Sunnyside Cogeneration Associates

P.O. Box 10, East Carbon, Utah 84520 • (435) 888-4476 • Fax (435) 888-2538

November 26, 2012

Mr. Keith Eagan
Division of Water Quality
195 North 1950 West
Salt Lake City, Utah 84116

RE: Sunnyside Cogeneration Associates (SCA)
Phase III Ash Landfill Construction & Reclamation Report
Ground Water Permit No. UGW070002

Dear Mr. Eagan:

This report addresses terraces five and six of SCA's Phase III Ash Landfill in accordance with the requirements of Ground Water Permit No. UGW070002, Part II.D.2.c.

On May 22, 2012, permeability samples of the cover material were taken from three different locations on terraces five and six of the Phase III landfill. Ash compaction tests were also performed using a nuclear density gauge at six different locations on terraces five and six of the Phase III landfill. All test results were well within permit requirements. (See attachments).

On November 16, 2012, terraces five and six of the Phase III landfill were hydro mulched and seeded with a certified seed mix. (See attachment and pictures).

If you have any questions or if further clarification is needed please contact Rusty Netz or myself at (435) 888-4476.

Thank You,

Richard Carter
Agent for
Sunnyside Cogeneration Associates

C.c. Rusty Netz
Plant File

COVER MATERIAL PERMEABILITY RESULTS AND ASH MATERIAL COMPACTION RESULTS

IGES® Intermountain GeoEnvironmental Services, Inc.
12429 South 300 East, Ste 100, Draper, UT 84020
~ T: (801) 748-4044 ~ F: (801) 748-4045

4153 Commerce Drive, Salt Lake City, UT 84107
~ T: (801) 270-9400 ~ F: (801) 270-9401

June 13, 2012

Sunnyside Cogeneration
#1 Power Plant Road
Sunnyside, UT 84539
Attn: Rusty Netz

IGES Project No. 00573-002

RE: **Ash Disposal Soils – Field and Laboratory Testing Results**
Sunnyside Cogeneration Facility
Sunnyside, Utah

Mr. Netz,

As requested, IGES performed field and laboratory testing on the ash disposal pile for the Sunnyside Cogeneration facility in Sunnyside, Utah. The suite of field and laboratory testing was performed to assess the density of the ash and the hydraulic conductivity of cover soils at the site. The general site location is shown on the *Site Vicinity Map* (Plate 1) attached to this report.

The scope of work completed for this investigation was performed in accordance with our proposal and signed authorization dated May 11, 2012. The following paragraphs present the results of the compaction and hydraulic conductivity testing.

Compaction

On May 22, 2012, soil density tests were performed on the ash using a nuclear density gauge. The test locations are shown on the *Site Map* (Plate 2) attached to this letter. The tests were performed at two different lifts on the south side of the current ash disposal pile. One bulk sample was taken of the ash and returned to the laboratory. A standard compaction test as performed in accordance with ASTM D-698 and attached to the end of this letter. Table 1 below gives the compaction testing results:

Table 1. Density Testing Results – Sunnyside Cogeneration Facility

Location	Lift	Dry Density (lb/ft^3)	Moisture Content (%)	Optimum Moisture Content (%)	Maximum Dry Density (lb/ft^3)	Relative Density (% of Maximum)
1	Lift 1	74.5	34.5	45.8	67.8	109.9
	Lift 2	75.3	36.0			111.1
2	Lift 1	76.1	33.9			112.2
	Lift 2	76.7	34.2			113.1
3	Lift 1	75.2	34.1			110.9
	Lift 2	75.6	35.0			111.5

Hydraulic Conductivity

Undisturbed soil samples were taken of the cover soil on the south side of the current ash disposal pile. Locations of the samples taken are shown on the *Site Map* (Plate 2). Back pressure permeability tests were performed on each of the three samples taken in accordance with ASTM D-5084. Table 2 below lists results of the backpressure permeability tests. According to the test results, the permeability of the cover soils ranged from 2.0E-05 to 9.8E-06 cm/s.

