



Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: na	Location ID: 2	
Drilling Company: HydroGeologic		Driller: T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 3/12/12 1027		Date/Time Total Depth Reached: 3/12/12 1033	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 40002 - 1035			
Geologist: I. Stone				Checked By / Date: Robbins Gellman 3/13/12			
Radiological Background: 17 / 3099 / 73		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	17/60	Silty Sand, Yellowish Brown (5/4 (dry)), 75% fine sand, 25% silt, trace rootlets, dry, low-med dense, no odor or staining TD = 0.5 ft bgs No gas encountered	SM	
0.5			0.0	19/105			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: NBZ	Location ID: 2	
Drilling Company: Boart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 8.5 ft bgs.	
Drilling Equipment: 6600 Geoprobe		Borehole Diameter: 1.75 in.		Date/Time Drilling Started: 3/12/12 1037		Date/Time Total Depth Reached: 3/12/12 1046	
Type of Sampling Device: 1.75 macrocore with acetate liner				Samples Collected: 90003 - 1125 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone				Checked By / Date: Roberts, Jellman 3/13/12			
Radiological Background: 17 / 3099 / 73		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Feet bgs.	+6.5' (CPM)
0.0			0.0	90	Silty Sand, Yellowish brown (5/4 10YR) 70% 75% fine sand, 25% silt, trace siltlets, dry, med dense, no odor or staining	SM	0.0	3407
0.5			0.0	72			0.5	4560
1.0			0.0	72	Sandy silt, Dark yellowish brown (4/4 10YR) 80% 30% fine sand, 70% silt, dry, low toughness, low strength, no odor or staining	ML	1.0	5192
1.5			0.0	48			1.5	5582
2.0			0.0	48	Silty Sand, Strong Brown (5/6 7.5YR) 80% fine sand, 20% silt, moist, med dense, no odor or staining	SM	2.0	5604
2.5			0.0	84			2.5	5549
3.0			0.0	66			3.0	5268
3.5			0.0	48			3.5	5190
4.0			0.0	60			4.0	5064
4.5			0.0	72			4.5	5001
5.0			0.0	60	5.0	4940		
5.5			0.0	72	5.5	4827		
6.0			0.0	78	Same as above	SM	6.0	4925

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: NBZ	Location ID: 3	
Drilling Company: Boart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 6.33 ft bgs.	
Drilling Equipment: 6600 Geoprobe		Borehole Diameter: 1.75 in.		Date/Time Drilling Started: 3/12/12 0901		Date/Time Total Depth Reached: 3/12/12 0913	
Type of Sampling Device: 1.75 macrocore with acetate liner				Samples Collected: 90005 - 0945 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone				Checked By / Date: J. Robins/J. Feldman 3/13/12			
Radiological Background: 17/3363/88		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 40.5' = 2969 (CPM)
0.0			0.0	48	Silty Sand, light yellowish brown (6/4 10YR) 70% fine sand, 25% silt, 5% gravel (sandstone, max size = 1.5in), dry, low-dred dense, no odor or staining	SM	3122
0.5			0.0	84			4555
1.0			0.0	78			5358
			0.0	72			5517
2.0			0.0	48			5715
			0.3	78			5856
3.0			0.3	60			5874
			0.0	54			5787
4.0			0.0	54			5960
			0.0	60			5940
5.0			0.0	54	Sand/silt, Brownish yellow (6/6 10YR) 90% fine sand, 10% silt, dry, high dense, no odor - iron oxide staining	SP	5937
			0.0	48			6117
6.0			0.0	96	Siltstone light olive brown (5/4 10YR) ↳ mechanically weathered, dry, high tough, high strength no odor or staining	Bedrock	N/A

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 4
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4/11/12 858	Date/Time Total Depth Reached: 4/11/12 0910	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90006 (0910)	
Geologist: Robbins Goldman	Checked By / Date: Cotton Sena 4/12/2012			

Radiological Background: 13 / 79	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13 / 84	Surface: exposed soil, sparse grass			
0.5			0.0	14 / 60	silty sand: dark brown (10YR 3/3), moist, low dense, 75% fine sand, 15% silt, 10% med sand, no odor or staining, noncohesive, quartz grains, mica flakes, trace rootlets + wood chips	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

TD = 0.5' bgs
no GW encountered
location not moved

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: NBZ	Location ID: 5	
Drilling Company: Boart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 7.33 ft bgs.	
Drilling Equipment: 6600 Geoprobe		Borehole Diameter: 1.75 in.		Date/Time Drilling Started: 3/13/12 0940		Date/Time Total Depth Reached: 3/13/12 0954	
Type of Sampling Device: 1.75 macrocore with acetate liner				Samples Collected: 90007-1040 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Starn				Checked By / Date: Robbin Goldman 3/14/12			
Radiological Background: 16 / 2687 / 60		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	54	Sandy Silt, Dark brown (3/3 10YR) 40% fine sand, 60% silt, dry, trace rocklets, low toughness, low strength, no odor	ML	10.5' = 2835
0.5			0.0	60			2982
1.0			0.0	84			3983
			0.0	48			4735
			0.0	48			4883
2.0			0.0	66	Silty Sand, Dark Yellowish Brown (4/4 10YR) 60% fine sand, 40% silt, moist, med dense, no odor or staining	SM	2 5081
			0.0	78			5112
3.0			0.0	72			3 5114
			0.0	60	Silty Sand, Dark Yellowish brown (4/6 10YR) 60% fine sand, 10% medium sand, 30% silt, med dense, no odor or staining	SM	5140
4.0			0.0	84			4 5342
			0.0	66			5113
5.0			0.0	72			5 5249
			0.0	66	Sand w/silt, Brownish yellow (6/6 10YR) 70% fine sand, 20% medium sand, 10% silt, moist, med dense, no odor or staining	SP	5087
6.0			0.0	72			6 4882

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 6
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/13/12 0851	Date/Time Total Depth Reached: 3/13/12 0858	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90068-0925	
Geologist: I. Stone	Checked By / Date: J. Robbins / 3/14/12			

Radiological Background: 16 / 2577 / 68	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' = 2676 (CPM)
0.0			0.0	84	Sandy Silt, Brown (4/3 104R) 40% fine sand, 60% silt, trace rust tabs, dry, low tough, low strength, no odor or staining, low strength.	ML SM	2819
0.5			0.0	72	Sandy Silt, Dark Brown (3/3 104R) 40% fine sand, 60% silt, moist, low tough, low strength, no odor or staining	ML	3834
1.0			0.0	66			4516
			0.0	78			4771
2.0			0.0	54	Sand (weathered sandstone), Brownish Yellow (6/6 104R) 95% fine sand, 5% silt, moist, high dense, no odor or staining	SP	5089
			0.0	72			5119
3.0			0.0	54			5237
			0.0	48			5115
4.0			0.0	66			5184
5.0					TD = 4 ft bgs no gw encountered refusal on sandstone no anomalies detected		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 7
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/12/12 1503	Date/Time Total Depth Reached: 3/12/12 1508	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90009 - 1550	
Geologist: I. Stone	Checked By / Date: Robbin Feldman 3/13/12			

Radiological Background: 15/2487/84	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	54	Sandy Silt, Dark yellowish Brown (4/4 10YR) 40% fine sand, 60% silt, trace rootlets, dry, low toughness, low strength, no odor or staining	ML		3429
0.5			0.0	66				4604
1.0			0.0	60	Silty Sand, Yellowish Brown (5/6 10YR) 70% fine sand, 30% silt, dry, ^(FS) moist med dense, no odor or staining	SM	1	5060
			0.0	48				5101
2.0			0.0	72			2	5041
			0.0	60				5214
3.0			0.0	54			3	5079
			0.0	48				4952
4.0			0.0	48			4	4867
			0.0	66				5015
5.0			0.0	72			5	4924
			0.0	54	Same as above	SM		4885
6.0			0.0	48			6	4920

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NB2	Group: west	Location ID: 7			
Radiological Background: 15/2487/84		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	48	Silty Sand, same as above	SM	6	4920
			0.0	60			7	4907
7.0			0.0	48			8	5307
			0.0	60			9	4967
8.0			0.0	66			10	5640
			0.0	54			11	5205
9.0			0.0	78			12	5183
			0.0	66			13	5050
10.0			0.0	84			14	5009
11.0					TD = 10ft bgs no gw encountered			
12.0								
13.0								



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 8
Drilling Company: HydroGeoLogic, Inc.	Driller: C Garcia	Ground Elevation: NA	Total Depth Drilled: 5'8" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: 4-12-12 235	Date/Time Total Depth Reached: 4-12-12 0940	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90010 (1003)	
Geologist: M Bienen	Checked By / Date: Duff Knott 4/14/12			

Radiological Background: NA/2871/67	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					surface: tall grass			3257
0.5			0.0	55	Silty sand, very dark brown (10gr 3/4) 60% fine sand, 40% silt, loose, semi moist, trace rustlets, non plasticity, no odor, no staining	SM		3873
1.0			0.0	66				4514
			0.4	92				4698
			0.3	62				4886
2.0								4982
			0.2	86	Silty sand, dark yellowish brown (10gr 3/4) 75% fine sand, 25% silt, semi moist, loose, non plasticity, 1" tree root at 28", mica flakes, no odor, no staining	SM		5242
3.0			0.2	46				5033
			0.6	80	Silty sand, dark yellowish brown (10gr 4/6) 40% fine sand, 25% med sand, 25% silt, loose, non plasticity, mottling, quartz flakes, no odor, no staining, semi moist, mottled	SM		4971
4.0			0.3	66				5012
			0.5	76				4995
5.0			0.1	66				5052
			0.3	48	poorly graded sand, yellowish brown, (10gr 5/16) 50% fine sand, 40% med sand, 10% silt, loose, non plasticity, no odor, no staining	SP		4892
6.0					TD = 68' bgs no groundwater	Bedrock (SP) mechanically weathered sandstone, yellowish brown		

(10gr 5/16) no odor, no staining

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 9	
Drilling Company: HGL		Driller: J. LeVanaie/M. Birney		Ground Elevation: NA		Total Depth Drilled: ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/10/12 0910		Date/Time Total Depth Reached: 4/10/12 0918	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 9001(0915)			
Geologist: LR Goldman				Checked By / Date: Chiff Rumpelt 4/11/12			
Radiological Background: 15 / 4057 / 77			Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			165		Surface: wooden twigs & soil		
0.5			96		Silty sand: dark brown (10YR 3/3), 65% fine sand, 35% silt, moist, non cohesive, loose, quartz grains, mica flakes, trace charcoal flakes (<2mm), trace rootlets.	SM	
1.0			0.0				
2.0					no GW encountered TD = 0.5' bgs location not moved		
3.0							
4.0							
5.0							
6.0							

WEST

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NA	Location ID: 9
Drilling Company: HydroGeoLogic	Driller: J. LeVange/M. Bimey	Ground Elevation: NA		Total Depth Drilled: 2.5 1.5 ft bgs.
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA 3"	Date/Time Drilling Started: 4/10/12 0910	Date/Time Total Depth Reached: 4/10/12 1013	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90012 (1015)	
Geologist: L.R. Goldman	Checked By / Date: W.H. Hardy 4/11/12			

Radiological Background: 15/4057/77	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
					pancake Surface: wooden sticks + soil		10.5 = 3874
0.0			0.0	96	Silty sand: dark brown (10YR 3/3), 65% fine sand, 35% silt, moist, non cohesive, loose, quartz grains, mica flakes, trace charcoal flakes (2mm), trace rootlets, no odor or staining	SM	3880
0.5			0.0	90	8" sand stone gravel (~55mm average) grain size larger...	SM	4214
1.0			0.0	48	Sand w/ silt and gravel: dark yellowish brown (10YR 3/6), 70% fine to med. sand, 10% med sand w/ quartz grains, 10% silt, 10% sandstone gravel, moist, non cohesive, loose. @ 1' bgs depth no odor or staining	SP/Bedrock	4565
1.5			0.0	96	poorly graded sand/sandstone bedrock (10YR 5/4), moist, fine and medium subrounded sand grains, mechanically weathered to SP	SP/Bedrock	5072
2.0							
3.0							
4.0							
5.0							
6.0							

no GW encountered
Total depth = 1.5' bgs
refusal on sandstone
location not moved
no anomalies

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 10
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 6.75 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/12/12 1334	Date/Time Total Depth Reached: 3/12/12 1344	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90013 -1415	
Geologist: I Stone	Checked By / Date: J Robbins Goldman 3/13/12			

Radiological Background: 16 / 2413 / 54	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 0.5 = 2903 (CPM)
0.0			0.0	72	Sandy Silt, Dark Yellowish Brown (4/4 10YR), 40% fine sand, 60% silt, trace rootlets, no odor dry, low toughness, low strength, no odor or staining	ML	3107
0.5			0.0	72			4266
1.0			0.0	60			4676
			0.0	54			4936
2.0			0.0	66			4873
			0.0	78			4928
3.0			0.0	54	Silty Sand, Dark Yellowish Brown (4/3 10YR) 70-80% fine sand, 30% silt, moist, med dense, no odor or staining	SM	3
			0.0	66			4986
			0.0	66			4924
4.0			0.0	66			4825
			0.0	54			4763
			0.0	72			4739
5.0			0.0	72	Same as above	SM	5
			0.0	60			4846
6.0			0.0	48			4762

Project Name: SSFL Area IV Radiological Study			Project Number: EP038.01.22.04.03	Subarea: NBE	Group: west	Location ID: 10	
Radiological Background: 16 / 2413 / 54			Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	40	Silty Sand, same as above	SM	4762
			0.0	54	Sand (weathered sandstone) yellowish brown (5/6.104M) 95% fine sand, 5% silt, moist, high dense, no odor or staining	SP	4901
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							

TID = 6.75 ft bgs
 no gw. encountered
 refusal on sandstone
 NO anomalies detected

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 11	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/12/12 1058	Date/Time Total Depth Reached: 4/12/12 1108 0.5		
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90014 (1108)			
Geologist: LR Goldman				Checked By / Date: Collins & Garcia 4/13/12			
Radiological Background: 12/30/78		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	Surface: stement weeds, sparse weeds sandy silt: dark brown (10YR 3/3), 85% fine sand, 15% silt, moist, noncohesive, no odor or staining trace rootlets + charcoal flakes		SM	
0.5			0.0	TD = 0.5' bgs no GW encountered location not moved			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: west	Location ID: 11	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 2.75 inches		Date/Time Drilling Started: 4/12/12 1058		Date/Time Total Depth Reached: 4/12/12 1158	
Type of Sampling Device: Handauger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90015 (1156)			
Geologist: L Robbins Goldman		Checked By: C. Garza		Date: 4/13/12			
Radiological Background: 12/30/7/81		Radiological Equipment Used: Micro / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			66	← skt pancake	surface: sersent weeds, sparse weeds		
0.5			00	90	Sandy silt: dark brown (10YR 3/3), 85% fine sand, 15% silt, moist, non cohesive, no odor or staining, trace rootlets + charcoal flakes	SM	3332
1.0			00	66	18" unit same as above, note color change: dark yellowish brown (10YR 4/4), no rootlets present		3761
2.0			00	108			4863
2.5			00	54	Sandstone bedrock: dark yellowish brown (10YR 4/4) moist, coarse, med. fine grained mechanically weathered to SP	Best Rock (SP)	5588
3.0					TP = 24.5' bgs Refusal on sandstone no anomalies location not moved		5402
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: <i>NA</i>	Location ID: 12
Drilling Company: HydroGeoLogic, Inc.	Driller: <i>M. Birney</i>	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 09/10	Date/Time Total Depth Reached: 04/19/12 / 0943 / 0.5 ft bgs	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90016 / (0925)	
Geologist: <i>Garcia</i>	Checked By / Date: <i>W. M. ... 4/20/12</i>			

Radiological Background: <i>NA/2417</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.4				<i>43</i>	Surface: leaf litter, vegetation, grass, soil surface			
0.5			<i>0.6</i>	<i>35</i> <i>54</i> <i>33</i>	Silty sand 60% fine sand 20% M sand 20% silt nonplastic, Loose, noncohesive (5YR/3/1) Very Dark Gray! Rootlets, Moist, NO odor or staining			
<p>Total Depth 0.5 ft bgs No groundwater encountered.</p>								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: B3		
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.		
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling: Started: 4/14/12 0955		Date/Time Total Depth Reached: 4/16/12 1005		
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90018(1005)				
Geologist: Robbins Goldman				Checked By / Date: Cliff Knipf 4/17/12				
Radiological Background: 143324/SE		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background:		0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description		USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)			
			0.0	14/66	Surface: soil, wooden twigs, sparse weeds			
0.5			0.0	14/54	Sand w/ silt: black (10YR 2/1) wet, noncohesive, 70% fine sand, 15% med sand, 15% silt, trace rootlets & sticks, GW encountered @ 6" ^{very} loose		SM	
1.0					TD=0.5' bgs GW encountered @ 6" <u>location not moved</u>			
2.0								
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 13
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 1.6 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 4/16/12 1006	Date/Time Total Depth Reached: 4/16/12 1025	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90019(1025)	
Geologist: Robbins Goldman	Checked By / Date: Cliff Rumbolt 4/17/12			

Radiological Background: 14/3324/58	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rac 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5 = NM* (CPM)
0.0			0.0	66	Sand w/ silt: black (10YR2/1), wet, noncohesive, 70% fine sand, 15% med sand, 15% silt, trace, rootlets & sticks, GW encountered @ 6", very loose	SM	NM
0.5			0.0	54			NM
1.0			0.0	54			NM
2.0			0.0	50			NM
2.2					refusal @ 19" on sandstone bedrock: dark brown (10YR 3/3), mechanically weathered to SP, moist, med. dense	Bedrock (SP)	
<p>Total depth = 19"</p> <p>Groundwater encountered @ 6" bgs,</p> <p>* no downhole gamma readings due to water in hole</p> <p><u>location not moved</u></p>							

Project Name: SSFL Area IV Radiological	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 14
Drilling Company: Geo Head	Driller: M Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 09:55	Date/Time Total Depth Reached: 4/7/12 / 10:00 / 0.5	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90020 / 1010	
Geologist: C Garcia	Checked By / Date: Cliff Knight 4-19-12			

Radiological Background: 3991 / 79	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	00 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0					Surface: sandstone soil, Moss, Vegetation			
0.0			72 / 4185		Silty sand, Dark Brown (7.5yr/3/2) noncohesive, loose; no odor or staining	SM		
0.0			60 / 3705		Non plastic, 60% Fine sand Rootlett 19 0% Med sand; 20% silt; Moist 0% gravel			
<p>Total Depth 0.5ft bgs no groundwater encountered.</p> <p>Location GPS: N 34 1401.0655 W 118 42 58.0671</p> <p>Location moved due to access.</p>								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBE	Group: West	Location ID: 14 CG
Drilling Company: HGL	Driller: M Givney	Ground Elevation: NA	Total Depth Drilled: 0.57 ft CG Conches ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 10 11	Date/Time Total Depth Reached: 4/17/12 10 12 CG Conches ft bgs.	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		No sample shallow refusal. 90021	
Geologist: C Garcia	Checked By / Date: W. K. [Signature] 4-18-12			

Radiological Background: 2991	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	73 4185	Surface: Moss, soil sandstone vegetation silty sand, Dark Brown, non cohesive loose, non plastic, no odor or staining, 60% Fine sand, 19% mud sand, 1% gravel, 20% silt, Moist (7.5YR/3.5) rootlets	SM		
0.5			0.0	66 3705				
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth 0.57 ft CG
No groundwater encountered
No sample taken
Shallow refusal.
no anomalies

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: west	Location ID: 16	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling: Started: 4/20/12 1150		Date/Time Total Depth Reached: 4/20/12 1205	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90024 (1200)			
Geologist: Robbins Goldman		Checked By / Date: Cliff [Signature] 4/13/12					

Radiological Background: 14 / 3550 / 49	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.0			0.1	15/96	silty sand: very dark brown (10YR 3/1), 65% fine sand, 35% silt, very loose, noncohesive, trace rootlets, mica flakes, no odor or staining. (dry) no GW encountered TD = 0.5' bgs location not moved	SM	
0.5			0.1	16/60			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NB2		Group: West		Location ID: 116	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 1.81 (22") ft bgs.			
Drilling Equipment: Trowel/shovel + hand auger		Borehole Diameter: N/A		Date/Time Drilling Started: 4/20/12 1156		Date/Time Total Depth Reached: 4/20/12 1235			
Type of Sampling Device: Trowel/shovel @ hand auger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90025 (1232)					
Geologist: L Robbins Goldman		Checked By / Date: Cliff Lumbert 4/23/12							
Radiological Background: 14/3550/49		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 105 = 3424 (CPM)
0.0			90	pancake	surface: twigs + leaves		3481
0.5			60		silty sand: very dark brown (10YR 3/1), 65% fine sand, 35% silt, very loose, noncohesive, trace rootlets, no odor or staining, dry	SM	4070
1.0			54		silty sand: very dark grayish brown (10YR 3/2), 65% fine sand, 20% med. sand, 15% silt, very loose, noncohesive, trace rootlets + roots, leaves mica flakes, no odor or staining	SM	4649
2.0			54		22": sandstone bedrock: olive brown (2.5Y 4/4), moist, dense, no odor or staining, mechanically weathered to SP	Bedrock (SP)	5137
3.0					no GW encountered 1.81 TD = 0.5' bgs no anomalies location not moved		5290
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological		Project Number: EP038.01.22.04.03		Subarea: N34.14	Group: 01.3303	Location ID: 17	
Drilling Company: Beart Drilling		Driller: Wade Murray		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 1355	Date/Time Total Depth Reached: 4/19/12 1357	0.5	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: C. Garcia				Checked By / Date: Wade Murray 4/20/12			
Radiological Background: NA 1500/100		Radiological Equipment Used: Micro Rn / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Description		USCS Symbol	Borehole Gamma Readings (CPM)
0.0				Surface: leaf litter, poison oak, tree branches			
0.0				Silty sand (5 parts/1) very dark gray		SM	
0.5				70% fine sand 15% silt sand			
1.0				15% silt, Rootlets, Loose, Dry, no odor or staining, non-plastic, non-cohesive			
2.0							
3.0							
4.0							
5.0							
6.0							

