Remedial Action Report – Forrest Street Properties (AOC FSP-1A, AOC FSP-1B, AOC FSP-2A, and AOC FSP-2B) Soil Garfield Avenue Group PPG, Jersey City, New Jersey

Appendix I

Compliance Averaging Evaluation



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Memorandum

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Subject	Forrest Street Properties (Block 21501, Lot 15)		
	Compliance Averaging for Nickel in Soil (Revision 0)		
From	Claire Hunt		
Date	January 15, 2019		

This memorandum provides documentation of attainment of compliance for nickel in soil with the Impact to Groundwater Soil Remediation Standard for Garfield Avenue Group Sites (IGWSRS-GAG) for a site-specific soil sample set from Forrest Street Properties (Block 21501, Lot 15) in accordance with the New Jersey Department of Environmental Protection (NJDEP) *Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria* (Attainment Guidance) (September 24, 2012, Version 1.0).

Introduction

This memorandum provides documentation of attainment of compliance for nickel with the IGWSRS-GAG (170 milligrams per kilogram [mg/kg]) for a site-specific soil sample set that includes a nickel exceedance in one sample collected at Forrest Street Properties in Block 21501, Lot 15:

Grid ID	Location ID	Sample ID	Depth Interval (ft bgs)	Sample Elevation (ft NAVD88)	Nickel (mg/kg)
X13B	FS18	FS18-2.0-2.5	2.0 - 2.5	9.6 - 9.1	366
Notes:	•	•		•	

bgs below ground surface foot or feet ft mg/kg milligrams per kilogram NAVD88 North American Vertical Datum of 1988

The IGWSRS-GAG applies to samples above the 50th percentile groundwater interface elevation for the Site, which is elevation (El.) 6.1 feet in the North American Vertical Datum of 1988 (ft NAVD88). The determination of the 50th percentile groundwater elevation is provided in Appendix A of the Remedial Action Report – Forrest Street Properties (AOC FSP-1A, AOC FSP-1B, AOC FSP-2A, and AOC FSP-2B) Soil (Forrest Street Properties RAR) (AECOM, January 2019).

Figure 1 shows borings with remaining nickel data, the site boundary, groundwater flow direction and the location of the sample exceeding the nickel IGWSRS-GAG. The remaining-in-place nickel sample results are provided in Table 5-3 of the Forrest Street Properties RAR (AECOM, January 2019).

Delineation

The sample FS18-2.0-2.5 is delineated by the following samples shown on Figure 1. Where multiple or duplicate samples were collected at a single location, both results are shown below.

Grid ID	Location ID	Depth Interval (ft bgs)	Sample Elevation (ft NAVD88)	Lab SDG	Sample Status	Date Collected	Nickel Result (mg/kg)	Direction
BB16B	FS22	0.0 - 0.5	10.3 - 9.8	JB96034A	remaining	6/2/2015	9.6 7.0 (dup)	East
W10B	B1001	2.8 - 3.3	9.1 - 8.6	R2318036	removed	8/15/2003	52.4	West
W13B	FSP-V13B-SW-E1	6.9 - 7.4	8.4 - 7.9	JC45343A	removed	6/16/2017	17.0	North
Y12B	P4-FOR-Y12B	0.5 - 1.0	9.9 - 9.4	JC22855A	remaining	6/23/2016	92.1	South
Y12B	P4-FOR-Y12BR	0.5 - 1.0	9.9 - 9.4	JC23104A	remaining	6/28/2016	53.2	South
X13B	FS18	4.0 - 4.5	7.6 - 7.1	JB62136A	remaining	3/17/2014	17.1 16.7 (dup)	Vertical
Notes: bgs	below ground	d surface						

uup	
ft	foot or feet
mg/kg	milligrams per kilogram
NAVD88	North American Vertical Datum of 1988
remaining	sample status that indicates the soil in that interval is outside the excavation footprint and remains in-place at that location
removed	sample status that indicates the sample was removed during excavation
SDG	sample delivery group

\\uspsw2pfpsw001\Data\Data_USPSW2VFP001\Environment\Piscataway\Project\PPG-NJCProgram\7-Deliverables\7.1B-GAGroup\RARs\Forrest Street Properties\FOR-008B FSP Full RAR\2019-01-15 REV 0\Appendix I - CAM\2019-01-15 FSP Comp Ni.docx Laboratory reports and data validation reports for samples at locations FS22 and FSP-V13B-SW-E1 are included in in **Attachment 1** of this memorandum. The boring log for location FS22 is included in **Attachment 2** of this memorandum. Location FSP-V13B-SW-E1 was a post-excavation grab sample and, therefore, does not have a boring log. Laboratory reports, data validation reports, and boring logs for samples at locations P4-FOR-Y12B and P4-FOR-Y12BR are included with the *Forrest Street RAR Tables and Figures* submittal (AECOM, September 2018). Laboratory reports, data validation reports, and boring logs for samples at location graps for samples at location graps for samples at location P4-FOR-Y12B and P4-FOR-Y12BR are included with the *Forrest Street RAR Tables and Figures* submittal (AECOM, September 2018). Laboratory reports, data validation reports, and boring logs for samples at location FS18 are included in Appendix D, Appendix E, and Appendix H, respectively, of the Forrest Street Properties RAR (AECOM, January 2019). For location B1001, the laboratory report for SDG R2318036 could not be located, as explained in the *Remedial Action Report, Site 114 (AOC 114-1A, AOC 114-2, AOC 114-3, AOC 114-4A, AOC 114-4B, and AOC 114-5) Soil* (Site 114 RAR) (AECOM, December 2018). The boring log for samples at location B1001 is included in Appendix K-7 in the Site 114 RAR (AECOM, December 2018).

Delineation to the east is demonstrated by a sample at location FS22 that was collected in the 98/100 Forrest Street building footprint. Delineation to the north is demonstrated by the sample at location FSP-V13B-SW-E1 that was removed during the remedial excavation in Forrest Street Properties (Block 21501, Lot 15). Delineation to the south is demonstrated by samples at locations P4-FOR-Y12B and P4-FOR-Y12BR collected in Forrest Street. Delineation to the west is demonstrated by a removed sample at location B1001 in Site 114, Phase 2B-2.

Functional Area

The extent of the functional area was developed in accordance with the Attainment Guidance. The horizontal extent of the functional area for the impact-to-groundwater pathway is limited to 100 feet in the direction of groundwater flow. Perpendicular to groundwater flow, the functional area is limited to the delineated extent of contamination. The functional area is oriented to be between the two delineation points (sample locations B1001 and FS22) that bound the functional area perpendicular to the groundwater flow direction. The horizontal extent of the functional area within the site boundary is shown in **Figure 1**. It should be noted that the functional area could be oriented in different ways due to the nature of the shallow groundwater flow regime in this area (as presented in Figure 3-3 of the *Draft Groundwater Remedial Investigation Report* [AECOM, October 2018]). The shallow groundwater elevation contours wrap around the western side of exceedance location FS18. However, there are no data to the west of the Forrest Street Properties; therefore, the functional area orientation presented on **Figure 1** was determined as the most logical given the existing understanding of groundwater flow conditions. The interpreted groundwater flow direction based on the 2018 synoptic well gauging event was used to orient the functional area and is shown on **Figure 1**.