Table 2. Backpressure Permeability Test Results

Sample	Sample Type	Dry Density (lb/ft^3)	Moisture Content (%)	Total Backpressure (lb/in^2)	Hydraulic Conductivity (cm/sec)
1	Undisturbed	99.1	8.0	33	6.2E-05
2	Undisturbed	106.2	8.4	36	2.0E-05
3	Undisturbed	97.7	6.5	36	9.8E-06

Limitations

The recommendations contained in this letter are based on a limited field exploration and laboratory testing. It is likely that variations in the soil conditions could exist between the points explored. If any conditions are encountered at the site that is different from those described in this letter, IGES should be notified so the revisions can be made as necessary. The field and laboratory testing were performed in accordance with the accepted standards of practice at the time this letter was written. No warranty, expressed or implied, is therefore made.

We appreciate the opportunity to provide you with our services. If you have any questions, please contact the undersigned at your convenience at (801) 270-9400.

Respectfully submitted,
IGES, Inc.

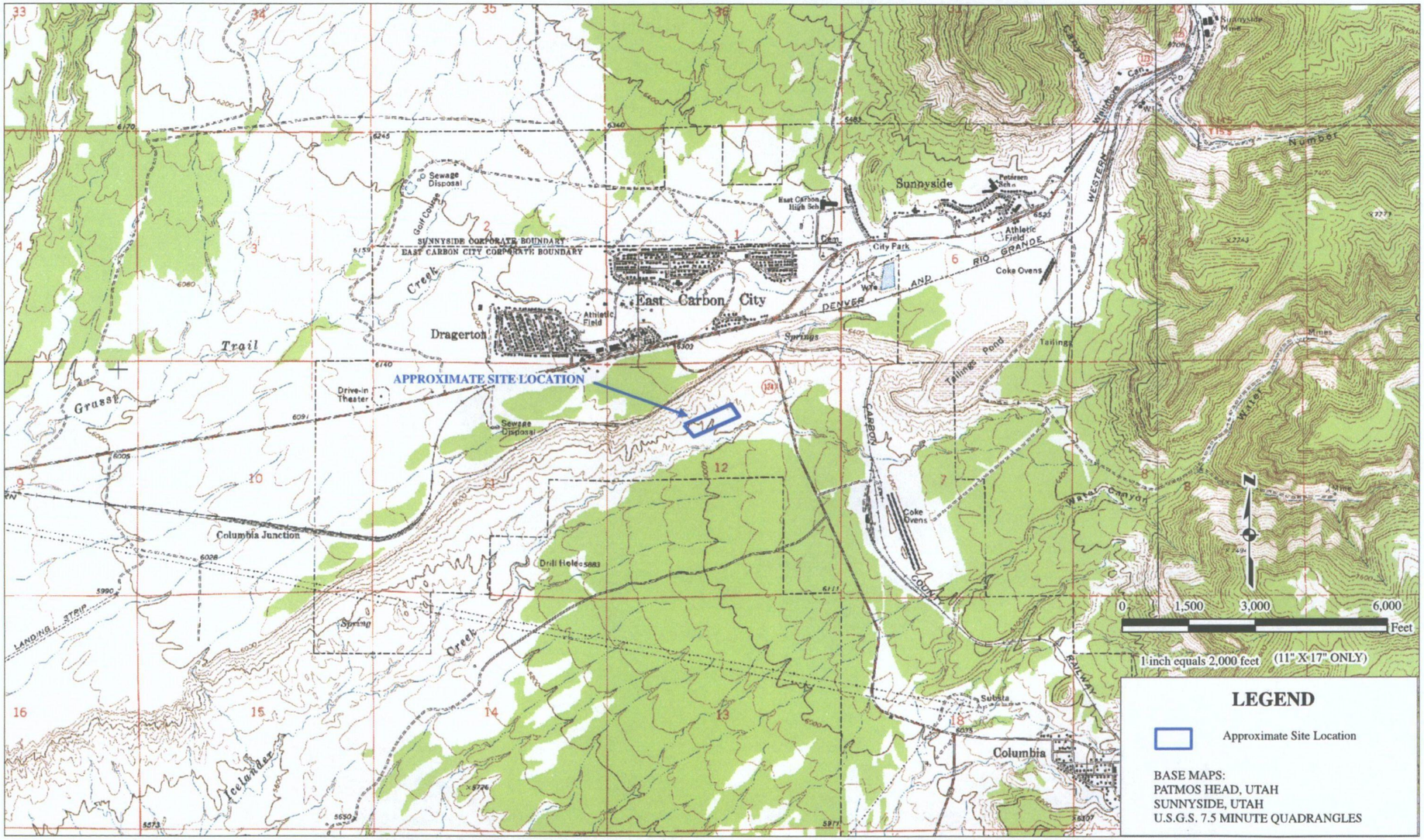
for

PROFESSIONAL ENGINEER
No. 5148339
DAVEY L. BREINHOLT
6-14-12
STATE OF UTAH

Bradley M. Johnson, P.E.
Project Engineer

Davey L. Breinholt, P.E.
Project Engineer

Attachments:
Plate 1 – Site Vicinity Map
Plate 2 – Site Map
Standard Proctor (Compaction) Results
Backpressure Permeability Results
Density Testing Results – Field Data Sheet



IGES®

Project Number - 00573-002

Field and Laboratory Testing
Ash Disposal Soils
Sunnyside Cogeneration Facility
Sunnyside, Utah

SITE VICINITY MAP

Plate
1

IGES®

Project Number - 00573-002

Field and Laboratory Testing
Ash Disposal Soils
Sunnyside Cogeneration Facility
Sunnyside, Utah

SITE MAP

Plate
2

Laboratory Compaction Characteristics of Soil

(ASTM D698 / D1557)

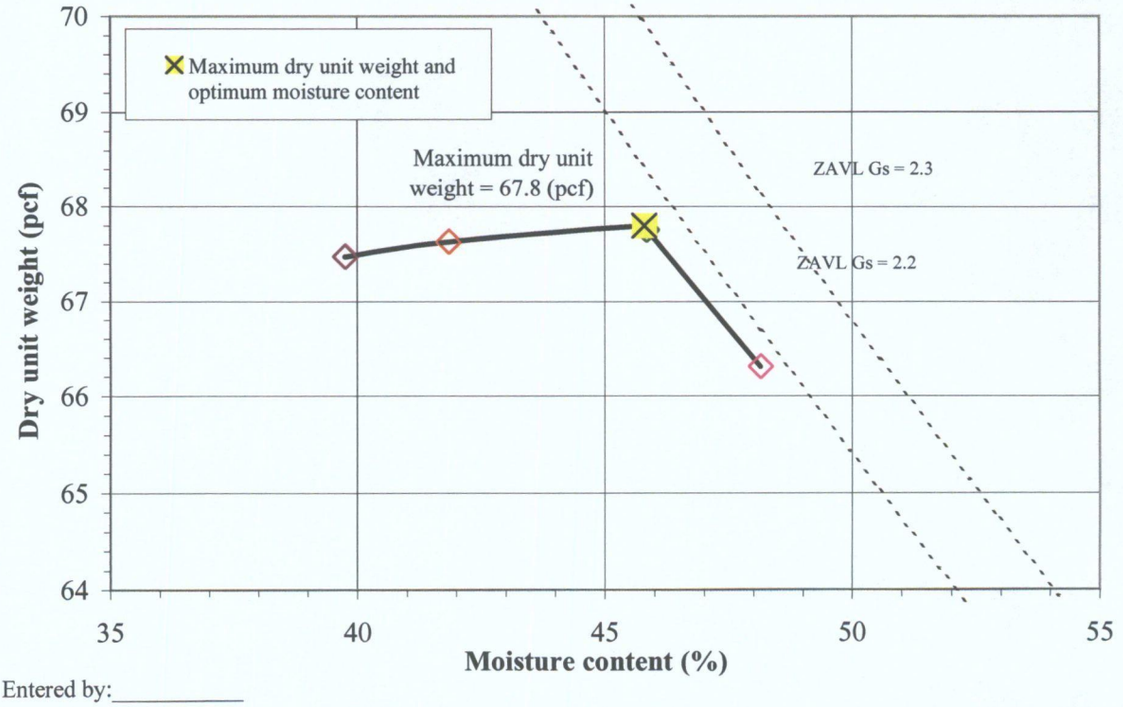
Project: Sunnyside Cogeneration
No: 00573-002
Location: Sunnyside , UT
Date: 6/8/2012
By: DKS