Total Depth 0.5 ft bgs
 Moved location due to
 N34.14 01.3303 need
 W118.42 50.7204 place-
 ment
 lat-long. in
 drainage.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: <u>West</u>	Location ID: <u>17</u>
Drilling Company: HydroGeoLogic, Inc.	Driller: <u>McKinney</u>	Ground Elevation: NA	Total Depth Drilled: <u>31 inches</u> 2.58 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: <u>1/4/01</u> <u>4/19/12</u> <u>1/4/15</u>	Date/Time Total Depth Reached: <u>2.58</u> <u>31 inches</u>	
Type of Sampling Device: Hand Auger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)	<u>90027</u> <u>(1430)</u>	
Geologist: <u>Garcia</u>		Checked By / Date: <u>Chris Smith</u> <u>4/20/12</u>		

Radiological Background: <u>NA 3450/67</u>	Radiological Equipment Used: Micro R / Pancake Meters	PID Used: Mini Rae 3000 - Background:	<u>0.0</u> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0				Surface leaf litter, tree bark, pine needles		3300
0.0			72	Silty sand, (5 yr/3/1) very dark gray, 70% fine sand, 15% med sand 15% silt	SM	3511
0.0			102	Dry, rootlets, loose no odor or staining non cohesive, non plastic,		3987
0.0			48			4769
0.0			42			5025
0.0			60	Silty sand (10 yr/3/2) very dark grayish brown	SM	5053
0.0			74	20% fine sand 30% med sand 10% silt 20% gravel (sub rounded) non cohesive mechanically weathered	SP	5191
				Bedrock on sandstone		
<p>Total Depth Reached 31 inches No groundwaters encountered No anomalies</p>						

Project Name: SSFL Area IV Radiological		Project Number: EP038.01.22.04.03		Subarea: <u>NAE-1038</u> Group: <u>NAE-1038</u>		Location ID: <u>18</u>	
Drilling Company: <u>HGL</u>		Driller: <u>W. H. Hines</u>		Ground Elevation: NA		Total Depth Drilled: <u>0.5</u> ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: <u>11/25/12</u>		Date/Time Total Depth Reached: <u>11/30/12</u> / <u>11:30</u> / <u>0.5</u>	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <u>90024</u> <u>1195</u>			
Geologist: <u>Campbell</u>				Checked By / Date: <u>W. H. Hines</u> <u>4/23/12</u>			
Radiological Background: <u>NAE-1038/05</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: <u>0.0</u> ppm			
Depth (ft bgs)		Interval		Recovery		Description	
0.0		0.0		0.0		<p>Surface soil covered with vegetation silty sand (FSL/1) very dark gray fine sand to med sand 20% silt; Rootlets, loose, dry, non plastic, non cohesive, no odor or staining</p>	
0.5						USCS Symbol: <u>SM</u>	
1.0						Borehole Gamma Readings (CPM)	
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: WEST	Location ID: 16
Drilling Company: HydroGeoLogic, Inc.	Driller: M. B. Carey	Ground Elevation: NA	Total Depth Drilled: 1 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: 11/20/06	Date/Time Total Depth Reached: 4/20/12 / 11:34 / 1 ft.	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90029 (155)	
Geologist: C. Garcia	Checked By / Date: W. J. Smith 4/23/12			

Radiological Background: NA / 3400 / 105	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radioisotopes	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			54		Surface Soil		53403
0.5			102		silty sand, (7.5 yr/3/1) very dark gray 40% fines sand 40% med sand dry 20% silt loose noncohesive non plastic no odor or staining	SM	3494
1.0			100		Mechanically weathered sandstone		5192
2.0							5692
3.0							
4.0							
5.0							
6.0							

Total Depth 1 ft bgs
No anomalies.
No groundwater encountered.



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: na	Location ID: 19
Drilling Company: HydroGeoLogic	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/13/12 1343	Date/Time Total Depth Reached: 3/13/12 1349	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90030-1350	
Geologist: I. Stone	Checked By / Date: J. Robbins / 3/14/12			

Radiological Background: 17 / 3283 / 94	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	17/94	Sand w/ Silt, Yellowish Brown (5/4 104R) 90% fine sand, 10% silt, trace concrete debris, trace roots, dry, low dense, no odor or staining TD = 0.5 ft bgs no gas encountered	SP	
0.5		0.0	18/54				
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 19
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/13/12 1352	Date/Time Total Depth Reached: 3/13/12 1403	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90031-1435	
Geologist: I. Stone		Checked By / Date: Robina Goldman 3/14/12		

Radiological Background: 17 / 3283 / 94	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Feet bgs.
					Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		+0.5' = 3391 (CPM)
0.5			0.0	78	Sand w/ silt, Yellowish Brown (5/14/04R) 90% fine sand, 10% silt, trace concrete debris, trace roots, dry, low dense, no odor or staining	AF/ SP	3810
			0.0	66	Sand as above (23)		5117
1.0			0.0	84	Sand w/ silt, 90% fine sand, 10% silt, moist med dense	SP	5676
			0.0	78	Sand (23)		5716
2.0			0.0	54	Sand (weathered sandstone), Very Pale Brown (7/4 10/12)		5647
			0.0	66	95% fine sand, 5% silt, moist, high dense, no odor or staining	SP	5101
3.0			0.0	48			5165
			0.0	54			5396
4.0			0.0	54			5551
			0.0	60			5428
5.0			0.0	66			NM
6.0					TD: 5 ft bgs no gas encountered Reveal on sandstone		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: <i>West</i>	Location ID: <i>20</i>	
Drilling Company: HydroGeoLogic, Inc.		Driller: <i>M. Birney</i>		Ground Elevation: NA		Total Depth Drilled: <i>0.5</i> ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: NA		Date/Time Drilling Started: <i>1340</i>		Date/Time Total Depth Reached: <i>4/4/2012/1350/0.5ft bgs</i>	
Type of Sampling Device: Trowel/Shovel				Samples Collected: <i>90037 (1358)</i>			
Geologist: <i>Garcia</i>				Checked By / Date: <i>Robbins, Goldman 4/5/12</i>			
Radiological Background: <i>NA/5400/30</i>		Radiological Equipment Used: Micro R, Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background:		<i>0.0</i> ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			<i>112</i>	<i>5500</i>	<p>Surface: leaves, sandstone, rat poop, rusted bottom (can)</p> <p>Sand; Dark Brown (7.5 YR/3/2); loose; Dry; cohesive non-plastic no odor & staining; 50% fine sand 40% med sand 10% silt</p> <p><i>poorly graded sand with silt</i></p>	<i>SP</i>	
<p>Total Depth 0.5 ft bgs No groundwater encountered.</p>							

Project Name: SSFL Area IV Radiological Study	Project Number: EP088.01.22.04.03	Subarea: NBZ	Group: WEST	Location ID: 20
Drilling Company: HydroGeoLogic, Inc.	Driller: M Birney	Ground Elevation: NA	Total Depth Drilled: 4 ft ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: 1355	Date/Time Total Depth Reached: 4/4/12 / 1515 / 4 ft	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90033 (1525)	
Geologist: Caricia	Checked By / Date: M. [unclear] 4/5/12			

Radiological Background: N/A 15400 / 30	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			112		Surface, leaves, sandstone; Kat Pool ^{related can bottom}		5277
0.5			108		Dark brown; (7.5 yr / 3/2); loose; dry cohesive; nonplastic; no odor or staining; 50% fine sand 40% med sand 10% silt; sand with salt.	CP	5157
1.0			100		Very dark brown; (7.5 yr / 2.5/2); cohesive; nonplastic; 80% fine sand 15% silt; 5% med sand; no odor or staining;	GM CG	5297
2.0			108		silty sand; very dark brown; (7.5 yr / 2.5/2) dry; loose; cohesive; nonplastic;	GM CG	5871
3.0			102		75% fine sand; 15% silt 10% med sand; no odor or staining	CG	5807
3.5			90		silty sand; very dark brown (7.5 yr / 2.5/3); dry; loose; cohesive; nonplastic; no odor or staining; roots	GM CG	5872
4.0			120		tree roots (reddish) silty sand 60% fine sand 25% coarse sand 15% silt; dark brown; no odor or staining; loose dry sweet	GM CG	0707
4.5			104		sandstone bedrock at 3.5 ft (not on log) mechanically weathered	SP	0400
5.0					Bedrock total depth reached 4.0 ft		
6.0					No ground water encountered		
					No anomalies		



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: na	Location ID: 21
Drilling Company: HydroGeoLogic	Driller: T. Morse	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/13/12 1520	Date/Time Total Depth Reached: 3/13/12 1525	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90034-1530	
Geologist: I. Stone		Checked By / Date: Shoblin Goldman 3/14/12		

Radiological Background: 30 / 300 / 91	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	20/91	NA/Pancake Sandy Silt, Yellowish brown (5/4 104R) 60% @ 40% fine sand, 60% silt, trace fossils, dry, low toughness, low strength, slow dilatancy, no odor or staining	ML	
0.5			0.0	24/66			
1.0							1
2.0							2
3.0							3
4.0							4
5.0							5
6.0							6

TD=0.5 ft bgs
no gw encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 21
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA		Total Depth Drilled: 7 ft bgs.
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/13/12 1527	Date/Time Total Depth Reached: 3/13/12 1537	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: 90035 - 1610 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone	Checked By / Date: Robbin Goldman 3/14/12			

Radiological Background: 20 / 3030 / 91	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	59 72	Sandy silt, Yellowish brown (5/4 10YR) 60% silt, 40% fine sand, trace rootlets, dry, low strength, low dilatancy, no odor	ML	3692
0.5			0.0	78 66	Silty sand, Strong Brown (5/6 7.5YR) 60% fine sand, 40% silt, dry, med dense, slow dilatancy, no odor or skinning	SM	5583
1.0			0.0	66 60			6040
			0.0	59 66			5977
2.0			0.0	60 72			6156
			0.0	78 72			6093
3.0			0.0	54			6016
			0.0	78			5939
4.0			0.0	66	- foot		5830
			0.0	54			5898
5.0			0.0	60			6144
			0.0	78			6063
6.0			0.0	54	Same as above	SM	6006

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 22
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/14/12 0910	Date/Time Total Depth Reached: 3/14/12 0920	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90037 - 1015	
Geologist: I. Stone	Checked By / Date: Cliff Knight 3/15/12			

Radiological Background: 18 / 2588 / 67	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	42	Silty Sand, Yellowish brown (5/6 104R) 60% fine sand, 40% silt, trace gravel, trace debris (wire), trace pebbles, low dense, no odor or staining, dry	AF/SM	3544
			0.0	84			4280
1.0			0.0	66	Sand, Yellow (7/6 104R) 60-70% fine sand, 30% medium sand, dry, moist, med dense, no odor or staining	SP	4099
			0.0	84			4589
2.0			0.0	72			4666
			0.0	60	Silty Sand, Dark yellowish brown (4/4 104R) 60% fine sand, 40% silt, moist, med dense, no odor or staining	SM	5010
3.0			0.0	60	Sand w/silt, Brownish Yellow (6/6 104R)	SP	5208
			0.0	66	90% fine sand, 10% silt, moist, med dense, no odor or staining		5593
4.0			0.0	66			5670
			0.0	60			5817
5.0			0.0	84	Silty Sand, Strong brown (4/6 7.54R)	SM	5684
			0.0	60	60% fine sand, 40% silt, moist, med dense, no odor or staining		5713
6.0			0.0	48			5908

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: na	Location ID: 23
Drilling Company: HydroGeoLogic	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/14/12 1132	Date/Time Total Depth Reached: 3/14/12 1138	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90038-1140	
Geologist: I. Stone	Checked By / Date: Cliff Knight 3/15/12			

Radiological Background: 19 / 3506 / 68	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	8.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			6.0	20/72	<p>Silty Sand, Yellowish Brown (5/4 10PR) 60% fine sand, 40% silt, trace rootlets, dry, low dense, no odor or staining</p> <p>TD = 0.5 ft bgs no gw encountered</p>	SM	
0.0			20/102				
1.0							1
2.0							2
3.0							3
4.0							4
5.0							5
6.0							6

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 23
Drilling Company: Boat Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 9.5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/14/12 1141	Date/Time Total Depth Reached: 3/14/12 1158	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: 90039 - 1245 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone	Checked By / Date: D.J. Knight 3/15/12			

Radiological Background: 19 / 3506 / 68	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' = 3293 (CPM)
0.0			0.0	78	Silty Sand, Yellowish brown (5/4 10YR)	SM	4160
0.5			0.0	54	60% fine sand, 40% silt, dry, trace rootlets (top 12"), low dense, no odor or staining		4601
1.0			0.0	72	----- Silty Sand, Yellowish Brown (5/4 10YR)		5249
			0.0	96	60% fine sand, 40% silt, dry, med dense no odor or staining	SM	5362
2.0			0.0	96			5345
			0.0	84			5383
3.0			0.0	66			5428
			0.0	60		SM	5489
4.0			0.0	54			5564
			0.0	66			5637
5.0			0.0	42	----- Silty Sand, light yellowish brown (6/4 10YR)	SM	5850
			0.0	66	75% fine sand, 25% silt, dry, med dense, no odor or staining		5666
6.0			0.0	42	same as above	SM	5657

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NBSZ	Group: west	Location ID: 23		
Radiological Background: 19 / 3506 / 68		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	42	Silty Sand, same as above	SM	5657
			0.0	60			5701
7.0			0.0	66	Sandy Silt, Dark yellowish Brown (4/4 10YR) 40% fine sand, 60% silt, dry, low tough, low strength, no odor or staining	ML	5747
			6.0	78			5635
8.0			6.0	72	Silty Sand, Yellowish brown (5/6 10YR) 80% fine sand; 20% silt, dry, med-high dense, no odor or staining	SM	5741
			0.0	66			5684
9.0			6.0	60			5638
			0.0	72			5896
10.0					TD = 9.5 ft bgs no gw encountered no anomalies detected refusal on sandstone (CK)		10
11.0							11
12.0							12
13.0							13

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: NBZ-25
Drilling Company: HydroGeoLogic, Inc.	Driller: M Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1353	Date/Time Total Depth Reached: 04/07/2012/1354/0.5ft.	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90042 (1353)	
Geologist: C Garcia	Checked By / Date: Will Thummet 4/4/12			

Radiological Background: NA / 3713 / 100	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0		Surface cross scattered; sandstone			
0.5			0.0	3675	silty sand; light brown; (7.5YR 6/3) Loose 90% med sand 5% silt. 4% cohesive 5% fine sand 3% nonplastic Dry no odor or staining	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth Reached 0.5ft
No groundwater encountered.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ		Group: <u>West</u>		Location ID: <u>NBZ-25</u>	
Drilling Company: HydroGeoLogic, Inc.		Driller: <u>M. Birney</u>		Ground Elevation: NA		Total Depth Drilled: <u>20 inches 1.66 ft bgs.</u>			
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time of Drilling Started: <u>04/02/2012 1420</u>		Date/Time Total Depth Reached: <u>1420 / 20 inches</u>			
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<u>90043 (1430)</u>			
Geologist: <u>C. Garcia</u>				Checked By / Date: <u>Chill Knight 4/4/12</u>					
Radiological Background: <u>NA / 5713 / 100</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 3000 - Background: <u>0.0</u> ppm				

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			0.0		Surface: scattered grass; sandstone		3534
0.5			0.0		0.5-1.0 ft: silty sand; light brown (7.5YR/6/3) loose; cohesive; non-plastic; no odor or staining; 90% med sand; 5% fine sand; 5% silt; Dry.	SP	4588
1.0			0.0		1.0-1.5 ft: same as above only color change to (7.5YR/5/6) strong brown.	SP	5817
2.0			0.0		2.0-2.5 ft: sandstone bedrock mechanically weathered (7.5YR/6/6) reddish yellow silty sand.	bedrock (SP)	5003
3.0					Total Depth Reached: <u>1.66 ft 20 inches</u>		
4.0					No groundwater encountered		
5.0					No Anomalies		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 26	
Drilling Company: HydroGeoLogic, Inc.		Driller: C Garcia		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: NA		Date/Time Drilling Started: 1245 4-2-12		Date/Time Total Depth Reached: 1255 4-2-12	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90042 90256 (1300) 90044			
Geologist: M Binner		Checked By / Date: Cliff Knight 4/4/12					
Radiological Background: NA / 3984 / T3		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	60/512	Surface - scattered weeds		
0.5			0.0	80/400	Silty sand, dark yellowish brown (10gr 4/6) 70% fine sand, 20% coarse sand, 10% silt, dry, loose, cohesive, low-n plasticity, no odor, no staining, trace rootlets	SM	
1.0					no groundwater		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West NBZ-07	Location ID:
Drilling Company: HydroGeoLogic, Inc.	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 0945 04/02/2017/0950	Date/Time Total Depth Reached:	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90046 (1000)		Checked By / Date: Chris Knight 4-4-12	

Radiological Background: NA/2431/50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	3150	Surface: Grassy; ^{upper} Soil; Mulch.			
0.5			0.0	112 3400	Silty sand Very dark brown (7.5 yr/2.5 B) 80% Fine sand; 5% Med sand 15% silt. no odor or staining; loose; cohesive; non plastic; dry;	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth 0.5ft.
No Groundwater encountered.

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Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: UB E-27
Drilling Company: HydroGeoLogic, Inc.	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 2.5 ft. ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: 0954	Date/Time Total Depth Reached: 04/02/2012 / 2.5 ft. / 1000	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90047 (1030)	
Geologist: C. Coaricia	Checked By / Date: Cliff Thumtha 4/4/12			

Radiological Background: NA 2531 / 50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	78 / 3150	Surface: Corrasy; ^{w/pebbles} Drainage; soil; mulch		2854
0.5			0.0	112 / 3400	Silty sand; Dark Brown; (7.5 yr / 2.5 / 3) Loose; No odor or staining; Dry; cohesive; non-plastic; 40% fine sand; 5% med sand; 15% silt	SM / CLC6	2934
1.0			0.0	60	Silty sand; Brown; (7.5 yr / 4 / 2) Loose; Dry; 85% fine sand; 2% med sand; 13% silt	SM / SP	3945
			0.0	60	No staining or odor; cohesive; non-plastic.		4501
2.0			0.0	60	Silty sand; (7.5 yr / 6 / 3) Light Brown loose cohesive; non-plastic; No staining or odor	CLC6 / SP	4963
			0.0	48	Dry; 80% fine sand; 8% med sand; 12% silt.		5655
3.0					sandstone Mechanically weathered Bedrock	Bedrock (SP)	
4.0							
5.0							
6.0							

Total
Depth 2.5ft
No groundwater
encountered.
No Anomalies.