To establish the vertical extent of the functional area for the impact to groundwater pathway, samples are grouped into two categories (as per the Attainment Guidance): (1) samples from the groundwater interface to two ft above the groundwater interface (El. 6.1 to 8.1 ft NAVD88), or (2) samples from two ft above the groundwater interface to the ground surface (El. 8.1 ft NAVD88 to the ground surface). The sample exceeding the IGWSRS-GAG (FS18-2.0-2.5) is located within the elevation range of El. 8.1 ft NAVD88 to the ground surface, so the vertical extent of the functional area is the elevation range of El. 8.1 ft NAVD88 to the ground surface. The selected samples used

in the compliance averaging calculation are all located within the same vertical extent (El. 8.1 ft NAVD88 to the ground surface) as per the Attainment Guidance.

Compliance Averaging

For sample FS18-2.0-2.5, compliance with the nickel IGWSRS-GAG is demonstrated through spatial averaging. Thiessen polygons were created within the functional area as shown in **Figure 1**.

The sample selection process is as follows:

- The samples for nickel with a sample status of remaining that fall within the functional area horizontally and vertically are identified.
- The maximum concentration is selected at each sample location for use in the weighted average. Either the maximum of the concentration for detections or the method detection limit/reporting limit (MDL/RL) for non-detects is selected.

The data listed below were selected:

Grid ID	Location ID	Sample Depth (ft bgs)	Sample Elevation (ft NAVD88)	Date Collected	Lab SDG	Maximum Nickel Result (mg/kg)	Area (sf)	Area x Maximum Nickel Result (sf x mg/kg)
AA13B	EF-73A	0.0 - 0.5	9.5 - 9	6/1/2015	JB95926A	16.0	1,579	25,264
BB14B	FS21	0.0 - 0.5	10.4 - 9.9	6/4/2015	JB96227A	12.5	2,519	31,488
BB16B	FS22	0.0 - 0.5	10.3 - 9.8	6/2/2015	JB96034A	9.6	3,368	32,333
U15B	FSP-U14B-SW-N5	8.0 - 8.5	11.8 - 11.3	5/19/2017	JC43710A	10.3	15	155
V15B	FSP-V14B-SW-N4	9.0 - 9.5	8.6 - 8.1	5/22/2017	JC43852A	9.3	1,009	9,384
X13B	FS18	2.0 - 2.5	9.6 - 9.1	3/17/2014	JB62136A	366	7,087	2,593,842
X16B	EF-04	2.5 - 3.0	18.7 - 18.2	4/11/2011	460251901	7.4 J	2,800	20,720
X16B	EF-04B	2.5 - 3.0	19.1 - 18.6	4/14/2011	460253501	29.8 J	879	26,194
Y12B	P4-FOR-Y12B	0.5 - 1.0	9.9 - 9.4	6/23/2016	JC22855A	92.1	2,241	206,396
Y12B	P4-FOR-Y12BR	0.5 - 1.0	9.9 - 9.4	6/28/2016	JC23104A	53.2	193	10,268
						Sum	21,690	2,956,044

Notes:

bgs	below ground surface
ft	foot or feet
J	The result was an estimated value; the associated numerical value was an approximate concentration of
	the analyte in the sample.
mg/kg	milligram per kilogram
NAVD88	North American Vertical Datum of 1988
SDG	sample delivery group
sf	square feet

Spatially Weighted Average Concentration = 2,956,044 sf x mg/kg / 21,690 sf = 136 mg/kg

\\uspsw2pfpsw001\Data\Data_USPSW2VFP001\Environment\Piscataway\Project\PPG-NJCProgram\7-Deliverables\7.1B-GAGroup\RARs\Forrest Street Properties\FOR-008B FSP Full RAR\2019-01-15 REV 0\Appendix I - CAM\2019-01-15 FSP Comp Ni.docx

Laboratory reports and data validation reports for samples at locations FSP-U14B-SW-N5, FSP-V14B-SW-N4, and FS18 are included in Appendix D and Appendix E, respectively, of the Forrest Street Properties RAR (AECOM, January 2019). The boring log for location FS18 is included in Appendix H of the Forrest Street Properties RAR. Samples collected at locations FSP-U14B-SW-N5 and FSP-V14B-SW-N4 were post-excavation grab samples and, therefore, do not have boring logs. The laboratory reports, data validation reports, and boring logs for the samples at locations P4-FOR-Y12B and P4-FOR-Y12BR were included with the Forrest Street RAR Tables and Figures submittal (AECOM, September 2018). The laboratory reports, data validation reports, and boring logs for the samples at locations EF-73A, FS21, FS22, EF-04, and EF-04B are included in Attachment 1 and Attachment 2 of this memorandum.

Conclusion

Based on the impact-to-groundwater scenario, the spatially weighted average nickel concentration within the study area at sample FS18-2.0-2.5 is 136 mg/kg, which is compliant with the 170 mg/kg IGWSRS-GAG.

Attachments:

Figure 1 Sample Map for Nickel in the Unsaturated Soil Zone Compared to IGWSRS-GAG and Functional Area Supplemental Lab and Data Validation Reports Attachment 1

Attachment 2 Supplemental Boring Logs Forrest Street Properties (Block 21501, Lot 15) Compliance Averaging for Nickel in Soil (Revision 0) PPG, Jersey City, New Jersey

FIGURE 1

Sample Map for Nickel in the Unsaturated Soil Zone Compared to IGWSRS-GAG and Functional Area



LEGEND

SAMPLING LOCATION (REMAINING SAMPLES) DEMAINING CAMPLES PEMAINING CAMPLES SURVEY POINT REPRESENTING •-3.8AS-BUILT TERMINAL EXCAVATION APPROXIMATE LO	O.5 SITE BOUNDARY OCATION GRID LAYOUT WITH AS-BUILT TERMINAL EXCAVATION ELEVATIONS (ET NAVD88)
◆-3.8AS-BUILT TERMINAL EXCAVATION APPROXIMATE LO	OCATION GRID LAYOUT WITH AS-BUILT TERMINAL EXCAVATION ELEVATIONS (ET NAVD88)
 NOT ANALYZED FOR ELEVATION (FT NAVD88) OF GRID SPLIT 	
CCPW METALS IN PLACE SHEET PILE FORREST STREET (AS OF JANUARY 2019) FUTURE RESIDEN	ITIAL USE AREAS BUILDING
RESULT IS BELOW THE MOST TO BE ADDRESSE STRINGENT STANDARD TO BE ADDRESSE CONTROLS AND II	D VIA ENGINEERING NSTITUTIONAL THIESSEN POLYGONS
RESULTS EXCEED THE MOST PRE-REMEDIATION ELEVATION CONTROLS TO BE STRINGENT STANDARD. CONTOUR IN A SEPARATE SU	E DISCUSSED FUNCTIONAL AREA
BUT ARE IN COMPLIANCE (1-FOOT INTERVAL IN FT NAVD88) 100 FORREST STF	
CONCEPTUAL POST-EXCAVATION CONTROLS AND II	NSTITUTIONAL CONTROLS
(1-FOOT INTERVAL IN FT NAVD88)	LOW DIRECTION

Soil Screening Level & Soil Remediation Standards (mg/kg)AnalyteIGWSRS-GAGNICKEL170