Boring No.:
Sample: Sample #1
Depth: 0.5'
Sample Description: Grey ash
Engineering Classification: Not requested
As-received moisture content (%): Not requested
Method: ASTM D698 B
Preparation method: Moist
Mold Id. Inc 2
Rammer: Mechanical-circular face
Mold volume (ft^3): 0.0332
Rock Correction: No * See results below

Optimum moisture content (%): 45.8
Maximum dry unit weight (pcf): 67.8

Point Number	+22%	+24%	+28%	+30%				
Wt. Sample + Mold (g)	5585.4	5609.9	5653.5	5644.7				
Wt. of Mold (g)	4164.5	4164.5	4164.5	4164.5				
Wet Unit Wt., γ_m (pcf)	94.3	95.9	98.8	98.2				
Wet Soil + Tare (g)	592.58	636.2	600.46	622.36				
Dry Soil + Tare (g)	460.26	490.1	451.74	478.99				
Tare (g)	127.42	140.91	127.33	181.18				
Moisture Content, w (%)	**39.8**	**41.8**	**45.8**	**48.1**				
Dry Unit Wt., γ_d (pcf)	**67.5**	**67.6**	**67.8**	**66.3**				

Comments:
Water was leaking out of the mold on point number +30%



Entered by:_____
Reviewed:_____

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Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

Project: Sunnyside Cogeneration
No: 00573-002
Location: Sunnyside, UT
Date: 6/12/2012
By: JDF

Boring No.:
Sample: Location 1
Depth: 0.5'
Sample Description: Brown sandy clay
Sample Type: Undisturbed

	Initial (o)	Final (f)
Sample Height, H (in)	2.916	2.913
Sample Diameter, D (in)	2.406	2.40
Sample Length, L (cm)	7.407	7.400
Sample Area, A (cm^2)	29.332	29.197
Sample Volume, V (cm^3)	217.26	216.05
Wt. Rings + Wet Soil (g)	1132.24	431.78
Wt. Rings (g)	759.56	0
Wet Unit Wt., γ_m (pcf)	107.1	124.8
Wet Soil + Tare (g)	554.4	543.86
Dry Soil + Tare (g)	528.94	457.09
Tare (g)	211.73	112.18
Weight of solids, Ws (g)	344.99	344.99
Moisture Content, w (%)	8.03	25.16
Dry Unit Wt, γ_d (pcf)	99.1	99.7
Void ratio, e, for assumed Gs	0.67	0.67
Saturation (%), for assumed Gs	31.8	100 [a]
Average K[b] (cm/sec)	**6.2E-05**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Gs	2.65	Assumed
Cell No.	1	
Station No.	1	
Permeant liquid used	Deaired Water	
Total backpressure (psi)	33	
Effective horiz. consolidation stress (psi)	3	
Effective vert. consolidation stress (psi)	3	

	Initial (o)	Final (f)
B value	0.70	0.97
External Burette (cm^3)	17.80	24.40
Cell Pressure (psi)	0.0	36.0

Backpressure bottom (psi)	33.0
Backpressure top (psi)	33.0
System volume coefficient (cm^3/psi)	0.150
System volume change (cm^3)	5.39
Net sample volume change (cm^3)	-1.21
Bottom burette ground length, l_b (cm)	82.00
Top burette ground length, l_t (cm)	82.1
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.06

Start Date and Time: 6/11/12 10:36

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratic R_f	K^b (cm/sec)
240.0	1.66 3.16	8.26 6.74	33.30	18.01	6.4E-05	22.0	0.95	6.1E-05
120.0	3.16 3.66	6.74 6.24	18.01	12.95	6.9E-05	22.0	0.95	6.5E-05
120.0	0.00 1.29	10.00 8.70	50.50	37.39	6.3E-05	22.0	0.95	6.0E-05
120.0	1.29 2.28	8.70 7.70	37.39	27.33	6.5E-05	22.0	0.95	6.2E-05
120.0	2.28 3.03	7.70 6.95	27.33	19.74	6.8E-05	22.0	0.95	6.4E-05

Entered by:_____
Reviewed:_____

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Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

Project: Sunnyside Cogeneration
No: 00573-002
Location: Sunnyside, UT
Date: 6/12/2012
By: JDF