Project Name: SSFL Area IV Radiological Study	Project Number: EP088.01.22.04.03	Subarea: NBZ	Group: West	Location ID: NBZ-28
Drilling Company: HydroGeoLogic, Inc.	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 09 08 4/2/2012/0915	Date/Time Total Depth Reached: /	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90048 (0930 ⁰⁰)	
Geologist: C. Carver	Checked By / Date: Will Knight 4/4/12			

Radiological Background: NA / 2011 / 14	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	60	Surface: Grassy; mulch; sandstone			
0.5			0.0	30-50	Silty sand; dark brown; (7.5 yr/3/3) loose; non plastic; dry; no odor or stain	SM		
1.0			0.0	60	80% fine sand 15% silt; 5% med sand;			
Total Depth 0.5 ft No groundwater encountered.								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: <i>West</i>	Location ID: <i>NBZ-28</i>
Drilling Company: HydroGeoLogic, Inc.	Driller: <i>McIney</i>	Ground Elevation: NA	Total Depth Drilled: <i>1 ft.</i> ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: <i>0910 06/22 4/2/012 / 0930</i>	Date/Time Total Depth Reached: <i>0935</i>	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<i>90949 (0935)</i>	
Geologist: <i>C Garcia</i>	Checked By / Date: <i>Chill Thumt 4/4/12</i>			

Radiological Background: <i>NA / 2559 / 44</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: <i>0.0</i> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			<i>0.0</i>	<i>60 / 3050</i>	Surface: <i>Crassy; Mulch; and sandstone</i>		<i>0.5 ft</i>	<i>2726</i>
0.5			<i>0.0</i>	<i>60 / 3390</i>	<i>Silty sand; Dark Brown; (7.5/3/3) loose no odor or staining, cohesive, nonplastic</i>	<i>SM</i>		<i>2804</i>
1.0			<i>0.0</i>	<i>60 / 3390</i>	<i>Dry to fine sand 50% med sand, 19% silt</i>			<i>3499</i>
1.0			<i>0.0</i>	<i>60 / 3390</i>	<i>Mechanically weathered Bedrock sandstone</i>	<i>Bedrock (SP)</i>		<i>4729</i>
<p><i>Total Depth reached 1 ft.</i></p> <p><i>Sample Depth 0.0-0.6 ft</i></p> <p><i>0.5-1.0</i></p> <p><i>No groundwater encountered.</i></p> <p><i>No Anomalies</i></p>								

SSFL BORING LOG



NBZ_029

at 1 of 1

West

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: 110 (6)	Location ID: 29
Drilling Company: HydroGeoLogic	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/15/12 0856	Date/Time Total Depth Reached: 3/15/12 0902	
Type of Sampling Device: Trowel/shovel	Samples Collected: 90650 - 0905		One 1/2 Gallon Bag (Approx 8 lbs.)	
Geologist: I. Stone	Checked By / Date: J. Robbins-Haldeman 3/16/12			

Radiological Background: 13 / 2850 / 65	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13/24	<p>Silly Sand, Dark Yellowish Brown (4/4 color) 60% fine sand, 40% silt, trace gravel, trace rootlets, dry, low dense, no odor or staining</p> <p>TD = 0.5 ft bgs no gw encountered</p>	SM	0	
0.5			0.0	12/78			1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: A172	Location ID: 29
Drilling Company: Boat Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 2.5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/15/12 0912	Date/Time Total Depth Reached: 3/15/12 0919	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: 90051 - 0940 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone	Checked By / Date: Robbins Goldman 3/16/12			

Radiological Background: 13 / 2850 / 65	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' = 2750 (CPM)
0.5			0.4	54	Silty Sand, Dark Yellowish Brown (4/4 104R) 60% fine sand, 40% silt, trace gravel, trace pebbles, dry, low dense, no odor or staining	SM	2893
1.0			0.4	66	Sandy silt/clay, Yellowish brown (5/4 104R) 30% fine sand, 60% silt, 10% clay, dry, low tough, low strength, no odor or staining	ML	3648
1.5			0.4	66			4499
2.0			0.4	60	Silty Sand, Brownish yellow (6/6 104R) 60% fine sand, 35% 40% silt, dry, med dense, no odor or staining	SM	4902
2.5			0.4	72			4961
3.0			0.4	54	Silty Sand, Brownish yellow (6/8 104R) 30% fine sand, 20% silt, dry, med-high dense, no odor or staining, trace pebbles	SM	NM (unable to widen)
4.0					TD = 2.5 ft bgs no gw encountered no anomalies detected		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: <u>WAT</u>	Location ID: 31
Drilling Company: HydroGeoLogic, Inc.	Driller: <u>W. Boney</u>	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 0930 4/3/12	Date/Time Total Depth Reached: 105 ft 105 ft	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		9:00 5/16 (0945)	
Geologist: <u>C. Garcia</u>	Checked By / Date: <u>Clyd Knight 4/5/12</u>			

Radiological Background: <u>N/A</u>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	<u>WAT</u>	Surface: Deep Pool; Rotten ^{cores} scattered		
0.0			0.0	<u>WAT</u>	gully sand; dark brown (7.5R/3/3);	SM	
0.5			0.0	<u>WAT</u>	90% Fine sand; ^{2.0} 10% med sand;		
1.0				<u>WAT</u>	Dry; 10% silt; Loose; ^{non} cohesive; Rotten;		
					Nonplastic; no odor or staining		
<p>Total Depth 0.5 ft bgs No groundwater encountered.</p>							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: NBZ-31
Drilling Company: HydroGeoLogic, Inc.	Driller: McBirney	Ground Elevation: msl NA	Total Depth Drilled: 27 inches 2.3ft. ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: 0937	Date/Time Total Depth Reached: 04/3/12 / 1043H / 2.3ft	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90055 (0952)	
Geologist: C. Coarica	Checked By / Date: Chris Knapp 4/5/12			

Radiological Background: NA / 3100 / 102	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			0.0	77	Surface: Open top; Rotten weathered cross;		0.5ft 2985
0.5			0.0	84	1/2 ft sand, Dark Brown; (7.5 YR/3/3) loose	SM	3036
1.0			0.0	60	60% fine sand; 10% med sand; 20% silt; non plastic; cohesive; no staining or odor; Dry; cl.		3559
1.5			0.0	54			4554
2.0			0.0	77			4858
2.3					2.3ft sandstone bedrock mechanically weathered bedrock for 90% fine sand 10% med sand	SM (cl)	5368
3.0					Total depth reached 2.3ft.		
4.0					No groundwater encountered		
5.0					No anomalies.		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: <u>10 West</u>	Location ID: <u>NBZ-92</u>	
Drilling Company: HydroGeoLogic, Inc.		Driller: <u>M. Binney</u>		Ground Elevation: NA		Total Depth Drilled: <u>10 inches</u> ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: <u>13 40</u>		Date/Time Total Depth Reached: <u>4/21/12 / 1405 / 10 inches</u>	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <u>90057 (1405)</u>			
Geologist: <u>C. Garcia</u>				Checked By / Date: <u>Utah Kempt 4/21/12</u>			
Radiological Background: <u>NA 1/975/10</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: <u>0.0</u> ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0					Surface: <u>clayey + sandstone</u>		0.5	5338
0.5					<u>silty sand (loose) - very dark grayish brown, loose, dry, 80% fine sand 1% med. sand</u>	SM		3374
1.0					<u>Bedrock - non-plastic, 100% silty, cohesive, no odor or staining;</u>			3495
1.0					<u>sandstone bedrock mechanically weathered bedrock + cl.</u>	Bedrock (CR)	1	5018
2.0					<u>Total Depth 10 inches</u>		2	
3.0					<u>No groundwater encountered.</u>		3	
4.0					<u>No Anomalies.</u>		4	
5.0					<u>1st Refusal 10 inches</u>		5	
6.0					<u>2nd Refusal 9 inches</u>		6	
					<u>3rd Refusal 8 inches</u>			

Project Name: SSFL Area IV Radiological Study	Project Number: EF038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 33
Drilling Company: HydroGeoLogic, Inc.	Driller: M Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 10:27	Date/Time Total Depth Reached: 04/09/12 / 10:30	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90058 / (1100)	
Geologist: C. Carcia	Checked By / Date: Chris Kumpf 4/5/12			

Radiological Background: NA / 9004 / 97	Radiological Equipment Used: Micro B / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			102	Pancake hole	Surface Drilling; soil sandstone.		2030
0.5			350		silty sand (10YR/3/4) dark yellowish brown; 70% fines sand; 25% med sand (6-10% silt; loose; dry, non-cohesive; non-plastic; no odor or staining)	SM	2030
1.0			60		<p>Total Depth 0.5ft No groundwater encountered</p>		
2.0			400				
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: <i>WRS</i>	Location ID: <i>NBZ-73</i>	
Drilling Company: HydroGeoLogic, Inc.		Driller: <i>M. Birney</i>		Ground Elevation: NA		Total Depth Drilled: <i>26 inches 2.2 ft</i> ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: <i>1033</i>		Date/Time Total Depth Reached: <i>02/03/2012/1040/2.2 ft bgs.</i>	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<i>90059 (1102)</i>	
Geologist: <i>C. Garcia</i>				Checked By / Date: <i>Will [unclear] 4/5/12</i>			
Radiological Background: <i>NA 3004/97</i>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: <i>0.0</i> ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			<i>102</i>		Surface: <i>scattered cobbles; soil, sandstone</i>		<i>0.57 3630</i>
0.0			<i>77</i>		<i>Silty sand; (10YR/3/4) Dark yellowish brown; 70% fine sand; 30% med sand; 20% silt; Dry loose; cohesive; nonplastic; no odor; no staining</i>	<i>SM</i>	<i>3647</i>
0.0			<i>77</i>		<i>Silty sand; (10YR/4/6) Dark yellowish brown; 60% fine sand; 40% med sand; 20% silt; Dry loose; nonplastic; cohesive; no odor; no staining</i>	<i>SM</i>	<i>4676</i>
0.0			<i>102</i>		<i>rock</i>		<i>5334</i>
0.0			<i>77</i>		<i>70% med sand 25% med sand 5% silt; silty sand (10YR/6/3) loose; nonplastic; cohesive; no odor or staining; Dry</i>	<i>SP</i>	<i>5444</i>
0.0					<i>9 sandstone Bedrock partially weathered Mechanically weathered Bedrock to (SP)</i>		<i>5545</i>
<p>Total Depth 2.2 ft No groundwater encountered. No anomalies.</p>							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: EP038	Location ID: NBZ-34
Drilling Company: HydroGeoLogic, Inc.	Driller: A Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1120 4/3/2012	Date/Time Total Depth Reached: 1124 4/3/2012	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90000 (1135)	
Geologist: C. Garcia	Checked By / Date: W. H. [Signature] 4/5/12			

Radiological Background: NA 4/3/12	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft-bgs)	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	Surface: soil ^{soil} fine sand ^{fine sand} 5% silt ^{5% silt} loose ^{loose} dry ^{dry} cohesionless ^{cohesionless} non-plastic ^{non-plastic} no odor or staining ^{no odor or staining}	SM	
0.5			0.0			
1.0						
2.0						
3.0						
4.0						
5.0						
6.0						

Total Depth 0.5 ft
No groundwater
Encountered.

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: EPA	Location ID: 75
Drilling Company: HydroGeoLogic, Inc.	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1/15/12	Date/Time Total Depth Reached: 1/17/12 / 0.5 ft bgs.	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90002 (144)	
Geologist: J. Garcia	Checked By / Date: Chris Kuyler 4/5/12			

Radiological Background: NA 19109/51	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	78	Surface soils, weathered loose sand, silty sand; very dark brown, (7.5yr/2.5/2)	SM		
0.5			0.0	3300	70% fine sand 10% med sand loose, non cohesive; non plastic; no odor, or staining; Dry			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth 0.5 ft bgs
No groundwater encountered

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EAST	Location ID: NBZ-30	
Drilling Company: HydroGeoLogic, Inc.		Driller: M. Birney C. Garcia		Ground Elevation: NA		Total Depth Drilled: 8.5 FT ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: 10/3/12		Date/Time Total Depth Reached: 03/23/2012 / 1135 / 8.5 FT	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 900004 (1225)			
Geologist: A. Birney / C. Garcia				Checked By / Date: Will Nutt 3-30-12			
Radiological Background: NA/26005/58		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description: (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
				Pancake	Surface scattered corals, Poronak , 2011		0.51 3580
0.5			30	30	Dark Reddish Brown Silty sandy silt 65% silt + 35% fine sand; 2% medium sand; cohesive; Loose; semi plastic; no odor or staining; Very moist.	SM	3140
1.0			42	42	same as above color change only (5YR/2.5/2) 65% silt; 35% fine sand; 2% med. sand	ML	4310
					(5YR/3/2) Dark Reddish Brown	ML	4819
			54	54		ML	4510
2.0			42	42	same as above; color change only (5YR/4/1) Dark reddish gray	ML	4570
			60	60		ML	4590
3.0			84	84	same as above; color change only (7.5YR/4/1) Dark Gray	ML	4559
			54	54		ML	4548
4.0			46	46	(7.5YR/5/2) Brown; Clayey sand; 15% clay; 75% fine sand; 5% med. sand	SC	4520
			30	30	no odor or staining; moist; cohesive; semi-plastic; soft	SC	4710
5.0			54	54	same as above color change light gray; (10YR/7/1)	SC	4717
			84	84			4770
6.0			84	84	same as above color change only	SC	5029

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: EAST	Location ID: NBZ-30			
Radiological Background: N.A. / 1005/58		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: <input type="radio"/> <input type="radio"/> ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	84	Same as above. color change only	SC	6	5029
			0.0	72	(5YR/7/2) light gray			4953
7.0			0.0	54	color change & grains & exchange	SC	7	4821
			0.0	76	(5YR/6/1); GRAY. 20% clay medium sand 70%; 10% silt. clayey sand. semi-plastic & cohesive. very stiff (WET; soft)			4788
8.0			0.0	60	4 inches circumference water stiff encountered		8	
			0.1	48	GWAT depth Bedrock reached	Bedrock (SP)		
9.0					sandstone 10 inches mechanically weathered bedrock		9	
					TOTAL DEPTH 9.5 FT			
					NO Anomalies			
					Perched GW at depth 4.0 ft bgs		10	
10.0								
11.0								
12.0								
13.0								

NO borehole readings below 7.5 due to ground water at 4.0 depth

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: NBZ-37		
Drilling Company: HydroGeoLogic, Inc.		Driller: C Garcia	Ground Elevation: NA		Total Depth Drilled: 4' 1" ft bgs.		
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches	Date/Time Drilling Started: 1420 03/28/12	Date/Time Total Depth Reached: 1547 3/28/12			
Type of Sampling Device: Hand Auger			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90065 (1608)				
Geologist: M Birney			Checked By / Date: Cliff Knight 3-30-12				
Radiological Background: NA / 3224 / 57		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	60	Silty Sand, very dark brown (10gr 2/2) 20% silt, 60% fine sand, 20% med sand, cohesive, moist, loose, low plasticity, no odor, no staining rootlets, loose	mb Art SM	2930 mb 2817 mb 2977 4320 mb 3850
1.0			0.0	66	same as above, color change to dark brown (7.5gr 3/2), void of rootlets	SM	4603 mb 3350 mb 4640
2.0			0.1	45			4630 mb 4640 mb 4684
2.0			0.2	50			4535 mb 4689 mb 4728
3.0			0.5	49	clayey sands very dark grayish brown (2.5gr 3/2) 20% clay 60% med sand, 20% fine sand moist, cohesive, low med plasticity, no odor, no staining med stiff dense	SC	4590 mb 4728 mb 4615
3.0			0.1	68			5128 mb
4.0			0.2	72	clayey sands grayish brown (2.5gr 5/2) 10% clay, 30% med sand, 30% fine sand, moist, cohesive, low plasticity, no odor, no staining med stiff	SP mb SP	461 mb 4467 4632
4.0			0.1	72	clayey sands, dark grayish brown (10gr 4/2) 10% clay, 40% med sand, 50 fine sand, semi moist, cohesive, low plasticity, no odor, no staining soft	SE mb SP	5183
5.0			0.2	66 mb	bedrock - mechanically weathered sandstone with siltstone, semi moist, no odor no staining no groundwater encountered TD = 49"	Bedrock	
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: <u>East</u>	Location ID: <u>NBZ-38</u>		
Drilling Company: HydroGeoLogic, Inc.		Driller: <u>M. Birney</u>		Ground Elevation: NA		Total Depth Drilled: <u>0.5</u> ft bgs.		
Drilling Equipment: Trowel/Shovel		Borehole Diameter: NA		Date/Time Drilling Started: <u>1100</u>		Date/Time/Total Depth Reached: <u>03/27/12 (1108)</u>		
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <u>90066 (1108)</u>				
Geologist: <u>Colleen Garcia</u>				Checked By / Date: <u>Walt Knight 3-29-12</u>				
Radiological Background: <u>NA / 340 / 64</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: <u>0.0</u> ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable		USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	84 / 3200	<p><u>pancake downhole</u></p> <p>surface scattered coarse sandstone rock clasts charcoal at surface. <u>sandy silt 90% med sand</u> Very Dark Brown (<u>7.5YR/3.2</u>) SM No odor; no staining rootlets; <u>low cohesion</u>, low cohesive faces moist, <u>med density</u> Mottled <u>silty sand</u></p> <p>Total depth = 0.5' bgs No groundwater encountered</p>			
0.5			0.0	84 / 3550				
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: East	Location ID: NBZ-39	
Drilling Company: HydroGeoLogic, Inc.		Driller: M. Birney		Ground Elevation: NA		Total Depth Drilled: 32.5 inches ft. bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: 1345 03/27/2012		Date/Time Total Depth Reached: 32 inches 1350	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		900 (08) (1440)	
Geologist: Colleen Garcia				Checked By / Date: (with initials) 3-29-12			
Radiological Background: NA 3182 / 83		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background:		00 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			48		Surface scattered grass + soil		3156	
0.5			54		Silty sand 20% silt 70% fine sand 10% med sand BROWN (10YR/4/3) MOIST; Cohesive; MODERATELY LOOSE; low plasticity; NO ODOR; NO STAINING; ROOTLETS;	SM	3199	3182
1.0			60		Silty sand 20% silt 65% fine sand 5% medium sand Dark Brown (7.5YR/5/2) MOIST; Cohesive; LOOSE; LOW PLASTICITY; NO ODOR; NO STAINING; ROOTLETS.	SM	5053	5453
2.0			54		Silty sand 15% silt 70% fine sand 15% med sand. Dark yellowish brown (10YR/5/4) MOIST; Cohesive; LOOSE; LOW PLASTICITY; NO ODOR; NO STAINING; ORGANIC ROOTLETS	SM	5589	4990
3.0					BECK ROCK REACHED; Mechanically weathered to SEMI-MOIST; Very Pale Brown (10YR/7/4) Mica/Quartz; Sandstone.	BECK ROCK (S)		
4.0					Total Depth 32 inches NO Groundwater encountered NO Anomalies			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: EPA	Location ID: NBZ-40
Drilling Company: HydroGeoLogic, Inc.	Driller: M. Bimney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 0838	Date/Time Total Depth Reached: 03/28/2012 0939	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90069 (0845)	
Geologist: C. Garcia	Checked By / Date: C. Garcia 3-30-12			

Radiological Background: NA/3263/50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	54/3250	Surface (crassy) silty sand (loose) (7.5 NR/4/3) Brown SM 20% silt 70% fine sand 10% medium sand; No odor or staining; LOOSE; Cohesive; non plastic; moist ROOTLETS			
0.5			0.0	72/3500				
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth 0.5 ft bgs.
No Groundwater encountered.
No anomalies.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EPA	Location ID: NBZ-40	
Drilling Company: HydroGeoLogic, Inc.		Driller: M Birney		Ground Elevation: NA		Total Depth Drilled: 3.5 ft ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: 08 57		Date/Time Total Depth Reached: 03/28/12 0912	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90070 (0940)	
Geologist: C Garcia				Checked By / Date: C Garcia 3/30/12			
Radiological Background: NA/3303/150		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			0.0	54	Surface (washed)		3181
0.5			0.0	72	silty sand; (7.5YR/4/3); Brown; 20% silt 70% sand; 10% medium sand; loose; cohesive; nonplastic; no odor or staining; moist; rootlets	SM	3354
1.0			0.0	54	- same as above		4352
1.5			0.0	112	- same as above		4904
2.0			0.7	48	- same as above color change only Brown (7.5YR/5/3)		5202
2.5			0.0	84	- same as above		5430
3.0			0.0	42	- same as above color change only Brown (7.5/4/2)		5499
3.5			0.0	102	- same as above color change only Reached bedrock at 47 inches mechanically weathered bedrock		5032
4.0					No Anomalies		5554
4.5					Total depth Reached at 47 inches (3.5 ft bgs)		
5.0					No Groundwater encountered		
5.5							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ WEST EAST	Group: EAST	Location ID: NBZ-42
Drilling Company: HydroGeoLogic, Inc.	Driller: <i>M Birney</i>	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1530	Date/Time Total Depth Reached: 03/29/2012 0.5ft 1555	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90072 (1000)	
Geologist: <i>Colleen Garcia</i>	Checked By / Date: <i>Cliff Knight 3/29/12</i>			

Radiological Background: NA	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.1 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Gamma Readings (CPM)
0.5			0.1	54	<p><i>Break.</i></p> <p>Asphalt; Glass bottles; metal pipes; concrete block - *Artificial fill; No odor</p> <p>0.6 inches Concrete & charcoal</p> <p>2775 (Downhole) Silty Sand. 0.4m</p> <p>organic material @ sand 10% coarse</p> <p>(Rootlets) Wet/Moist.</p> <p>(10YR/4/3) Medium to dark silty sand</p> <p>Brown. No staining. LOOSE</p> <p>20% silt</p> <p>75% medium sand.</p> <p>5% fine sand.</p>	AF		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total depth 0.5ft
No groundwater encountered.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ EAST	Group: EAST	Location ID: NBZ-43	
Drilling Company: HydroGeoLogic, Inc.		Driller: M. Birney		Ground Elevation: NA		Total Depth Drilled: 18 inches. ft bgs.	
Drilling Equipment: Hand Auger Hand Auger OK		Borehole Diameter: 3 inches		Date/Time Drilling Started: 1522		Date/Time Total Depth Reached: 03/26/2012 / 18 inches / 1530	
Type of Sampling Device: Hand Auger Hand Auger OK		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90074 (1535)			
Geologist: Coleen Garcia		Checked By / Date: WJ [Signature] 3-28-12 3/27/12					
Radiological Background: NA / 933249		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0		ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	SCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
			0.0	60	71% clay and silt 22% silt 7% sand; 0.1 coarse sand, yellow brown color (10YR/4/4) compacted moist; no odor; no staining; cohesive	[GM]	3249
0.5			0.1	54	10 inches 2nd refusal - silty sand. Loose	[FM]	
1.0			0.1	40	14 inches 1st refusal		
2.0			0.1	112	18 inches 3rd refusal. Bedrock encountered 18 inches sandstone. Total depth reached at 18 inches. No groundwater encountered.		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: NBZ-44
Drilling Company: HydroGeoLogic, Inc.	Driller: M. W. Wynn	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 12:50 07/29/12/2013	Date/Time Total Depth Reached: 0.5 ft bgs.	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		190075 (1315)	
Geologist: P. Carcia	Checked By / Date: W. Knuff 9-2-12			

