) have been used to process dynamic measurements of strain and acceleration between the drill string and similar hammers made by the same manufacturer (Boart Longyear). The Average Energy Transfer Ratio is accepted as 75% for this model hammer.

The soil types were logged in the field by the drill crew and representative portions of each sample were contained in glass jars per ASTM D 4220 and brought back to our laboratory. Boring Logs defining the soil lithology and ground water observations is included in the Appendix of this report.

Ground water depth was determined during hollow stem auger drilling only. The borings were completed using wet rotary methods and therefore, the water levels inside the boreholes at the completion of the drilling were not representative. PVC casing was installed shortly after the completion of the drilling and reaming at location I-20. Boring I-21 was sealed with grout immediately following the drilling and sampling to prevent an open hole hazard. Therefore, 24 hour water level readings were not obtained. The ground water depth measured during the hollow stem auger drilling is considered the most accurate indication of the undisturbed ground water levels at the site.

3.0 GEOPHYSICAL TESTING

Geophysical testing consisting of a Cross Hole Seismic Investigation, was performed at location I-20. The original bore hole (I-20) was reamed to a depth of 100 feet using a 6" tri cone roller bit and then cased with 3" PVC casing sealed in place with cement-bentonite grout. Two additional holes (I-20A and I-20B) were drilled using a 6" tri cone roller bit to a depth of 100 feet and were located in a straight line at approximate distances of 10 and 20 feet from I-20. These bore holes were also completed with the installation of 3" PVC casing sealed in place with cement-bentonite grout.

The Cross Hole testing was performed by Geotechnology, Inc. In general conformance with Section 4.31 of ASTM D 4428. A copy of the report prepared by Geotechnology, Inc. summarizing the test results is included in the Appendix of this report. Following the testing each of the PVC casings were sealed with bentonite chips which were hydrated upon placement. In addition the PVC was cut off near the ground surface and topsoil was place over the holes.

4.0 LABORATORY TESTING

The soil samples obtained from the borings were examined in our laboratory and visually classified according to the Unified Soils Classification System (ASTM D 2488). Cohesive soils were measured for moisture content (ASTM D 2216) and unconfined compressive strength (ASTM D 2166). Additional testing including grain size distribution (ASTM D 422, D 1140), Atterberg Limits (ASTM D 4318), pH (ASTM G 51) and dry unit weight determinations (EM 1110-2-1906) were performed on samples selected by Sargent and Lundy. The results of this testing has been summarized and incorporated into the Soil Test data Sheets included in the Appendix.

Two (2) soil samples selected by the client were analyzed for soluble chlorides (Method 4500CL,C) and soluble sulfates (Method 4500SO4, E) by First Environmental Laboratories. A copy of their report is Appended.

5.0 CLOSURE

The data and results presented in this report are based upon the conditions encountered at the two (2) locations investigated as indicated on the Soil Boring Location Plan. This report does not reflect any variations that may occur between these locations, the nature and extent of which may not become evident until the construction phase of the project.

We are appreciative of the opportunity to assist you with this project and look forward to working with you in the future. Please call if you have any questions or are in need of further information.

Respectfully Submitted,

Michael V. Machalinski
Vice President
Registered Professional Engineer
Illinois No. 062-038559

Prepared By,.

Darin Delaney
Project Geologist

APPENDIX

UNIFIED CLASSIFICATION CHART

LEGEND FOR BORING LOGS

TWO (2) BORING LOGS
(6 pages)

BORING LOCATION PLAN
(1 page)

GEOPHYSICAL DATA REPORT
Geotechnology, Inc.
(16 pages)

SOIL DATA SHEETS
(12 pages)

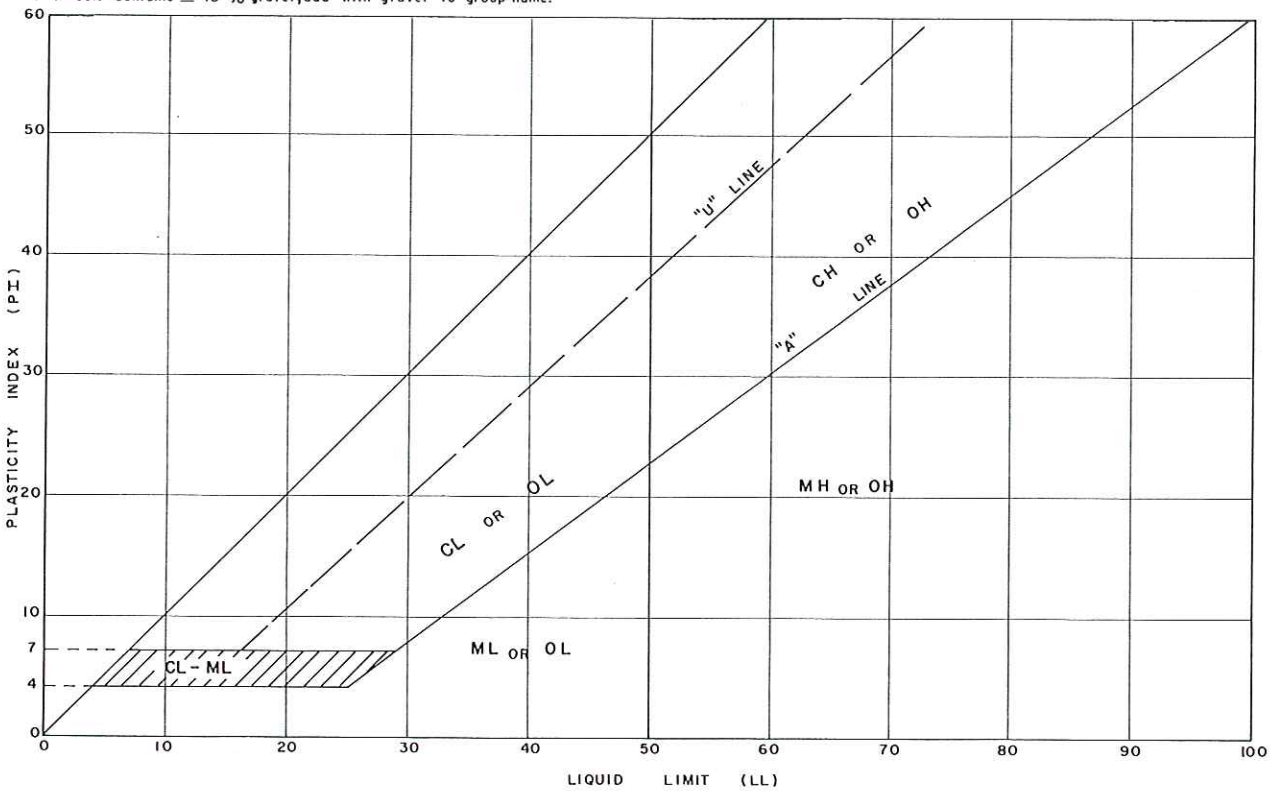
TWO (2) ANALYTICAL REPORTS
First Environmental Laboratories, Inc.
(5 pages)

TESTING SERVICE CORPORATION

UNIFIED CLASSIFICATION CHART

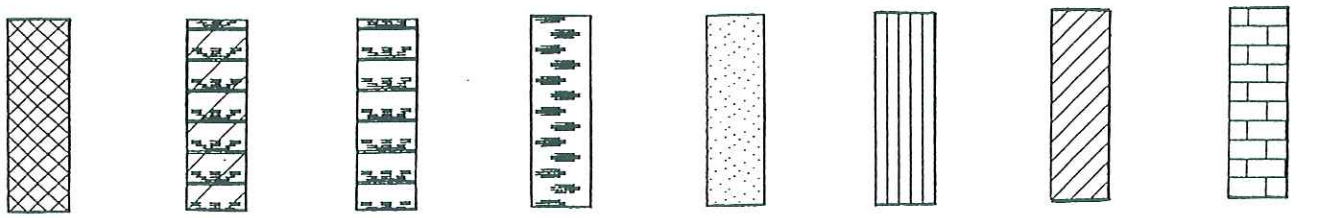
CRITERIA FOR ASSIGNING GROUP SYMBOLS AND GROUP NAMES USING LABORATORY TESTS [a]				SOIL CLASSIFICATION	
				GROUP SYMBOL	GROUP NAME [b]
COARSE-GRAINED SOILS more than 50 % retained on No. 200 sieve	GRAVELS More than 50 % of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS Less than 5 % fines [c]	$C_u \geq 4$ and $1 \leq C_c \leq 3$ [e]	GW	Well graded gravel [f]
			$C_u < 4$ and/or $1 > C_c > 3$ [e]	GP	Poorly graded gravel [f]
		GRAVELS WITH FINES More than 12 % fines [c]	Fines classify as ML or MH	GM	Silty gravel f,g,h
			Fines classify as CL or CH	GC	Clayey gravel f,g,h
	SANDS 50 % or more of coarse fraction passes No. 4 sieve	CLEAN SANDS Less than 5 % fines [d]	$C_u \geq 6$ and $1 \leq C_c \leq 3$ [e]	SW	Well-graded sand [i]
			$C_u < 6$ and/or $1 > C_c > 3$ [e]	SP	Poorly graded sand [i]
		SANDS WITH FINES More than 12 % fines [d]	Fines classify as ML or MH	SM	Silty sand g,h,f
			Fines classify as CL or CH	SC	Clayey sand g,h,f
FINE-GRAINED SOILS 50 % or more passed the No. 200 sieve	SILTS & CLAYS Liquid limit less than 50 %	Inorganic	PI > 7 and plots on or above "A" line [j]	CL	Lean clay k,l,m
			PI < 4 or plots below "A" line [j]	ML	Silt k,l,m
		Organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OL	Organic clay k,l,m,n Organic silt k,l,m,o
	SILTS & CLAYS Liquid limit 50 % or more	Inorganic	PI plots on or above "A" line	CH	Fat clay k,l,m
			PI plots below "A" line	MH	Elastic silt k,l,m
		Organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OH	Organic clay k,l,m,p Organic silt k,l,m,q
Highly organic soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

a. Based on the material passing the 3-in (75-mm) sieve.
b. If field sample contained cobbles and/or boulders, add "with cobbles and/or boulders" to group name.
c. Gravels with 5 to 12 % fines require dual symbols
GW-GM well graded gravel with silt
GW-GC well graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
d. Sands with 5 % to 12 % fines require dual symbols
SW-SM well graded sand with silt
SW-SC well graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
e.
$C_u = D_{60}/D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
f. If soil contains ≥ 15 % sand, add "with sand" to group name.
g. If fines classify as CL-ML, use dual symbol GC-GM, SC-SM.
h. If fines are organic, add "with organic fines" to group name.
i. If soil contains ≥ 15 % gravel, add "with gravel" to group name.
j. If Atterberg Limits plot in hatched area, soil is a CL-ML, silty clay.
k. If soil contains 15 to 29 % plus No. 200, add "with sand" or "with gravel" whichever is predominant.
l. If soil contains ≥ 30 % plus No. 200, predominantly sand, add "sandy" to group name.
m. If soil contains ≥ 30 % plus No. 200, predominantly gravel, add "gravelly" to group name.
n. PI ≥ 4 and plots on or above "A" line.
o. PI ≥ 4 or plots below "A" line.
p. PI plots on or above "A" line.
q. PI plots below "A" line.



TESTING SERVICE CORPORATION

LEGEND FOR BORING LOGS



FILL TOPSOIL PEAT GRAVEL SAND SILT CLAY DOLOMITE

SAMPLE TYPE:

SS = Split Spoon
ST = Thin-Walled Tube
A = Auger

FIELD AND LABORATORY TEST DATA:

N = Standard Penetration Resistance in Blows per Foot
Wc = In-Situ Water Content
Qu = Unconfined Compressive Strength in Tons per Square Foot
* Pocket Penetrometer Measurement; Maximum Reading = 4.5 tsf
γD = Dry Unit Weight in Pounds per Cubic Foot

WATER LEVELS:

▼ While Drilling
▽ End of Boring
▼ 24 Hours

SOIL DESCRIPTION:

MATERIAL	PARTICLE SIZE RANGE
BOULDER	Over 12 inches
COBBLE	12 inches to 3 inches
Coarse GRAVEL	3 inches to ¾ inch
Small GRAVEL	¾ inch to No. 4 Sieve
Coarse SAND	No. 4 Sieve to No. 10 Sieve
Medium SAND	No. 10 Sieve to No. 40 Sieve
Fine SAND	No. 40 Sieve to No. 200 Sieve
SILT and CLAY	Passing No. 200 Sieve

COHESIVE SOILS

CONSISTENCY	Qu
Very Soft	Less than 0.3
Soft	0.3 to 0.6
Stiff	0.6 to 1.0
Tough	1.0 to 2.0
Very Tough	2.0 to 4.0
Hard	4.0 and over

COHESIONLESS SOILS

RELATIVE DENSITY	N
Very Loose	0 - 4
Loose	4 - 10
Firm	10 - 30
Dense	30 - 50
Very Dense	50 and over

MODIFYING TERM	PERCENT BY WEIGHT
Trace	1 - 10
Little	10 - 20
Some	20 - 35

PROJECT ISFSI Zion Nuclear Power Plant

CLIENT Sargent & Lundy, LLC

BORING I-20 DATE STARTED 8-12-08 DATE COMPLETED 8-14-08 JOB L-72,070

ELEVATIONS

GROUND SURFACE 587.2

END OF BORING 487.2

WATER LEVEL OBSERVATIONS

WHILE DRILLING 3.5 '

AT END OF BORING Mud Rotary Wash

24 HOURS (PVC Pipe Installed)

DISTANCE BELOW SURFACE IN FEET

LENGTH RECOVERY	SAMPLE NO.	SAMPLE TYPE	N	WC	Qu	γ_{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
							0		
	1	SS	5-11-13						Firm brown and gray fine to medium SAND, trace gravel, damp (SP)
							3.0	584.2	
	2	SS	2-2-4						Loose brown and gray fine to medium SAND, trace gravel, saturated (SP)
							5.5	581.7	S-2: % Graval = 8 % Sand = 86 % Silt and Clay = 6
	3	SS	2-1-1						Loose dark gray fine to medium SAND, trace gravel, saturated (SP)
	4	SS	1-2-3						
							10.5	576.7	
	5	SS	8-10-12						Firm gray fine to medium SAND, trace gravel, saturated (SP)
	6	SS	7-8-10						
							15.5	571.7	
	7	SS	9-23-22						S-7: % Gravel = 5 % Sand = 91 % Silt and Clay = 4
	8	SS	10-17-19						Dense gray fine to medium SAND, trace gravel, saturated (SP)
	9	SS	13-14-21						
							23.0	564.2	
	10	SS	14-30-29						Dense gray fine SAND, trace silt, saturated (SP-SM)
							25.5	561.7	
	11	SS	8-5-5	26.6					Firm gray sandy SILT, saturated (ML)
							28.0	559.2	
	12	SS	8-10-11	11.0	4.5+*	129.9			S-12: (LL, PL, PI) = 22, 11, 11 % Gravel = 3 % Sand = 24 % Silt = 52 % Clay = 21
	13	SS	8-9-13	11.2	6.73	128.4			
	14	SS	7-7-10	20.5	4.73	108.5			Very tough to hard gray silty CLAY, some sand, trace gravel, moist (CL)
	15	SS	10-14-15	12.8	6.90	125.2			
							38.0	549.2	
	16	SS	31-50/5"	14.8		120.4			Very dense gray clayey SILT, very moist (ML)

DRILL RIG NO. 315

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.