ABBREVIATIONS:

bgs - below ground surface

CCPW - Chromate Chemical Production Waste

ft - feet

IGWSRS-GAG - Impact to Groundwater Soil Remediation Standard - Garfield Avenue Group (alternative remediation standard as proposed in the *Supplemental Soil Remedial Investigation Report, Final (Revision 1)*, dated 08/30/2018 and approved by NJDEP on 10/22/2018)

mg/kg - milligrams per kilogram

NAVD88 - North American Vertical Datum of 1988

Ni - nickel

- NJDEP New Jersey Department of Environmental Protection
- U.S. United States

GENERAL NOTES:

- G1. The nickel data associated with the sample locations shown on this figure are provided in the Technical Memorandum *Forrest Street Properties (Block 21501, Lot 15), Compliance Averaging for Nickel in Soil,* AECOM, January 2019.
- G2. "Elevation" refers to the sample elevation based on the pre-remediation surface elevation for samples collected from the pit bottom, and the surface elevation of the sample location when the sample was collected via boring or test pit.
- G3. Elevation vertical datum is NAVD88, in U.S. survey ft.
- G4. Results are reported in mg/kg.
- G5. Source of block/lot information is Jersey City Parcel Data from New Jersey Geographic Information Network (NJGIN), last updated 10/6/2015 (available at: http://data.jerseycitynj.gov/dataset/jersey-city-parcel-polygon).
- G6. This figure presents data for locations within the Site boundary and functional area that have samples remaining in place. In addition, locations from outside the Site boundary and/or removed samples may be shown to demonstrate compliance with the remediation objectives.

SPECIFIC NOTES:

- S1. Property lines and pre-construction topographical contours are sourced from the "Boundary and Topographic Survey, PPG Industries Site 114, Lots 11, 12, 14 and 15, Block 21501, City of Jersey City, Hudson County, New Jersey" prepared by Borbas Surveying and Mapping, LLC, dated January 8, 2019.
- S2. Post-excavation elevation survey points were taken from the "Post Excavation Elevations Plan for ENTACT, LLC; PPG Site 133 & 135 Skyways," produced by Maser Consulting P.A., dated 06/30/17.
- S3. Conceptual post-excavation elevation contours in Forrest Street Properties and Forrest Street were generated using professional judgment based on post-excavation elevation survey points and knowledge of excavation practices utilized during remedial excavation (i.e., excavation conducted on a 30 ft by 30 ft basis).
- S4. The as-built terminal excavation elevations in Grids V11B, W10B, and W11B are sourced from "Post Excavation Grade Plan for ENTACT, LLC, PPG SITE 114" prepared by Maser Consulting, dated August 10, 2018.
- S5. In Grid Y12B, two sample locations are located adjacent to one another; therefore, the sampling location symbols overlap on the figure.

MAP LOCATION



AECOM	0	20	40	FORRES (BL GARF JERSI	PPG ST STREET PROPER OCK 21501, LOT 15) TIELD AVENUE GRO EY CITY, NEW JERS	RTIES) UP EY	SAMPLE MAP FOR NI IN THE UNSATURATED SO COMPARED TO IGWSF AND FUNCTIONAL A	CKEL OIL ZONE RS-GAG REA
			Feet	Date: 1/23/2019				FIGURE 1

Forrest Street Properties (Block 21501, Lot 15) Compliance Averaging for Nickel in Soil (Revision 0) PPG, Jersey City, New Jersey

ATTACHMENT 1

Supplemental Lab and Data Validation Reports

(provided separately on DVD)

Forrest Street Properties (Block 21501, Lot 15) Compliance Averaging for Nickel in Soil (Revision 0) PPG, Jersey City, New Jersey

ATTACHMENT 2

Supplemental Boring Logs



Boring ID: FF-04

A LOGS/G	ECO	Μ						Boring I	D: EF-04
30 Knig	htsbridge Roa 732.564.3200	d, Pisca office te	taway, NJ 088 elephone	354					Page: 1
	lame: PP	G Soil	I RIWP		Drilling C	Company:	SGS		Tugo.
	lumber: 6	<u>6015-4</u>	801		Drilling N	Airknife	irknife/Geoprobe	Coordinates (NJSPNAD83) x: 611733.927	
Date Sta	shed Drilli	<u>g: 4/</u> ing: 4	<u>13/2011</u> 4/13/2011		Core Size	e: 2 in	Geoprope	Boring Total Depth: 10 ft	
Logged I	By: M. Me	erdinge	ər		Project N	lanager:	Robert Cataldo	Depth to Water: N/A ft	
Physical	Location:	Nea	r PSEG-SI	B38				(Note bgs = below ground s	urface)
Depth Range	Recovery (ft/ft)	PID (ppm)	Moisture Content	GA Class	USCS	Graphic Log	Su	rface Cover and Thickness:	Sample Number
	. ,	,				Ű		_	
∰		0	moist	2	Fill Fill		Black Asphalt Brown (7.5YR 3/4) r	nedium-fine SILTY SAND. little Gravel. trace	
	-		moiot	2	 ;;;		Coal Ash (5%), mois	st. No odor.	-
	-	0	moist	3	Fill		Reddish Brown (7.5	YR 4/3) SILTY SAND, some coarse angular	
	-						Gravel, trace fine-m	edium Gravel and Coal Ash, moist. No	
88_4	-								
¥_5	1		moist	10	SP-SM		Reddish Brown (5V		
	-	0	drv	13	BEDROCK		fine Sand and Silt, d	lense, moist. No odor.	-
7	-		,				Black with White flee	cks DIABASE fragments, dry, very dense.	
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9 11 -	-						Refusal at 10 ft on D	Diabase. Bent core barrel.	
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Boring ID: EF-04B

GINTL			
LOGS/(AECOM		Boring ID: EF-04B
BORING	30 Knightsbridge Road, Piscataway, NJ 08854 732.564.3200 office telephone		Page: 1
3K/E	Project Name: PPG Soil RIWP	Drilling Company: SGS	
NOF	Project Number: 6015-4801	Drilling Method: Airknife/Geoprobe	Coordinates (NJSPNAD83) x: 611741.715
á	Date Started Drilling: 4/14/2011	Rig Type: Airknife/Geoprobe	Coordinates (NJSPNAD83) y: 683781.465
Ε	Date Finished Drilling: 4/14/2011	Core Size: 2 in	Boring Total Depth: 15 ft
NO	Logged By: M. Merdinger	Project Manager: Robert Cataldo	Depth to Water: 5 ft
ATIC	Physical Location: 2nd off-set of EF-04, 1	6 ft N of original location	
é			(Note bgs = below ground surface)

Depth Range (ft bgs)	Recovery (ft/ft)	PID (ppm)	Moisture Content	GA Class	USCS	Graphic Log	Surface Cover and Thickness:	Sample Number
2 4 1		0	moist	2	Fill		Black Asphalt	EF-B04B_0.15
2 -				5			Coal Ash (5%), moist. No odor.	FF-B04B 2 0
	-	0	moist	3	Fill		Reddish Brown (7.5YR 4/3) SILTY SAND, some coarse angular	EF-B04B_2.5
							Gravel, trace fine-medium Gravel and Coal Ash, moist. No odor.	
	-							<u>EF-DU4D_4.U</u>
5		0	wet	10	SP-SM		Reddish Brown (5YR 4/3) fine to medium SAND and fine to	
<u> 6 </u>					SP-SM		coarse angular GRAVEL, some to little Silt, wet, dense. No	
7	0.5						No Recovery	
8								
9	1							
10	-			10	00		Mark Dad and Diask weathand DEDDOOK, Diask/M/bite	
5_11	-	0	wet	13	58		Diabase and Weak Red Mudstone fragments, wet, dense. No	
12							odor.	
5	0.5							
<u>-</u> 14 −								
- 16 -	-						Refusal at 15 ft on Bedrock.	
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Commen	ts: No CO	OPR/G	GM identi	fied at	this location	า.		