Radiological Background: NA / 2924 / 53	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.1 ppm
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Depth (ft bgs)	Interval	Recovery	RID	Radiological	Description At: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.1			90	2950	<p>Plastic material Silt/sand mixture with metal shavings Silty sand 15% silt; 85% fine sand; 40% med sand; 1% coarse sand. (7.5 yr / 5/2) Brown; Loose; cohesive; nonplastic; no odor; no staining; Dry; Knotlets; Glass; metal shards</p>	SM		
0.5			90	3350				
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth Reached 0.5 ft.
No groundwater encountered.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EP038	Location ID: NBZ-44	
Drilling Company: HydroGeoLogic, Inc.		Driver: M. Kinney		Ground Elevation: NA		Total Depth Drilled: 1.0 ft ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: 1305 03-12-13 10:40 AM		Date/Time Total Depth Reached:	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90070 No sample shallower Refusal			
Geologist: C. Garcia				Checked By / Date: W. Knott 4-2-12			
Radiological Background: NA 1926/53		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.1 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.1 72		Surface Glass, Plastic Bottle cap; Asphalt Metal shards; Silt and 15% silt; 70% fine sand; 4% med sand; 10% coarse; (7.5 R/5/2); Brown; Loose; cohesive; non plastic; no odor or staining; Dry; roots; Glass metal shards	SM AF	
1.0			0.1 102		No sample taken shallower. Refusal at 1 ft Artificial Fill		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ EAST	Group: East	Location ID: NBZ-45
Drilling Company: HydroGeologic, Inc.	Driller: M Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 11:50 AM 03/26/2012	Date/Time Total Depth Reached: 11:36 AM 03/26/2012	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)	Checked By / Date: C. Garcia 3/26/12		

Radiological Background: N/A	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.1 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0 - 0.5			0.1	Pancake	Asphalt present at sample location Dark Brown color (2.54/1/3) Silty sand; cohesive, non plastic MOIST; 85% sand; 15% silt; 3200cpm (downhole) loose; no odor; no staining; trace rootlets	GM	3000
0.5 - 1.0			0.1			SM	3200
1.0 - 2.0							
2.0 - 3.0							
3.0 - 4.0							
4.0 - 5.0							
5.0 - 6.0							

Total depth = 0.5 ft
No groundwater encountered
No anomalies.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ <i>CEAST</i>	Group: <i>CAAT</i>	Location ID: <i>NBZ-46</i>
Drilling Company: HydroGeoLogic, Inc.	Driller: <i>M Birney</i>	Ground Elevation: NA	Total Depth Drilled: <i>0.5</i> ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: <i>0747 0930</i>	Date/Time Total Depth Reached: <i>03/26/2012 0930 0.5 bgs</i>	
Type of Sampling Device: Trowel/ <u>Shovel</u>	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <i>#21(0947) 90079</i>			
Geologist: <i>Colton Garcia</i>	Checked By / Date: <i>WJ Knight 3-28-12</i>			

Radiological Background: <i>NA / 29.76 counts/hr</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: <i>0.0</i> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			60	<i>Pancake</i>	<i>Silty sand; Dark Brown; (7.5yr/2.5/2) vegetation pieces; non-cohesive; coarse grain size; organic; very loose; No odor; Moist; No staining;</i>	<i>GM</i>		
0.0			54 <i>3258</i>		<i>(downhole) 85% sand 15% silt</i>	<i>GM</i>		
<p>Total depth = 0.5 ft No groundwater encountered. No anomalies.</p>								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EPA	Location ID: NBZ-46	
Drilling Company: HydroGeoLogic, Inc.		Driller: M Birney		Ground Elevation: NA		Total Depth Drilled: 7.0 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: 0947 03/26/2012 1115		Date/Time Total Depth Reached: 7.0	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90080 (1121)			
Geologist: C Garcia				Checked By / Date: Bill Knudsen 3/28-12			
Radiological Background: NA/2976d		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	every 6 inches Borehole Gamma Readings 3001 Feet bgs. (CPM)
0.5			0.0	42	Dark Brown Silty sand (7.5R/2.5Y); cohesive nonplastic; no odor; no staining; moist; loose; 85% fine sand 15% silt rootlets;	SM	3732
1.0			0.0	60	description above.		4089
2.0			0.0	60	Light Brown color (7.5YR/4/4) loose nonplastic; cohesive; rootlets;	SM	5017
3.0			0.0	42	silty sand; 20% silt 70% fine sand 10% med sand. no staining no odor. moist		5397
4.0			0.0	60			6015
5.0			0.0	42	tan (7.5Y/4/3) silty sand; 40% coarse 80% fine sand; 20% silt. loose sand; rootlets; no staining no odor, moist 76%.	SM	6083
6.0			0.0	42			6093
			0.0	77			5786
			0.0	60			5886
			0.0	42			5869
			0.0	42			5851
			0.0	42	10YR 15/6 color change only	SM	5768
			0.1	77	10YR/6/6 color change only.	SM	5705
			0.0	90			5766

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NBZ EP038 CA NBZ-46	Group:	Location ID:		
Radiological Background: NA/2970		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	96			5766
			0.1	60	Core change only 7.5/6/6	SM	6002
7.0			0.1	60	sandstone, yellowish brown (10YR/5/4) bedrock mechanically no not staining Weathered Bedrock. (R)		6012
8.0					No Anomalies Total Depth 7.0ft No groundwater encountered.		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 47
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 7.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/23/12 1503	Date/Time Total Depth Reached: 3/23/12 1615	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90081 (1615)	
Geologist: L Robbins Goldman	Checked By / Date: WJ Knight 3-27-12			

Radiological Background: 14/3019/44	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			102	pancake	Surface: wood chips, grass + soil		405-2951
0.5			90		Silty sand: dark brown (10YR 3/3), 75% fine to med. sand, 25% silt, no odor or staining, moist, dense, low plasticity, trace rootlets	SM	3208
1.0			54				4206
2.0			54		Silty sand: very dark brown (7.5 YR 3/2), 75% fine sand, 10% med sand, 15% silt, moist, no odor or staining, cohesive, low plasticity, trace rootlets, dense	SM	4917
2.5			72				5321
3.0			78				5275
3.5			60				5439
4.0			72				5495
4.5			60				5258
5.0			78		Silty sand (unit same as above note color change) very dark yellowish brown (10YR 4/6)	SM	5182
5.5			78				5255
6.0			72		Silty sand: light olive brown (2.5Y 5/4), 85% fine sand w/ silt, 10% med. sand, 10% silt, moist, dense, no odor or staining, trace	SM	5323
6.5			72				5170
7.0			72				4842

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	NBZ	east	48① 47		
Radiological Background:		Radiological Equipment Used:		PID Used:			
14/3025/54		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.1	72	sand w/ silt (unit same as above)	SM	6 4842
			0.1	66			4639
7.0			0.1	54			7 4624
			0.1	66	sandstone bedrock: (2.54 7/4) pale brown, moist, very dense, no odor or staining, slightly mottled w/ iron oxide, mechanically weathered to sp	Bedrock (SP)	8 4821
8.0							8
					total depth = 7.5' bgs no groundwater encountered no anomalies		9
9.0						9	
						10	
10.0						10	
						11	
11.0						11	
						12	
12.0						12	
						13	
13.0						13	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22:04.03		Subarea: NBZ	Group: east	Location ID: 48	
Drilling Company: HGL		Driller: M. Birney		Ground Elevation: NA		Total Depth Drilled: 6 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 3/22/12 11:22		Date/Time Total Depth Reached: 3/23/12 1450	
Type of Sampling Device: Handauger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: L Robbins Goldman				Checked By / Date: Bill Lambert 3/22/12 90083 (1455)			
Radiological Background: 14/3025/34		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings to 5' 3272 (CPM)
			0.0	84	pancake (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface = soil + grass			3094
0.5			0.1	84	silty sand: dark yellowish brown (10YR 3/4), 65% fine sand, 5% med. sand, 30% silt, moist, no odor or staining, cohesive, low plasticity, dense, trace rootlets, charcoal pieces (2mm-5mm)	SM		4493
			0.1	78				5256
1.0			0.1	78				5618
			0.1	78				5841
2.0			0.1	60	silty sand: dark yellowish brown (10YR 4/6) unit same as above, trace roots (2mm dia)	SM		5980
			0.1	72				5980
3.0			0.1	92				5980
			0.0	96				5872
4.0			0.1	36	silty sand: light yellowish brown (10YR 6/4), 85% fine to med. sand, 15% silt, moist, cohesive, low plasticity, dense	SM		5938
			0.1	56				5924
5.0			0.1	78				5973
			0.1	54	sandstone bedrock: yellow (10YR 7/6), very dense moist, no odor or staining, mechanically weathered to SP	Bedrock		5853
6.0			0.1	72				5853

total depth = 6.0' bgs
no GW encountered

(SP)

SSFL BORING LOG



NBZ_049

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: N152	Group: R08A	Location ID: 49
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 3.2 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/22/12 10:50	Date/Time Total Depth Reached: 3/22/12 11:27	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90084 (1135)	
Geologist: L. Robbins Goldman	Checked By / Date: [Signature] 3/22/12			

Radiological Background: 13/3074/51	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	pancake	Surface: Soil + grass		105 = 3166
0.5			0.0	78	silty sand; sand & silt: dark brown (7.5 YR 3/3), 65% fine sand, 10% med. sand, 25% silt, moist, cohesive, low plasticity, no odor or staining, dense, trace rootlets	SM	3137
1.0			0.0	84			4148
1.5			0.0	72	Silty sand: brown (7.5 YR 4/4), 70% fine sand, 5% med. sand, 25% silt, moist, cohesive, no odor or staining; dense, trace rootlets	SM	5022
2.0			0.0	84			5252
2.5			0.0	90	--- (LRG) ---		5375
3.0			0.0	54			5499
3.5			0.0	54	sandstone bedrock: light yellowish brown (10 YR 6/4), moist, no odor, cohesive or staining, mechanically weathered to SP	Bed-rock (SP)	5309
4.0					total depth 3.21 or 38 inches no groundwater encountered no anomalies		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: EAST	Location ID: NBZ-50
Drilling Company: HydroGeoLogic, Inc.	Driller: <i>M. Borely</i>	Ground Elevation: NA	Total Depth Drilled: 25 inches ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: <i>4:35 PM 3/26/2012</i>	Date/Time Total Depth Reached: <i>11:43 AM 3/26/2012</i>	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		9.0086 (1233) 3-20-12	
Geologist: <i>Colleen Garcia</i>	Checked By / Date: <i>Colleen Garcia 3/26/2012</i> OK 3/27/12			

Radiological Background: <i>NA 3048 / 19</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0				Pancake			
0.0			96		<i>very dark brown, moist, silty sand; organic rootlets; (7.5/2.5/2)</i>	[SM]	3121
0.5			20	72	<i>0.4 med grain sand - 85% med. sand 15% silt noncohesive; plastic, nonstaining, very dark brown.</i>		3344
1.0			0.1	54	<i>Medium sand and some coarse sand moist 1% coarse sand 99% med sand 15% silt fine sand. Loose.</i>	[SM]	4771
2.0			0.1	60	<i>staining same color 7.5/2.5/2 Noodor very dark brown nonplastic</i>		5435
2.0			0.0	60	<i>Bedrock Total Depth 25 inches Shallow Refusal at 25 inches</i>	Bedrock	5801
3.0					<i>1st refusal 18 inches</i>		5603
4.0					<i>2nd refusal 25 inches</i>		
5.0					<i>3rd refusal 10 inches</i>		
6.0					<i>No groundwater encountered</i>		
					<i>No anomalies.</i>		

SSFL BORING LOG



NBZ_051

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: east	Location ID: 51	
Drilling Company: HGL		Driller: M. Birney		Ground Elevation: NA		Total Depth Drilled: 2.25 (16) 2.33 (16) ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 1000 3/23/12		Date/Time Total Depth Reached: 3/23/12 1035	
Type of Sampling Device: Handauger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90087 (1041)			
Geologist: L Robbins Goldman				Checked By / Date: With Knut 3-27-12			
Radiological Background: 13/348/59		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5 = 3109 (CPM)
0.0			66		surface: wood chips, soil, grass		
0.5			54		silty sand: dark brown (7.5YR, 3/2), 80% fine sand, 20% silt, moist, no odor or staining, cohesive, low plasticity, dense, trace rootlets, small charcoal flakes	SM	3299 (16) 5322
1.0			84		8" silty sand: unit same as above, note color change: yellowish brown (10YR 5/6)	SM	5322 (16) 6120
2.0			48		10" sand w/ silt: yellowish brown (10YR 5/6), 85% fine sand, 15% silt, moist, no odor or staining, cohesive, dense, trace rootlets	SM	6120 (16) 6947
3.0			60		sandstone bedrock: yellowish brown (10YR 5/6), moist, no odor or staining, mechanically weathered to SP	bed-rock (SP)	6947 (16) 5847
4.0					total depth: 28 inches		NM
5.0					no groundwater encountered		
6.0					no anomalies		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: East	Location ID: 52	
Drilling Company: HydroGeoLogic		Driller: M. Birney / T. Morse		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 3/15/12 1154		Date/Time Total Depth Reached: 3/15/12 1205	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90264 (1205)			
Geologist: L. Robbins Goldman				Checked By / Date: J. Robbins Goldman 3/16/12			
Radiological Background: 9/2131/69		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	9/69	0" - 2" : silty sand w/ gravel: brown (10YR 5/3), 25% angular non-native (road) gravel (10-15mm), 60% med. sand, 10% fine sand, 5% silt, dry, dense, non-cohesive, low plasticity, slow dilatancy, no odor or staining, debris present in trace amount: glass	SM / AF	
0.5			0.0	10/48	2" - 6" : Silty sand: dark yellow with brown (10YR 3/6), 65% med. sand, 15% fine sand, 15% silt, 5% clay, dry, low dense, low plasticity, slow dilatancy, no odor, no staining	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					no GW encountered TD = 0.5' bgs location not moved		

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: A42	Location ID: 52
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/15/12 1210	Date/Time Total Depth Reached: 3/15/12 1225	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90088 (n/a)	
Geologist: L. Robbins Goldman	Checked By / Date: L. Robbins Goldman 3/16/12			

Radiological Background: 9/2131/69	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	54	AF = artificial fill surface: grass + soil		
0.5			0.0	42	Silty sand w/ gravel: brown (10YR 5/3), 25% angular non-native (road) gravel (10-15mm), 60% med. sand, 10% fine sand, 5% silt, dry, dense, non cohesive, low plasticity, slow dilatancy, no odor or staining, debris present in trace amount: glass.	SM / AF	NM
1.0			0.0	54	2"-7": silty sand: dark yellowish brown (10YR 3/6) 65% med. sand, 15% fine sand, 15% silt, 5% clay, dry, low dense, low plasticity, slow dilatancy, no odor, no staining, 2" thick interbedded sand layer (described below)	SM	Shallow refusal
2.0			0.0	54	7"-1.5': sand w/ silt: yellowish brown (10YR 5/6), 25% coarse subrounded sand, 25% med. sand, 25% fine sand, 25% silt, semi-moist dense, low plasticity, med dilatancy, non-cohesive, no odor, no staining.	SM SM SM	
3.0					1.5'-1.5': sandstone bedrock: brown (10YR 5/3), trace Fe oxidation nodules, mechanically weathered to SP, no odor		
4.0							
5.0							
6.0							

- total depth = 1.5' bgs
- no bw encountered
- no sample collected due to shallow refusal

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east #416	Location ID: ST-53
Drilling Company: HydroGeoLogic	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 4.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/15/12 1409	Date/Time Total Depth Reached: 3/15/12 1415	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90089 (1415)	
Geologist: L. Robbins Goldman		Checked By / Date: L. Robbins Goldman 3/16/12		

Radiological Background: 10/2226 / 52	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	10/2226	<p>→ M/R pancake AF=artificial fill</p> <p>silty sand w/ gravel: brown (10YR 5/3), 25% angular non-native gravel (~10mm-20mm size), 60% med. sand, 10% fine sand, 5% silt, dry, dense, non-cohesive, low plasticity, slow dilatancy, no odor or staining, debris present in trace amount: glass, concrete, aluminum strap, trace rootlets, piece of metal ties, wire, metal (~35 mm Long x 15 mm tall)</p>	AF / SM		NM
0.5			0.0	10/18	<p>no GW encountered</p> <p>TD=0.5' bgs</p> <p>location not moved</p>			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: A02	Location ID: 54(6) 53
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4.5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/15/12 1424	Date/Time Total Depth Reached: 3/15/12 1433	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90090(i440)			
Geologist: L Robbins Goldman	Checked By / Date: L Robbins Goldman 3/16/12			

Radiological Background: 1022261 52	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5 = 2481 (CPM)
					AF = artificial fill Surface = grass + soil		
0.5			0.0	86	Silty sand w/ gravel: brown (10YR 5/3), 25% angular non-native gravel (v 10mm-20mm size), 60% med. sand, 10% fine sand, 5% silt, dry, dense, non-cohesive, low plasticity, slow dilatancy, no odor or staining, debris present in trace amount: glass, concrete, aluminum strap, piece of metal ties, wire, metal piece (v 35 mm long x 15 mm tall), trace rootlets	AF	2534
			0.0	72		SM	3127
1.0			0.0	66			3117
			0.0	66			3072
2.0			0.0	54			NM
			0.0	60			
3.0			0.0	90	-asphalt layer (1" thick), pieces range from 1mm to 10mm		
			0.0	60	sandy silt: dark yellowish brown (10YR 4/4), 50% fine sand, 30% med. sand, 20% silt, dry, dense, med. plasticity, slow dilatancy, no odor or staining, debris present in trace amounts: glass, wire, 2" asphalt layer present at 3'6", trace charcoal flakes (6) flakes, small mica flecks	SM	
4.0			0.0	48		AF	
			0.0	56		SP	
5.0					41 3/4" 41 1/4" sand w/ silt: light yellowish brown (2.5Y 4/3), 75% (6) 65% med. sand, 25% med. sand, 10% silt, dry, dense, no odor or staining, 3" thick sandy silt layer as described	bed rock	
6.0					45" above Sandstone bedrock: yellow (2.5Y 7/3), trace iron oxide layers, mechanically weathered to SP		

total depth = 4.5' bgs

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EAST #22 12	Location ID: 54	
Drilling Company: HydroGeoLogic		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 3/22/12 1329		Date/Time Total Depth Reached: 3/22/12 1340	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90091 (1345)			
Geologist: L Robbins Goldman				Checked By / Date: Will Kintz 3-26-12			
Radiological Background: 11/2311 / 95		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
0.0			50		Surface: grass, soil. AF = artificial fill		
0.5			11		Silty sand w/ gravel: dark brown (10YR 3/3). 70% sand, 20% silt, 10% angular gravel (road-fill gravel), dry, loose, no odor or staining, abundant debris: plastic (~30mm) glass (~20mm), 2 metal straps (~1ft length each)	SM AF	
1.0			72				
2.0					total depth = 0.5' bgs no GW encountered location not moved		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 54
Drilling Company: HGL	Driller: J. LeVargie	Ground Elevation: NA	Total Depth Drilled: 2.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/22/12 1330	Date/Time Total Depth Reached: 3/22/12 1425	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90092 (1430)	
Geologist: L Robbins Goldman		Checked By / Date: Cliff Thumby 3-26-12		

Radiological Background: 11/2311/95	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5 = 2754 (CPM)
					Surface: grass + soil AF = artificial fill		
0.5			0.0	50	Silty sand w/ gravel: dark brown (10YR 3/3), 70% sand, 20% silt, 10% angular gravel (road fill gravel). dry, loose, no odor or staining, abundant debris: plastic (~30mm), glass (~20mm), 2 metal straps (~1 foot length each)	SM AF	2786
			0.0	72			3211
1.0			0.0	72			4229
			0.2	72			4954
2.0			0.1	90	Silty sand with gravel same as above, note color change: brown (10YR 5/3), debris: glass (~12mm)	SM AF	5389
			0.1	48	Sandstone bedrock: ⁹⁰ 2.5 pale brown (2.5Y 7/3), dense moist, no odor or staining, mechanically weathered to SP	Bedrock (SP)	5283
3.0							
4.0							
5.0							
6.0							

total depth = 2.5' bgs (or 33")
no groundwater encountered
no anomalies

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: East	Location ID: 55	
Drilling Company: HydroGeoLogic		Driller: L Robbins Goldman		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 113 3-22-12		Date/Time Total Depth Reached: 1130 3-22-12	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90093 (1135)			
Geologist: M Birney				Checked By / Date: <i>Cliff Johnson</i> 3/26/12			
Radiological Background: 12/3/17/74		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.1 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.1	64/14	pancake / Micro (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
1.0			0.1	84/15	Surface - scattered grass + soil		
1.0			0.1	84	Silty sand, dark brown (10gr 3/3) 70% fine to med coarse grain sand, 30% silt, cohesive, dense, trace rootlets no odor, no staining, moist	SM	
2.0							
3.0							
4.0							
5.0							
6.0							
					TD = 5"		
					NO groundwater encountered		

SSFL BORING LOG



NBZ_056

sheet 1 of 1

East

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: 206	Location ID: 56
Drilling Company: HydroGeoLogic	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/15/12 1526	Date/Time Total Depth Reached: 3/15/12 1533	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90095 (1535)	
Geologist: L. Robbins Goldman	Checked By / Date: J. Robbins Goldman 3/16/12			

Radiological Background: 12/2928/61	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	13/108	AF = artificial fill, surface: soil, woodchips grass silty sand; dark brown (10YR 3/3), 65% med. sand, 15% fine sand, 20% silt, dry, loose, low plasticity, non-cohesive, med. dilatancy, no odor or staining, trace rootlets, trace debris-glass	SM AF	1	
1.0			0.0	13/54			2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	

total depth = 0.5'
no refusal
no GW encountered
no (6)