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CLIENT Sargent & Lundy, LLC

BORING I-20 DATE STARTED 8-12-08 DATE COMPLETED 8-14-08 JOB L-72,070

ELEVATIONS

GROUND SURFACE 587.2

END OF BORING 487.2

WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING 3.5 '

▽ AT END OF BORING Mud Rotary Wash

▼ 24 HOURS (PVC Pipe Installed)

DISTANCE BELOW SURFACE IN FEET

LENGTH RECOVERY	SAMPLE NO.	SAMPLE TYPE	N	WC	Qu	γ_{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
							40.5	546.7	Description on Page 1
	17	SS	11-14-14	9.6	10.71	133.8			Very tough to hard gray silty CLAY, little sand, trace gravel, moist (CL)
	18	SS	10-10-11	10.6	5.90	131.0			
	19	SS	11-13-13	10.5	9.38	131.3			
	20	SS	8-12-15	12.9	5.12	124.4			
	21	SS	9-10-13	13.8	5.06	122.7			
	22	SS	8-12-14	13.4	5.32	123.7			S-22: (LL, PL, PI) = 31, 12, 19 % Gravel = 1 % Sand = 15 % Silt = 50 % Clay = 34
	23	SS	12-16-17	13.4	6.23	123.7			
	24	SS	12-15-15	15.7	5.12	118.3			
	25	SS	10-11-13	20.3	4.07	108.8			
	26	SS	8-9-11	20.1	3.93	106.9			
	27	SS	8-8-8	13.8	4.53	117.7			
							68.0	519.2	
	28	SS	10-50/6"	17.4	3.01	114.6			Very tough to hard gray silty CLAY, little sand, trace gravel, occasional Cobbles, moist (CL)
	29	SS	--						Boulder Zone 69.5 to 72.5'
							72.5	514.7	
	30	SS	25-34-42	7.6	14.57	113.8			Very tough to hard gray silty CLAY, little sand, trace gravel, occasional silt seams, moist (CL)
	31	SS	21-31-36	11.1	4.5+*	129.6			
							78.0	509.2	
	32	SS	37-50/5"	10.7		130.7			Very dense gray clayey SILT, little sand, moist (CL-ML)

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DRILL RIG NO. 315

PROJECT ISFSI Zion Nuclear Power Plant

CLIENT Sargent & Lundy, LLC

BORING I-20 DATE STARTED 8-12-08 DATE COMPLETED 8-14-08 JOB L-72,070

ELEVATIONS

GROUND SURFACE 587.2

END OF BORING 487.2

WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING 3.5 '

▽ AT END OF BORING Mud Rotary Wash

▼ 24 HOURS (PVC Pipe Installed)

LENGTH RECOVERY	SAMPLE NO.	SAMPLE TYPE	N	WC	Qu	γ_{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
	33	SS	43-50/4"	12.0		127.3			S-32: (LL, PL, PI) = 17, 10, 7 % Gravel = 0 % Sand = 27 % Silt and Clay = 73
	34	SS	44-50/4"	12.1					
	A			13.2			86.0	501.2	Very dense gray clayey SILT, little sand, moist (CL-ML)
	35	SS	9-				87.0	500.2	Firm gray clayey SAND, saturated (SC)
	B		8-9	15.1	2.55	119.7			
	36	SS	7-8-11	18.0	3.21	113.4			
	A			16.0	2.48	115.4			Very tough to hard gray very silty CLAY, little sand, occasional silt seams, moist (CL-ML)
	37	SS	8-						
	B		12-13	16.2	4.0*	117.2			
	38	SS	8-12-13	17.3	3.0*	114.8			
	A			12.1			95.5	491.7	Dense gray fine to medium SAND, saturated (SP)
	39	SS	26-				97.0	490.2	
	B		27-15	13.9	2.0	122.5			Very tough gray very silty CLAY, little sand, occasional silt seams, moist (CL-ML)
	40	SS	15-21-28	11.9	2.0*	127.5			

End of Boring at 100.0'

* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.

Diedrich D-120 Truck Rig (#315)
CME Automatic Hammer

DISTANCE BELOW SURFACE IN FEET

80 85 90 95 100 105 110 115 120

DRILL RIG NO. 315

Division lines between deposits represent approximate boundaries between soil types. in-situ, the transition may be gradual

PROJECT ISFSI Zion Nuclear Power Plant

CLIENT Sargent & Lundy, LLC

BORING I-21 DATE STARTED 8-18-08 DATE COMPLETED 8-18-08 JOB L-72,070

ELEVATIONS

GROUND SURFACE 587.1

END OF BORING 487.1

WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING 5.5 '

▽ AT END OF BORING Rotary Wash

▼ 24 HOURS Grouted Upon Completion

DISTANCE BELOW SURFACE IN FEET

LENGTH RECOVERY	SAMPLE NO.	SAMPLE TYPE	N	WC	Qu	γ_{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
	1	SS	6-8-9						Firm brown and gray clayey SAND and GRAVEL, damp (SC-GC)
							3.0	584.1	
	2	SS	4-7-10						Firm brown and gray SAND, trace gravel, damp (SP)
	3	SS	4-5-9				5.5	581.6	▼ S-2: % Gravel = 1 % Sand = 95 % Silt and Clay = 4
	4	SS	10-13-15						
	5	SS	8-13-14						S-5: % Gravel = 24 % Sand = 72 % Silt and Clay = 4 Firm gray SAND, some gravel, occasional Cobbles, saturated (SP)
	6	SS	11-13-13						
							22.0	565.1	
	7	SS	10-15-12						Firm gray SAND, saturated (SP)
							27.0	560.1	
	8	SS	6-8-11						Firm gray silty fine to medium SAND, saturated (SM)
							32.0	555.1	
	9	SS	16-16-21	12.7	5.41	122.7			S-9: (LL, PL, PI) = 28, 14, 14 % Gravel = 1 % Sand = 8 % Silt = 59 % Clay = 32 Very tough to hard gray silty CLAY, trace sand, trace gravel, moist (CL)
							38.0	549.1	
	10	SS	36-50/4"	12.2	4.5+*				Very tough to hard gray very silty CLAY, little sand, trace gravel, occasional silt seams, damp (CL-ML)

DRILL RIG NO. 315

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual

PROJECT ISFSI Zion Nuclear Power Plant

CLIENT Sargent & Lundy, LLC

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GROUND SURFACE 587.1

END OF BORING 487.1

WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING 5.5 '

▽ AT END OF BORING Rotary Wash

▼ 24 HOURS Grouted Upon Completion

DISTANCE BELOW SURFACE IN FEET

LENGTH RECOVERY	SAMPLE NO.	SAMPLE TYPE	N	WC	Qu	γ_{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
									Very tough to hard gray very silty CLAY, little sand, trace gravel, occasional silt seams, damp (CL-ML)
							42.0	545.1	
	11	SS	16-22-25	13.0	4.0*	124.7			S-11: (LL, PL, PI) = 23, 12, 11 % Gravel = 5 % Sand = 20 % Silt = 51 % Clay = 24
	12	SS	15-31-34	9.7	9.22	133.5			Very tough to hard gray silty CLAY, little sand, trace gravel, moist (CL)
							52.0	535.1	
	13	SS	26-50/3"	9.9	3.5*				Very tough to hard gray very silty CLAY, little sand, trace gravel, moist (CL)
							58.0	529.1	
	14	SS	17-29 50/1"						Dense to very dense gray SAND and GRAVEL, occasional Cobbles and Boulders, saturated (SP-GP)
	15	SS	27-24-24						
							68.0	519.1	
	16	SS	14-17-20	14.5	7.73	121.1			Very tough to hard gray silty CLAY, little sand, trace gravel, moist (CL)
	17	SS	14-17-23	15.7	2.5*	118.3			S-17: (LL, PL, PI) = 25, 12, 13 % Gravel = 3 % Sand = 19 % Silt = 51 % Clay = 27
	18	SS	16-16-18	13.3	6.23	124.0			

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DRILL RIG NO. 315

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ELEVATIONS

GROUND SURFACE 587.1

END OF BORING 487.1

WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING 5.5 '

▽ AT END OF BORING Rotary Wash

▼ 24 HOURS Grouted Upon Completion

DISTANCE BELOW SURFACE IN FEET

LENGTH RECOVERY	SAMPLE NO.	SAMPLE TYPE	N	WC	Qu	γ_{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
	19	SS	10-18-21	13.4	4.5+*				Very tough to hard gray silty CLAY, little sand, trace gravel, moist (CL)
							87.0	500.1	
	20	SS	11-22-26	17.5	3.5*				
	21	SS	15-20-25	13.2	4.5+*				Very tough to hard gray very silty CLAY, little sand, occasional silt seams, moist (CL-ML)
	22	SS	20-29-37	10.3	4.5+*				
									End of Boring at 100.0'

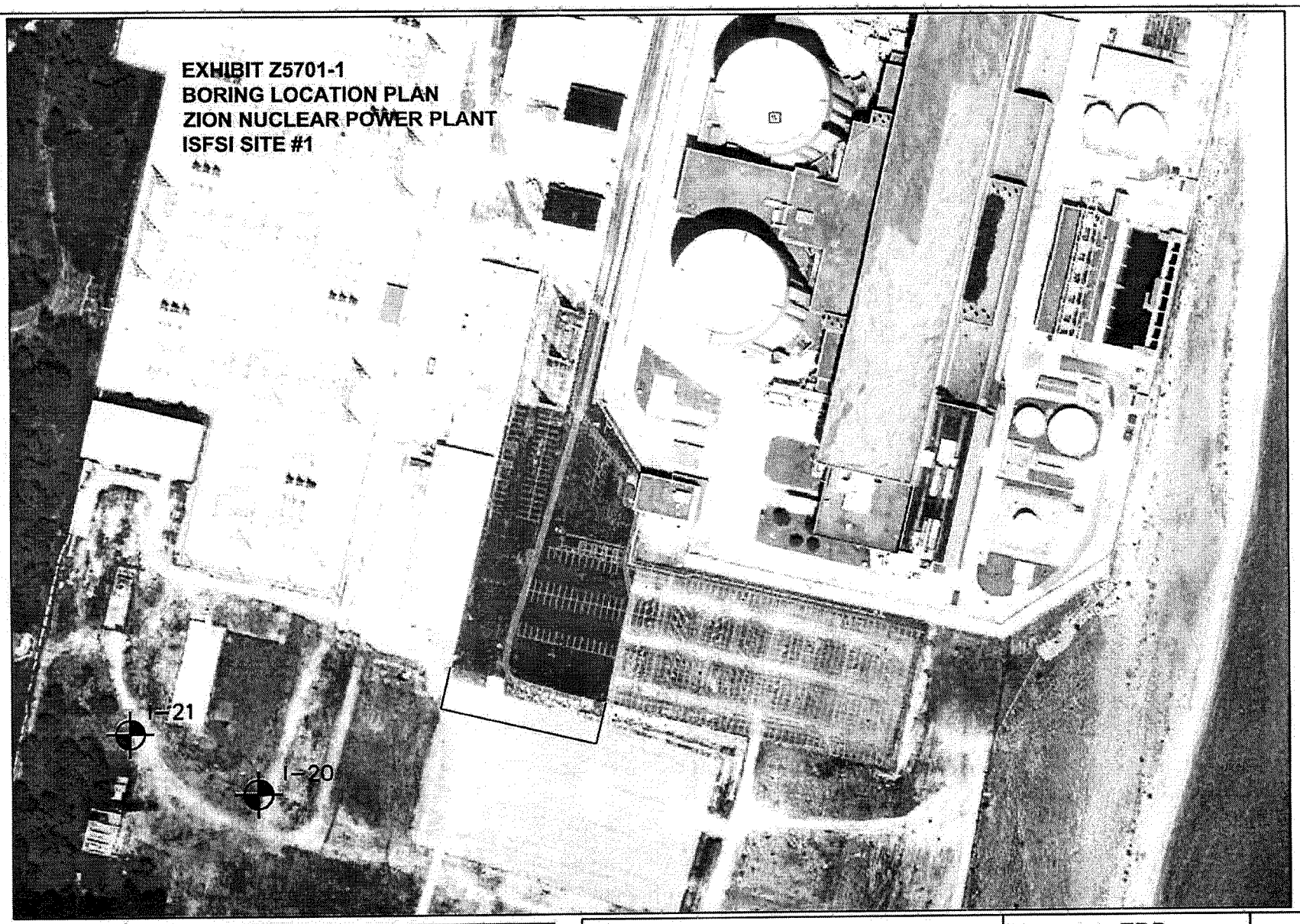
* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.

Diedrich D-120 Truck Rig (#315)
CME Automatic Hammer

DRILL RIG NO. 315

Division lines between deposits represent approximate boundaries between soil types. in-situ, the transition may be gradual

EXHIBIT Z5701-1
BORING LOCATION PLAN
ZION NUCLEAR POWER PLANT
ISFSI SITE #1



Boring	Survey Coordinates		Elevation (ft)
	Northing (ft)	Easting (ft)	
I-20	2,104,754	1,126,708	587.2
I-21	2,104,826	1,126,498	587.1

TSC
TESTING SERVICE CORPORATION
457 EAST GUNDERSEN DRIVE
CAROL STREAM, ILLINOIS 60188

DRAWN BY: TRP
CHECKED BY: DPD
JOB NO. : L-72,070
DATE: October 2008

GEOPHYSICAL DATA REPORT
CROSSHOLE SEISMIC RESULTS
ZION NUCLEAR POWER PLANT
ZION, ILLINOIS

Prepared for:

TESTING SERVICE CORPORATION
Carol Stream, Illinois

Prepared by:

GEOTECHNOLOGY, INC.
St. Louis, Missouri

Geotechnology, Inc. Report No. 0979802.85IS

September 15, 2008

GEOTECHNOLOGY, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES
SAINT LOUIS • COLLINSVILLE • KANSAS CITY

September 15, 2007 0979802.85IS

Mr. Darin Delaney
Testing Service Corporation
457 East Gundersen Drive
Carol Stream, Illinois 60188

Reference: Geophysical Data Report
Crosshole Seismic Results
Zion Nuclear Power Plant
Zion, Illinois

Dear Mr. Delaney:

Presented herein are the results of the crosshole seismic test for the referenced site. This work was conducted in general accordance with proposal P14676.00.85IS dated July 31, 2008. Presented in this report is a description of the geophysical method and data plots.