Boring ID: EF-73A

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Project I	Name: -	PG So				Drilling Company: SGS North America	O a surlive state (NLIOD	LA DOO)
Project I	Number:	6015-	4801	1.00.00 ANA		Drilling Method: Geoprobe	Coordinates (NJSPI	AD83) X: 611/68
Date Sta	arted Drill	ing: (0/1/2015 1	1:20:00 AM		Rig Type:	Coordinates (NJSPN	AD83) y: 683636.5
Date Fin		illing:	6/2/2015	10:40:00 AM		Core Size: 3 In Project Manageri - Robert Cataldo	Boring Total Depth:	_40 π
Dhysical	Dy. ⊏vv	a :				Froject Manager. Robert Cataluo	Surface Elevation:	
Fliysical		l					Surface Elevation.	9.5 IT NAVD86
Depth Range (ft bgs)	Recovery (ft/ft)	PID (ppm)	Moisture Content	USCS	Graphic Log	Surface Cover and Thickn	ess:	Sample ID
		0.0	dry	FILL		medium SAND,trace slag,(7.5YR 3/2) dau odor,no staining.	rk brown,dry,no	EF-73A-0.0-0.5
		0.0	dry moist	FILL FILI		medium SAND,trace coarse gravel trace reddish brown,dry,no odor,no staining.	coal,(5YR 3/2) dark	
	4.5	0.0	slightly	FILL		fine to medium SAND,(7.5YR 3/2) dark b	rown,moist,no	EF-73A-2.0-2.5
3 4		0.0	dry	FILL		\medium SAND,with ash and cinders,(10\ yellowish brown,slightly moist,no odor,no fine SAND,trace silt,(7.5YR 3/1) very darl odor no staining	/R 3/4) dark staining. < gray,dry,no	EE 730 4 0 4 5
\vdash \dashv								EF-73A-4.0-4.5
		0.0	dry	FILL		fine SAND,trace silt,(7.5YR 3/1)very dark	gray,dry,no	
6 7	4.5	0.0	moist	FILL		fine SAND,some silt,(7.5YR 6/1) gray,mo staining.	ist,no odor,no	EF-73A-6.0-6.5
	4.5							EF-73A-8.0-8.5
9		0.0	moist	SM		UNDno medium SAND, some silt,(5YR 4. brown,moist,no odor,no staining.Soils cor UNDno.	/3) reddish nsistent with	
10 11 12		0.0	moist	SM		UNDno medium SAND,some silt, (5YR 4. brown,moist,no odor,no staining. Soils co UNDno.	/3) reddish nsistent with	EF-73A-10.0-10.5
	4.5	0.0	moist	SM		UNDno fine to coarse SAND,with mediun dark reddish brown,moist,no odor,no stair consistent with UNDno.	n gravel,(5YR 3/2) ning. Soils	EF-73A-12.0-12.5
⊢ ⊣	-							
15-	4	0.0	moiot			NU RECOVERY.	a group (EVD 2/2)	-
		0.0	moist	SM		dark reddish brown,moist,no odor,no stair consistent with UNDno.	ning.Soils	EF-73A-16.0-16.5
 17 								
								EF-73A-18.0-18.5
				NR		NO RECOVERY.		
21 21		0.0	moist	SM		UNDno fine to coarse SAND,with mediun dark reddish brown,moist,no odor,no stair consistent with UNDno.	n gravel,(5YR 3/2) ning. Soils	EF-73A-20.0-20.5
22 23 	5							EF-73A-22.0-22.5
 25 		0.0	moist	SM		UNDno fine to coarse SAND, with mediun dark reddish brown.moist.no.odor.no.stair	n gravel,(5YR 3/2) ning. Soils	
Notes: bgs - belo	w surface	grade	COPR - chr	omite ore proc	essing re	sidue UNDno - non-organic undisturbed native de	eposits MGP - manu	Ifactured gas plant
IVIIVI - Mea Comments:	adow mat		GGINI - gree	n grey mud		Unuborg - organic undisturbed native depos	sits CCPW - Chr	omate chemical production waste



Boring ID: EF-73A

Page: 2

Projec	t Name: F	P <u>FG S</u> o	il RIWP			Drilling Company: SGS North America				
Projec	t Number:	6015-	4801			Drilling Method: Geoprobe	Coordinates (NJSP	ISPNAD83) x: 611768		
Date S	tarted Dril	ling: (6/1/2015 1	1:20:00 AM		Rig Type:	NAD83) y: 683636.5			
Date F	inished Dr	illing:	6/2/2015	10:40:00 AM		Core Size: 3 in	Boring Total Depth:	40 ft		
Logge	d By: EW					Project Manager: Robert Cataldo	Depth to Water: N	Α		
Physic	al Locatio	n:	1		1		Surface Elevation:	9.5 ft NAVD88		
Depth Range (ft bgs)	Recovery (ft/ft)	PID (ppm)	Moisture Content	USCS	Graphi Log	Surface Cover and Thick	kness:	Sample ID		
						consistent with UNDno.		EF-73A-26.0-26.5		
Range (ft bgs) 27		0.0 0.0	moist	SM		Surface Cover and Thick consistent with UNDno. UNDno fine to coarse SAND, (5YR 3/2) brown, moist, no odor, no staining. Soils of UNDno. UNDno fine to coarse SAND, (5YR 3/2) brown, moist, no odor, no staining. Soils of UNDno.	dark reddish consistent with	EF-73A-26.0-26.5 EF-73A-28.0-28.5 EF-73A-28.0-28.5 EF-73A-30.0-30.5 EF-73A-30.0-30.5 EF-73A-32.0-32.5 EF-73A-34.0-34.5 EF-73A-36.0-36.5 EF-73A-38.0-38.5 EF-73A-39.5-40.0		
9 RA PPG_LOGS_A.GDT - 1:										
ONotes:bgs - bebgs - beMM - mOComments	elow surface eadow mat	grade	COPR - chr GGM - gree	romite ore proc en grey mud	essing r	esidue UNDno - non-organic undisturbed native UNDorg - organic undisturbed native dep	deposits MGP - man osits CCPW - ch	ufactured gas plant romate chemical production waste		