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: A12	Location ID: 56
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4.0 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/15/12 1540	Date/Time Total Depth Reached: 3/15/12 1613	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90096 (1613)			
Geologist: L. Robbins Goldman	Checked By / Date: L. Robbins Goldman 3/16/12			

Radiological Background: 12/2928/61	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0 - 0.5			0.0	66	Silty sand: dark brown (104R 3/3), 65% med. sand, 15% fine sand, 20% silt, dry, loose, low plasticity, non cohesive, med. dilatancy, no odor or staining, trace rootlets, trace debris - glass.	SM	3578
0.5 - 1.0			0.0	54		AF	4279
1.0 - 1.5			0.0	60			5013
1.5 - 2.0			0.0	54			5406
2.0 - 2.5			0.0	54	Silty sand w/ gravel: brown (104R 5/3), 15% subangular non-native gravel (~2mm), 65% med. sand, 10% fine sand, 10% silt, dry, loose, no odor or staining, large pieces of chlorite fractured slate (fill)	SM	5584
2.5 - 3.0			0.0	66		AF	5740
3.0 - 3.5			0.0	108	Silty sand: dark yellowish brown (104R 3/3), same as described from 0'-2' above, rootlets present, no debris present	SM	5468
3.5 - 4.0			0.0	60			NA
4.0 - 4.5			0.0	66	Sand w/ silt: brownish yellow (104R 6/6), 65% med. sand, 15% fine sand, 20% silt, semi-moist, dense, low plasticity, med. dilatancy, no odor or staining.	SM	NA
4.5 - 5.0						Bedrock	NA
5.0 - 5.5					Sandstone bedrock: brownish yellow (104R 6/6), some iron-oxide nodules, biotite flecks (~1mm), mechanically weathered to SP		
5.5 - 6.0					total depth = 4.0' bgs no GW encountered		

refusal on bedrock
no anomalies

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: 57
Drilling Company: HGL	Driller: AA Robbins Goldman	Ground Elevation: NA	Total Depth Drilled: 1' 6" + 2' NA ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 08573-23-12	Date/Time Total Depth Reached: 923 3-23-12	
Type of Sampling Device: Handauger	Geologist: M Birney	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)	90097 (6935)	
Radiological Background: 12 / 3448 / 69	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	108	surface: soil + grass		
0.5			0.0	78	Silty Sand, Dark yellowish brown (10gr 3/4)	Sm	
1.0			0.0	66	75% fine to med coarse grain sand, 25% silt, semi moist, cohesive, low plasticity, no odor, no staining, loose		No down hole data collected due to shallow refusal
2.0			0.0	72	Silty Sand, Dark yellowish brown (10gr 4/4)	sm	
					80% fine to med coarse grain sand, 20% silt, semi moist, cohesive, low plasticity, no odor, no staining, loose, dense	bedrock (SP)	
3.0					Sandstone bed rock, yellowish brown (10gr 5/6) dense, semi moist, mechanically weathered to sp, no odor, no staining.		
4.0							
5.0							
6.0							

TD 18 inches

No groundwater encountered

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: A52	Location ID: 58
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/15/12 1045	Date/Time Total Depth Reached: 3/15/12 1058	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90098 (1125)			
Geologist: L. Robbins Goldman	Checked By / Date: J Robbins Goldman 3/16/12			

Radiological Background: 16/2901/86	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	54	Silty sand: dark yellowish brown (10YR 3/6), 65% med. sand, 15% fine sand, 15% silt, 5% clay, dry, low dense, low plasticity, slow dilatancy, no odor, no staining, trace rootlets in upper 2' of unit	SM	3601
0.5			0.0	72			4833
1.0			0.0	78			5377
			0.0	1278			5718
2.0			0.0	96			5782
			0.0	90			5700
3.0			0.0	60		5765	
			0.0	78		5842	
4.0			0.0	66		5973	
			0.0	78	4'6" silty sand: dark yellowish brown (10YR 4/6) 75% med. sand, 10% fine sand, 10% silt, 5% clay, (med. sand-sub rounded), semi-moist, med. dense, low plasticity, slow-med. dilatancy, no odor, no staining,	SM	5827
5.0			0.0	66	50' bedrock sandstone: brownish yellow (10YR 6/6), mechanically weathered total depth = 5' bgs to SP no GW encountered NO anomalies	Bedrock (SP)	5701
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 59
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.8 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/22/12 1:56	Date/Time Total Depth Reached: 3/22/12 (1650)	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)	Field No: 90253 (NA) 90099 (1055)		
Geologist: L. Robbins Goldman	Checked By / Date: W. Knight 3-26-12			

Radiological Background: 23/3049/75	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.1 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
					pancake Surface: soil, woodchips, sparse grass		
0.5			0.1	66	Silty sand: dark brown (10YR 3/3), 80% fine to med. sand. 20% ^{silt} moist, no odor or staining, dense, cohesive, low plasticity	SM	
1.0			0.0	78			
1.0			NM	NM	0.8' Sandstone bedrock: olive brown (10YR 4/3), moist, dense, no odor or staining	bed-rock	
					Total depth = 0.8' or 10" bgs no groundwater encountered		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: east	Location ID: 60	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 1 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 3/22/12 1008		Date/Time Total Depth Reached: 3/22/12 1020	
Type of Sampling Device: Handauger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90100 (1024)			
Geologist: L Robbins Goldman				Checked By / Date: C. J. Knight 3-26-12			
Radiological Background: 13/3180/86		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.1 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.1			54		Surface = soil + grass AF = artificial fill	SM	
0.1			78		Silty sand: very dark grayish brown (10YR 3/2), 75% fine sand, 25% silt, moist, no odor or staining, dense, low plasticity, cohesive, trace rootlets, trace gravel pieces, a melted glass w/ metal encountered (debris)	AF	NM
0.1			60		Sandstone bedrock: olive brown (10YR 4/3), moist, very dense, no odor or staining, mechanically weathered to SP total depth = 1'	bedrock (SP)	
no groundwater encountered							
sample collected from 0-1' bgs							
no gamma readings due to shallow depth							

SSFL BORING LOG



NBZ_061

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 61
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/22/12 808	Date/Time Total Depth Reached: 3/22/12 940 (R6) 3/22/12 0940	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90101 (940)	
Geologist: L Robbins Goldman	Checked By / Date: Will Knudsen 3-26-12			

Radiological Background: 14/3309/71	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings +0.5 = 3248 (CPM)
0.0			72		pancake Surface = soil + grass		
0.5			55		Silty sand: dark brown (10YR 3/3): 75% fine sand, 25% silt, no odor or staining, moist, cohesive, low plasticity, dense, trace rootlets, small charcoal flecks	SM	3310
1.0			60				5307 5705
			80				5705
2.0			80		Sandstone bedrock: olive brown (10YR 4/3) moist, very dense, no odor or staining	Bedrock	6383
3.0							
4.0							
5.0							
6.0							

total depth = 2' bgs
no groundwater encountered
no anomalies

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 62
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 35 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/21/12 1510	Date/Time Total Depth Reached: 3/21/12 1533(G) 1550	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.), 90102 (1555)		Checked By / Date: Will Thuttho 3-28-12	
Geologist: L Robbins Goldman	Radiological Background: IS/3218/76	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 105 = 3118 (CPM)
0.0			0.0	72	Surface = grass + soil AF = artificial fill		
0.5			0.0	96	Silty sand: dark brown (10YR 3/3), moist, loose, 65% fine sand, 35% silt, cohesive, no odor or staining, trace rootlets, trace gravel fragments (angular)	SM AF	3226 4265
1.0			0.0	72			5094
			0.0	54			5478
2.0			0.0	72			5578
			0.0	84	← 3'3" large elderberry roots encountered		5659
3.0			0.0	96			5551
			0.1	102	Sandstone bedrock: yellowish brown (10YR 6 5/4), dense, moist, mechanically weathered to SP, no odor or staining	Bed Rock (SP)	5244
4.0							
5.0							
6.0							

total depth = 35' bgs
no groundwater encountered
no anomalies

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: east	Location ID: 63	
Drilling Company: HGL		Driller: M. Birney		Ground Elevation: NA		Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 3/24/12 1430		Date/Time Total Depth Reached: 3/24/12 1450	
Type of Sampling Device: Handauger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90103 (1450)			
Geologist: LR Goldman				Checked By / Date: Duff Knight 3-28-12			
Radiological Background: 14/3455/87		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	54	pancake Surface: Soil + grass		
0.5			0.0	54 54	Silty sand: dark brown (10YR 3/3), 80% fine to med. sand, 20% silt, moist, no odor or staining, low plasticity, med. dense.	SM	NM
1.0			0.0	60	sandstone bedrock: dark yellowish brown (10YR 4/4), moist, no odor or staining, mechanically weathered to SP		
2.0			0.0	78			
<p>total depth = 1.5' bgs no groundwater encountered refusal on sandstone sample collected from 0.0' - 1.5'</p>							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 64	1.25'
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 14' ft bgs.		
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/28/12 1330	Date/Time Total Depth Reached: 3/28/12 1350		
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90104 (1350)		
Geologist: L Robbins Goldman	Checked By / Date: M. Knight 3-28-12				

Radiological Background: 15/3229/80	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.1 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			54		Surface: soil, grass			NM
0.5			56		Silty sand: 70% very dark grayish brown (10YR 3/2) 75% fine to med sand, 25% silt, no odor or staining, moist, loose, trace rootlets.	SM		NM
1.0			48		Sparse + scattered asphalt chunks on the surface.			NM
2.0			72		Sandstone bedrock: yellowish brown (10YR 5/4), moist, no odor or staining.	Bedrock		NM
					Total depth 14 ft. 3 in.			
					NO groundwater encountered			
					no gamma downhole readings due to total depth			
					Sample collected from 0.0' to 14' bgs. 1.25'			

SSFL BORING LOG



NBZ_065

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 65
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/2/12 1050	Date/Time Total Depth Reached: 3/2/12 1110	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90105(1120)	
Geologist: L. Roberts Goldman	Checked By / Date: Dell J. Hurd 3.28.12			

Radiological Background: 12/3021/76	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.1 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface = soil + sparse weeds		+0.5 = 2915
0.5			0.0	66	Silty sand: brown (10YR 4/3), 65% fine sand, 10% med sand, 25% silt, moist, no odor or staining, cohesive, low plasticity, trace rootlets, loose	SM	3001
			0.0	72			4724
1.0			0.0	48			5301
			0.0	72			5473
2.0			0.0	84	sandstone bedrock: light yellowish brown (10YR 6/4) fine to med. grained, semi-moist, no odor or staining, mechanically weathered to SP	Bed-rock	5532
3.0							
4.0							
5.0							
6.0							

total depth = 2' bgs
no groundwater encountered
no anomalies

SSFL BORING LOG



NBZ_066

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: 66
Drilling Company: HGL	Driller: M Binney	Ground Elevation: NA	Total Depth Drilled: 3 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 909 3-21-12	Date/Time Total Depth Reached: 1001 3-21-12	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90106 (1000)	
Geologist: L Robbins Goldman	Checked By / Date: Will [Signature] 3-28-12			

Radiological Background: 14/3221/60	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 10.5 = 3257 (CPM)
			0.0	78	Surface: grass + soil		
0.5			0.0	54	silty sand: dark brown (10YR 3/3), 75% fine to med. sand, 25% silt, moist, cohesive, low plasticity, no odor or staining, loose, abundant rootlets, some mica flecks + quartz grains	SM	3448
1.0			0.0	72			3944
			0.0	72			4886
			0.1	96	1'6" silty sand: (10YR 5/4) yellowish brown, unit is the same as described above.	SM	5018
2.0			0.0	66			5189
			0.0	84			5226
3.0			0.0	54	3' sandstone bedrock: yellowish brown (10YR 5/4) moist, dense, mechanically weathered to Sp, trace rootlets in upper contact	Bedrock (Sp)	5030
					total depth = 3' bgs no groundwater encountered no anomalies		
4.0							
5.0							
6.0							



east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: A02	Location ID: 67
Drilling Company: Boat Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 2.5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/16/12 1110	Date/Time Total Depth Reached: 3/16/12 1118	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90107-1140	
Geologist: J. Starn	Checked By / Date: Chill/Kumha 3-19-12			
Radiological Background: 9 / 3366 / 51	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 00 ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	54	Silty Sand, Dark Yellowish Brown (4/4 10YR) 60% fine sand, 40% silt, trace rootlets, dry low dense, no odor or staining	SM	3399
0.5			0.0	48			4751
1.0			0.0	54	Silty Sand, Strong Brown (5/8 7.5YR) 80% fine sand, 20% silt, moist, med. dense, no odor or staining	SM	5448
			0.0	60			5622
2.0			0.0	60			5487
3.0			0.0	54	Sand w/ silt, Yellowish Brown (5/6 10YR) 90% fine sand, 10% silt, moist, high dense, no odor or staining	SP	5243
4.0							
5.0							
6.0							

TD = 2.5 ft bgs
NO gw encountered

SSFL BORING LOG



NBZ_068

1 of 1

East

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ		Group: A42		Location ID: 68	
Drilling Company: Boart Longyear		Driller: Don Hansen		Ground Elevation: NA		Total Depth Drilled: 3.5 ft bgs.			
Drilling Equipment: 6600 Geoprobe		Borehole Diameter: 1.75 in.		Date/Time Drilling Started: 3/16/12 0931		Date/Time Total Depth Reached: 3/16/12 0938			
Type of Sampling Device: 1.75 macrocore with acetate liner				Samples Collected: 90108 - 1005 One 1/2 Gallon Bag (Approx 8 lbs.)					
Geologist: I. Stone				Checked By / Date: <i>Cliff Knight</i> 3-19-12					
Radiological Background: 9 / 3011 / 31		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm				

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings 0.5 = 2954 (CPM)
0.5			0.0	48	Silly Sand, Dark yellowish brown (3/4 10YR) 80% fine sand, 20% silt, trace rootlets, dry, low dense, no odor or staining	SM	3281
1.0			0.0	66	Silly Sand, Dark Brown (3/3.75 YR) 70% fine sand, 30% silt, moist, med dense, no odor or staining	SM	4238
2.0			0.0	54			5026
			0.0	60			5360
			0.0	72	Sand w/silt Strong Brown (4/6 7.5 YR) 85% fine sand, 5% medium sand, 10% silt, moist, med dense, no odor or staining	SP	5505
			0.0	78			5789
3.0			0.0	66	Sand (weathered silty) Brownish Yellow (6/6 10YR) 80% fine sand, 15% medium sand, 5% silt, moist, high dense, no odor or staining	SP	5760
			0.0	66			5454
4.0					TP = 3.5 ft bgs No LW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: 69
Drilling Company: HGL	Driller: CRK	Ground Elevation: NA	Total Depth Drilled: 4 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3:59 3-20-12	Date/Time Total Depth Reached: 1443 3-20-12	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90109 (1443)	
Geologist: M Birney	Checked By / Date: Jeff Young/AT 3-21-12			

Radiological Background: 21 / 3523 / 72	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.1 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. CPM
0.0			0.1	78	<p><i>Pancake</i></p> <p>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</p> <p>Silty sand; very dark brown (10yr 2 1/2) 70% fine sand 30% silt, semi moist, loose, low plasticity, cohesive, trace rootlets, mica flakes no odor, no staining</p>	SM	3683
0.5			0.1	84		4670	
1.0			0.1	78		5375	
1.5			0.1	78		5537	
2.0			0.1	72		5824	
2.5			0.1	72	5909		
3.0			0.1	66	<p>2'9" - - - dashed - - -</p> <p>silty sand, dark yellowish brown (10yr 4/4) 80% fine to med. sand 20% silt, ^{semi} moist loose, low plasticity, cohesive, mica flakes no odor or staining</p>	SM	6079
3.5			0.1	90			6027
4.0			0.1	90	<p>4' bedrock</p> <p>sandstone bedrock w/ interbedded siltstone light yellowish brown (10yr 6/4), low plasticity, cohesive, semi moist no odor, no staining</p>	Bedrock	7087
5.0					no groundwater		
6.0					TD = 4'		
					No anomalies		

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: 70
Drilling Company: HGL	Driller: CRK	Ground Elevation: NA	Total Depth Drilled: 2' ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 1508 3-20-12	Date/Time Total Depth Reached: 1544 3-20-12	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90110 (1547)			
Geologist: M Birney	Checked By / Date: Will Knut 3-21-12			

Radiological Background: 17/2991/75	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			0.0	120	<p><i>Pancake</i></p> <p>Silty sand, dark brown (10gr 3/3) 70% fine to med sand, 30% silt, semi moist, low plasticity low plasticity, cohesive, trace rootlets, plastic netting present on surface no odor, no staining.</p>	SM	3338
0.5			0.0	66		4584	
1.0			0.0	60		5446	
2.0			0.0	90		5820	
2.0			0.0	96		6006	
3.0					<p>weathered sandstone bedrock, light yellowish brown (10gr 6/4), mechanically weathered to SP, fine grain sandstone, no odor, drg, high density</p> <p>no groundwater TD = 2' No anomalies</p>	Bed. rock	
4.0							
5.0							
6.0							



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: A02	Location ID: 71
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/19/12 0852	Date/Time Total Depth Reached: 3/19/12 0900	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: 90111-0930 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone	Checked By / Date: [Signature] 3-20-12			

Radiological Background: 11 / 2669 / 71	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' = 2791 (CPM)
0.5			0.0	72	Silty Sand Dark Yellowish Brown (3/6 10YR) 70% fine sand, 30% silt, trace rocklets, moist, low dense, no odor or staining	SM	3406
			0.0	66	Silty Sand, Yellowish Brown (5/4 10YR) 60% fine sand, 20% medium sand, 20% silt, dry, med dense, no odor or staining	SM	5350
1.0			0.0	96			6708
			0.0	72			6907
2.0			0.0	60	Sand w/ silt Brownish Yellow (6/6 10YR) 60% fine sand, 30% medium sand, 90% silt, dry, med dense, no odor or staining	SP	6679
			0.0	36			6606
3.0			0.0	54			6971
			0.0	84			7978
4.0			0.0	72			8837
			0.0	66			9059
5.0			0.0	66	Silty Sand, Dark yellowish brown (4/6 10YR) 70% fine sand, 30% silt, dry, high dense, no odor or staining	SM	9036
6.0					TD = 5ft bgs, refusal on sandstone (C10) no gw encountered no anomalies detected		

East 63

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: ABZ	Location ID: 72
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 7 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/16/12 1353	Date/Time Total Depth Reached: 3/16/12 1403	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: 90112-1440 One 1/2 Gallon Bag (Approx 8 lbs.) 90252 - (nr) dup 1 1/2 gallon bag			
Geologist: J. Stone	Checked By / Date: Duff Knudsen 3/19/12			

Radiological Background: 8 / 2656 / 41	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 00 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings +0.5' = 3003 (CPM)
0.0			0.0	60	Silty Sand, Dark yellowish brown (4/4 10YR) 70% fine sand, 30% silt, trace gravel (sandstone, max size = 0.5"), trace rootlets, dry, low dense, no odor or staining	SM	3328
0.5			0.0	72	Silty Sand, Brown (4/4 7.5YR) 60% fine sand, 40% silt, dry, low dense, no odor or staining	SM	4634
1.0			0.0	60	Silty Sand w/clay Strong Brown (5/6 7.5YR)		5059
2.0			0.0	78	65% fine sand, 25% silt, 10% clay, moist, med dense, no odor or staining, slow dilatancy	SM	5270
3.0			0.0	54			5261
4.0			0.0	60			5146
5.0			0.0	54	Sand w/silt, Strong Brown (5/6 7.5YR) ⁶³ Yellowish Brown (5/6 10YR)	SP	5093
6.0			0.0	78	90% fine sand, 10% silt, moist, med dense, no odor or staining		4884
			0.0	42			4943
			0.0	60			4626
			0.0	54			4719
			0.0	66			4828
			0.0	84	Same as above	SP	4956

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ (6)	Location ID: 73
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/19/12 1332	Date/Time Total Depth Reached: 3/19/12 1338	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: 90113-1420 One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: I. Stone	Checked By / Date: J. Rollins / 3/20/12			

Radiological Background: 12 / 2818 / 68	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings +0.5' = 3090 (CPM)	
0.5			0.0	54	Silty Sand, Very dark grayish brown (3/2 10YR) 70% fine sand, 30% silt, trace rootlets, moist, low dense, no odor or staining	SM		3022	
			0.0	60					4120
1.0			0.0	72				1	5323
			0.0	78					5533
2.0			0.0	66	Silty Sand, Dark Yellowish Brown (4/4 10YR) 75% fine sand, 25% silt, dry, trace rootlets, low dense, no odor or staining	SM	2	5762	
			0.0	54					5804
3.0			0.0	66				3	5750
			0.0	78					5670
4.0			0.0	78	Silty Sand, Dark Yellowish Brown (4/6 10YR) 70% fine sand, 10% medium sand, 20% silt, moist, med dense, no odor or staining, slight mottling	SM	4	5831	
			0.0	72					5595
5.0			0.0	84				5	5413
			0.0	54					5465
6.0			0.0	60			6	5521	

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: ABZ	Location ID: 74
Drilling Company: Boart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: 6600 Geoprobe	Borehole Diameter: 1.75 in.	Date/Time Drilling Started: 3/19/12 1038	Date/Time Total Depth Reached: 3/19/12 1043	
Type of Sampling Device: 1.75 macrocore with acetate liner	Samples Collected: 90114 - 1110		One 1/2 Gallon Bag (Approx. 0.5 lbs.)	
Geologist: I. Stone	Checked By / Date: Robbin Fedman 3/20/11			