It is a pleasure to be of service to you on this project. If you have any questions or comments, please contact the undersigned at (314) 997-7440.

Very truly yours,

GEOTECHNOLOGY, INC.

Glen L. Adams
Senior Geophysicist

Douglas W. Lambert, P.G.
Senior Project Manager-Geophysics

GLA/DWL:gla/sjc

Copies Submitted: (3)

GEOPHYSICAL DATA REPORT
CROSSHOLE SEISMIC RESULTS
ZION POWER STATION
ZION, ILLINOIS

TABLE OF CONTENTS

ILLUSTRATIONS

APPENDIX

GEOPHYSICAL DATA REPORT
CROSSHOLE SEISMIC RESULTS
ZION POWER STATION
ZION, ILLINOIS

1.0 INTRODUCTION

1.1 Site Description. The site consists of an existing nuclear power plant near Zion, Illinois. A site location map is presented on Plate 1. The crosshole borings were located approximately 900 feet south of the switch yard within the plant perimeter fence, as shown on the site plan on Plate 2.

1.2 Scope of Work. The scope of work included mobilizing geophysical equipment and personnel to the site, conducting a crosshole seismic test, and processing/interpreting the data. The seismic data were processed, and shear and compressional wave velocities were calculated to determine dynamic soil properties. The seismic data were plotted and the results are presented in this report. Engineering analysis or recommendations based on this data are outside our scope of work.

2.0 GEOPHYSICAL METHODOLOGY

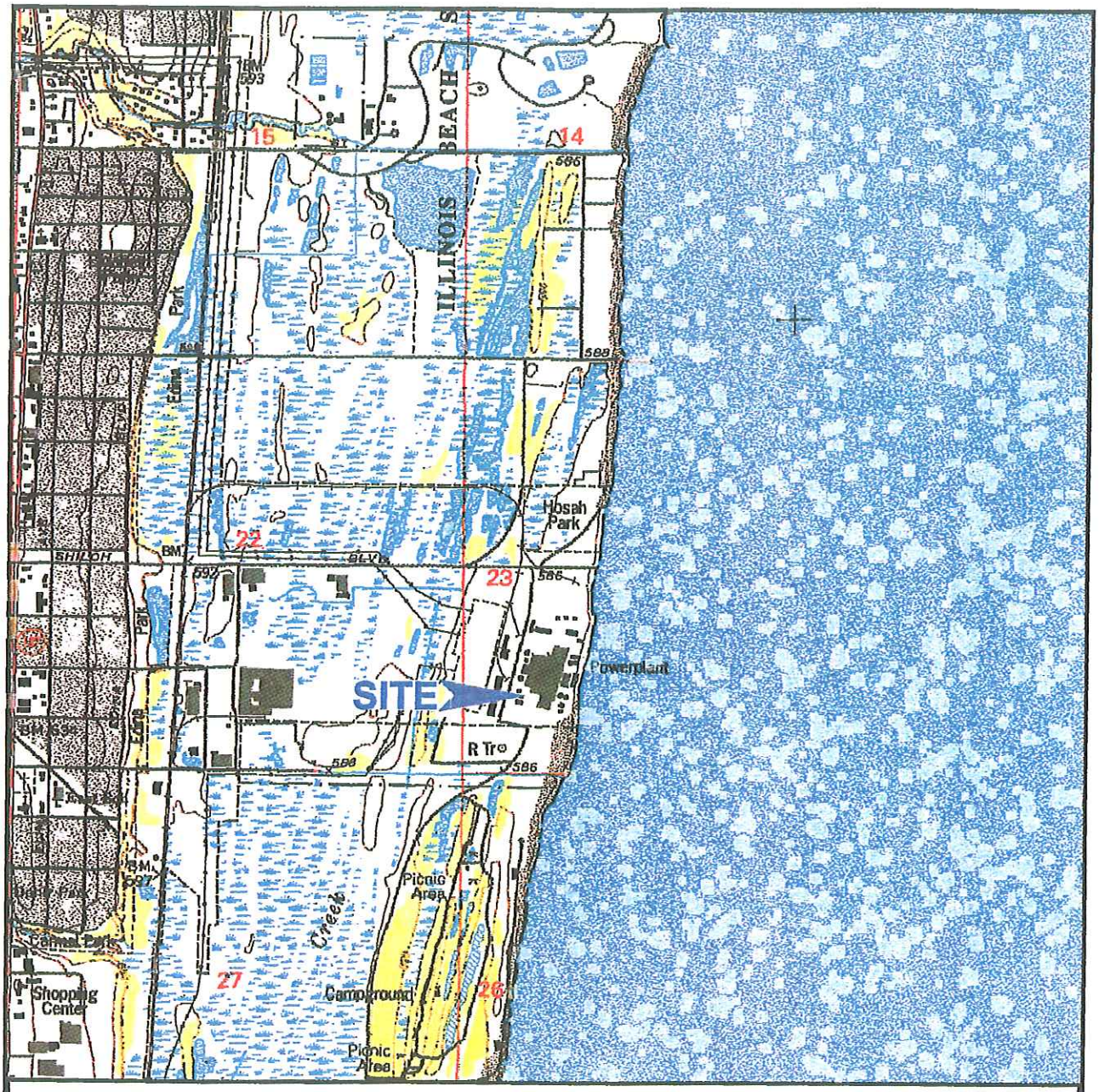
The crosshole seismic testing method involves generating compressional (P) and shear (S) wave seismic energy at periodic depth intervals within a borehole and measuring the seismic wave travel-times at geophones situated at the source depth between two adjacent boreholes (per ASTM Standard D4428). The seismic wave arrivals at the geophones are transmitted through cables to the seismograph for digital recording. The data are interpreted by analyzing the differences in elapsed travel-time from the source to geophones. P- and S-wave velocities can be calculated for each depth interval by analyzing the travel-time data. The distance between boreholes may vary with depth; therefore borehole deviation logging is conducted to adjust the borehole separation distance with depth for the velocity calculations.

3.0 RESULTS

Crosshole seismic testing was conducted using a source boring and two adjacent receiver (geophone) borings, indicated as Borings I-20 (source), I-20A (Geophone 1), and I-20B (Geophone 2), respectively, as shown on Plate 3. Crosshole data were recorded on 5-foot intervals throughout the depth of the borings. Due to a physical limitation of the crosshole equipment, data could only be collected to a depth of 97-feet from the surface. The borings were cased to

approximately 99-feet and the downhole equipment requires approximately 2-feet from the bottom of the casing to collect data.

Seismic velocities calculated between the source boring and the two geophone borings are presented on Plates 4 and 5. A table of all tabulated values and velocities is presented on Plate 6. Plates 7 through 9 are plots of the deviation from vertical for the three borings used for the crosshole test. Due to the inherent noise in the earth, and lateral variations in soil velocities between the test borings, some variations in velocities were calculated between the two receiver holes. An average velocity is plotted on the crosshole data plots that allows a smoother fit to the data. Densities used for the moduli calculations were based on lab values provided by the client as wet unit weights.



NOTES

Plan adapted from a 7.5 minute U.S.G.S. map for Zion, Illinois Quadrangle, last revised in 1993.

0 2,000 4,000

SCALE IN FEET

N

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Date: 09-12-08	Date: 9/15/08	Date: 9/15/08

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Zion Nuclear Power Plant
Zion, Illinois

SITE LOCATION AND TOPOGRAPHY

Project Number 0979802.65IS

PLATE 1

NOTES

1. Plan adapted from an aerial photograph courtesy of Google Earth.

LEGEND

- Boring Location

0 300 600

SCALE IN FEET

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Date: 09-12-08	Date: 9/15/08	Date: 9/15/08

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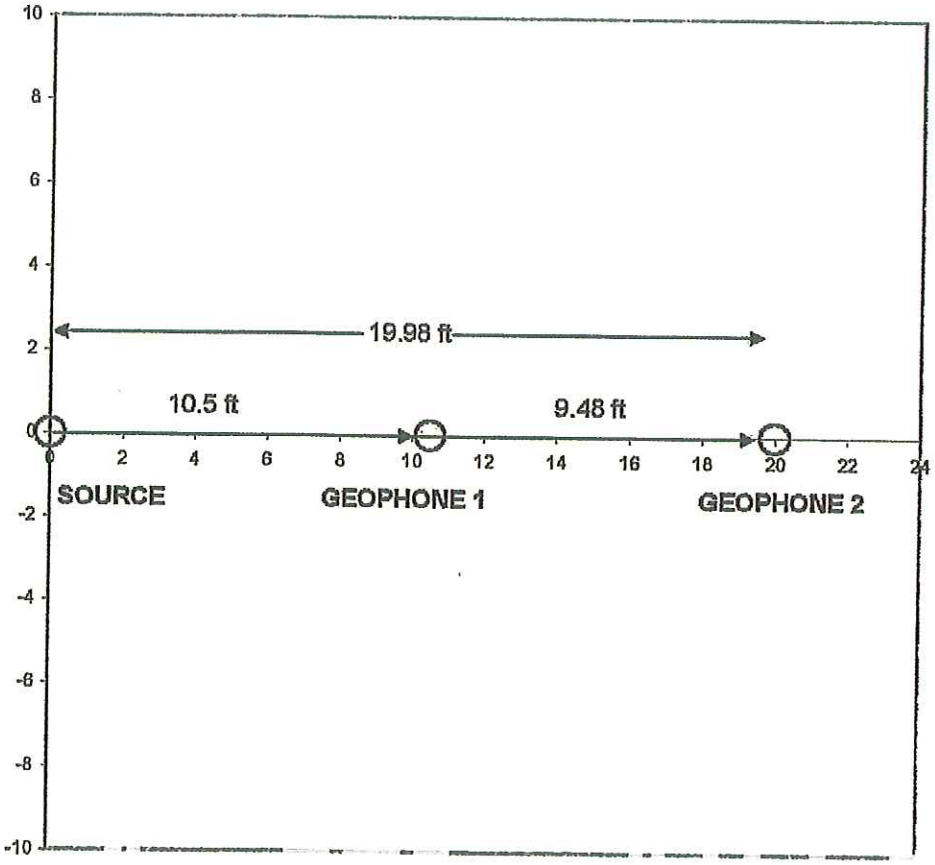
Zion Nuclear Power Plant
Zion, Illinois

PLAN OF SITE AND BORING LOCATIONS

Project Number	
0979802.85IS	PLATE 2



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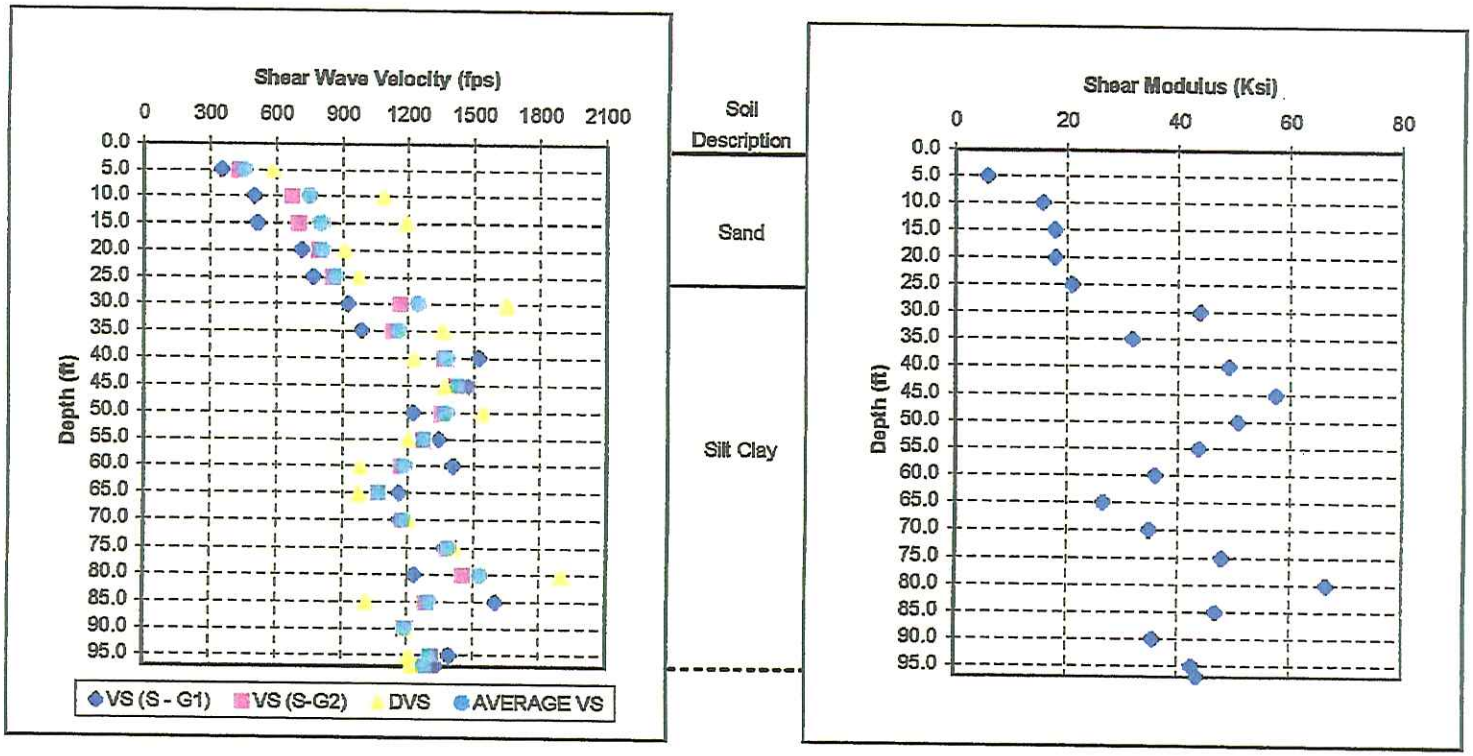
Zion Nuclear Power Plant
Zion, Illinois