Desite Defiling Methods: Goodnames MUSPNADE3.19: End 1114.4 Started Difficies: 64/2015 20.00 PM Project Manager: South Mines Boring Total Depth: 40.1 South Mines Boring Total Depth: 40.1 South Mines Boring Total Depth: 40.1	niect	732.564.32	00 office t	field Ave			Drilli	ng Company: SGS North America		
te Started Diffing: 64/2015 9:30:00 AM. Rig Type: 6 Finished Diffing: 64/2015 4:00:00 PM. Core Size: 3 in Port of Calaberth: 40 ft gade U.c. EW. BV Project Manager: Sost Mikaelian Dupth to Water: NA Age Starte Elevation: 10.4 ft NAVD88 Surface Elevation: Forrest Street - F521 pth Recovery PID Moisture Ca. USCS Graphic 10 00 49, 2 Fill. 00 09, 2 Fill. 00 00, 2 Fill. 00 0	oiect	Number:	60240	739			Drilli	ng Method: Geoprobe	Coordinates (NJSPNA	D83) x: 611814.4
Definition Outcome Description Description <thdescription< th=""> <thdescription< th=""> <thd< th=""><th colspan="6">Date Started Drilling: 6/4/2015 9:30:00 AM</th><th>Ria T</th><th>vpe:</th><th>Coordinates (NJSPNAD</th><th>183) v: 683665.4</th></thd<></thdescription<></thdescription<>	Date Started Drilling: 6/4/2015 9:30:00 AM						Ria T	vpe:	Coordinates (NJSPNAD	183) v: 683665.4
Open EV Project Manager: Dopth to Vater: NA Project Manager: South Keiselan Dopth to Vater: NA Status Formal Street - FS2 7 Surface Elevation: 10.4 ft NAVD88 Status Fill Surface Cover and Thickness: Sample Content Cleas Fill Surface Cover and Thickness: Sample Content Cleas Fill Cleas ASH and CINDERS (SYR 4/2) dark redish gray, dyr, no PSI-0.0.6.M. Content Cleas S Fill Cleas PSI-0.0.6.M. PSI-0.0.6.M. Content Cleas S Fill Cleas PSI-0.0.6.M. PSI-0.0.6.M. Content S Fill Cleas PSI-0.0.6.M. PSI-0.0.6.M. Content S Fill PSI-0.0.6.M. PSI-0.0.6.M. PSI-0.0.6.M. Content S Fill NO RECOVERY PSI-0.0.6.M. PSI-0.0.6.M. S On Wet S Fill Modum SAND come alti(7.5YR 4/1) dark gray, wet, no odor, no staining. Solis consistent with UNDno.<	ate Fi	nished Dr	illina:	6/4/2015 4	1:00:00	PM	Core	Size: 3 in	Boring Total Depth: 4	0 ft
Statul Location: Formal Street - FS21 Surface Elevation: 10.4 /t NAVD88 (th) (pp) (c) (c) (c) (c) (c) Surface Elevation: 10.4 /t NAVD88 (c) (c) (c) (c) Surface Elevation: (c) Surface Elevation: (c) Surface Elevation: (c) (c) Surface Elevation: (c) Surface Elevation: (c)	ogged	By: EW					Proje	ct Manager: Scott Mikaelian	Depth to Water: NA	
Becomy (http) PHD (mm) Moisture (mm) CA or (mm) Ga or (mm) USCS Fraphic File Surface Cover and Thickness: Surface Cover and Thickness: Sample D 1 0.0 0.4 3 FILL Cover (mm) ASH and CINDERS, (SYR 4/2) dark reddish gray, dry, no oddr. no staining. PSI-10-04X 2 5 0.0 0.0 3 FILL Cover (mm) PSI-10-04X 4 0.0 0.0 0.0 3 FILL PSI-10-04X 0.0 0.0 0.0 0.0 0.0 PSI-10-04X 0.0 0.0 0.0 0.0 0.0 PSI-10-04X 0.0 wet 3 FILL NO RECOVERY PSI-10-04X 6 0.0 wet 3 FILL modum SAND, some silt, (7.5YR 4/1) dark gray, wet, no odor, no staining. PSI-10-04X 7 5 0.0 wet 3 FILL modum SAND, some silt, (7.5YR 4/1) dark gray, wet, no odor, no staining. Solic consistent with UNDno. PSI-10-04X 10 0.0 wet 3 FILL <td< td=""><td>nysica</td><td>al Location</td><td>n: Forr</td><td>est Street</td><td>- FS21</td><td></td><td></td><td></td><td>Surface Elevation: 10</td><td>4 ft NAVD88</td></td<>	nysica	al Location	n: Forr	est Street	- FS21				Surface Elevation: 10	4 ft NAVD88
Barling Recovery (UM) PID (WM) Mosture Content Class (P) CA USCS Graphic Log Surface Cover and Thickness: Sample ID Sample ID 1 0.0 dry 3 FILL ASH and CINDERS, (SYR 4/2) dark reddish gray, dry, no dot, no staining. PST40.05.8 2 5 0.0 dry 3 FILL ASH and CINDERS, (SYR 4/2) dark forwin, dry, no dot, no staining. PST40.05.8 3 0.0 dry 3 FILL ASH and CINDERS, (SYR 4/2) dark forwin, dry, no dot, no staining. PST40.05.8 3 0.0 wet 3 FILL ASH and CINDERS, (SYR 4/2) dark forwin, dry, no dot, no staining. PST40.05.8 4 - - - - - PST40.05.8 5 0.0 wet 3 FILL PST40.05.8 PST40.05.8 6 - - - - - PST40.05.8 PST40.05.8 7 - - - - - - PST40.05.8 PST40.05.8 7 - - <	onth									
1 0.0 dry 3 FILL AdV and CINDERS (SYR 4/2) dark reddish gray, dry, no F81100.03. 2 5 0.0 dry 3 FILL AdV and CINDERS (SYR 4/2) dark reddish gray, dry, no F81100.03. 3 4 0.0 dry 3 FILL AdV and CINDERS (SYR 4/2) dark reddish gray, dry, no F81100.03. 2 5 0.0 wet 3 FILL AdV and CINDERS (SYR 4/2) dark reddish gray, dry, no F821.0.03. 4 - - - - - F821.0.03. F821.0.03. 4 - - - - - F821.0.03. F821.0.03. 5 0.0 wet 3 FILL NO RECOVERY. F821.0.03. F821.0.03. 6 - - - - - - F821.0.03. F821.0.03. F821.0.03. 6 - - - - - - - F821.0.03. F821.0.03. F821.0.03. F821.0.03. F821.	ange bgs)	Recovery (ft/ft)	PID (ppm)	Moisture Content	GA Class	USCS	Graphic Log	Surface Cover and Th	ickness:	Sample ID
Image: constraint of the second sec			0.0	dry	3	FILL	XXXXX	─ ASH and CINDERS,(5YR 4/2) dark r	eddish gray,dry,no /	FS21-0.0-0.5
1 0.0 drv 3 FILL One of all info. SARD, (7.5 YR 3/2) dark frew, diy, no 2 5 0.0 wet 3 FILL No regime. Sart and CINDERS, (5YR 4/2) dark readish gray, dry, no Fist 12.0.2.5 3 - 0.0 wet 3 FILL No Record madum SAND, (7.5 YR 3/2) dark brown, dry, no Fist 12.0.2.5 3 - 0.0 wet 3 FILL medium SAND, cross all (7.5 YR 4/1) dark gray, wet, no Fist 12.0.2.5 5 0.0 wet 3 FILL MO RECOVERY. Fist 16.0.4.5 6 - - - - - Fist 16.0.6.5 7 - 5 - - - Fist 16.0.6.5 7 - 5 - - - Fist 16.0.6.5 9 0.0 wet 3 FILL Mo Drom Salaning. Fist 16.0.6.5 10 - 0.0 wet 9 SM UNDro fine SAND, inthte silt, (5YR 4/3) reddish brow, my, et, no dor, no st	_		0.0	dry	3	FILL		\odor,no staining.	/	F521-0.0-0.5X