Radiological Background: 15 / 3305 / 78	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. +0.5' = 3120 (CPM)
0.0 - 0.5			0.0	54	Silty Sand, Dark Yellowish Brown (3/4 10YR) 70% fine sand, 30% silt, moist, low dense, no odor or staining	SM	3550
0.5 - 1.0			0.0	66	Silty Sand, Yellowish brown (5/6 10YR)	SM	5423
1.0 - 2.0			0.0	72	60% fine sand, 20% silt, 20% medium sand, 20% silt, dry, med dense, no odor or staining		5316
2.0 - 6.0			0.0	84	Sand (weathered sandstone), very pale brown (7/4 10YR) 75% fine sand, 20% medium sand, tot. 5% silt; dry, high dense, no odor or staining	SP	5416
<p>TD = 1.5 ft bgs</p> <p>No gw encountered</p> <p>Sample collected from 0-1.5 because no surface sample planned at this location.</p> <p>No anomalies were detected</p>							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 75
Drilling Company: HGL		Driller: C. Knight	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/20/12 905		Date/Time Total Depth Reached: 3/20/12 905
Type of Sampling Device: Handauger		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90116 (na)	
Geologist: L. Robbins Goldman		Checked By / Date: Cliff [Signature] 3-21-12			
Radiological Background: 22/3751/67		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	26	<p><i>pancake</i></p> <p>Silty sand: dark brown (10YR 3/3), 75% fine to med. sand, 25% silt, semi-moist, low plasticity, loose, no odor, no staining</p> <hr/> <p>refusal on sandstone</p> <p>total depth = 0.5' bgs</p> <p>no groundwater encountered</p> <p>no sample collected</p> <p><u>Shallow refusal</u></p>	SM	NM
0.5			0.0	120			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: east	Location ID: 76	
Drilling Company: HGL		Driller: M. Birney		Ground Elevation: NA		Total Depth Drilled: 1.08 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 3/20/12 0940		Date/Time Total Depth Reached: 3/20/12 0940	
Type of Sampling Device: Handauger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90118 (n/a)			
Geologist: L. Robbins Goldman				Checked By / Date: Cliff Kinnett 3-2-12			
Radiological Background: 21/385074		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Feet bgs.	(CPM)
0.4			78		silty sand: dark brown (10YR 3/3), 75% fine to med sand, 25% silt, semi-moist, low plasticity, loose, no odor or staining	SM		NM
0.4			60					
1.0			72		sandstone bedrock (10YR 5/6) yellowish brown, no odor, mechanically weathered to SP, moist, dense	Bedrock (SP)		
					total depth = 1' 1" bgs			
					no groundwater encountered			
					no sample collected -			
					<u>shallow refusal</u>			

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EG-1 max	Location ID: 77	
Drilling Company: HydroGeologic		Driller: C. Knight		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 3/20/12 1005		Date/Time Total Depth Reached: 3/20/12 1014	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90119 (1015)			
Geologist: L. Robbins Goldman				Checked By / Date: Will Knight 3-21-12			
Radiological Background: 22/3546/72		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	22/72	Surface: leaves, twigs, soil		
0.5			0.0	25/84	Silty sand: dark brown (10YR 3/3), 75% ^{fine to med.} sand, 25% silt, moist, loose, no odor or staining, low plasticity, abundant detritus material	SM	
					total depth = 0.5' bgs		
					no groundwater encountered		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NDZ	Group: east	Location ID: 77
Drilling Company: HGL	Driller: C. Knight	Ground Elevation: NA	Total Depth Drilled: 3 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3.0 inches	Date/Time Drilling Started: 3/20/12 1017	Date/Time Total Depth Reached: 3/20/12 1102	
Type of Sampling Device: Handauger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90120 (1105)	
Geologist: L. Robbins Goldman		Checked By / Date: C. Knight		

Radiological Background: 22/3546/72	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rac 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 10.5 = 3467 (CPM)
					Surface: leaves, twigs, soil		
0.0			72		Silty sand: dark brown (10YR 3/3), 75% fine to med. sand, 25% silt, moist, no odor or staining, low plasticity, ^{clay} clay nodules, loose, abundant detritus material	SM	3518
0.5			84				4293
1.0			60		-----		5049
			72		Silty sand: brownish yellow (10YR 6/6), 75% fine sand, 25% silt, moist, no odor or staining, low plasticity, loose	SM	5175
2.0			66				5177
			54				5241
3.0			96		Sandstone bedrock (10YR 6/6), moist, mechanically weathered to SP, no odor or staining	bedrock (SP)	5944
<p>total depth = 3.01 bgs no groundwater encountered</p>							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: east	Location ID: 78	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 05 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 3/27/12 0930		Date/Time Total Depth Reached: 3/27/12 0937	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90121 (940)			
Geologist: LRGoldman				Checked By / Date: DJT/WHM 3/24/12			
Radiological Background: 15 / 94		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	16 / 84	Surface = scensent weeds + soil		
0.5			0.0	15 / 60	Sandy silt Silty sand: dark olive brown (2.54 3/3), 65% fine to med. sand, 25% silt, 10% clay, no odor or staining, moist, cohesive, dense	SM	
1.0					total depth = 0.5' bgs no groundwater encountered		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: East	Location ID: NBZ-79	
Drilling Company: HydroGeoLogic, Inc.		Driller: J LeVing, P		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: NA		Date/Time Drilling Started: 0912 3-30-12		Date/Time Total Depth Reached: 0957 3-30-12	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90122 (1008)			
Geologist: M Bisney				Checked By / Date: Cliff Knight 4-2-12			
Radiological Background: NA/3563/169		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	64/3440	Surface - soil w/ tall grass + exposed rocks		
0.5			0.0	84/3762	Silty Sand, Dark brown (10YR 3/3) 65% med sand, 15% fine sand, 20% silt, loose semi moist, cohesive, low plasticity, no odor, no staining, rootlets	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
				TD = 0.5 bgs no groundwater encountered			

Project Name: SSFL Area IV Radiological		Project Number: EP038.01.22.04.03		Subarea: NBZ		Group: West		Location ID: 40	
Drilling Company: HGL		Drillers: W. Birney		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.			
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 04/25/09 12:49		Date/Time Total Depth Reached: 04/25/09 12:54 / 0.5			
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90/24 (93)					
Geologist: C. Garcia				Checked By / Date: Will 7/2/12 4/23/12					
Radiological Background: NA/14/10		Radiological Equipment Used: Micro R / Downhole Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm					
Depth (ft bgs)	Interval	Recovery	PID	Description include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable				USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.2	Surface: mulching, 18 filter soil grass					
0.5			0.1	Silty sand 40% Fine sand 55% Med sand 15% silt, trace coarse sand nonplastic noncohesive rootlets loose Moisture no odor or staining. Dry (7YR/3/6) Dark Brown				SM	
1.0									
2.0									
3.0									
4.0									
5.0									
6.0									

Total Depth 0.5 ft bgs
No groundwater encountered.

Location in drainage #40
N34 14.201
W118 42.297

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: west	Location ID: 81	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/18/12 0940		Date/Time Total Depth Reached: 4/18/12 0953	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90126 (950)			
Geologist: Robbins Goldman		Checked By / Date: Bill Hunt 4/19/12					
Radiological Background: 15 / 81		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			16/60		<p>dry pancake surface: leaves, wooden twigs</p>	SM	
0.5			0.0	16/70	<p>silty sand: very dark brown (10YR2/2), 60% fine sand, 40% silt, dry, very loose, noncohesive, trace rootlets, leaves + sticks, insect parts</p>		
1.0					<p>no GW encountered TD = 0.5' bgs</p>		
2.0					<p>location moved ~10' south due to dense veg. + poison oak</p>		
3.0					<p>GPS position: 6344874.182E 1908201.850N</p>		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EPQ38.01.22.04.03	Subarea: NBZ	Group: <i>West</i>	Location ID: <i>82</i>
Drilling Company: HydroGeologic, Inc.	Driller: <i>M. Birney</i>	Ground Elevation: NA	Total Depth Drilled: <i>0.5</i> ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: <i>1044</i>	Date/Time Total Depth Reached: <i>4/19/12 / 1046 / 0.5</i>	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<i>90127 (1120) 90261 (NA)</i>	
Geologist: <i>C. Carcia</i>	Checked By / Date: <i>diff / 4/19/12</i>			

Radiological Background: <i>NA 2345 / 53</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	<i>01</i> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			<i>0.1</i>	<i>60</i>	<p>Surface leaf litter, sandstone crattered grass</p> <p>Silt + ye sand, (5YR/3/1) very dark gray, 70% fine sand 15% med sand 15% silt 2% coarse sand, non plastic non cohesive loose, moist, no odor or staining.</p>	<i>SM</i>		
1.0			<i>0.1</i>	<i>3150</i>				
2.0				<i>54</i>				
3.0				<i>3725</i>				
4.0								
5.0								
6.0								

total Depth 0.5 ft bgs
No groundwater encountered.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: <u>West</u>	Location ID: <u>52</u>	
Drilling Company: HydroGeoLogic, Inc.		Driller: <u>M. Birney</u>		Ground Elevation: NA		Total Depth Drilled: <u>44 inches</u> <u>3.6700 ft</u>	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: <u>11/09</u>	Date/Time Total Depth Reached: <u>4/13/12</u> <u>11:20</u>	<u>3.6700 ft</u> <u>44 inches</u>	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<u>90126</u> <u>(135)</u>	
Geologist: <u>C. Garcia</u>				Checked By / Date: <u>[Signature]</u> <u>4/19/12</u>			
Radiological Background: <u>NA 3345 / 53</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background:		<u>0.1</u> ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.1	60	Surface leaf litter scattered across <u>make</u>		0.5	3244
0.5			0.1	54	silty sand, (5YR/3/1), very dark gray, 70% fine sand, 13% med sand, 15% silt, non plastic, non cohesive, loose, moist, no odor or staining	SM	1	3390
1.0			0.2	54			1	4140
1.5			0.2	72			1	4772
2.0			0.2	72			1	5058
2.5			0.1	102	clayey silty clay, 45% clay 15% silt non plastic, cohesive, medium dense, moist, reddish brown	CL	2	5155
3.0			0.2	42			2	5372
3.5			0.1	102	silty clay 35% clay 30% silt 30% med sand. 5% fine sand. Reddish gray (5YR/5/2) non plastic cohesive, medium dense, moist, no odor or staining	CL	3	5473
4.0			0.0	50			3	5501
4.5					mechanically weathered sandstone bedrock (5YR/5/3) reddish brown (SP) quartzite non cohesive non plastic no odor or staining		4	
5.0					Total depth 44 inches 3.6700 ft		5	
5.5					No groundwater encountered		5	
6.0					No Anomalies		6	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: 207	Location ID: 83
Drilling Company: HydroGeoLogic, Inc.	Driller: C Garcia	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4-12-13 1358	Date/Time Total Depth Reached: 4-12-13 1415	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90129 (1415)	
Geologist: M Bincey	Checked By / Date: Cliff Thompson 4/19/12			

Radiological Background: NA 3382 / 60	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	85/3200	Surface! tall grasses, poison oak		
0.5			0.0	45/3300	silty sand, very dark brown (7.5yr 2.5/3) 55% fine sand, 45% silt, loose, semi moist, trace rootlets, charcoal, non plasticity, no odor, no staining	SM	
1.0							1
2.0							2
3.0							3
4.0							4
5.0							5
6.0							6

TP 0.5' bgs
NO groundwater

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea:NBZ	Group: W01	Location ID: 83
Drilling Company: HydroGeoLogic, Inc.	Driller: C Garcia	Ground Elevation: NA	Total Depth Drilled: 2' 10" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: 4-12-12 1417	Date/Time Total Depth Reached: 4-12-12 1443	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90BD (1453)	
Geologist: M Birney	Checked By / Date: Cliff Knott 4/14/12			

Radiological Background: NA 3292/60	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	85/86 ms	Silty sand, very dark brown (7.5 yr 2.5/3) 55% fine sand, 45% silt, base, semi moist, trace rootlets, charcoal, non plasticity, non cohesive; no odor, no staining	sm	3833
1.0			0.0	95/96 ms			4287
1.5			0.0	76			4631
2.0			0.0	90	sandy silt, very dark brown (7.5 yr 2.5/2) 60% silt, 30% fine sand, 10% clay, soft, semi moist, cohesive, low plasticity, no odor, no staining	ml	4628
2.5			0.0	86			4981
3.0			0.0	86	silty sand, dark yellowish brown, (10 yr 4/4) mottled 60% fine sand, 25% med sand, 15% silt, loose semi moist, non plasticity, mottling, no odor, no staining	sm	4370
3.5					TD = 34" no groundwater encountered no anomalies	Bedrock (SP)	4941 @ 34"
4.0					Bedrock, mechanically weathered sandstone yellowish brown (10 yr 5.8) oxidation of bedrock, no odor, no staining, siltstone present in bedrock.		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: west	Location ID: 85	
Drilling Company: HGL		Driller: J. LeVangie / M. Birney		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/10/12 1349		Date/Time Total Depth Reached: 4/10/12 (1357)	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90133 (1357)			
Geologist: LR Goldman				Checked By / Date: [Signature] 4-11-12			
Radiological Background: 13/3419/72		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	0.14 60 14 102	<p>← MR/pancake</p> <p>surface: wooden twigs, leaves</p> <p>Silty sand w/ gravel: very dark brown (10YR 2/2), 65% fine sand, 25% silt, 10% med sand, moist non cohesive, no odor or staining, trace organics including leaf + wood pieces, trace charcoal + rootlets</p> <p>no GW encountered TD = 0.5' bgs</p>	SM	

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Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: west	Location ID: 85	
Drilling Company: HGL		Driller: J. LeVergie/M. Birney		Ground Elevation: NA		Total Depth Drilled: 1.4' ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 2.75 inches		Date/Time Drilling Started: 4/10/12		Date/Time Total Depth Reached: 4/10/12	
Type of Sampling Device: Handauger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90134 (1428)	
Geologist: URGeldman				Checked By / Date: [Signature] 4-11-12			
Radiological Background: 13/3419/72		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	60	Surface: wooden twigs, leaves pancake Silty sand w/ gravel: very dark brown (10YR 2/2)	SM	3503
0.5			0.0	102	very @ 65% fine sand, 25% silt, 10% med sand, moist, non cohesive, no odor or staining, trace organics including leaf + wood pieces, trace charcoal + rootlets		4234
1.0			0.0	90			4692
2.0			AM	AM	1.4' bgs Sandstone bedrock/SP: yellowish brown 10YR (5/8), moist, no odor or staining, siltstone nodules (small size), mechanically weathered to SP	bed rock (SP)	hole not widened to bottom
3.0					TD = 1.4' bgs refusal on sandstone no GW encountered no anomalies		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 030
Drilling Company: HydroGeoLogic, Inc.	Driller: M. Hurney	Ground Elevation: NA	Total Depth Drilled: 5.62 Zinches ft. bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 11/19/12	Date/Time Total Depth Reached: 11/40 / 0.5 Zinches.	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90135	(1155) 90260 (199)
Geologist: C. Garcia	Checked By / Date: M. Hurney 4/20/12			

Radiological Background: 6734/09	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: Oil ppm
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Depth (ft bgs)	Interval	Recovery	PID	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			8.0	Surface: Moss, sandstone, grass soil			
0.5			8.0	Silty sand; (10R/3/2) very dark gray sh	SM		
1.0			8.0	100% fine sand, 70% med sand, 70% silt Rootlets, Moss, leaf, non cohesive non plastic, no odor or staining	SP		
2.0				sandstone mechanically weathered Bedrock sandstone.			
3.0				Total Depth 5.62 ft bgs Zinches No groundwater encountered			
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: <i>MSA</i>	Location ID: <i>47</i>
Drilling Company: HydroGeoLogic, Inc.	Driller: <i>M. Birney</i>	Ground Elevation: NA	Total Depth Drilled: <i>0.5</i> ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: <i>1000</i>	Date/Time Total Depth Reached: <i>04/19/12/1005</i>	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<i>90137 (019)</i>	
Geologist: <i>Claudia</i>	Checked By / Date: <i>Clay 9/11/12 4-20-12</i>			

Radiological Background: <i>NA/7074/CO</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: <i>0.0</i> ppm
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Depth (ft. bgs.)	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			<i>0.0</i>	<i>Surface: sandstone, grass, vegetation</i>			
0.5			<i>0.0</i>	<i>Silty sand, 60% fine sand, 20% med sand, 20% silt (7.5/12/2.5/1) very dark brown trace coarse sand loose wet non cohesive, non plastic no odor or staining</i>	<i>SM</i>		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Total Depth 0.5 ft bgs
No groundwater encountered.

Project Name: SSFL Area IV Radiological	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: 1 NBZ	Location ID: CP
Drilling Company: Boart Longyear	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 10:55 04/17/12	Date/Time Total Depth Reached: 10:58 0.5	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000	
Geologist: C. Carra	Checked By / Date: C. Carra 4-18-12			

Radiological Background: NA/3452/107	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0				Surface: Sand		
0.1			0.178	Partly fine med sand, Dark Brown		
0.5			0.590	40% fine sand, 60% med sand.		
1.0			0.590	50% (7.5/1/36) med sand, 50% gravel		
2.0				Moist, no odor or staining		
3.0				Loose, non plastic noncohesive		
4.0				Total Depth 0.55 ft bgs.		
5.0				No groundwater encountered.		
6.0				Location CP MOVED due to Access		
				Random surface at		
				AD 6345 24 N34 13 59.2170		
				W 118 42 57.5098		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NWE	Group: West	Location ID: 86	
Drilling Company: HGL		Driller: M. Birney		Ground Elevation: NA		Total Depth Drilled: 20 inches 1.67 ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3.0 inches		Date/Time Drilling Started: 11/12		Date/Time Total Depth Reached: 04/17/12 11:20 1.67 bgs	
Type of Sampling Device: Handauger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: C. Carcia				Checked By / Date: Will King 4-18-12			
Radiological Background: NA 3452 / 107		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs.)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.1			0.1	Pancake	Room graded med sand; Dark Brown; Moist; Loose, non plastic non cohesive.	SP	3695
0.5			0.5		40% fine sand 50% med sand 5% silt 2% coarse sand 2% gravel subrounded; (7.5 yr 1/2)		4220
1.0			1.5		GW encountered at 13 inches		4554
			0.2		Mechanically weathered Bedrock sandstone	SP	NM.
Total Depth 1.67 ft bgs GW encountered at 1.15 ft bgs.							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: <i>1011</i>	Location ID: <i>49</i>
Drilling Company: HydroGeoLogic, Inc.	Driller: <i>M. Barney</i>	Ground Elevation: NA	Total Depth Drilled: <i>0.5</i> ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: <i>12/20</i>	Date/Time Total Depth Reached: <i>4/20/12 12:55</i>	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		<i>190141 (1235)</i>	
Geologist: <i>C. Garcia</i>	Checked By / Date: <i>Cliff / 4/20/12</i>			

Radiological Background: <i>NA 1235 / 105</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: <i>0.1</i> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0				Surface: leaf litter sandstone; vegetation			
0.1			<i>105</i>	<i>silty sand (10WR/4/1) Dary Gray 40% Fines and</i>	<i>SM</i>		
0.5			<i>60</i>	<i>loose dry, non cohesive non plastic</i>			
1.0				<i>wood or staining. Rootlets,</i>			
2.0				Total Depth 0.5 ft bgs No groundwater encountered.			
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: 1028	Location ID: 89
Drilling Company: HydroGeoLogic, Inc.		Driller: Barnes	Ground Elevation: NA	Total Depth Drilled: 1.0ft ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches	Date/Time Drilling Started: 1/30/12	Date/Time Total Depth Reached: 4/20/12 1:30 PM / 1.0ft	
Type of Sampling Device: Hand Auger			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90142 (1315)		
Geologist: Garcia			Checked By / Date: Will Threlkeld 4/23/12		
Radiological Background: NA / 4/22/10		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.1 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings
					Surface: leaf litter sandstone vegetation		3630 (CPM)
0.5			0.1	60	silty sand (10YR4/1) Dark gray, loose, dry, 40% fine sand 40% med. sand 20% silt Trace coarse sand. no odor or staining nonplastic noncohesive Rootlets loose dry	SM	3577
1.0			0.1	72	silty sand (10YR4/2) dark gray, in part trace gravel subrounded 40% fine sand 40% med sand 20% silt. noncohesive nonplastic dry loose no odor or staining or Rootlets loose	SM	4105
1.5			0.1	90	Mechanically weathered sandstone cemented (10YR5/3) brown no odor or staining nonplastic dense 55% fine sand 15% med. sand subrounded. Quartz mica trace silt.	SP	4409
2.0							5263
3.0							
4.0							
5.0							
6.0							