Boring No.:
Sample: Location 2
Depth: 0.5'
Sample Description: Brown sandy clay
Sample Type: Undisturbed

	Initial (o)	Final (f)
Sample Height, H (in)	2.933	2.936
Sample Diameter, D (in)	2.402	2.41
Sample Length, L (cm)	7.450	7.458
Sample Area, A (cm^2)	29.235	29.396
Sample Volume, V (cm^3)	217.80	219.25
Wt. Rings + Wet Soil (g)	1161.15	445.54
Wt. Rings (g)	759.56	0
Wet Unit Wt., γ_m (pcf)	115.1	126.9
Wet Soil + Tare (g)	478.17	581.61
Dry Soil + Tare (g)	454.9	507.12
Tare (g)	179.2	140.31
Weight of solids, Ws (g)	370.33	370.33
Moisture Content, w (%)	8.44	20.31
Dry Unit Wt, γ_d (pcf)	106.2	105.4
Void ratio, e, for assumed Gs	0.56	0.54
Saturation (%), for assumed Gs	40.0	100 [a]
Average K[b] (cm/sec)	**2.0E-05**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Gs	2.65	Assumed
Cell No.	5	
Station No.	2	
Permeant liquid used	Deaired Water	
Total backpressure (psi)	36	
Effective horiz. consolidation stress (psi)	3	
Effective vert. consolidation stress (psi)	3	

	Initial (o)	Final (f)
B value	0.90	0.97
External Burette (cm^3)	12.30	17.10
Cell Pressure (psi)	0.0	39.0

Backpressure bottom (psi)	36.0
Backpressure top (psi)	36.0
System volume coefficient (cm^3/psi)	0.160
System volume change (cm^3)	6.25
Net sample volume change (cm^3)	1.45
Bottom burette ground length, l_b (cm)	81.99
Top burette ground length, l_t (cm)	81.97
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.06

Start Date and Time: 6/11/12 10:38

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_f	K^b (cm/sec)
120.0	0.00 0.48	10.00 9.54	50.62	45.86	2.1E-05	21.9	0.95	2.0E-05
120.0	0.48 0.90	9.54 9.11	45.86	41.56	2.1E-05	21.9	0.95	2.0E-05
120.0	0.90 1.30	9.11 8.72	41.56	37.57	2.1E-05	21.9	0.95	2.0E-05
120.0	1.30 1.65	8.72 8.37	37.57	34.02	2.1E-05	21.9	0.95	2.0E-05

Entered by:_____
Reviewed:_____

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Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)

Project: Sunnyside Cogeneration
No: 00573-002
Location: Sunnyside, UT
Date: 6/12/2012
By: JDF

Boring No.:
Sample: Location 3
Depth: 0.5'
Sample Description: Brown sandy clay
Sample Type: Undisturbed

	Initial (o)	Final (f)
Sample Height, H (in)	2.968	2.979
Sample Diameter, D (in)	2.418	2.44
Sample Length, L (cm)	7.539	7.567
Sample Area, A (cm^2)	29.626	30.175
Sample Volume, V (cm^3)	223.34	228.34
Wt. Rings + Wet Soil (g)	1131.96	441.35
Wt. Rings (g)	759.53	0
Wet Unit Wt., γ_m (pcf)	104.1	120.7
Wet Soil + Tare (g)	467.98	558.56
Dry Soil + Tare (g)	447.17	467.57
Tare (g)	127.42	120.51
Weight of solids, Ws (g)	349.67	349.67
Moisture Content, w (%)	6.51	26.22
Dry Unit Wt, γ_d (pcf)	97.7	95.6
Void ratio, e, for assumed Gs	0.69	0.69
Saturation (%), for assumed Gs	24.9	100 [a]
Average K[b] (cm/sec)	**9.8E-06**	

[a] Saturation set to 100% for phase calculations
[b] K corrected to 20°C

Gs	2.65	Assumed
Cell No.	3	
Station No.	3	
Permeant liquid used	Deaired water	
Total backpressure (psi)	36	
Effective horiz. consolidation stress (psi)	3	
Effective vert. consolidation stress (psi)	3	

	Initial (o)	Final (f)
B value	0.83	0.97
External Burette (cm^3)	17.70	18.60
Cell Pressure (psi)	0.0	39.0