0.0 ury 3 FILL View in staining. Note: no staining. The to medium SAND.(7.5YR 3/2)dark treddleh gray, dry, no hoder, no staining. The to medium SAND.(7.5YR 3/2)dark brown, dry, no doer, no staining. FS212.02.35 3	1 —		0.0	dry	3	FILL		- fine to medium SAND,(7.5YR 3/2) da	ark brown,dry,no	-
2 5	_		0.0	ary	3	FILL		ASH and CINDERS (5VP 4/2) dark	reddish gray dry po	
2 5	2							odor no staining	reduisit gray, di y, no	
3 0 0.0 wet 3 FILL oddr, no staining. medium SAND, some sitt, (7.5YR 4/1) dark gray, wet, no odor, no staining. PST-38 5-0.0 5 0.0 wet 3 FILL NO RECOVERY. PST-38 5-0.0 6 - - 0.0 wet 3 FILL medium SAND, some sitt, (7.5YR 4/1) dark gray, wet, no odor, no staining. PST-38 5-0.0 6 - - 0.0 wet 3 FILL medium SAND, some sitt, (7.5YR 4/1) dark gray, wet, no odor, no staining. PST-46-85 9 - 0.0 wet 3 FILL fine SAND some sitt, (SYR 4/2) dark reddish gray, wet, no odor, no staining. Soils consistent with UNDno. PST-46-85 9 0.0 wet 9 SM UNDno fine SAND, little sitt, (SYR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. PST-46-85 11 - 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (6YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. PST-46-14.5 13 - - 9 SM UNDno medium to coarse SAND,	2	5						fine to medium SAND, (7.5YR 3/2)da	rk brown,dry,no	FS21-2.0-2.5
3	_	Ŭ	0.0	wet	3	FILL		odor, no staining.		1
- -	3 —							medium SAND,some silt,(7.5YR 4/1)	dark gray,wet,no	
4 1	_							odor,no staining.		
S 0.0 wet 3 FILL NO RECOVERY. 6 3 FILL MO RECOVERY. Redum SAND.some silt.(7.SYR 4/1)dark gray.wet.no odor, no staining. F8214.0.4.5 6 5 0.0 wet 3 FILL medium SAND.some silt.(5YR 4/2)dark reddish gray.wet.no odor, no staining. F8214.0.4.5 9 0.0 wet 3 FILL fine SAND.some silt.(5YR 4/2)dark reddish gray.wet.no odor, no staining. Soils consistent with UNDon. F8214.0.4.5 9 0.0 wet 9 SM UNDron fine SAND. little silt.(5YR 4/2)dark reddish brown, wet.no odor, no staining. Soils consistent with UNDon. F8214.0.4.5 10 0.0 wet 9 SM UNDron fine SAND. little silt.(5YR 4/3) reddish brown, wet.no odor, no staining. Soils consistent with UNDno. F8214.0.4.5 11 5 0.0 wet 9 SM UNDron fine SAND. wet.no odor, no staining. Soils consistent F8214.0.4.5 12 5 0.0 wet 9 SM UNDron medium to coarse SAND, with medium gravel.(5YR 4/3) reddish brown, wet.no odor, no staining. Soils consistent F8214.0.4.4.5 13	4									ES21-39 5-40 0
5 0.0 wet 3 FILL NO RECOVERY. 6 0.0 wet 3 FILL medium SAND,some silt,(7.5YR 4/1)dark gray,wet.no odor, no staining. FS216.0.8.5 7 5 0.0 wet 3 FILL fine SAND,some silt,(5YR 4/1)dark gray,wet.no odor, no staining. FS216.0.8.5 9 0.0 wet 9 SM Other SAND, ittle silt, (5YR 4/2) reddsh brown, wet,no odor, no staining. Solis consistent with UNDo. FS21-8.0.8.5 10 0.0 wet 9 SM UNDon fine SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Solis consistent with UNDo. FS21-10.0-10.5 11 5 0.0 wet 9 SM UNDon fine SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Solis consistent FS21-12.0-12.5 11 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel (5YR 4/3) reddish brown, wet, no odor, no staining. Solis consistent FS21-12.0-12.5 16 3.5 9 SM UNDno medium to coarse SAND, with medium gravel (5YR 4/3) reddish brown, wet, no odor, no staining. Solis consistent FS21-18.0-18.5	т									FS21-4.0-4.5
5 0.0 wet 3 FILL medium SAND.some silt.(7.5YR 4/1)dark gray.wet.no odor, no staining. 6 -	_	1			3	FILL		NO RECOVERY.		1
Instrume Instrume Instrume Instrume Instrume Instrume Fight Addition Fight Addit	5		0.0	wet	3	FILL		medium SAND some silt (7 5VP 4/1)	dark grav wet no	1
6 - 5 - FS21-60-65 8 - 0.0 wet 3 FILL fine SAND, some silt, (5YR 4/2)/dark reddish gray, wet, no oddr, no staining. Soils consistent with UNDno. FS21-60-65 9 - 0.0 wet 9 SM UNDno fine SAND, Utilte silt, (5YR 4/2) reddish brown, wet, no oddr, no staining. Soils consistent with UNDno. FS21-60-65 10 0.0 wet 9 SM UNDno fine SAND, little silt, (5YR 4/3) reddish brown, wet, no oddr, no staining. Soils consistent with UNDno. FS21-100-105 11 - 5 0.0 wet 9 SM UNDno medium to coarse SAND with medium gravel, (5YR 4/3) reddish brown, wet, no oddr, no staining. Soils consistent with UNDno. FS21-120-12.5 13 - - - - FS21-120-12.5 14 - - - - - - 16 - - - - - - 17 - - - 9 SM VINDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, with UNDno. -	_		5.5	WCL				odor, no staining.		
7 5 0.0 wet 3 FILL fine SAND.some silt.(SYR 4/2)dark reddish gray.wet.no FS21-8.0.8.5 9 0.0 wet 9 SM UNDon fine SAND.little silt.(SYR 4/3) reddish brown,wet.no FS21-8.0.8.5 10 0.0 wet 9 SM UNDon fine SAND.little silt.(SYR 4/3) reddish brown,wet.no FS21-8.0.8.5 10 0.0 wet 9 SM UNDon fine SAND.little silt.(SYR 4/3) reddish brown,wet.no FS21-10.0-10.5 11 5 0.0 wet 9 SM UNDon fine SAND.with medium gravel.(SYR 4/3) reddish brown, wet.no FS21-10.0-10.5 12 5 0.0 wet 9 SM UNDon medium to coarse SAND.with medium gravel.(SYR 4/3) reddish brown, wet.no FS21-10.0-10.5 13 - - - - - FS21-10.0-10.5 FS21-10.0-10.5 14 - - - - - - FS21-10.0-10.5 FS21-10.0-10.5 15 0.0 wet 9 SM UNDon medium to coarse SAND.with medium gravel.(SYR 4/3) reddish	6 —							······································		F00/ 5
7 5 0.0 wet 3 Fill fine SAND, some silt (SYR 4/2) dark reddish gray, wet, no OUNDon fine SAND, little silt (SYR 4/3) reddish brown, wet, no odor, no staining. Solis consistent with UNDno. F821-80-8.5 9 0.0 wet 9 SM UNDon fine SAND, little silt (SYR 4/3) reddish brown, wet, no odor, no staining. Solis consistent with UNDno. F821-80-8.5 10 0.0 wet 9 SM UNDon fine SAND, little silt, (SYR 4/3) reddish brown, wet, no odor, no staining. Solis consistent with UNDno. F821-10.6-10.5 11 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel. (SYR 4/3) reddish brown, wet, no odor, no staining. Solis consistent with UNDno. F821-10.6-16.5 13 -	0									FS21-6.0-6.5