RELATIVE BOREHOLE LOCATIONS

Project Number 0979802.85IS	PLATE 3



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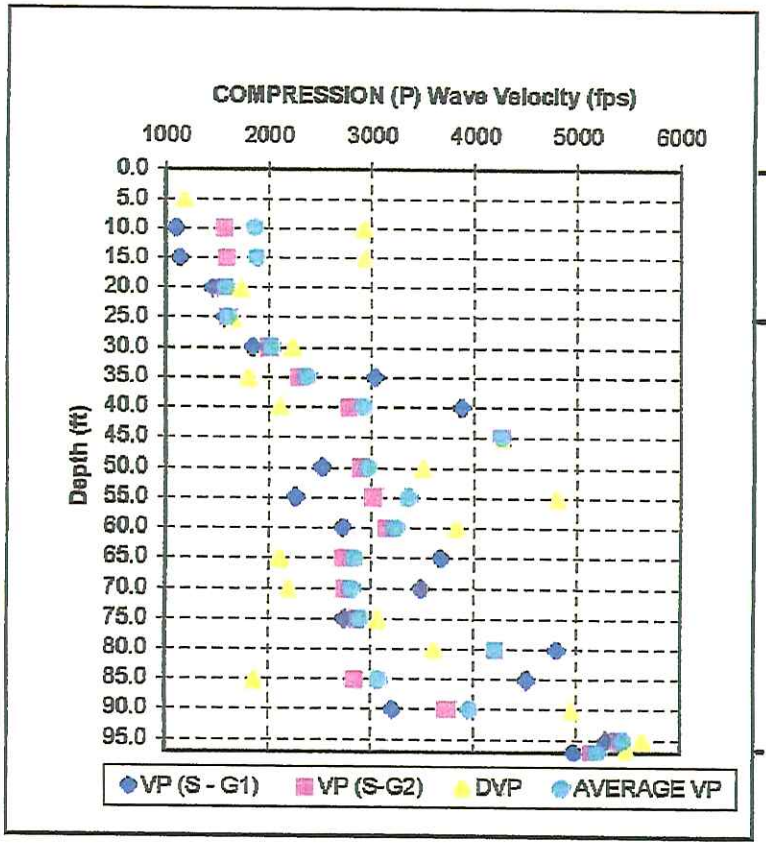
Zion Nuclear Power Plant
Zion, Illinois

SHEAR (S) WAVE VELOCITY AND SHEAR MODULUS VS DEPTH

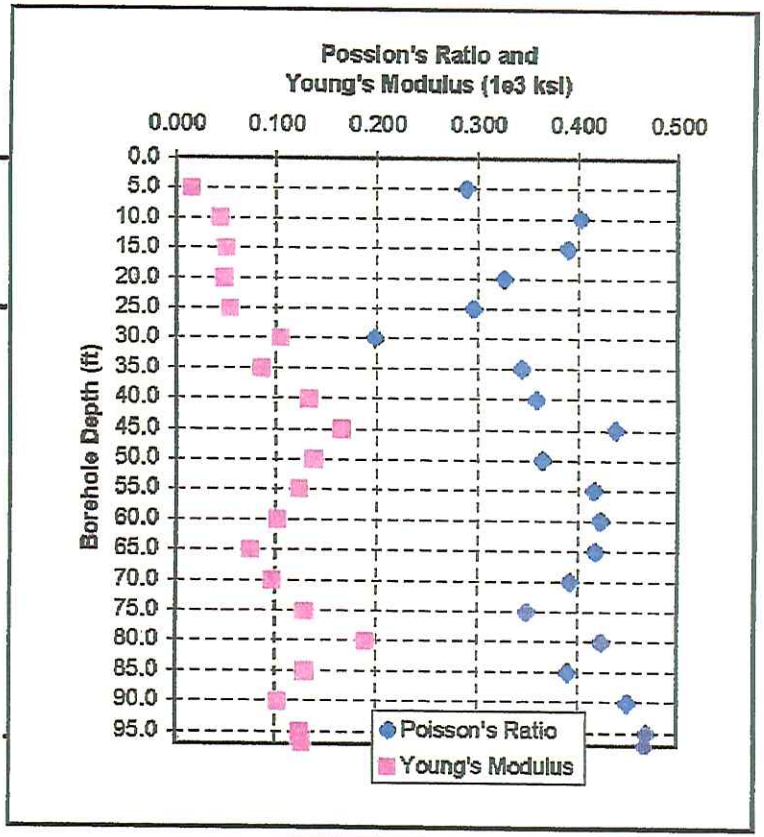
Project Number 0979802.85IS	PLATE 4



Soil Description

Sand

Silt Clay



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Zion Nuclear Power Plant
Zion, Illinois

COMPRESSIONAL (P) WAVE VELOCITY, POISSON'S RATIO, AND YOUNG'S MODULUS VS DEPTH

Project Number	
0979802.85IS	PLATE 5

DEPTH (FT)	SHEAR VELOCITY (AVERAGE, FT/SEC)	P-WAVE VELOCITY (AVERAGE, FT/SEC)	UNIT WEIGHT (LB/CU FT)	SHEAR MODULUS (KSI)	POISSON RATIO	YOUNG'S MODULUS (KSI)
5	455	836	128	5.75	0.29	14.83
10	752	1865	128	15.73	0.40	44.13
15	802	1890	128	17.88	0.39	49.71
20	807	1590	128	17.98	0.33	47.71
25	866	1609	128	20.84	0.30	54.01
30	1246	2030	130	43.81	0.20	104.91
35	1159	2379	109	31.75	0.34	85.38
40	1371	2921	120	48.95	0.36	133.02
45	1420	4263	131	57.36	0.44	164.92
50	1371	2970	124	50.59	0.36	138.06
55	1272	3360	124	43.52	0.42	123.29
60	1184	3230	118	35.90	0.42	102.12
65	1066	2839	107	26.39	0.42	74.85
70	1181	2808	115	34.78	0.39	96.88
75	1390	2890	114	47.78	0.35	128.98
80	1528	4208	131	66.37	0.42	189.04
85	1302	3073	127	46.70	0.39	129.88
90	1193	3963	115	35.54	0.45	103.06
95	1304	5448	115	42.46	0.47	124.81
97	1279	5200	122	43.34	0.47	127.23

Drawn By: SLC	Ck'd By: GLA	App'vd By:
Date: 09-15-08	Date: 9/15/08	Date: 9/15/08

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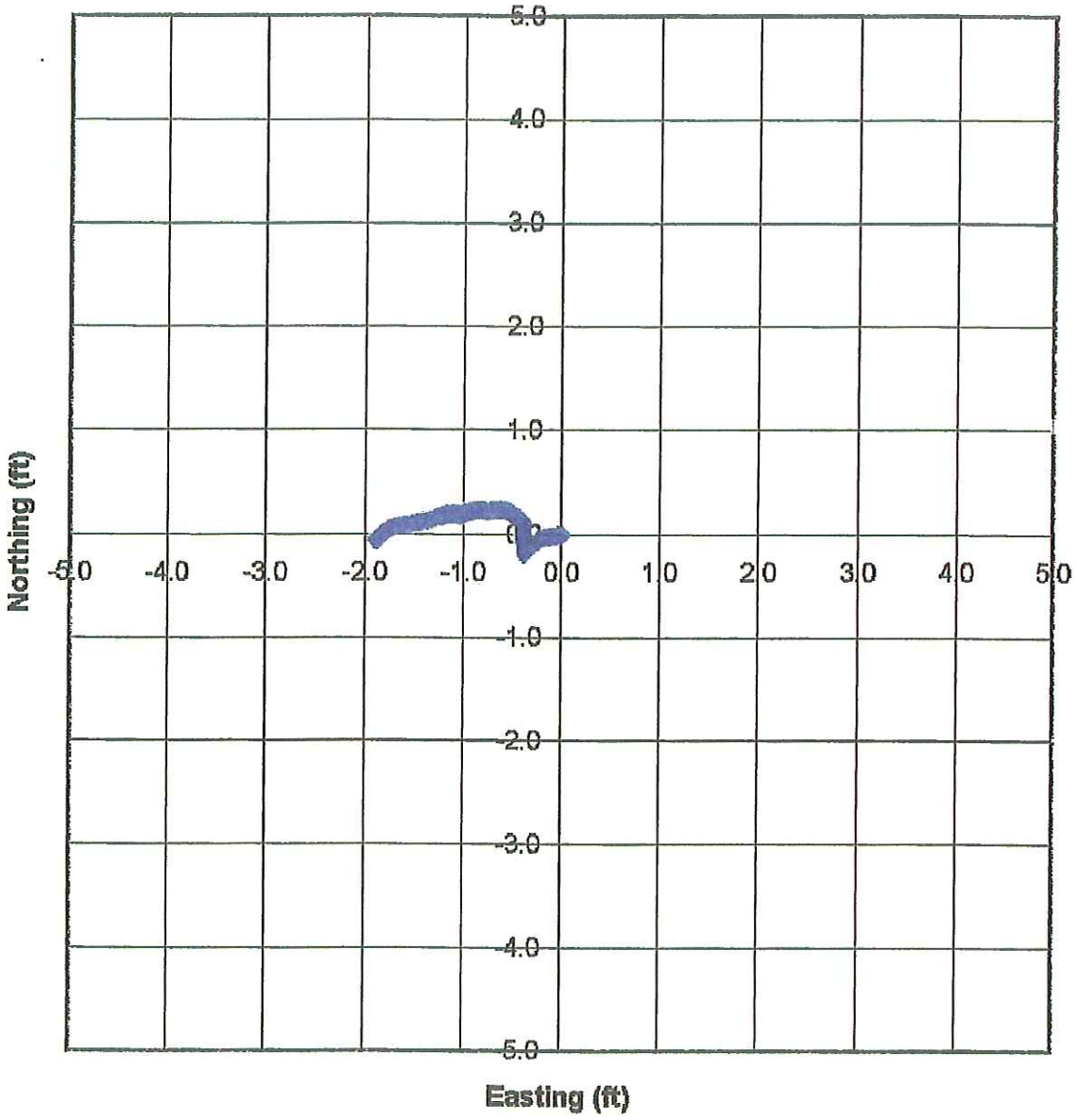
Zion Nuclear Power Plant
Zion, Illinois

SUMMARY TABLE - CROSSHOLE RESULTS

Project Number
0979802.85IS

PLATE 6



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Date: 09-15-08	Date: 9/15/08	Date: 9/15/08

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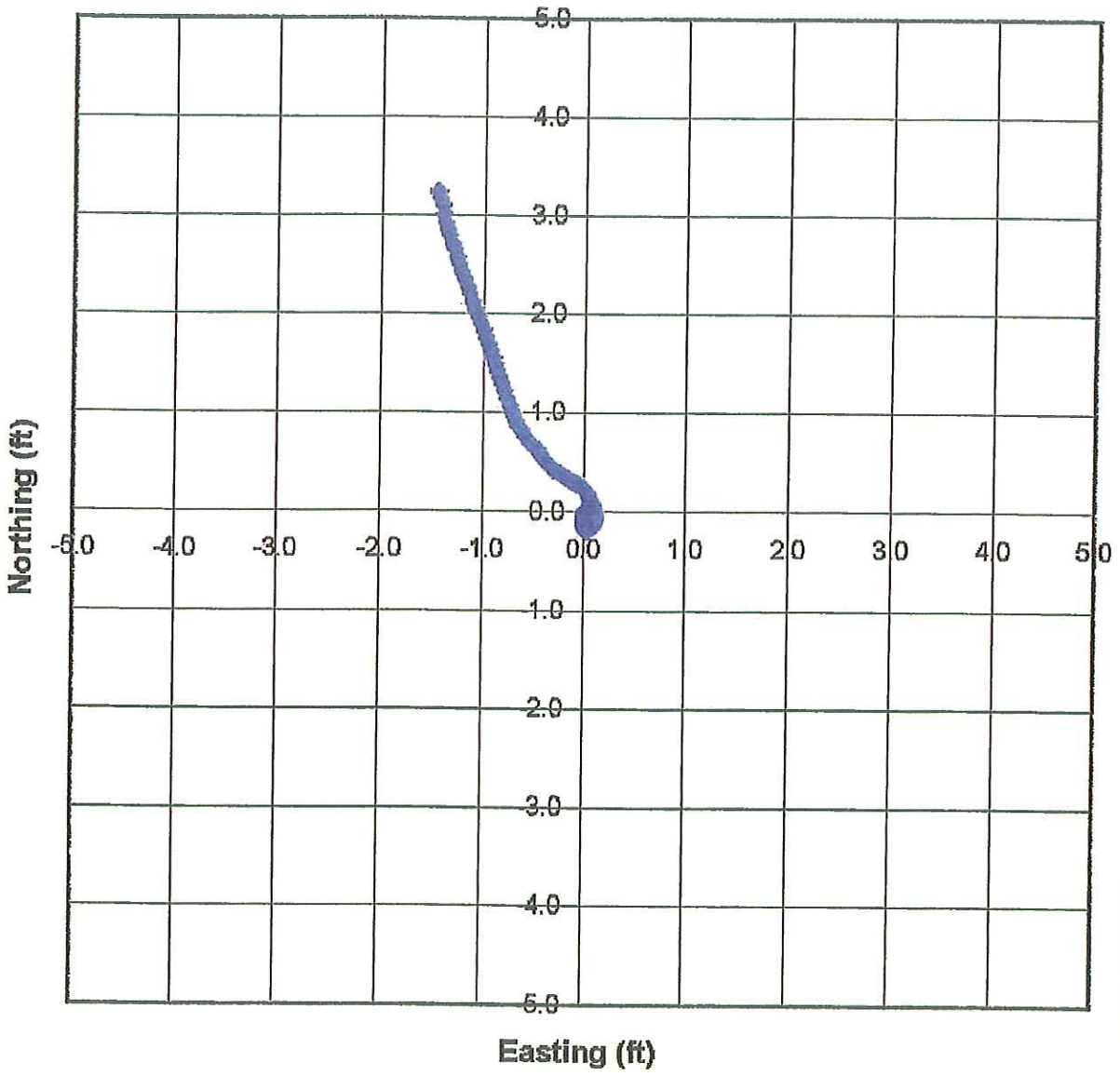
ENGINEERING AND ENVIRONMENTAL SERVICES
ST. LOUIS • COLLINSVILLE • KANSAS CITY

Zion Nuclear Power Plant
Zion, Illinois

SOURCE BORING DEVIATION

Project Number 0979802.85IS	PLATE 7



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Date: 09-15-08	Date: 9/15/08	Date: 9/15/08