Backpressure bottom (psi)	36.0
Backpressure top (psi)	36.0
System volume coefficient (cm^3/psi)	0.151
System volume change (cm^3)	5.90
Net sample volume change (cm^3)	5.00
Bottom burette ground length, l_b (cm)	82.10
Top burette ground length, l_t (cm)	81.9
Burette area, a (cm^2)	0.197
Conversion, reading to cm head (cm/rd)	5.06

Start Date and Time: 6/11/12 12:04

Elapsed time (sec)	Bottom Burette (cm^3)	Top Burette (cm^3)	h_1 (cm)	h_2 (cm)	K (cm/sec)	Temp (°C)	Visc. Ratio R_f	K^b (cm/sec)
120.0	0.18 0.40	9.57 9.32	47.71	45.34	1.1E-05	22.1	0.95	1.0E-05
120.0	0.40 0.61	9.32 9.10	45.34	43.16	1.0E-05	22.1	0.95	9.6E-06
120.0	0.61 0.81	9.10 8.90	43.16	41.14	9.9E-06	22.1	0.95	9.4E-06
120.0	0.81 1.00	8.90 8.69	41.14	39.11	1.0E-05	22.1	0.95	9.9E-06
120.0	1.00 1.19	8.69 8.49	39.11	37.14	1.1E-05	22.1	0.95	1.0E-05

Entered by:_____
Reviewed:_____

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IGES®
12429 South 300 East, Suite 100
Draper, UT 84020
Ph. 748-4044 Fax 748-4045

DENSITY OF SOILS/AGGREGATES - NUCLEAR METHOD

(ASTM D2922-01 AASHTO T310-02)

CLIENT: Sunny Side Cogeneration
PROJECT: Ash Compaction
GENERAL LOCATION: Sunnyside, UT