Total Depth 1.0ft
No ground water encountered
No anomalies

Project Name: SSFL Area IV Radiological		Project Number: EP038.01.22.04.03		Subarea: NBE	Group: WPA	Location ID: 90	
Drilling Company: Boat Longyear		Driller: M Birney		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 1351		Date/Time/Total Depth Reached: 04/17/12 1353 0.5	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90143 (1420)			
Geologist: C Garcia				Checked By / Date: Chiff Humphreys 4-18-12			
Radiological Background: NA/3575/51		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.2 ppm			
Depth (ft-bgs)	Interval	Recovery	PID	Description		USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.1	Surface: leaf litter, roots, rocks			3789 CPM
0.5			0.2	Poorly graded med sand, very dark brown (5YR/2.5/2) 40% fine sand, 50% med sand, 10% coarse sand, 2% silt. No odor, no staining, loose, non plastic non cohesive. No roots.		SP	
1.0				<p>No groundwater encountered</p> <p>Total Depth 0.5 ft</p> <p>Location moved to upstream due to access</p> <p>N 34. 1402. 3031</p> <p>W 118. 4252. 9295</p>			
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EMT	Location ID: NBZ-91	
Drilling Company: HydroGeoLogic, Inc.		Driller: M Birney		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: NA		Date/Time Drilling Started: 0910 03/29/2012		Date/Time Total Depth Reached: 0911/0.5ft bgs	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90145 (0924)			
Geologist: C Carida				Checked By / Date: Cliff Knott 4-2-12			
Radiological Background: NA/54/77		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	54 3250 72 3700	<p>include lithology, grain size, sorting, angularity, Munsell color name & texture, mineralogy, bedding, plasticity, density, consistency, etc., as applicable</p> <p>surface scattered cross-brown drainage</p> <p>sandy silt; (10YR/2/2) very dark brown 70% silt; 30% fine sand, moist; loose; no odor and staining; cohesive; non-plastic</p>	ML	
<p>Total Depth 0.5 ft bgs No groundwater encountered</p>							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: EAST	Location ID: NBZ-91	
Drilling Company: HydroGeologic, Inc.		Driver: M. Birney		Ground Elevation: NA		Total Depth Drilled: 4ft 10 inches ft bgs.	
Drilling Equipment: Hand Auger		Borehole Diameter: 3 inches		Date/Time Drilling Started: 0913 03/29/2012 09150		Date/Time Total Depth Reached: 4ft 10 inches (4.83 ft)	
Type of Sampling Device: Hand Auger				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 96146 (1030)			
Geologist: M. Garcia				Checked By / Date: Duff Thuyet 7-2-12			
Radiological Background: NA/3549/77		Radiological Equipment Used: Micro R ₁ Downhole / Pancake Meters		PID Used: Mini Rae 3000 - Background: 0.0 ppm			

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
0.0			0.0	54	Surface scattered clasts, 1/2" - 1" diameter. Sandy silt; (10YR 2/2) very dark brown; loose, cohesive; non-plastic; no odor or staining; moist;	SH SM	0.59 3394 3698
0.5			0.0	60	70% silt; 30% fine sand; non-plastic; no odor or staining; moist;	ML	4311
1.0			0.0	64	Sandy silt (5Y 2.5/1) Black, moist; loose, cohesive, non-plastic; 70% silt; 30% fine sand; no staining or odor	CH SM ML	4585
1.5			0.0	47			4849
2.0			0.0	72			4918
2.5			0.0	66			4971
3.0			0.0	66	Sandy silt; (10YR 5/3) 65% silt; 32% fine sand; 3% med sand; cohesive; non-plastic; no odor or staining; moist; dark brown;	CH SM ML	4708
3.5			0.0	66			4734
4.0			0.0	98	Groundwater Reached. Sandy Clay (10YR 5/2) soft, cohesive, semi-plastic; wet; no odor or staining; grayish brown;	CH SM ML CL	5085
4.5			0.0	72	65% Clay; 10% silt 25% fine sand		Initial GW NM due to GW
5.0					Bedrock Reached 4ft 10 in sandstone Mechanically Weathered Bedrock Groundwater encountered at 4ft 2 inches Total Depth Reached at 4ft 10 in No Anomalies	Bedrock	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: EST	Location ID: NBZ-92
Drilling Company: HydroGeoLogic, Inc.	Driller: C Garcia	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1121 03/29/12	Date/Time Total Depth Reached: 1125 3-29-12	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90147 (1131)	
Geologist: M Birney	Checked By / Date: Will K... 4-2-12			

Radiological Background: NA/3292/77	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.1	MB	Surface: grass + scattered flowers			
0.5			0.1	MB	sandy silt very dark brown (10YR 2/2) moist, ^{sub} cohesive, low plasticity, no odor, no staining, trace rootlets, mica flakes 60% silt, 30% fine sand, 10% med sand	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

TD = 0.5 ft bgs
no ground water encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group:	Location ID: NBZ-92
Drilling Company: HydroGeoLogic, Inc.	Driller: C Garcia	Ground Elevation: NA	Total Depth Drilled: 2' 3" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 3 inches	Date/Time Drilling Started: 4-2-12 1137	Date/Time Total Depth Reached: 1200 3-29-12	
Type of Sampling Device: Hand Auger	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90148 (1215)	
Geologist: M Birney	Checked By / Date: WJ Kuntz 4-2-12			

Radiological Background: NA / 3298 / 77	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
					Pancake Surface - grass + small flowers		+0.05 3295
0.5			0.1	82	Sandy silt, very dark brown (10YR 3/2), moist, cohesive, low plasticity, no color, no staining	ML	3326
			0.1	80	trace rootlets, mica flakes 60% silt, 30% fine sand, 10% med sand		4224
1.0			0.1	52	— — — — —		4524
			0.1	81	silty sand, dark yellowish brown (10YR 4/4) 20% silt, 50% med sand, 30 fine sand, semi moist, low-med density, trace rootlets, low plasticity, no color, no staining, mica flakes	SM	4651
2.0			0.1	70			5004
3.0					Bedrock mechanically weathered to SP; semi moist dark yellowish brown (10YR 4/4)	Bedrock	
4.0							
5.0							
6.0							

TD = 2' 3"
no groundwater encountered

SSFL BORING LOG



NBZ_093

Sheet 1 of 1

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: (6) west	Location ID: 93
Drilling Company: HGL	Driller:	Ground Elevation: NA	Total Depth Drilled: 0 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started:	Date/Time Total Depth Reached:	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90150 / 90151 (n/a)	
Geologist: L Robbins Goldman	Checked By / Date: Julie Robbins Goldman 4/23/12			

Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5					<p>no samples collected, location is within 800' golden eagle nesting buffer. <u>Not reassigned.</u></p> <p>JM 4/23/12</p>		1	
1.0						2		
2.0						3		
3.0						4		
4.0						5		
5.0						6		

SSFL BORING LOG



NBZ_094

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 94
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/28/12 1405	Date/Time Total Depth Reached: 3/28/12 1408	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90152 (1410)	
Geologist: J.R. Goldman	Checked By / Date: Dito Knappe 3-30-12			

Radiological Background: 12 / 75	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	13		0.0	13	surface: grass, woodchips, soil		
0.5	16		0.0	13	silty sand: dark brown (10YR 3/3), 65% fine sand, 35% silt, moist, no odor or staining, low dense, cohesive, trace rootlets	SM	
1.0				60			
2.0					no groundwater encountered		
3.0					no location deviation		
4.0					total depth = 0.5' bgs		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: NBZ-95
Drilling Company: HydroGeoLogic, Inc.	Driller: C Garcia	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1000 3-27-12	Date/Time Total Depth Reached: 1030 3-27-12	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90152 90153 (1033) 90254 (NA)	
Geologist: M Birney	Checked By / Date: Chris Knudt MB 3-29-12			

Radiological Background: NA/3184 180	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	60/3240	Surface - scattered grass + sandstone rocks on surface			
0.5			0.0	80/3380	Sandy silt dark brown (10Yr 3/3) 75% silt, 15% med sand, 10% fine sand, cohesive, moist, med stiff, med plasticity, no odor, no staining, trace rootlets	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth = 0.5 bgs
no groundwater encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea/SE Group: NB7 east	Location ID: 96
Drilling Company: HydroGeoLogic	Driller: D. L. Vangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/28/12 0833	Date/Time Total Depth Reached: 3/28/12 0940
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90154 (945)
Geologist: LR Goldman	Checked By / Date: D. L. Vangie 3/30/12		

Radiological Background: 14/70	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13/72	Surface = grass + soil MR/pancake silty sand: dark brown (10YR 3/3); 75% fine to med. sand, 25% silt, moist; no odor or staining, cohesive, ^{low} dense, rootlets	SM		
0.5			0.0	14/54				
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

total depth = 0.5
no groundwater encountered

GPS location
6351685.12E
1910140.47N

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: ^{MB} 194 98
Drilling Company: HydroGeoLogic, Inc.	Driller: NA	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4-24-12	Date/Time Total Depth Reached: NA	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90156 (NA)			
Geologist: M Birney	Checked By / Date: <i>[Signature]</i> 6-15-12			

Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
0.5					<p>Loc ^{MB} 194 moved due to Eagle buffer. Loc reassigned to Loc 199, sample 90156</p>		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG



NBZ_100

1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: <u>50</u> NBZ	Group: east	Location ID: 100	
Drilling Company: HydroGeoLogic		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 4/4/12 0935		Date/Time Total Depth Reached: 4/4/12 0945	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90158(0945)			
Geologist: L Robbins Goldman				Checked By / Date: JLS 4/9/12			
Radiological Background: 14.5/100		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	14.5/84	Surface: wooden twigs, sparse grass, bare soil		
0.5			0.0	14.5/82	Silty sand: 80% fine sand, 10% med-sand, 15% silt, yellowish brown (10YR 5/4), moist, non-cohesive, low plasticity, med. dense, no odor or staining, trace rootlets. some siltstone cobbles (~5mm)	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

no GW encountered
total depth = 0.5' bgs
location not moved

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: east	Location ID: 102	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 3/27/12 1345		Date/Time Total Depth Reached: 3/27/12 1355	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90160 (1400)			
Geologist: Robbins Goldman				Checked By / Date: Cliff Kump 3-29-12			
Radiological Background: 5 / 95		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	15/90	Surface = grass (abundant + soil)		
0.5			0.0	15/90	silty sand: 65% fine sand, 10% med sand, 25% silt, moist. trace rootlets, low dense, no odor or staining, trace charcoal	SM	
1.0					No groundwater encountered total depth = 0.5' bgs		
2.0							
3.0							
4.0							
5.0							
6.0							
GPS location:				6349630.18E 1909981.70N			

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: ①	Location ID: 103
Drilling Company: HydroGeologic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/29/12 0917	Date/Time Total Depth Reached: 3/29/12 0925	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (0930) 90161			
Geologist: LR Goldman	Checked By / Date: Will Thumby 4-2-12			

Radiological Background: 13 / 80	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13 / 66	<p>MR/pancake silty sand: 65% fine sand, 35% silt, moist no odor or staining, dense, cohesive, very dark brown (10YR 2/2), trace rootlets charcoal flakes</p> <p>total depth = 0.5' bgs no GW encountered</p> <p>GPS location: 6350312.32 E 1910552.87 N</p>	SM		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: East	Location ID: 104
Drilling Company: HydroGeoLogic, Inc.	Driller: C. Carlin	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1040 4/4/12	Date/Time Total Depth Reached: 1040 4/4/12	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90163 (1045)	
Geologist: M Birney	Checked By / Date: Robbin Goldman 4/5/12			

Radiological Background: NA/3212/54	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			60	3380	Surface - grass			
0.5			0.0	90	silty sand, dark brown (10gr 3/3), 60% fine sand, 28% coarse sand, 15% silt. cohesive, semi moist, low plasticity, no color, no staining, trace rootlets	sm		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

TD = 0.5
no groundwater

(16)

Project Name: SSFL Area IV Radiological	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 106 (new loc. #194)
Drilling Company: Boart Longyear HGL	Driller: na	Ground Elevation: NA	Total Depth Drilled: ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started:	Date/Time Total Depth Reached:	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90164	
Geologist: L Robbins Goldman	Checked By / Date: [Signature] 6/18/12			

Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5					<p>Location #106 was reassigned as location #194 due to the Golden Eagle exclusion zone. Sample ID remains #90164.</p>			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 107
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4/2/12 0340	Date/Time Total Depth Reached: 4/2/12 1353	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		91065 (1355)	
Geologist: P. Goldman	Checked By / Date: Cliff Thompson 4-4-12			

Radiological Background: 13/59	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0	13/12		0.0	13/12	Surface = soil + grass Silty sand: dark brown (10YR 3/3), 75% fine sand, 15% med. sand, 10% silt, moist, low dense, slightly cohesive, non plastic, no odor or staining, trace rootlets & charcoal flakes	SM	1	
0.5	13/66		0.0	13/66			2	
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

no GW encountered
total depth = 0.5' bgs

location not moved.

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: east	Location ID: 108	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/3/12 0925		Date/Time Total Depth Reached: 4/3/12 0935	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90166 (0935)			
Geologist: LR Goldman		Checked By / Date: Cliff / 4/4/12					
Radiological Background: 14 / 90		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			135 / 54		surface: soil + twigs		
0.5			0.0		SC(6) silty sand: 75% fine sand, 10% med sand, 15% silt, dark yellowish brown (10YR 5/4), moist, low plasticity, no odor or stain, low dense, cohesive, trace rootlets + twigs	SM	
1.0					no GW encountered		
2.0					total depth = 0.5' bgs		
3.0					Location moved:		
4.0					6349834.30E		
5.0					191 0881.73N		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 109
Drilling Company: HGL	Driller: J. Lebrun	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/21/12 1450	Date/Time Total Depth Reached: 3/21/12 1500	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90167 (1505)	
Geologist: LR Goldman	Checked By / Date: Will Knott 3/22/12			

Radiological Background: 14/92	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.0					Surface: weeds + soil		
0.5					up pancake (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
1.0					Silty sand w/ clay: dark yellowish brown (10YR 3/4), 60% fine sand, 20% silt, 20% clay. moist, no odor or staining, trace rootlets, dense, trace debris (sm. green crystalline fragment (< 1mm) and erosional woodcell netting)	SM / AF	
2.0					no GW encountered total depth = 0.5' bgs		
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: EAST	Location ID: CG 110
Drilling Company: HydroGeoLogic, Inc.	Driller: M Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 0905 4/4/12	Date/Time Total Depth Reached: 0.5 / 0910	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90108 (0912)	
Geologist: C. Clark	Checked By / Date: J. Robbins Goldman 4/5/12			

Radiological Background: 3297 / 49	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	3297 / 49	Surface: Grass, sandstone, plants. Silty Sand (7.5% F/3/2) Dark Brown, loose, 15% Silty, 75% Fine Sand, 10% Med Sand, Non plastic, cohesive, no odor or staining; Dry; Rootlets;	SM	0.5	
					<p>Total Depth 0.5 ft bgs No groundwater encountered.</p>			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: ENV	Location ID: 114
Drilling Company: HydroGeoLogic, Inc.	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 0920 4/4/12	Date/Time Total Depth Reached: 0.5 / 0925	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90177 / 950	(0930)
Geologist: C. Courcia	Checked By / Date: R. Goldman 4/5/12			

Radiological Background: NA 13273 / 104	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	Pancake Meter	Surface: coarse, scattered leaves, sandstone			
0.5			0.0	3420	Silty sand (10% R/4/2); Dark grayish brown; loose; dry; cohesive; nonplastic; no color or staining. 15% silt; 75% fine sand; 10% med sand.	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Total Depth Reached 0.5 ft bgs
No groundwater encountered

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: 22	Location ID: 116
Drilling Company: HydroGeoLogic	Driller: J. LeVongie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/22/12 1450	Date/Time Total Depth Reached: 3/22/12 1500	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90174 (1505)	
Geologist: Robbins Goldman	Checked By / Date: Chris Ruyter 3-26-12			

Radiological Background: 14/3336/84	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	12/78	<p>surface: grass + soil</p> <p>Silty sand: 65% sand, 35% silt, no odor or staining, moist, low plasticity, low density, color: dark brown (10YR 3/3).</p> <p>total depth 0.5' bgs no groundwater encountered</p>	SM		
0.5			0.1	14/84				
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

99

SSFL BORING LOG

(16)

Project Name: SSFL Area IV Radiological	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 117 (new loc. # 195)
Drilling Company: Boart Loozebeek HGL	Driller: n/a	Ground Elevation: NA	Total Depth Drilled: ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started:	Date/Time Total Depth Reached:	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90175	
Geologist: L Robbins Goldman	Checked By / Date: with [signature] 6/18/12			

Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5					<p>Location #117 was reassigned as location #195 due to the Golden Eagle exclusion zone, sample I.D. remains # 90175</p>			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: na (1)	Location ID: 118
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/29/11 1452	Date/Time Total Depth Reached: 3/29/11 1459	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		dup: 90255 (na) 90176 (1500)	
Geologist: URGoldman	Checked By / Date: Cliff L... 4-2-12			

Radiological Background: 15/70	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	15/90	Surface: grass + soil Silty sand: dark brown (10YR 3/3): 75% fine sand, 15% med. sand, 10% silt, moist, dense, no odor or staining, non plasticity, cohesive	SM	1	
0.5			0.0	16/78			2	
1.0							3	
2.0							4	
3.0							5	
4.0							6	
5.0								
6.0								

no GW encountered

GPS locations: 6350307.30E
1910311.97N

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 119
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/27/12 10:58	Date/Time Total Depth Reached: 3/27/12 1045	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90177 (1048)	
Geologist: LR Goldman	Checked By / Date: [Signature] 3/27/12			

Radiological Background: 15/87	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	15/96	<p>← <i>nb/pancake</i></p> <p>Silty sand: dark brown (10YR 3/3), 75% fine to med. sand, 25% silt, moist, no odor or staining, cohesive, low plasticity, dense, trace rootlets + charcoal flakes (~1mm)</p> <p>no groundwater encountered to depth = 0.5'</p> <p>GPS location: 6349510.11E 1910637.43N</p>	SM	

part

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: part	Location ID: 122	
Drilling Company: HydroGeologic		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 4/3/12 1048		Date/Time Total Depth Reached: 4/3/12 1059	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90180 (1100)			
Geologist: LRGoldman				Checked By / Date: Lit/7/4/12			
Radiological Background: 5/84		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0		ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	13/84	Surface: dense grass + soil		
0.5			0.0	16/72	silty sand: very dark grayish brown (10YR 3/2) 65% fine sand, 35% silt, moist, low dense, cohesive, slight low plasticity, trace rootlets + twigs, mica flecks, + opaqueness, no odor or staining. 1 trace charcoal (5mm)	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

NO GW encountered
total depth = 0.5' bgs
location not moved

SSFL BORING LOG

Project Name: SSFL Area IV Radiological	Project Number: EP038.01.22.04.03	Subarea:	Group: 1	Location ID: 125 (new 196)
Drilling Company: Boaz Longyear HGL	Driller:	Ground Elevation: NA	Total Depth Drilled: NA ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4-26-12	Date/Time Total Depth Reached: NA	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90193 (NA)	
Geologist: M Birney	Checked By / Date: 90193 m3		WJ [signature] 6/16/12	
Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: ppm		

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
0.5					<p>Loc 125 was reassigned as Loc 196 due to Golden Eagle exclusion zone. Sample ID remains # 90193</p>		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG



part

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NA (URS)	Location ID: 127
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4/3/12 0955	Date/Time Total Depth Reached: 4/3/12 1005	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90185 (1005)	
Geologist: UR Goldman	Checked By / Date: Cliff Thuyet 4/4/12			

Radiological Background: 15 / 98	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	15 / 108	Surface: soil + thin grass silty sand: yellowish brown (10YR 5/4), 65% fine sand, 35% silt, low dense, moist, cohesive, low plasticity, no odor or staining trace rootlets, trace bedrock cobbles (5mm to 10mm size).	SM	1	
0.5			0.0	16 / 72			2	
1.0							3	
2.0							4	
3.0							5	
4.0							6	
5.0								
6.0								

no GW encountered
total depth = 0.5' bgs
location not moved

SSFL BORING LOG

Project Name: SSFL Area IV Radiological	Project Number: EP038.01.22.04.03	Subarea:	Group: 1 E	Location ID: 128 (new #197)
Drilling Company: Boart Longyear HGL	Driller:	Ground Elevation: NA	Total Depth Drilled: NA ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4-26-12	Date/Time Total Depth Reached: NA	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90186 (NA)	
Geologist: M Birney	Checked By / Date: Will Knight 6/18/12			

Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background:	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5					<p>Loc #128 was reassigned as loc 197 due to Golden Eagle exclusion zone</p> <p>Sample ID remains 90186</p>		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

east



NBZ_129

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: NGLP	Location ID: 129	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 3/27/12 1435		Date/Time Total Depth Reached: 3/27/12 1435	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90187 (1440)			
Geologist: LR Goldman		Checked By / Date: Cliff Knott 3-29-12					
Radiological Background: 15 / 185		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	15 / 72	Silty sand: dark brown (10YR 7/3), 65% fine sand, 10% med. sand, 25% silt, trace rocklets. moist, low plasticity, low dense, no odor or staining.	SM	
0.5			0.0	15 / 60			
1.0					no GW encountered		
2.0					total depth = 0.5' bgs		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 130
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/27/12 1007	Date/Time Total Depth Reached: 3/27/12 1020	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90188 (1030) (1030) (1070)	
Geologist: LR Goldman	Checked By / Date: Chris [unclear] 3/29/12			

Radiological Background: 14 / 71	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	14		0.0	14	Surface: soil + grass	SM	
0.5	28		0.0	15	silty sand: dark brown (10YR 7/3), 75% fine to med. sand, 25% silt, cohesive, moist, dense no odor or staining		
1.0	72				no GW encountered		
2.0							
3.0							
4.0							
5.0							
6.0							

GPS location:
6349358.19E
1910691.67N

SSFL BORING LOG



NBZ_131

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 131
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling: Started: 3/29/12 1025	Date/Time Total Depth Reached: 3/29/12 1032	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		(90189) 1035	
Geologist: LR Goldman	Checked By / Date: UMB NMD 4-2-12			