7 5 0.0 wet 3 Fill Fine SAND, some silt.(5YR 4/2) dark reddish gray, wet, no odor, no staining. Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent 14 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent Field sin from SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils con	_									
s 0.0 wet 3 FILL fine SAND some silt (5YR 4/2)dark reddish gray.wet,no F821-80-85 9 0.0 wet 9 SM UNDon fine SAND little silt (5YR 4/3) reddish brown,wet,no F821-80-85 10 0.0 wet 9 SM UNDon fine SAND, little silt (5YR 4/3) reddish brown,wet, no F821-80-85 10 0.0 wet 9 SM UNDon fine SAND, little silt (5YR 4/3) reddish brown, wet, no F821-10.0-10.5 11 - 5 0.0 wet 9 SM UNDon fine SAND, little silt (5YR 4/3) reddish brown, wet, no F821-10.0-10.5 12 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent F821-10.0-10.5 14 - - - - F821-10.0-10.5 16 - - - - F821-10.0-10.5 16 - - - - - 17 - - - - - -	7 —									
8 0.0 wet 3 FILL fine SAND some sit.(5YR 4/2)dark reddish gray.wet,no FS21-8.8.5 9 0.0 wet 9 SM UNDon fine SAND, little sit.(5YR 4/2) reddish brown, wet, no FS21-8.8.5 10 0.0 wet 9 SM UNDon fine SAND, little sit.(5YR 4/3) reddish brown, wet, no FS21-8.8.5 10 5 0.0 wet 9 SM UNDon fine SAND, little sit.(5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-10.5 11 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-12.0-12.5 14 - - - - - - 15 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. - 16 - - - - - - - 17 - - - 9 SM UNDno medium	_	5								
0.0 wet 3 FILL XXXX Fine SAND, some sitt, (5YR 4/2) dark reddish gray, wet, no FS21-80.85 9 0.0 wet 9 SM Odor, no staining. Soils consistent with UNDno. FS21-80.85 10 0.0 wet 9 SM UNDno fine SAND, little sitt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-105 10 0.0 wet 9 SM UNDno fine SAND, little sitt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-105 11 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-12.0-12.5 13 - - - - - 14 - - - - - 15 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-16.0-16.5 16 - - - - - - -	8									500/ 0.0.5
9 0.0 wet 9 SM Octor, no staining. UNDno fine SAND, little sit(,6YR 4/3) reddish brown,wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-10.5 10 0.0 wet 9 SM UNDno fine SAND, little sit(,6YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-10.5 11 - 5 0.0 wet 9 SM UNDno fine SAND, little sit(,6YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-12.0-12.5 12 - 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel.(5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-14.0-14.5 14 - - - - - 16 - 9 SM UNDno medium to coarse SAND, with medium gravel.(5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent FS21-18.0-18.5 17 - 3.5 9 SM UNDno medium to coarse SAND, with medium gravel.(5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent FS21-18.0-18.5 19 - - 9 SM UNDno medium to coarse SAND, with medium gravel.(5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent	Ŭ		0.0	wet	3	FILL		fine SAND,some silt,(5YR 4/2)dark r	eddish gray,wet,no	FS21-8.0-8.5
9 0			0.0	wet	9	SM		odor, no staining.	raddiab brown wat no	
0 0.0 wet 9 SM UNDno fine SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-10.5 11 -	9							odor no staining Soils consistent with) readish brown,wet,no	
10 0.0 wet 9 SM UNDno fine SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-10.5 11 - 5 0.0 wet 9 SM UNDno fine SAND, little silt, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-10.0-10.5 12 - 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-12.0-12.5 13 - 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-14.0-14.5 16 - - - - - - 17 - 3.5 - 9 SM V NO RECOVERY. FS21-18.0-18.5 19 - - 9 SM V UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-18.0-18.5 19 - 0.0 wet 9 <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>I UNDIO.</td> <td></td>	_								I UNDIO.	
11 10.0 wet 9 SM <	10		0.0						o)	ES21 10 0 10 5
11 5 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-12.0-12.5 13 - 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-12.0-12.5 14 - 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno. FS21-16.0-16.5 16 - - - - - - 16 - - - - - - - 17 - 3.5 - 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent - - 18 - - - - - - - 20 - 0.0 wet 9 SM UNDno medium to coarse SAND, with medium gravel, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent - - 21 - 0.0 wet <td< td=""><td>_</td><td></td><td>0.0</td><td>wet</td><td>9</td><td>SM</td><td></td><td>UNDno fine SAND, little silt, (5YR 4/</td><td>3) reddish brown, wet,</td><td>F 52 1-10.0-10.5</td></td<>	_		0.0	wet	9	SM		UNDno fine SAND, little silt, (5YR 4/	3) reddish brown, wet,	F 52 1-10.0-10.5
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21- 0.0 wet 9 SM UNDno medium to coarse SAND, (5YR 4/3) reddish brown, wet, no odor, no staining. Soils consistent with UNDno.	-					0.01		4/3) reddish brown, wet, no odor, no st	aining. Soils consistent	
es:	21—					~		with UNDno.	-	-
es:	_		0.0	wet	9	SM		UNDno medium to coarse SAND, (5	YR 4/3) reddish brown,	
es:								wet, no odor, no staining. Soils consi	stent with UNDno.	
	es:	•			•I		•. •(. • P•.*]			