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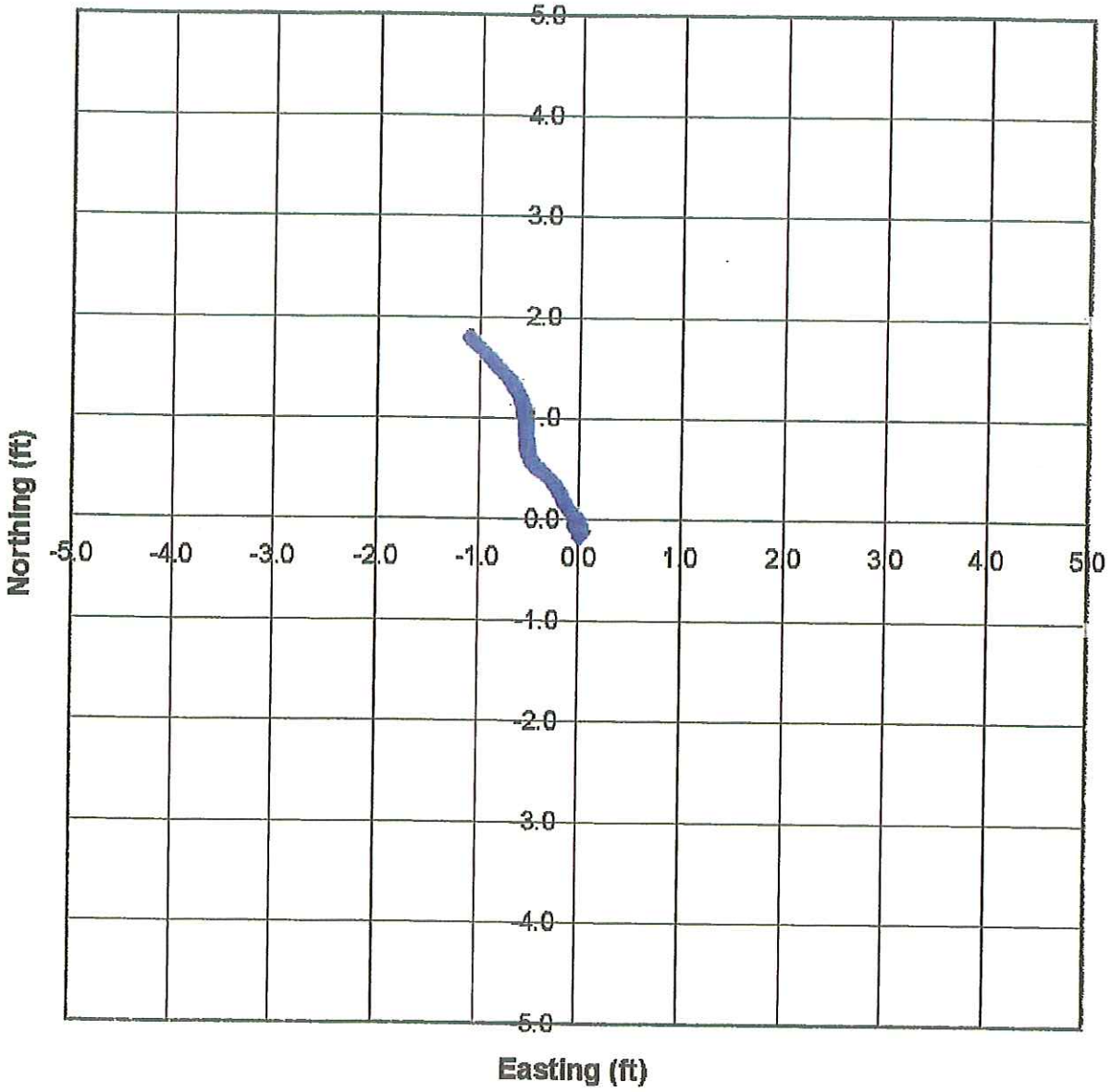
Zion Nuclear Power Plant
Zion, Illinois

GEOPHONE BORING
1 DEVIATION

Project Number
0979802.85IS

PLATE 8



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Date: 09-15-08	Date: 9/15/08	Date: 9/15/08

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Zion Nuclear Power Plant
Zion, Illinois

GEOPHONE BORING 2 DEVIATION

Project Number 0979802.85IS	PLATE 9

APPENDIX A

LIMITATIONS OF REPORT

GEOPHYSICAL SERVICES
LIMITATIONS OF REPORT

1. This report was prepared for the exclusive use of the owner, architect, and engineer for evaluating the project as it relates to the technical aspects discussed herein. It can be made available to prospective contractors for information on factual data only and not as a warranty of subsurface conditions included in this report. Unless other contractual agreements were made, the services described in this report were carried out in accordance with the Terms for Geotechnology's Services which were attached to the proposal.

2. Geotechnology endeavored to perform the crosshole seismic geophysical survey in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area. The findings and conclusions stated herein must be considered not as scientific certainties, but rather as professional opinions concerning the significance of the limited data gathered during the course of the survey. No warranty, express or implied, is made.

3. The geophysical analyses and conclusions contained in this report are based on the site conditions, project layout, sampling interval, geophysical data, and interpretive procedures described herein. Geotechnology can make no interpretation of underground conditions beyond the test location. Geophysical exploration methods are indirect and potentially influenced by a variety of natural or man-made conditions. The resulting interpretations are based on the quality of the recorded data as limited by site conditions

TESTING SERVICE CORPORATION
457 East Gundersen Drive
Carol Stream, Illinois

TSC Job No. L - 72,070
September 9, 2008

CLIENT: Sargent & Lundy, LLC
55 East Monroe Street
Chicago, IL

PROJECT: ISFSI Project
Zion Nuclear power Plant
Zion, IL

SOIL TEST DATA

LOCATION						
BORING NUMBER		I-20	I-20	I-20	I-20	I-20
SAMPLE NUMBER		2	7	12	22	32
DEPTH IN FEET		3.5 - 5.0	16.0 - 17.5	28.5 - 30.0	53.5 - 55.0	78.5 - 80.0
HRB CLASSIFICATION & GROUP INDEX						
UNIFIED CLASSIFICATION		SP	SP	CL	CL	CL
GRAIN SIZE CLASSIFICATION						
GRADATION - PASSING 1" SIEVE %						
GRADATION - PASSING 3/4" SIEVE %		100	100	100	100	
GRADATION - PASSING 3/8" SIEVE %		95	99	99	99	
GRADATION - PASSING # 4 SIEVE %		92	95	97	99	
GRADATION - PASSING # 10 SIEVE %		88	91	95	97	100
GRADATION - PASSING # 40 SIEVE %		79	71	85	92	98
GRADATION - PASSING # 100 SIEVE %		14	8	77	88	88
GRADATION - PASSING # 200 SIEVE %		6	4	73	84	73
SAND AND GRAVEL%		94	96	27	16	27
SILT OR SILT AND CLAY COMBINED %		6	4	52	50	73
CLAY % (<0.002 MM)				21	34	
LIQUID LIMIT %				22	31	17
PLASTIC LIMIT %				11	12	10
PLASTICITY INDEX %				11	19	7
NATURAL MOISTURE CONTENT %				11.0	13.4	10.7
DRY UNIT WEIGHT				129.9	123.7	130.7
pH		9.26				
SOLUBLE CHLORIDES		<50				
SOLUBLE SULFATES		<150				
ORGANIC CONTENT	L-O-I %					
	WET COMBUSTION %					

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Carol Stream, Illinois

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September 9, 2008

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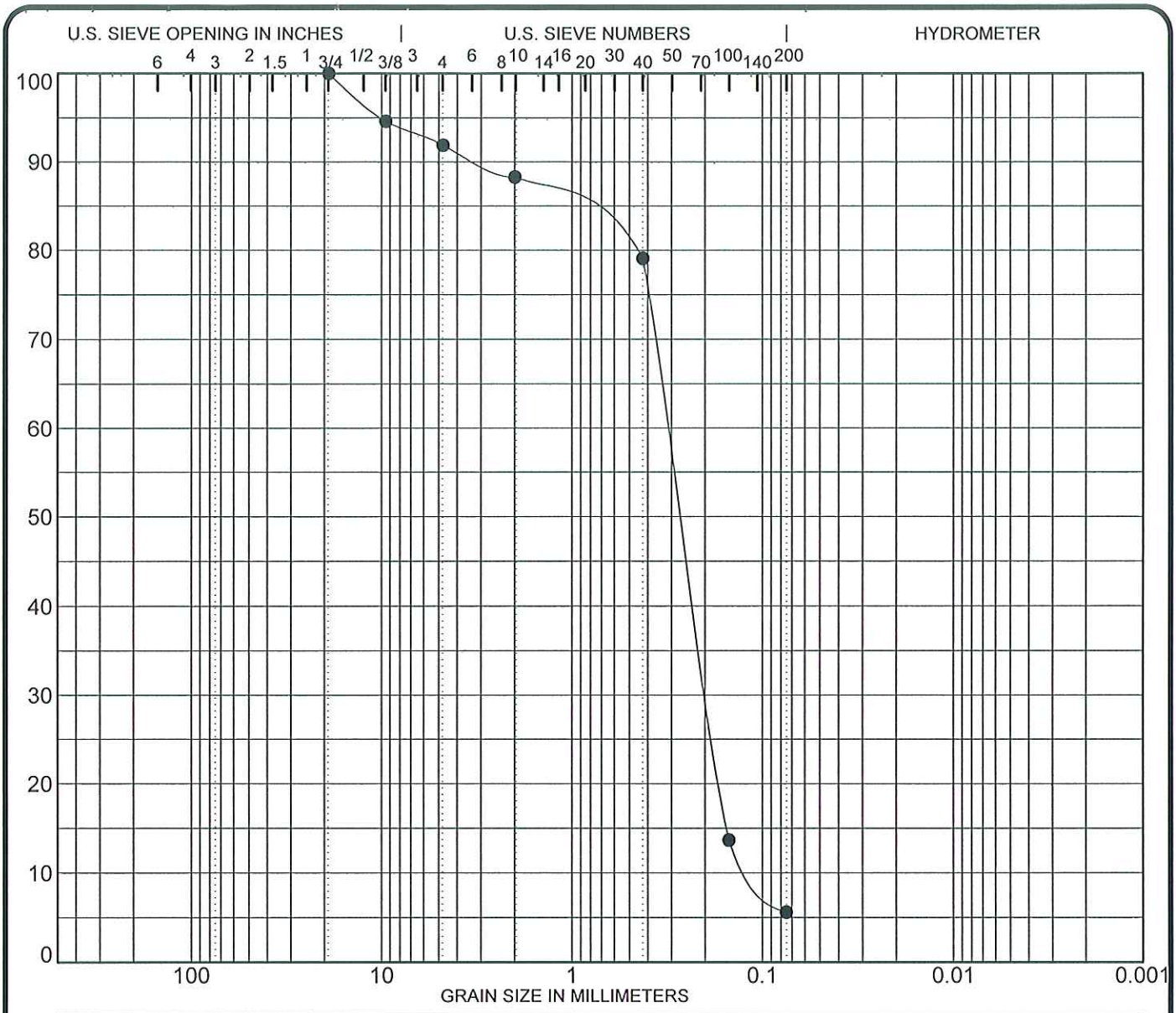
55 East Monroe Street
Chicago, IL

PROJECT: ISFSI Project
Zion Nuclear power Plant
Zion, IL

SOIL TEST DATA

LOCATION						
BORING NUMBER		I-21	I-21	I-21	I-21	I-21
SAMPLE NUMBER		2	5	9	11	17
DEPTH IN FEET						
HRB CLASSIFICATION & GROUP INDEX						
UNIFIED CLASSIFICATION		SP	SP	CL	CL	CL
UNCONFINED COMPRESSIVE STRENGTH (TSF)				5.41	NP	NP
GRADATION - PASSING 1" SIEVE %			86			
GRADATION - PASSING 3/4" SIEVE %			86		100	100
GRADATION - PASSING 3/8" SIEVE %		100	79	100	98	98
GRADATION - PASSING # 4 SIEVE %		99	76	99	95	97
GRADATION - PASSING # 10 SIEVE %		99	71	98	93	96
GRADATION - PASSING # 40 SIEVE %		96	62	95	85	89
GRADATION - PASSING # 100 SIEVE %		9	7	92	79	83
GRADATION - PASSING # 200 SIEVE %		4	4	91	76	78
SAND AND GRAVEL%		96	96	9	25	22
SILT OR SILT AND CLAY COMBINED%		4	4	59	51	51
CLAY % (<0.002 MM)				32	24	27
LIQUID LIMIT %				28	23	25
PLASTIC LIMIT %				14	12	12
PLASTICITY INDEX %				14	11	113
NATURAL MOISTURE CONTENT %				12.7	13.0	15.7
DRY UNIT WEIGHT				122.7	124.7	118.3
pH		9.11				
SOLUBLE CHLORIDES		<50				
SOLUBLE SULFATES		<150				
ORGANIC CONTENT	L-O-I %					
	WET COMBUSTION %					

NP - Not Possible



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: I-20	3 inch	100	Brown SAND, trace silt, clay and gravel
Sample: 2	2	100	(SP)
	1 1/2	100	
	1	100	%GRAVEL 8 / %SAND 86 / %SILT (6% Combined) / %CLAY
NOTES:	3/4	100	
	3/8	95	
	# 4	92	
	# 10	88	
	# 40	79	
	# 100	14	
	# 200	6	