DATE: 5/22/12
IGES JOB #: 00573-002
OPERATOR: JWW

KEY:
WTL=WATER
SWL=SEWER LINE
SD=STORM DRAIN
CG=CURB&GUTTER
SW=SIDEWALK
RD=ROADWAY
FTG=FOOTINGS
BP=BUILDING PAD

ELEV. KEY:
BSG=BELOW SUB-GRADE
BFG=BELOW FINISH-GRADE
SG=SUB-GRADE
FG=FINISH GRADE

TEST MODE:
B=BACKSCATTER
DT=DIRECT TRANSMISSION

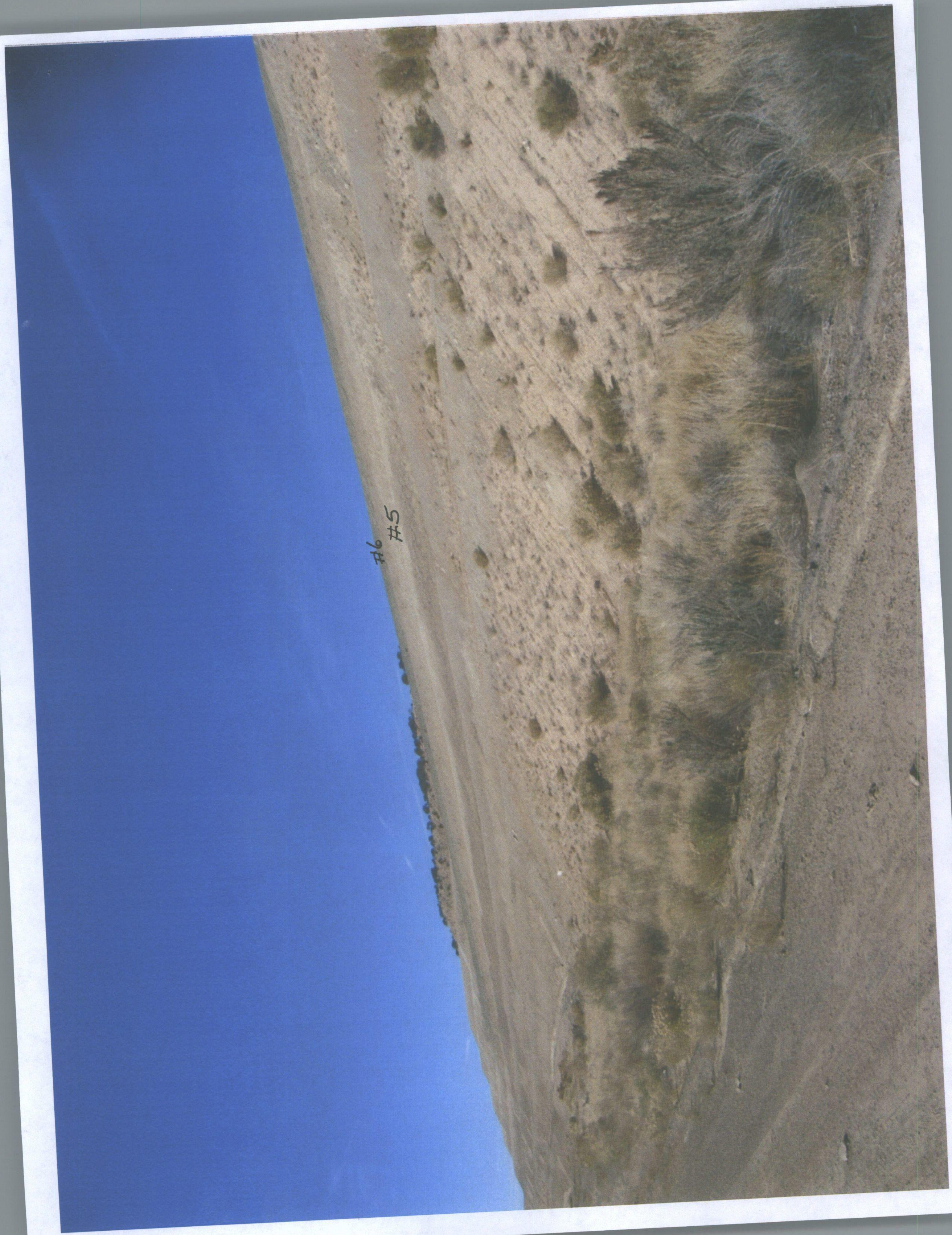
TEST #	TEST MODE	TEST DEPTH (INCHES)	PROCTOR CURVE #	WET DENSITY (PCF)	DRY DENSITY (PCF)	WATER CONTENT (%)	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	% COMP.	% REQUIRED	RETEST NEEDED	APPROXIMATE TEST LOCATION	VISUAL SOIL DESCRIPTION
L1.1	DT	10		100.2	74.5	34.5				95		West side	Ash
L1.2	↓	12		102.4	75.3	36.0				↓		↓	↓
L2.1		10		101.9	76.1	33.9						Middle	
L2.2		12		102.9	76.7	34.2						↓	
L3.1		10		100.8	75.2	34.1						East side	
L3.2	↓	12		102.1	75.6	35.0				↓		↓	↓

REMARKS:

RESULTS REPORTED TO: Rusty Netz

GUAGE:
MAKE: Troxler
MODEL No.: 3430
SERIAL No.: 60912
LAST CALIBRATION DATE:
STANDARD COUNTS:

LANDFILL PICTURES AND SEED CERTIFICATION



Sunnyside Cogeneration Ash Pile Mix

Purity	Mixture Contents	Origin	Germ/Hard
15.02%	Yellow Blossom Sweet Clover, VNS	CO	82 %
14.66%	Fourwing Saltbrush, VNS	UT	42 %
14.16%	Crested Wheatgrass, Hycrest	Canada	87 %
13.39%	Intermediate Wheatgrass, Oahe	SD	92 %
13.39%	Alfalfa, Ladak	Canada	92 %
6.41%	Annual Sunflower, VNS	UT	96 %
5.81%	Shadscale Saltbrush, VNS		53 %
3.90%	Rubber Rabbitbrush, VNS	Utah	79 %
3.85%	Palmer Penstemon, VNS	UT	80 %
3.28%	Rocky Mountain Beeplant, VNS	UT	94 %

0.08% Crop
6.03% Inert
0.02% Weed,
No Noxious Found

Oldest Test Date: 9/28/2011

Native Western Plants
2076 East 8900 South
Price, UT 84501

PO #Dave B.
Lot #25805
Net Weight 50 Lbs.

Ash Pile