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Boring ID: FS21

Page: 2

Project Name: PPG Garfield Ave Project Number: 60240739 Date Started Drilling: 6/4/2015 9:30:00 AM							ing Company: SGS North America ing Method: Geoprobe Type:	Coordinates (NJSPN Coordinates (NJSPN/	3PNAD83) x: 611814.4 (PNAD83) y: 683665.4	
ate Fi	nished Dri	Iling:	6/4/2015 4	1:00:00	PM	Core	Size: 3 in	Boring Total Depth:	40 ft	
oggea hysica	By: Evv	• Forr	est Street .	- ES21		Proj	ect Manager: Scott Mikaellan	Surface Elevation: 1		
Depth Range ft bgs)	Recovery (ft/ft)	PID (ppm)	Moisture Content	GA Class	USCS	Graphic Log	Surface Cover and Tr	ickness:	Sample	
-23 -24	4.5								FS21-22.0-22.5 FS21-24.0-24.5	
_				9	SM		NO RECOVERY.		_	
25 <u> </u>		0.0	wet	9	SM		UNDno fine SAND,with medium grav brown,wet,no odor,no staining. Soils	vel,(5YR 4/3) reddish consistent with		
20	5								FS21-26.0-26.5	
28— — 29— —									FS21-28.0-28.5	
30— — 31— —		0.0	wet	9	SM		UNDno fine SAND,with medium grav brown,wet,no odor,no staining. Soils UNDno.	vel, (5YR 4/3) reddish consistent with	FS21-30.0-30.5	
32— 33— 34—	5								FS21-32.0-32.5	
		0.0	wet	9	SM		UNDno fine SAND, with medium gra brown, wet, no odor, no staining. Soi	vel, (5YR 4/3) reddish Is consistent with	_	
36— — 37—	5						UNDno.		FS21-36.0-36.5	
38— — 39— —									FS21-38.0-38.5	
40										
4000										
ies: s - belo <u>/ - mea</u>	ow surface (adow mat	grade (COPR - chro GGM - greer	omite or n grey n	e processi nud	ng residue	 UNDno - non-organic undisturbed native or UNDorg - organic undisturbed native deport 	deposits MGP - manuf osits CCPW - chro	actured gas plant mate chemical production wa	

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Boring ID: FS22

Page.	1
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Ductors	Neme		-			Deilling Company COO Month America		Page: 1
roject	Name: F	YG Ga	ITTIELD AVE			Drilling Company: SGS North America	Coordinates (NUCP)	(AD92) v. 611946 4499
Date Started Drilling: 6/1/2015 0.20.00 AM						Jrilling Method: Geoprobe Coordinates (NJSP		AD92) x 692702 1547
Jale Si	arteu Drii	illing: (6/2/2015 9	1:40:00 RM		Core Size: 2 in	Coordinates (NJSPN	AD63) y: 063703.1547
		ming.	0/3/2013	1.40.00 FIM		Project Manager: Scott Mikaolian	Dopth to Water: NA	40 11
bysic:	lLocatio	n: For	rost Stroot	- ES22			Surface Elevation:	
TIYSIC		1. 10		-1 022			Surface Lievation.	
Depth Range ft bgs)	Recovery (ft/ft)	PID (ppm)	Moisture Content	USCS	Graphi Log	C Surface Cover and Thickno	ess:	Sample ID
		0.0	dry	FILL		fine to medium SAND,some medium grav brown,dry,no odor,no staining.	el,(7.5YR 3/2) dark	FS22-0.0-0.5
-1		0.0	dry	FILL		fine to medium SAND,trace silt,trace fine 2.5/3) very dark brown,dry,no odor,no stai	gravel,(7.5YR ning.	
-2	3.5	0.0	dry	FILL		fine to medium SAND, some ash and cinc dark brown,dry,no odor,no staining.	lers,(7.5YR 3/2)	FS22-2.0-2.5
-3—		0.0	wei			NO RECOVERY.		ES22.2.0.2.5
Ŭ		0.0	slightly	FILL		fine SAND, with silt, (7.5YR 3/1) very dark	gray,slightly	FS22-3.0-3.5
-4		0.0	moist	NR		NO RECOVERY.	/	
-5		0.0	dry	FILL		fine silty SAND,(7.5YR 4/1) dark gray,dry,	no odor,no	FS22-5.0-5.5
_6		0.0	dry	FILL		fine SAND.little silt (7 5YR 3/2) dark brow	vn.drv.no odor no	
-7	5	0.0	wet	FILL		staining. fine SAND,(7.5YR 4/1) dark gray,wet,no c	odor,no staining.	FS22-6.0-6.5
-8								FS22-8.0-8.5
-10		0.0	moist	SM		UNDno fine SAND, (5YR 4/3) reddish bro moist,no odor,no staining.Soils consistent	wn,slightly with UNDno.	FS22-10.0-10.5
_ -11		0.0	wat	<u>CM</u>				
-12 -13 -	4.5	0.0	wei	Sivi		reddim SAND, with medium to coarse gra reddish brown, wet, no odor, no staining. Soi UNDno.	ils consistent with	FS22-12.0-12.5
-14								FS22-14.0-14.5
-		0.0		NR				
-15		0.0	wet	SM		medium SAND,with medium to coarse gra reddish brown,wet,no odor,no staining.Soi	avel, (5YR 4/3) ils consistent with	
-16 -17 -	4							FS22-16.0-16.5
-18								FS22-18.0-18.5
-19 -		0.0		NR		NO RECOVERY.		
-20 -21 -		0.0	wet	SM		medium SAND,with medium to coarse gra reddish brown,wet,no odor,no staining. Sc UNDno.	avel,(5YR 4/3) olls consistent with	FS22-20.0-20.5
otes: gs - bel	ow surface	grade	COPR - chr	omite ore proc	essing re	esidue UNDno - non-organic undisturbed native de	eposits MGP - manu	ifactured gas plant
omments:	auow mat		geivi - gree	n grey mua		טיטטיט - organic undisturbed native depos	ous CCPW - Chr	unate chemical production waste

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Boring ID: FS22

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Dealer	A Norman .		metional Association			Drilling Components COO North Assess		Fage. 2
Project		PG Ga				Drilling Company: SGS North America		
Project	t Number:	60240)739			Drilling Method: Geoprobe	VAD83) x: 611846.4133	
Date S	tarted Dril	ling: (6/1/2015 9	:20:00 AM		Rig Type:	NAD83) y: 683703.1547	
Date F	inished Dr	illing:	6/3/2015	<u>1:40:00 PM</u>		Core Size: 3 in	Boring Total Depth:	40 ft
Logged	d By: EW					Project Manager: Scott Mikaelian	Depth to Water: N/	Α
Physic	al Locatio	n: For	rest Street	- FS22		1	Surface Elevation:	10.3 ft NAVD88
Depth Range (ft bgs)	Recovery (ft/ft)	PID (ppm)	Moisture Content	USCS	Graphi Log	ic Surface Cover and Thickn	ess:	Sample ID
23 24 24 25 26 26 27 27 28 28 28 28	5	0.0	wet	SM		medium SAND,with medium to coarse gra reddish brown,wet,no odor,no staining. So UNDno.	avel,(5YR 4/3) bils consistent with	FS22-22.0-22.5 FS22-24.0-24.5 FS22-26.0-26.5 FS22-28.0-28.5
29	- 5	0.0	wet	SM		medium SAND,(5YR 4/3) reddish brown, staining. Soils consistent with UNDno.	wet,no odor,no	FS22-30.0-30.5
	0.5	0.0	wet	SM NR		medium SAND,(5YR 4/3) reddish brown, staining. Soils consistent with UNDno. NO RECOVERY.	wet,no odor,no	FS22-34.0-34.5 FS22-35.0-35.5
Notes: bgs - be MM - me	low surface eadow mat	grade	COPR - chr GGM - gree	romite ore proc	cessing r	esidue UNDno - non-organic undisturbed native de UNDorg - organic undisturbed native depos	eposits MGP - man sits CCPW - ch	ufactured gas plant romate chemical production waste