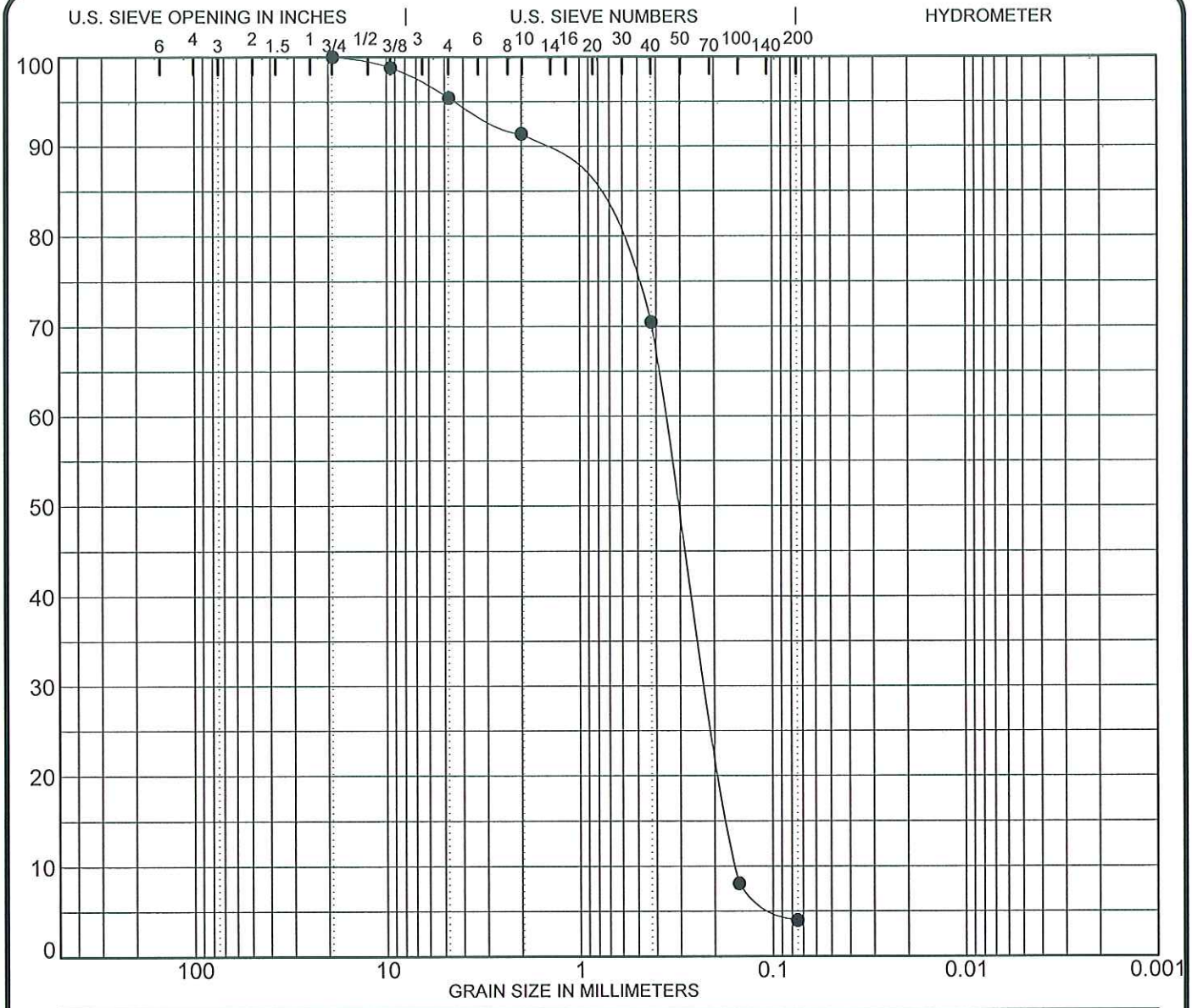
PROJECT ISFSI Zion Nuclear Power Plant
LOCATION Zion, Illinois
JOB NO. L-72,070
DATE September 8, 2008

I-20

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC_ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: I-20	3 inch	100
Sample: 7	2	100
	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	99
	# 4	95
	# 10	91
	# 40	71
	# 100	8
	# 200	4

SOIL CLASSIFICATION

Brown SAND, trace silt, clay and gravel

(SP)

%GRAVEL	%SAND	%SILT	%CLAY
5	91	(4% Combined)	

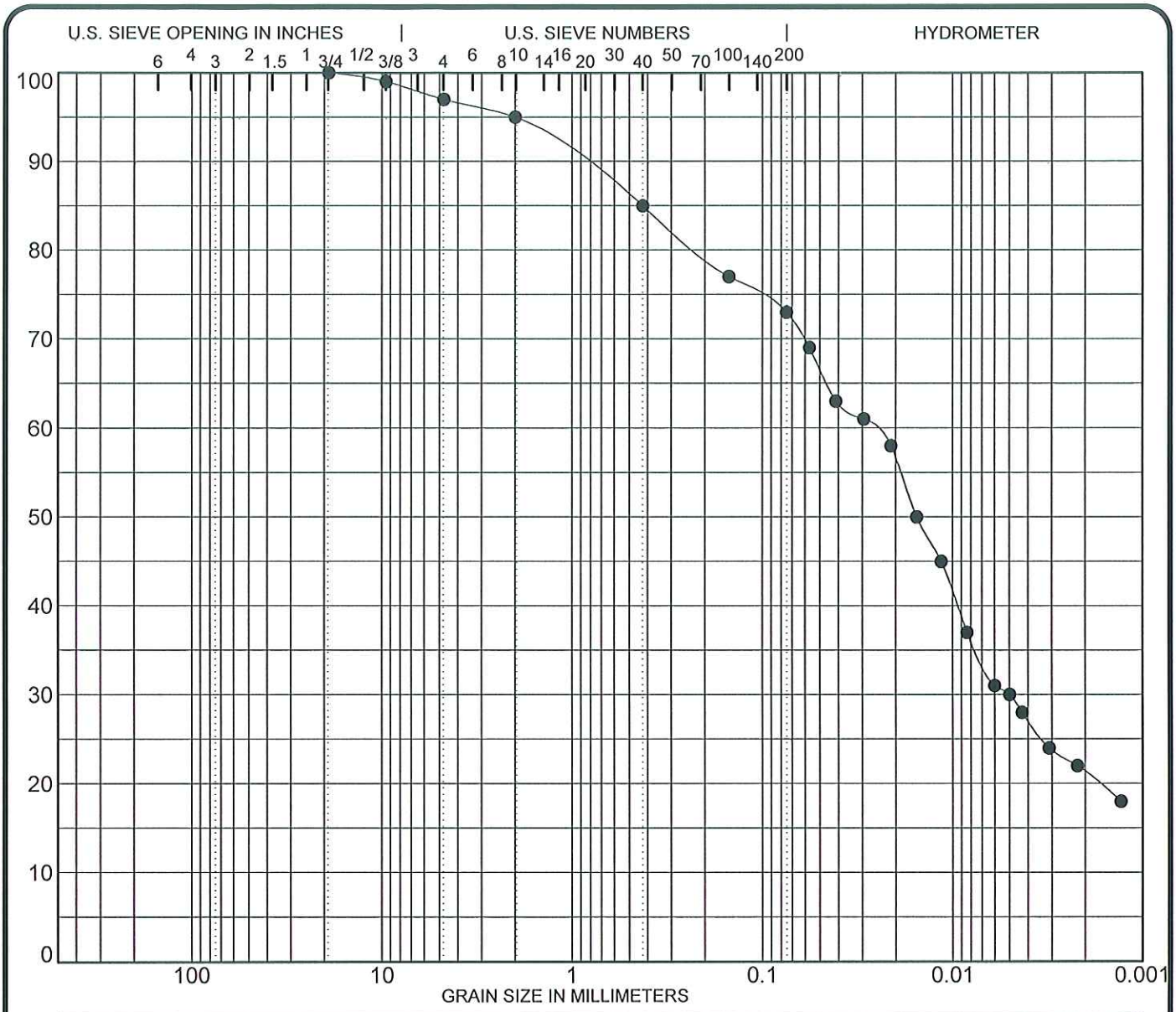
PROJECT ISFSI Zion Nuclear Power Plant
LOCATION Zion, Illinois
JOB NO. L-72,070
DATE September 8, 2008

I-20

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: I-20	3 inch	100
Sample: 12	2	100
	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	99
	# 4	97
	# 10	95
	# 40	85
	# 100	77
	# 200	73

SOIL CLASSIFICATION

Gray silty CLAY, some sand, trace gravel

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
3	24	52	21

PROJECT ISFSI Zion Nuclear Power Plant
LOCATION Zion, Illinois

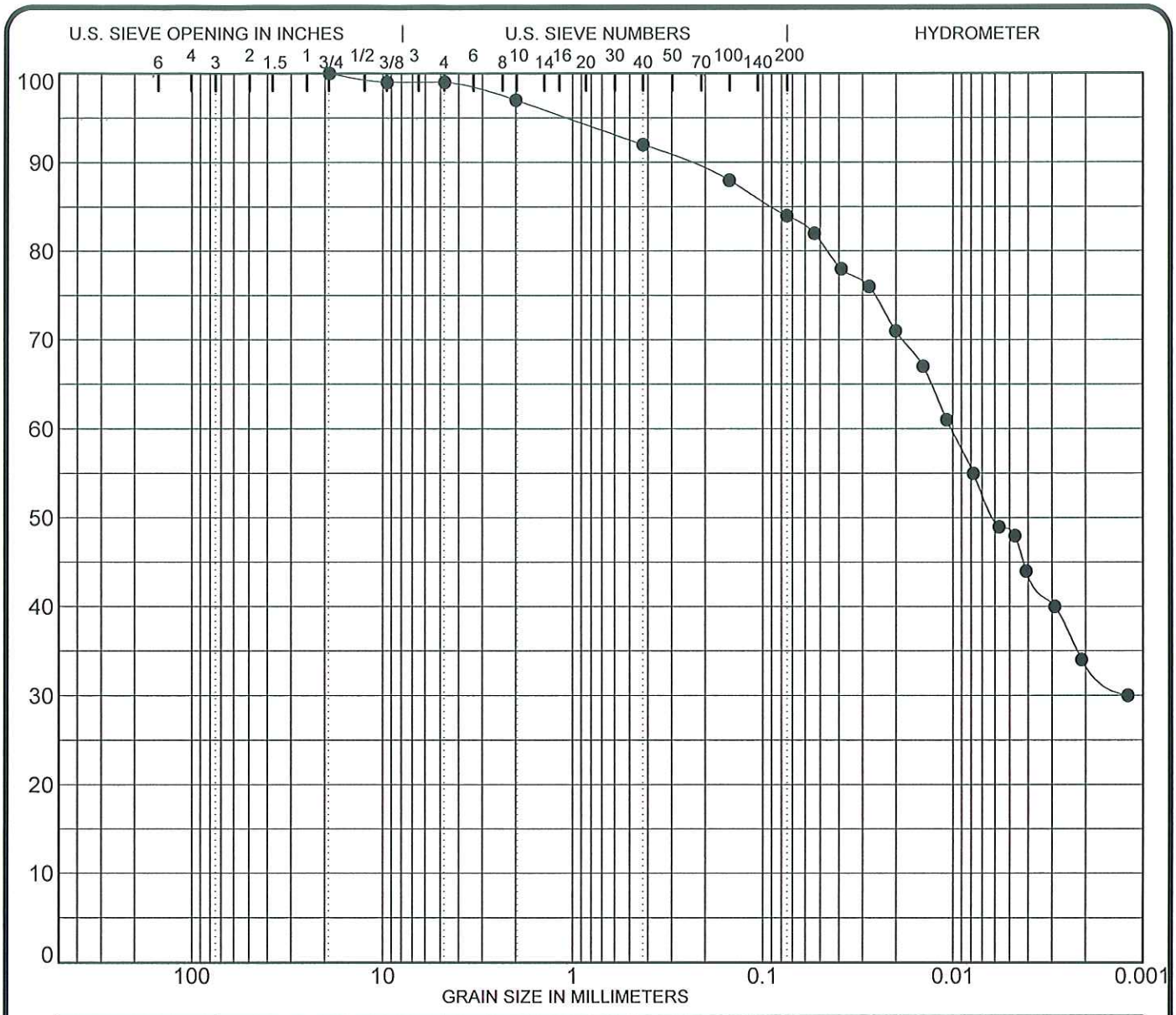
JOB NO. L-72,070
DATE September 8, 2008

I-20

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC_ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: I-20	3 inch	100
Sample: 22	2	100
	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	99
	# 4	99
	# 10	97
	# 40	92
	# 100	88
	# 200	84

SOIL CLASSIFICATION

Gray silty CLAY, little sand, trace gravel

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
1	15	50	34

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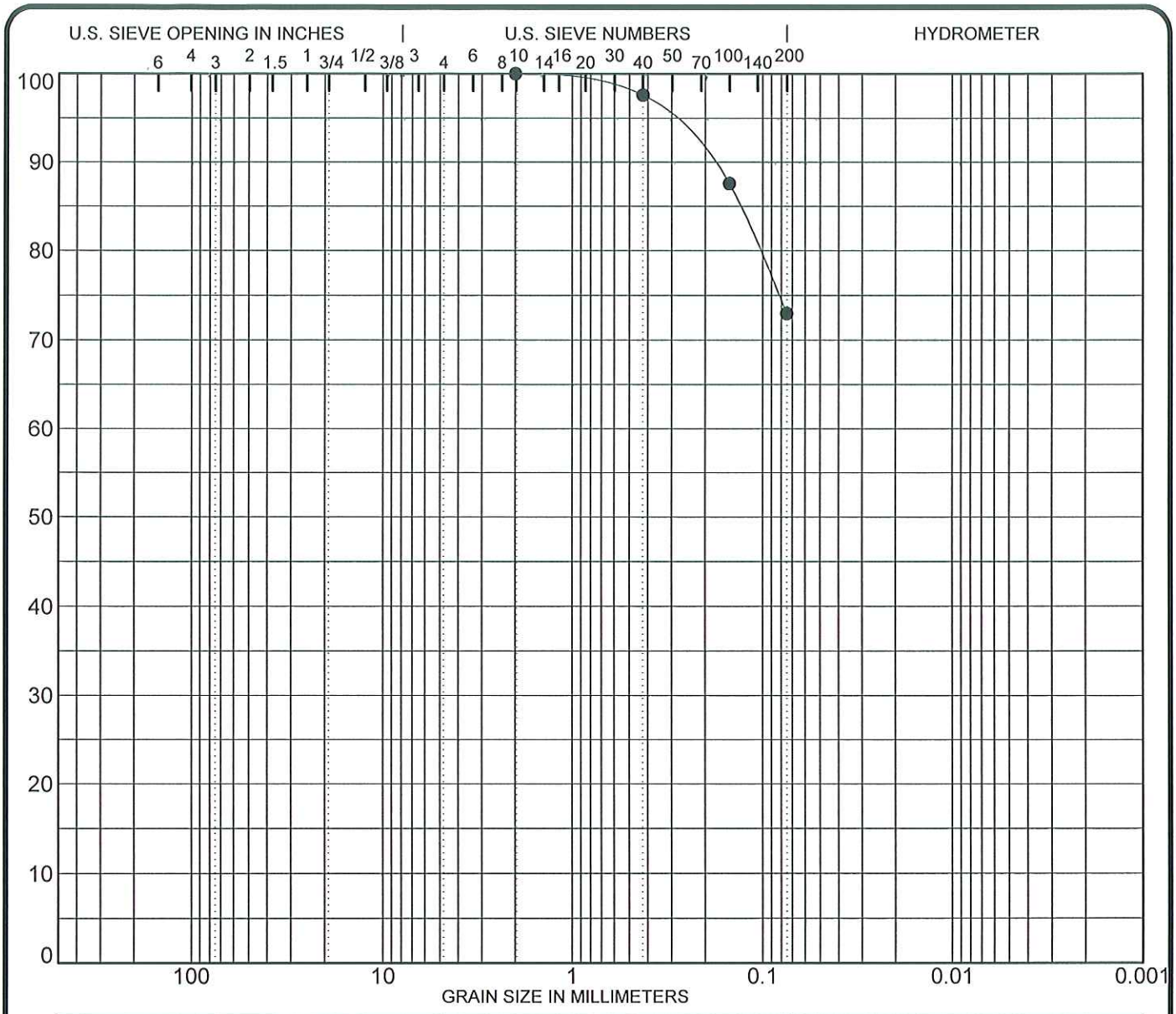
I-20

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC_ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: I-20	3 inch	100	Gray silty CLAY, some sand (CL)
Sample: 32	2	100	
	1 1/2	100	
	1	100	%GRAVEL: 0 / %SAND: 27 / %SILT: (73% Combined) / %CLAY:
NOTES:	3/4	100	
	3/8	100	
	# 4	100	
	# 10	100	
	# 40	98	
	# 100	88	
	# 200	73	

PROJECT ISFSI Zion Nuclear Power Plant
LOCATION Zion, Illinois
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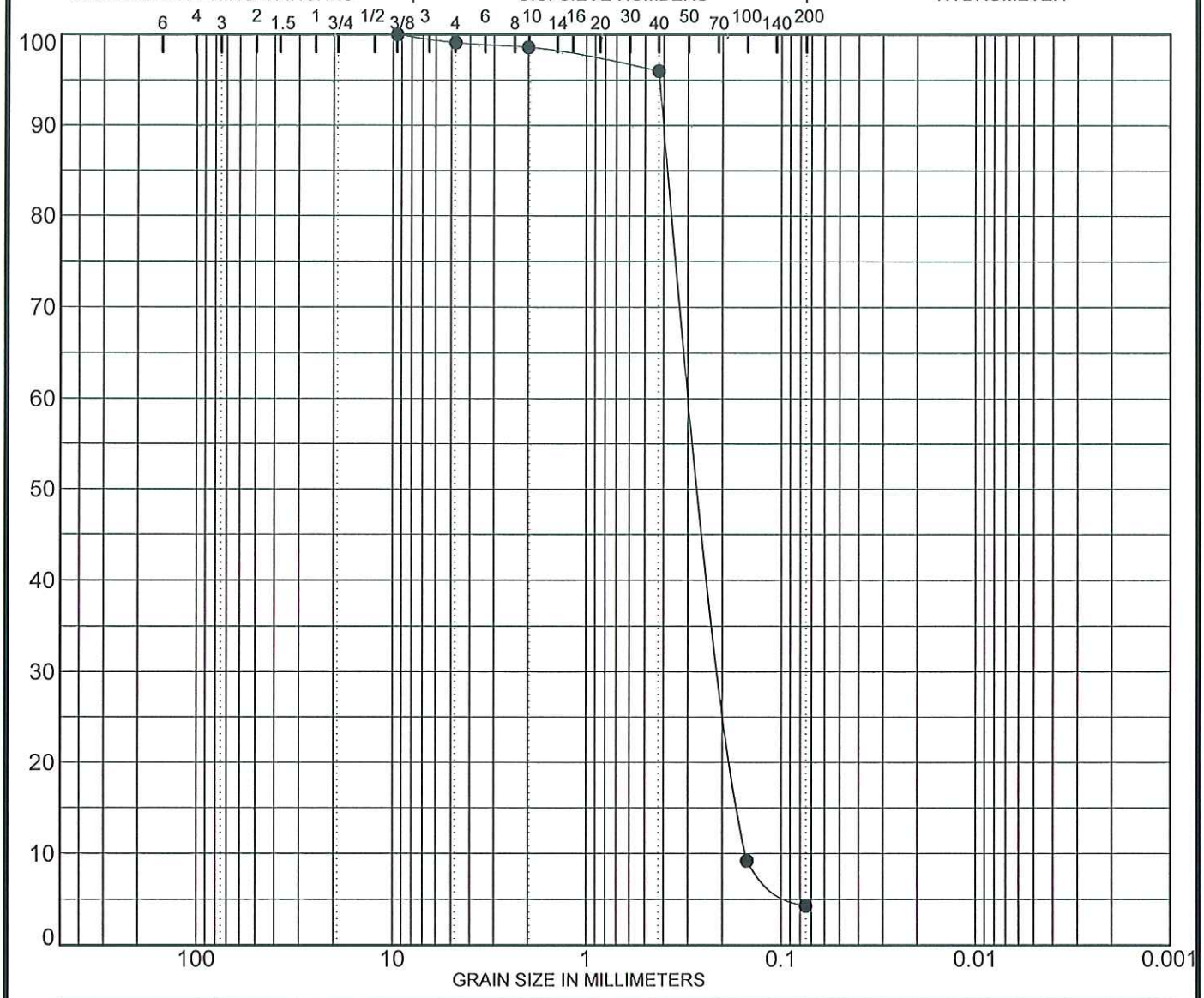
I-20

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: I-21	3 inch	100	Brown SAND, trace silt, clay and gravel
Sample: 2	2	100	(SP)
	1 1/2	100	
	1	100	%GRAVEL 1 / %SAND 95 / %SILT (4% Combined) / %CLAY
NOTES:	3/4	100	
	3/8	100	
	# 4	99	
	# 10	99	
	# 40	96	
	# 100	9	
	# 200	4	

PROJECT ISFSI Zion Nuclear Power Plant
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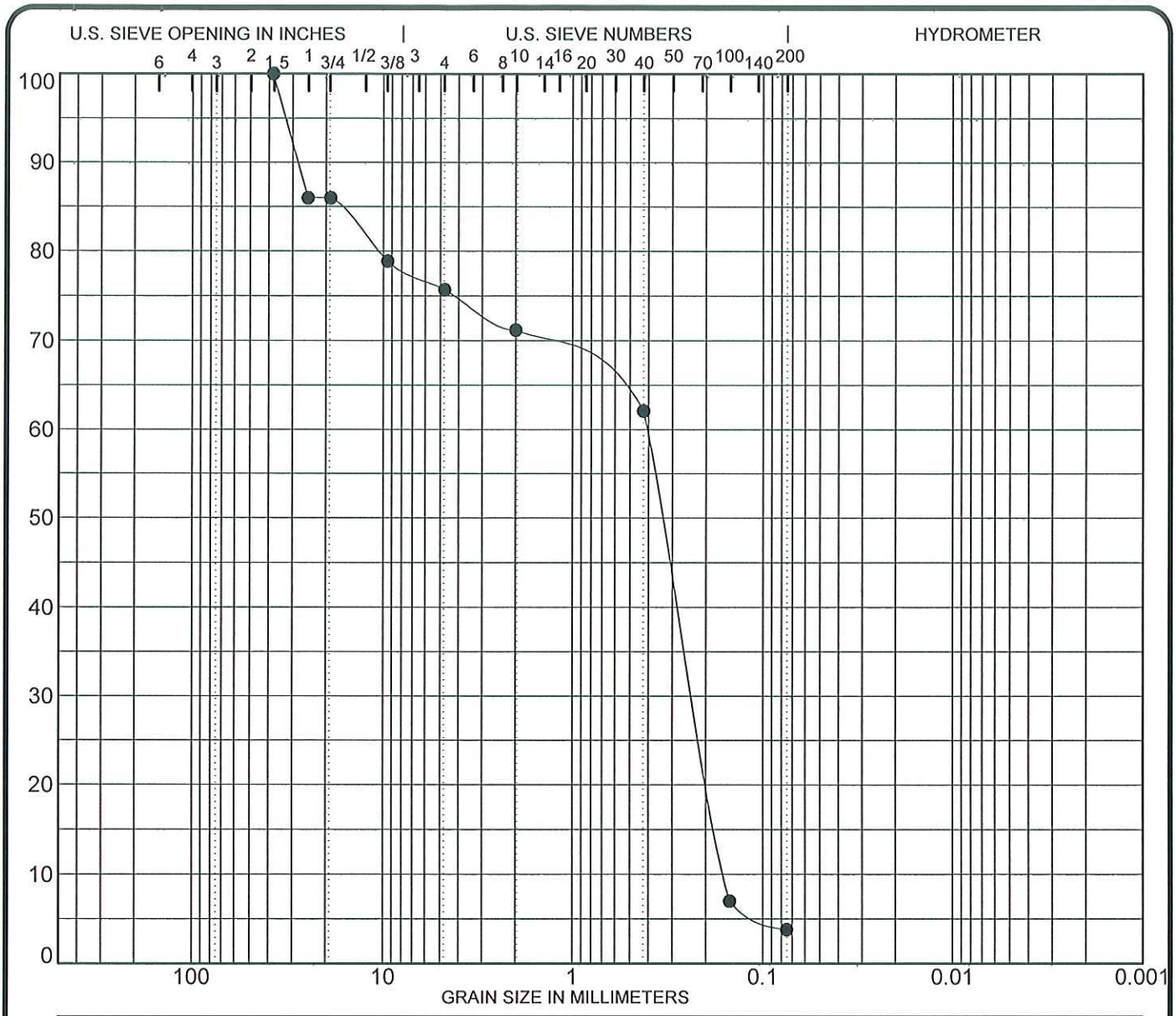
I-21

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: I-21	3 inch	100	Light brown SAND, some gravel, trace silt
Sample: 5	2	100	and clay (SP)
	1 1/2	100	
	1	86	%GRAVEL 24 / %SAND 72 / %SILT (4% Combined) / %CLAY
NOTES:	3/4	86	
	3/8	79	
	# 4	76	
	# 10	71	
	# 40	62	
	# 100	7	
	# 200	4	

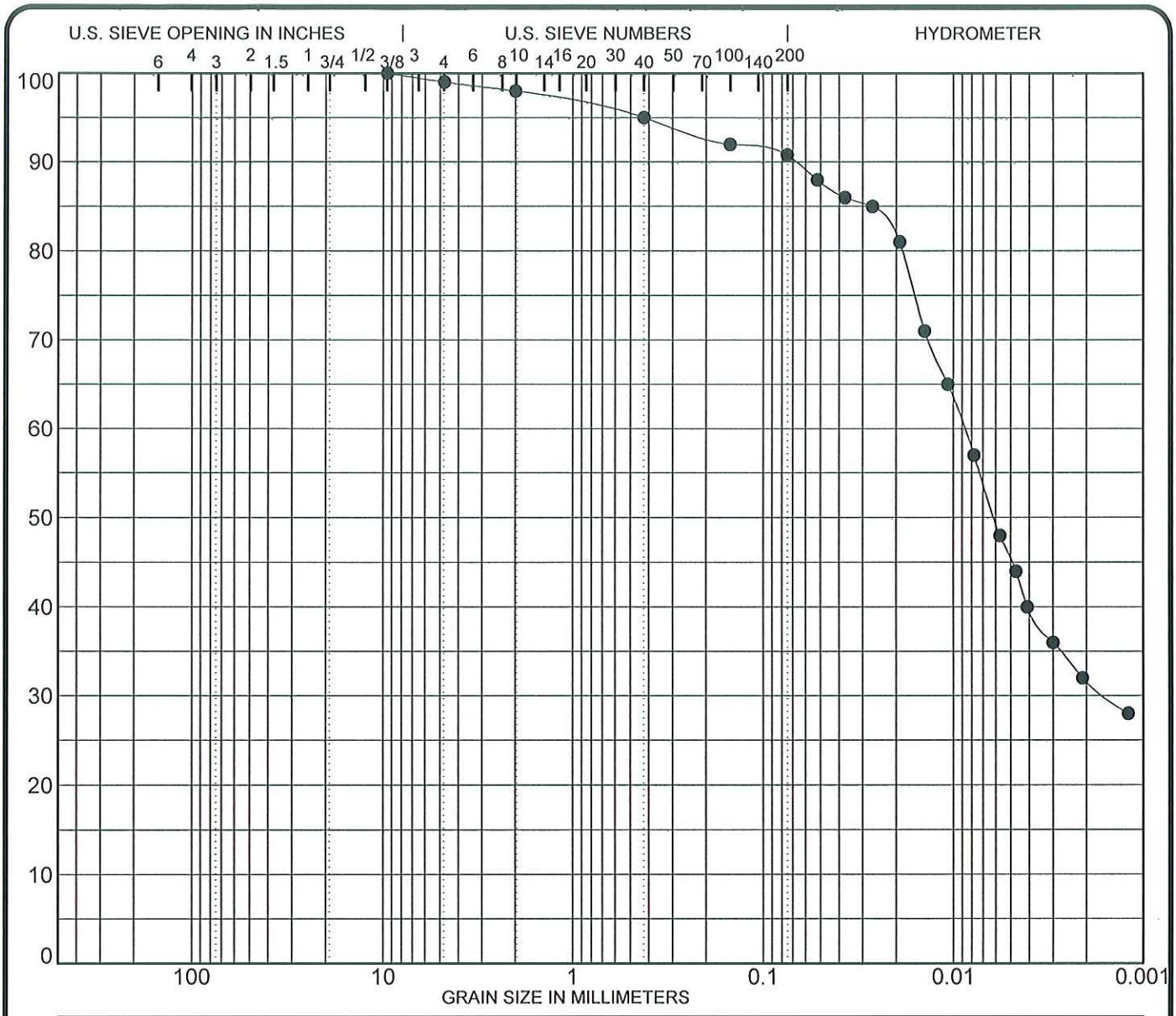
PROJECT ISFSI Zion Nuclear Power Plant
LOCATION Zion, Illinois
JOB NO. L-72,070
DATE September 8, 2008

I-21

SOIL DATA SHEET

Testing Service Corporation
Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: I-21	3 inch	100
Sample: 9	2	100
	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	100
	# 4	99
	# 10	98
	# 40	95
	# 100	92
	# 200	91

SOIL CLASSIFICATION

Gray silty CLAY, trace sand and gravel

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
1	8	59	32

PROJECT ISFSI Zion Nuclear Power Plant
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I-21

SOIL DATA SHEET

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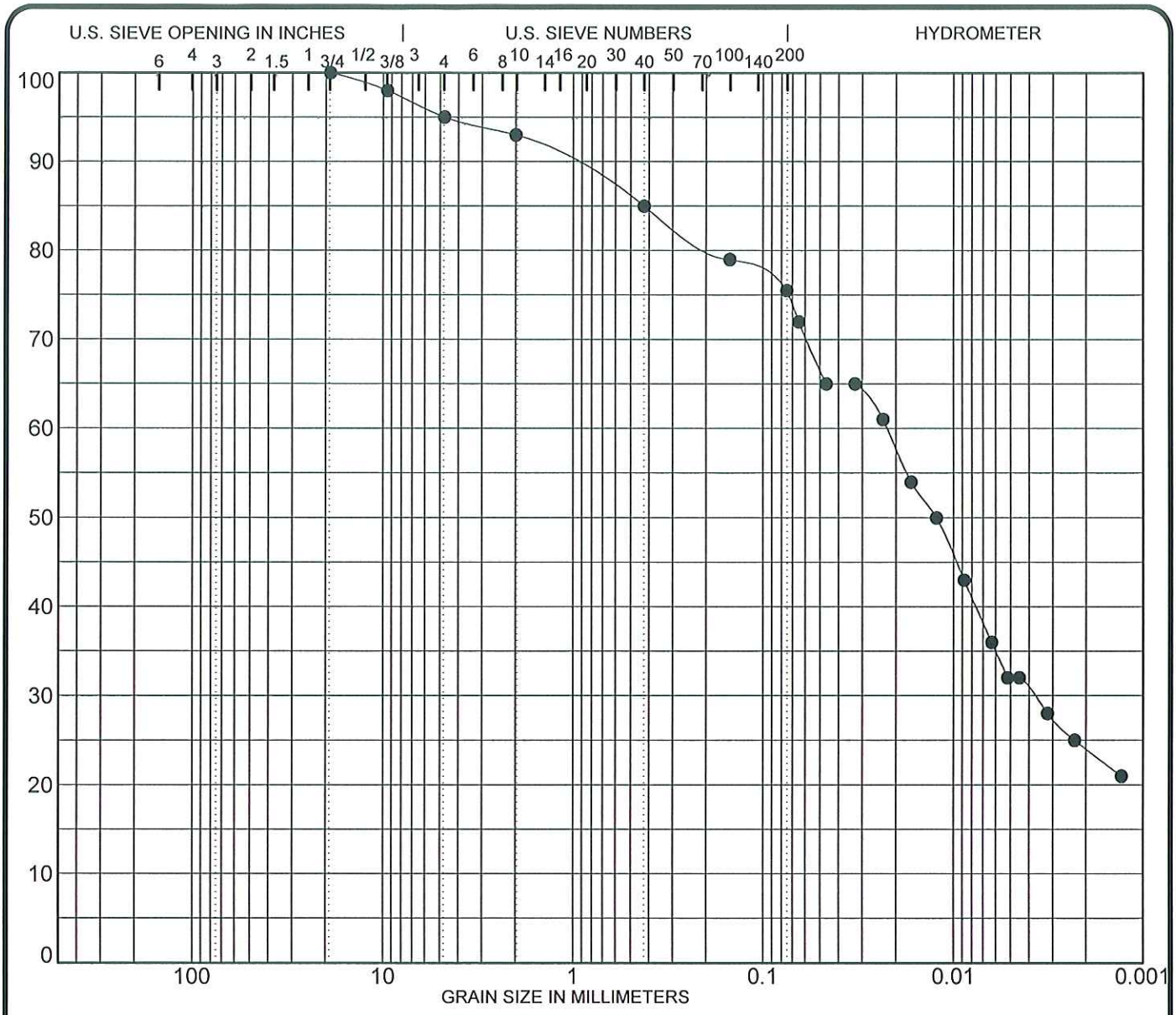
SOILGENR 72070.GPJ TSC ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS
Boring: I-21	3 inch	100
Sample: 11	2	100
	1 1/2	100
	1	100
NOTES:	3/4	100
	3/8	98
	# 4	95
	# 10	93
	# 40	85
	# 100	79
	# 200	76

SOIL CLASSIFICATION

Gray silty CLAY, little sand, trace gravel

(CL)

%GRAVEL	%SAND	%SILT	%CLAY
5	20	51	24

PROJECT ISFSI Zion Nuclear Power Plant
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I-21

SOIL DATA SHEET

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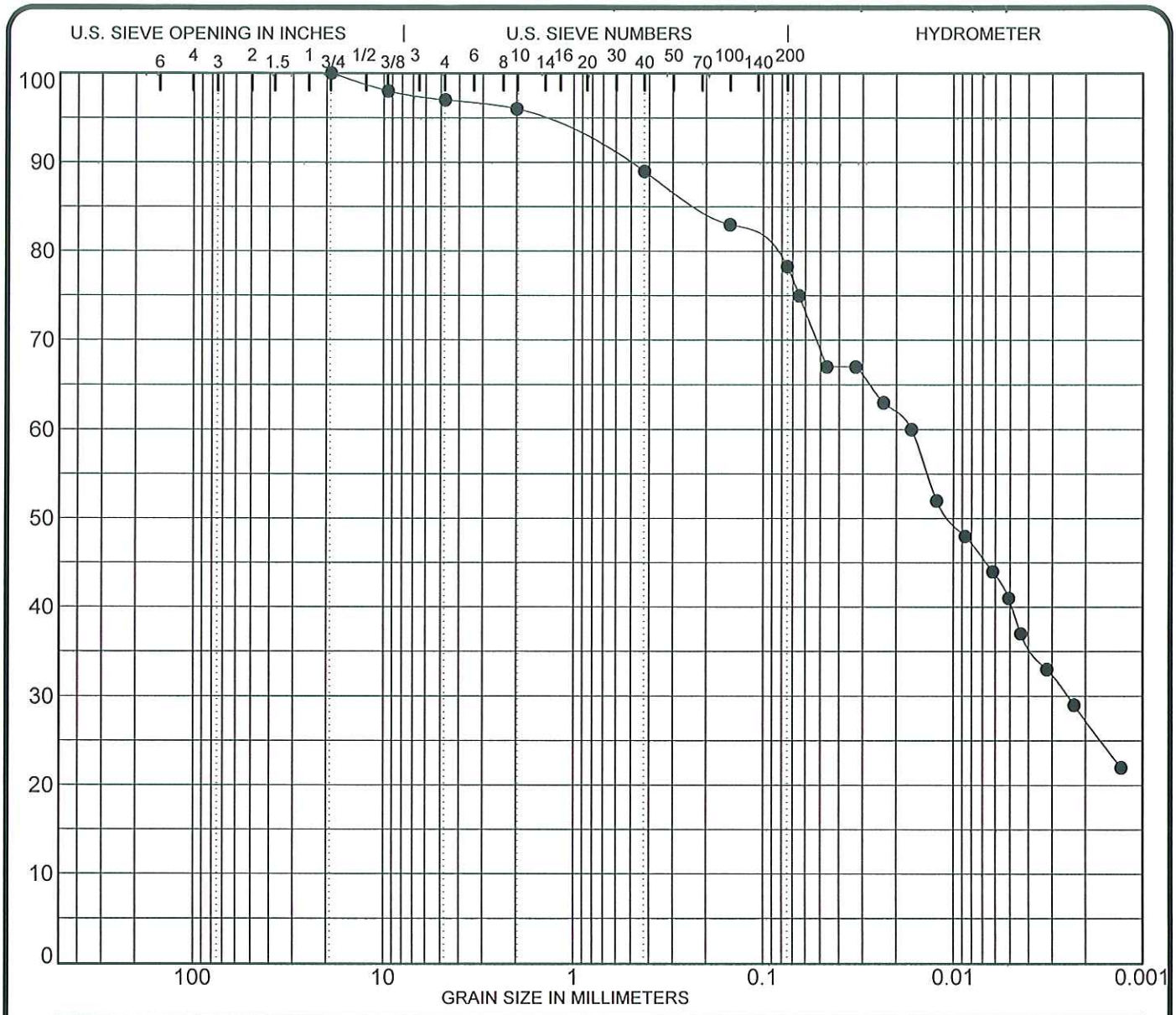
SOILGENR 72070.GPJ TSC ALL.GDT 9/8/08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

SPECIMEN IDENTIFICATION	SIEVE	% PASS	SOIL CLASSIFICATION
Boring: I-21	3 inch	100	Gray silty CLAY, little sand, trace gravel
Sample: 17	2	100	(CL)
	1 1/2	100	
	1	100	%GRAVEL / %SAND / %SILT / %CLAY
NOTES:	3/4	100	3 / 19 / 51 / 27
	3/8	98	
	# 4	97	
	# 10	96	
	# 40	89	
	# 100	83	
	# 200	78	

PROJECT ISFSI Zion Nuclear Power Plant
LOCATION Zion, Illinois
JOB NO. L-72,070
DATE September 8, 2008

I-21

SOIL DATA SHEET

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Carol Stream, IL 60188

SOILGENR 72070.GPJ TSC_ALL.GDT 9/8/08

First
Environmental
Laboratories, Inc.
IL ELAP / NELAC Accreditation # 100292
1600 Shore Road • Naperville, Illinois 60563 • Phone (630) 778-1200 • Fax (630) 778-1233

September 03, 2008

Mr. Darin Delaney
TESTING SERVICE CORP.
360 So. Main Place
Carol Stream, IL 60188

Project ID: 72070
First Environmental File ID: 8-3902
Date Received: August 27, 2008

Dear Mr. Darin Delaney:

The above referenced project was analyzed as directed on the enclosed chain of custody record.

All Quality Control criteria as outlined in the methods and current IL ELAP/NELAP have been met unless otherwise noted. QA/QC documentation and raw data will remain on file for future reference. Our accreditation number is 100292 and our current certificate is number 002045: effective 05/14/08 through 02/28/09.

I thank you for the opportunity to be of service to you and look forward to working with you again in the future. Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (630) 778-1200.

Sincerely,

Stan Zaworski
Project Manager

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Case Narrative

TESTING SERVICE CORP.

Project ID: **72070**

First Environmental File ID: **8-3902**

Date Received: **August 27, 2008**

Flag	Description	Flag	Description
<	Analyte not detected at or above the reporting limit.	L+	LCS recovery outside control limits; high bias.
B	Analyte detected in associated method blank.	L-	LCS recovery outside control limits; low bias.
C	Identification confirmed by GC/MS.	M	MS recovery outside control limits; LCS acceptable.
D	Surrogates diluted out; recovery not available.	M+	MS recovery outside control limits high bias; LCS acceptable.
E	Estimated result; concentration exceeds calibration range.	M-	MS recovery outside control limits low bias; LCS acceptable.
F	Field measurement.	N	Analyte is not part of our NELAC accreditation.
		ND	Analyte was not detected using a library search routine; No calibration standard was analyzed.
G	Surrogate recovery outside control limits; matrix effect.	P	Chemical preservation pH adjusted in lab.
H	Analysis or extraction holding time exceeded.	Q	The analyte was determined by a GC/MS database search.
J	Estimated result; concentration is less than calib range.	S	Analyte was sub-contracted to another laboratory for analysis.
K	RPD outside control limits.	T	Sample temperature upon receipt exceeded 0-6°C
RL	Routine Reporting Limit (Lowest amount that can be detected when routine weights/volumes are used without dilution.)	W	Reporting limit elevated due to sample matrix.

All quality control criteria, as outlined in the methods, have been met except as noted below or on the following analytical report.

Sample Batch Comments:

Sample acceptance criteria were met.

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Analytical Report

Client: TESTING SERVICE CORP.
Project ID: 72070
Sample ID: I-20 S-2
Sample No: 8-3902-001

Date Collected: 08/27/08
Time Collected: 10:00
Date Received: 08/27/08
Date Reported: 09/03/08

Analyte	Result	R.L.	Units	Flags
Chloride, Soluble	**Method: 4500CL,C**			
Analysis Date: 09/03/08				
Chloride, Soluble	< 50	50	mg/kg	
Sulfate, Soluble	**Method: 4500SO4,E**			
Analysis Date: 09/03/08				
Sulfate, Soluble	< 150	150	mg/kg	
pH @ 25°C, 1:10	**Method: 4500H+B**			
Analysis Date: 08/28/08 13:30				
pH @ 25°C, 1:10	9.26		Units	

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Analytical Report

Client: TESTING SERVICE CORP.
Project ID: 72070
Sample ID: I-21 S-2
Sample No: 8-3902-002

Date Collected: 08/27/08
Time Collected: 10:00
Date Received: 08/27/08
Date Reported: 09/03/08

Analyte	Result	R.L.	Units	Flags
Chloride, Soluble	**Method: 4500CL,C**			
Analysis Date: 09/03/08				
Chloride, Soluble	< 50	50	mg/kg	
Sulfate, Soluble	**Method: 4500SO4,E**			
Analysis Date: 09/03/08				
Sulfate, Soluble	< 150	150	mg/kg	
pH @ 25°C, 1:10	**Method: 4500H+B**			
Analysis Date: 08/28/08 13:30				
pH @ 25°C, 1:10	9.11		Units	

CHAIN OF CUSTODY RECORD

Page____ of ____ pgs

First Environmental Laboratories, Inc.

First Environmental Laboratories
1600 Shore Road, Suite D
Naperville, Illinois 60563
Phone: (630) 778-1200 • Fax: (630) 778-1233
E-mail: firstinfo@firstenv.com
IEPA Certification #100292

Company Name: TSC

Street Address:

City: State: Zip:

Phone: Fax: e-mail:

Send Report To: Via: Fax ☐ e-mail ☐

Sampled By: Darin Delaney

Project I.D.: 72070

P.O. #.:

Analyses

Matrix Codes: S = Soil W = Water O = Other

Date/Time Taken	Sample Description	Matrix	pH	Sol. Chlorides	Sol. Sulfates	Comments	Lab I.D.
8/27/08 @10:00	I-20 S-2	S					8-3902-001
8/27/08 @10:00	I-21 S-2	S					002

FOR LAB USE ONLY:

Cooler Temperature: 0.1-6ºC Yes__ No__ 25.6 ºC
Received within 6 hrs. of collection:_____
Ice Present: Yes__ No✓

Sample Refrigerated: Yes__ No__
Refrigerator Temperature:_____ºC
5035 Vials Frozen: Yes__ No__
Freezer Temperature:_____ºC

Containers Received Preserved: ☑ Yes ☐ No

Notes and Special Instructions:

Relinquished By: D. Delaney Date/Time 8-27-08 @2:30 Received By: [illegible] Date/Time 8/27/08 2:30

Relinquished By: Date/Time Received By: Date/Time

Rev. 4/06