Radiological Background: 15 / 105	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Surface: exposed soil Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	15/90		0.0	MR/pancake	Surface: exposed soil Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
0.5	16/84		0.0		Silty sand: dark grayish brown (2.5Y 4/2), moist ^{low} dense, no odor or staining, 85% fine sand, 10% med. sand, 25% silt, cohesive trace rootlets	SM	
1.0					no GW encountered		
2.0					location moved ~ 20' SW due to dense the vegetation coverage		
3.0					GPS location: 6350314.78 E 1910762.83 N		
4.0							
5.0							
6.0							

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 133
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/26/12 1517	Date/Time Total Depth Reached: 3/26/12 1518	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90191 (1520)	
Geologist: Robbins Goldman	Checked By / Date: W. H. Kuntz 3-28-12			

Radiological Background: 14 / 74	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	14 / 74	<p>silty sand: dark yellowish brown (10YR 3/6), 70% fine sand, 20% silt, 10% clay, moist, cohesive, no odor or staining, charcoal flakes, rootlets med. dense</p> <p>total depth = 0.5' bgs no groundwater encountered</p>	SM	
0.5			0.0	14 / 72			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG



NBZ_134

et _1_ of _1_

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea:NBZ	Group:	Location ID: NBZ-134
Drilling Company: HydroGeoLogic, Inc.	Driller: J LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 1035 3-20-12	Date/Time Total Depth Reached: 1033 3-20-12	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90192 (1043)	
Geologist: M Birney	Checked By / Date: Cliff Thummet 4-2-12			

Radiological Background: NA / 3712 / 85	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	82/3611	Surface - low chaparral + grass			
0.5			0.0	100/3496	Silty sand, dark yellowish brown (10 YR 3/4) 75% med sand, 20% fine sand, 5% silt, loose, semi moist, non plasticity, trace rootlets no odor, no staining	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

TD = 0.5'
no groundwater encountered

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ		Group: east		Location ID: 135	
Drilling Company: HydroGeologic		Driller: J. Langie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.			
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 3/28/12 10A		Date/Time Total Depth Reached: 3/28/12 1025			
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90193 (1030)					
Geologist: LR Goldman				Checked By / Date: Cliff Muff 3/30/12					
Radiological Background: 14 / 96		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)		
0.0	12		0.0	12	Surface: soil, twigs, deer scat sandy silt Silty sand: dark brown (10YR 3/3), 65% silt, 20% med. sand, 15% fine sand, moist, no odor or staining, low plasticity, soft, true roots, charcoal	SM (L) ML			
0.5	12		0.0	12					
1.0									
2.0									
3.0									
4.0									
5.0									
6.0									

no groundwater encountered (20m)
no location deviation

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 136
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling: Started: 3/28/12 1336	Date/Time Total Depth Reached: 3/28/12 1345	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90194 (1350)	
Geologist: UR Goldman	Checked By / Date: C. H. Hunt 3-30-12			

Radiological Background: 13 / 72	Radiological Equipment Used: Micro R / Downnote / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	0.0		13 / 90	13 / 96	<p>met pancake surface twigs, sparse rocks, soil silty sand, dark yellowish brown (10YR 4/6), 60% fine sand, 15% med sand, 15% silt, 10% gravel (~2-5mm) - gravel varies between sandstone & siltstone, moist, dense, no odor or staining, cohesive</p>	SM	
no GW encountered no deviation in location							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: GAT	Location ID: 138	
Drilling Company: HydroGeoLogic		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 4/2/12 0950		Date/Time Total Depth Reached: 4/2/12 0958	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90196 (1000)			
Geologist: LR Goldman				Checked By / Date: Cliff Knight 9-4-12			
Radiological Background: 13 / 82		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
0.0			14/90		Surface: Soil & grass		
0.5			0.0		UP pancake Silty sand: very dark brown, 75% fine sand, 10% med sand, 15% silt, moist, low plasticity, low dense, nonplastic, no odor or staining, trace rootlets, mica flakes.	SM	
1.0							1
2.0							2
3.0							3
4.0							4
5.0							5
6.0							6
no groundwater encountered td = 0.5' bgs							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 140
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/3/12 1348	Date/Time Total Depth Reached: 4/3/12 1400	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90198 (1400)	
Geologist: LRGoldman	Checked By / Date: [Signature] 4/4/12			

Radiological Background: 13 / 81	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	14 78	<p>UR/pancake</p> <p>surface: tall grass + soil</p>		
0.5			0.0	15 72	<p>Silty sand: dark brown (10YR 3/3), moist, low dense, low plasticity, 70% fine sand, 15% silt, 10% med. sand, small opagnes + mica flecks, small quartz nodules, trace rootlets, trace charcoal flakes (~2mm)</p>	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

no GW encountered
location not moved

total depth = 0.5' bgs

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 141
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 05 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/28/12 0854	Date/Time Total Depth Reached: 3/28/12 0900	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90199(905)	
Geologist: URGoldman	Checked By / Date: W. King 3/30/12			

Radiological Background: 13 / 82	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			14	82	Surface: soil + twigs		
0.5			00	15	72	Silty sand: dark yellowish brown (10YR 4/6) 65% fine sand, 15% med sand, 20% silt, moist, low dense, cohesive, no odor or staining, trace roots.	5M
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

no GW encountered
no deviation in location

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ 2	Group: east	Location ID: 143	
Drilling Company: HGL		Driller: J. LaVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 3/28/12 1440		Date/Time Total Depth Reached: 3/28/12 1450	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)			
Geologist: LR Goldman				Checked By / Date: <i>[Signature]</i> 3/30/12			
Radiological Background: 4 / 81		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm	

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	14				<p>Surface = grass + wood chips</p> <p>Silty sand: dark olive brown (2.5Y 3/3), 85% fine to med. sand, 15% silt, moist, no odor or staining, non cohesive, dense, rootlets (trace)</p>	SM	
0.5	15						
1.0	12						
2.0					no GW encountered no deviation in location		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: WEST	Location ID: 144
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/12/12 (920)	Date/Time Total Depth Reached: 4/12/12 0932 05	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90202 (0930)	
Geologist: LRGoldman	Checked By / Date: Cecilia Herrera 4/12/12			

Radiological Background: 12/88	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	12/78		0.0	Micro R / Pancake	Surface: bare soil + wooden twigs	SM	
0.5	14/114		0.0	Micro R / Pancake	Silty sand w/ gravel: dark yellowish brown (10YR 4/4), 75% fine sand, 15% silt, 10% subangular siltstone gravel, moist, no odor or staining, noncohesive		
1.0					no GW encountered		
2.0					TD = 0.5' bgs		
3.0					location moved 5' east to avoid dense vegetation		
4.0					GPS coordinates:		
5.0					6343027.82 E		
6.0					1907035.44 N		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 145
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/11/12 1430	Date/Time Total Depth Reached: 4/11/12 1430	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90203(1430)	
Geologist: RobbinsGoldman	Checked By / Date: Carmen Garcia 4/12/12			

Radiological Background: 13/67	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	13	Surface = wooden twigs, exposed soil		
0.5			0.0	13	clayey silt: very dark brown (10YR 3/2), 60% silt, 40% clay, moist, cohesive, no odor or staining	ML	
1.0				60	trace rootlets, trace charcoal flakes		
1.0 - 6.0					no GW encountered TD = 0.5' bgs location not marked		

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 146
Drilling Company: HGL	Driller: J. LeVargie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/18/12 1531	Date/Time Total Depth Reached: 4/18/12 1531	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90204 (1530)	
Geologist: L. Robbins Goldman	Checked By / Date: Cliff Humphrey 4/19/12			

Radiological Background: 13 / 73	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	13 / 78		0.0	13 / 78	Surface: leaf litter, wooden sticks		
0.5			0.0	14 / 60	Silty sand: black (10YR 2/1), moist, noncohesive, very loose, trace rootlets + leaf matter, mica flakes	SM	
1.0					NO GW encountered		
2.0					TD = 0.5' bgs		
3.0					Location moved due to poison oak.		
4.0					GPS location:		
5.0					6345585.17E		
6.0					1908197.73N		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 147
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/17/12 1508	Date/Time Total Depth Reached: 4/17/12 1524	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90205 (1510)	
Geologist: Robbins Goldman		Checked By / Date: Curt Knudsen 4/18/12		

Radiological Background: 16/87	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	16/102		0.0	16/87	<p>Surface: exposed soil, wooden twigs</p> <p>Silty sandy gravel: 80% fine sand, 15% fine sand, 15% silt, 10% siltstone gravel, moist, very loose, noncohesive, abundant roots + organic material (leaves, sticks, etc.) 104R 3/2 very dark grayish brown</p> <p>TD = 0.5' bgs no GW encountered location moved ~20' NE to avoid poison oak + rocky outcrop GPS position: 6348776.43E 1907397.69N</p>	SM	

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 150
Drilling Company: HGL	Driller: J. LeBorgie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/16/12 1515	Date/Time Total Depth Reached: 4/16/12 1530	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90208(1525) / DWP: 90262(1/2)	
Geologist: Robbins Golden	Checked By / Date: CJL / 4/26/12			

Radiological Background: 13.5/86	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	UR/pancake	Surface: grass		
0.5			0.0	13.5 84 14.5 78	Silty sand; dark brown (10YR 3/3), 85% fine sand, 15% silt. dry, very loose, noncohesive, mica flakes, abundant rootlet balls, trace charcoal trace twigs	SM	
1.0					no GW encountered		
2.0					TD = 0.5' bgs		
3.0					location moved to a soil outcrop amongst sandstone outcrop. GPS position:		
4.0					6345662.87E		
5.0					1907995.19N		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 152	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/12/12 0945		Date/Time Total Depth Reached: 4/12/12 0955	
Type of Sampling Device: Trowel/Shovel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90210(0955)			
Geologist: LR Goldman		Checked By / Date: Valencia Garcia 4/13/12					
Radiological Background: 12/88		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			80	54 135	<p>pancake / MR surface: Subrounded rocks, plant debris, twigs silty sand w/ gravel: dark brown (10YR 3/3), 65% fine sand, 20% subrounded conglomerate gravel (varies from 1" - 6" length), 15% silt, moist, noncohesive, no odor or staining, mica flakes, trace siltstone/sandstone angular fragments, trace rootlets, trace charcoal flakes</p> <p>no GW encountered TD = 0.5' bgs <u>location not moved.</u></p>	SM	
1.0			80	42 15			
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: W	Location ID: 153
Drilling Company: HGL	Driller: NA	Ground Elevation: NA	Total Depth Drilled: NA ft bgs.	
Drilling Equipment: Hand Auger Trowel/Shovel	Borehole Diameter: 3.0 inches NA	Date/Time Drilling Started: 4-24-12	Date/Time Total Depth Reached:	
Type of Sampling Device: Hand Auger Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90211 (NA)			
Geologist: m B	Checked By / Date: C. M. [Signature] 6/18/12			

Radiological Background:	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5					<p>Loc 153 moved due to nesting birds. Loc reassigned to loc 202 sample 90211</p>		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 154	
Drilling Company: HGL		Driller: J. Levingie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 0950 4/11/12		Date/Time Total Depth Reached: 4/11/12 1000 0.5	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90212 (1000)			
Geologist: L Robbins Goldman				Checked By / Date: C Vance 4/12/12			
Radiological Background: 11 / 67		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	11.5 / 84	<p>Surface: sparse grass + exposed soil</p> <p>Silty sand: very dark grayish brown (10YK 3/2), 75% fine s @ 65% fine sand, 20% silt, 15% med sand, moist, noncohesive, no odor or staining, trace rootlets + charcoal flakes</p> <p>no GW encountered location moved off the road</p> <p>GPS location: 63439.50.77E 1906923.15N</p>	SM	
0.5				12 / 66			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							



CA West

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SC NBZ	Group: WEST	Location ID: 155
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4/4/12 1448	Date/Time Total Depth Reached: 4/4/12 1455	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90213 (1455)	
Geologist: Robbins Goldman		Checked By / Date: SLA 4/6/12		

Radiological Background: 15/99	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	15/126	Surface: thick grass + soil			
0.5			0.0	15/60	Silty sand: dark brown (10YR 3/3), 65% fine sand, 35% silt, ^{low} dense, moist, ^{non} cohesive, low plasticity, no odor or staining, mica flakes, trace rootlets	SM		
1.0					no GW encountered			
2.0					Location not moved			
3.0								
4.0								
5.0								
6.0								

TD = 0.5' bgs

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: well	Location ID: 156
Drilling Company: HGL	Driller: J. Le Vangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/17/12 1102	Date/Time Total Depth Reached: 4/17/12 1110	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90214 (1110)	
Geologist: L Robbins Goldman	Checked By / Date: Duff Knudsen 4/18/12			

Radiological Background: 13.5 / 83	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			13/66		Surface: wooden twigs, exposed soil + rocks		
0.5			0.0		<p>no pancake</p> <p>Silt w/ Sand: sandy silt: very dark brown (10YR 2/2), 70% silt, 30% fine sand, semi-moist, very soft, trace rootlets, plant debris, trace charcoal flakes (~2mm)</p> <p>no GW encountered</p> <p>TD = 0.5' bgs</p> <p>Location moved, GPS position</p> <p>6344376.18E</p> <p>1907890.71N</p>	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: nabest	Location ID: 157	
Drilling Company: HydroGeoLogic		Driller: J LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 4-9-12 1330		Date/Time Total Depth Reached: 4-9-12 1350	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90215 (1352)			
Geologist: M Birney				Checked By / Date: [Signature] 4-10-12			
Radiological Background: 15 / 33		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	15 / 73	Surface: scattered grass silty sand, dark yellowish brown (10gr 3/4) 60% fine sand, 25% silt, 15% med coarse sand, semi moist, non cohesive, loose, no odor, no staining trace rootlets	SM	
1.0			0.0	16 / 114			
2.0							
3.0							
4.0							
5.0							
6.0							

TD = 0.5' bgs
no groundwater

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 158
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/12/12 1450	Date/Time Total Depth Reached: 4/12/12 1500 0.5	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90216 (1500)	
Geologist: Robbins Goldman	Checked By / Date: Calleen Garcia 4/13/12			
Radiological Background: 114R/Top 14"	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:		0.0 ppm

Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	11/72				Surface: rock fragments + wooden twigs		
0.5	0.0			12/86	Sandy silt: dark yellowish brown (10YR 4/4), 70% fine sand, 20% silt, 10% siltstone and near gravel, moist, loose, noncohesive, trace rootlets, trace charcoal flakes	SM	
1.0							
2.0					no GW encountered TD = 0.5' bgs location not moved		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: W51	Location ID: 160
Drilling Company: HGL	Driller: J LeVangio	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4-16-12 1438	Date/Time Total Depth Reached: 4-16-12 1438	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		902.18 (1440)	
Geologist: M Birney	Checked By / Date: [Signature] 4-17-12			

Radiological Background: 15 NA 199	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	12/16	surface: thick brush			
0.5			0.0	12/16	silty sand, strong brown (7.5 yr 4/6) 60% fine sand, 25% med sand, 15% silt, loose, semi moist, non plasticity, no odor, no staining	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

T.D = 0.5' bgs
no groundwater

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 161
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/17/12 1137	Date/Time Total Depth Reached: 4/17/12 1152	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90219(1145)	
Geologist: L. Roberts Goldman	Checked By / Date: Duff Hunt 4/18/12			

Radiological Background: 125/96	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0-0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0-0	13/66	<p>Surface: exposed soil, wadded twigs, sparse deer scat</p> <p>MR pancake</p> <p>Silty sand: dark brown (10YR 3/3), 60% fine sand, 40% silt, moist, trace rootlets, noncohesive, very loose, trace charcoal flakes</p>	SM	
0.5			0-0	14/96	<p>NO GW encountered</p> <p>TD = 0.5' bgs</p> <p>location not moved due to dense vegetation, GPS position:</p> <p>6344402.30E</p> <p>1907778.17N</p>		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 162
Drilling Company: HGL	Driller: J. heVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/17/12 0945	Date/Time Total Depth Reached: 4/17/12 1000	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.)		90220(0955)	
Geologist: L Robbins Goldman	Checked By / Date: [Signature] 4-18-12			

Radiological Background: 13 / 92	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	13		0.0	MR/pancake	Surface: exposed soil w/ sparse grass		
0.5	14		0.0	66	silty sand: (10YR 3/3) dark brown, 85% fine grained sand, 15% silt, very loose, noncohesive, semi-moist, mica flakes, quartz grains, trace rootlets, charcoal flakes (trace) ~ 2mm	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

TD = 0.5' bgs
 no GW encountered
 Location moved to avoid ~~dense~~ dense vegetation & rock face; GPS position:
 6344566.06 E
 1907960.19 N

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 163
Drilling Company: HGL	Driller: M. Birney	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/11/12 1310	Date/Time Total Depth Reached: 4/11/12 1320 0.5	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs)		90221 (1320)	
Geologist: Robbins Goldman	Checked By / Date: C. Garcia 4/12/12			

Radiological Background: 13/87	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	13/87	Surface = bare soil, sparse weeds	(G)	
0.5			0.0	14/90	clayey silt w/ gravel: yellowish brown (10YR 4/4), 60% silt, 30% clay, 10% siltstone subangular gravel, moist, ^{very} soft, no odor, no staining, trace mica flakes, trace charcoal flakes	ST ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

no BW encountered
TD = 0.5' bgs
location not moved

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 164	
Drilling Company: HGL		Driller: M. Brney		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/16/12 126		Date/Time Total Depth Reached: 4/16/12 1135	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90222 (1130)			
Geologist: LRobbinsGoldman				Checked By / Date: C. K. 4-17-12			
Radiological Background: 13/41		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	13/78	Surface: grass		
0.5			0.0	15/84	Silty sand: dark brown (10YR 7/3), 75% fine sand, 25% silt, moist, non cohesive, very loose, trace rootlets, trace sticks	SM	
1.0					no GW encountered		
					TD=0.5' bgs		
					location not moved		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 166
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/17/12 10A	Date/Time Total Depth Reached: 4/17/12 1027	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90224 (1025)	
Geologist: L. Robbins Goldman	Checked By / Date: Cliff Knott 4-18-12			

Radiological Background: 14 / 80	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13/96	Surface: Soil + twigs			
0.5			0.0	15/84	Silty sand: dark brown (10YR 3/3), 85% fine sand, 15% silt, semi-moist, very loose, noncohesive, trace sandstone gravel (fragile), mica flakes, quartz grains, trace rootlets + charcoal flakes (<1mm)	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

TD=0.5' bgs
no GW encountered
location moved
GPS position: 6344527.04E
1907900.84N

SSFL BORING LOG



NBZ_167

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: H204	Location ID: 167
Drilling Company: HydroGeoLogic		Driller: J LeVangie	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA	Date/Time Drilling Started: 4-9-12 1404	Date/Time Total Depth Reached: 4-9-12 1414	
Type of Sampling Device: Trowel/shovel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90235 (1418)		
Geologist: M Birney			Checked By / Date: Cliff Knight 4-10-12		

Radiological Background: 15 / 84	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	15/96	surface: small grasses			
0.5			0.0	94/104	<p>silty sand, brown (7.5yr 4/3)</p> <p>60% fine sand 35% coarse, 15% silt, med dense, semi moist, rootlets, charcoal flakes, non cohesive, no odor, no staining</p>	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

TD = 0.5' bgs
no ground water

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: WST	Location ID: 168
Drilling Company: HGL	Driller: J LeVang, Jr	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4-11-12 0927	Date/Time Total Depth Reached: 4-11-12 0932	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs)		90226 (0935) 90258 (N/A)	
Geologist: M Birney	Checked By / Date: C Garcia 4/12/12			

Radiological Background: 12 / 85	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	17/72	Surface: scattered grass			
0.5			0.0	12/108	poorly graded sand 60% fine sand, 30% coarse sand, 10% silt, dark yellowish brown (10 yr 3/8), ^{mb} act , non cohesive, mica flakes, trace rootlets, ^{mb} part no odor, no staining (see moist)	SP		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

TD = 0.5' bgs
no groundwater

SSFL BORING LOG



NBZ_169

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: NBZ-169
Drilling Company: HydroGeoLogic, Inc.	Driller: P. Harvey	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: NA	Date/Time Drilling Started: 0630	Date/Time Total Depth Reached: 4/3/2012 / 0905	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90227 (0910)	
Geologist: C. Garcia	Checked By / Date: C. Garcia / 4/5/12			

Radiological Background: NA 2891/34	Radiological Equipment Used: MicroR / Downhole / Pancake Meters	PID Used: Mini Rae 3000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0					Surface: Sage Plant, Grassy			
0.5			1.6	36 3750 38 3550	Silty sand; Dark Brown (7.5 YR/3/3) Loose; non-cohesive; non-plastic; No odor or staining Dry; 40% fines and 5% med sand 15% silt	SM		
1.0					<p>Total Depth 0.5 ft No groundwater encountered.</p>			
2.0								
3.0								
4.0								
5.0								
6.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 170
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/20/12 1038	Date/Time Total Depth Reached: 4/20/12 1059	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90228(1045)	
Geologist: L Robbins Goldman	Checked By / Date: Bill Thibault 4/23/12			

Radiological Background: 13 / 62	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0					Surface: wooden sticks, grass (green + senescent)		
0.5				0.0	Silty sand: dark yellowish brown (10YR 3/4), 75% fine sand, 25% silt, dry, very loose, noncohesive, trace rootlets, mica flakes, trace med sand.	SM	
1.0				0.0			
2.0							
3.0							
4.0							
5.0							
6.0							

no GW encountered
TD=0.5' bgs
location not moved

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 171	
Drilling Company: HGL		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/21/12 1305		Date/Time Total Depth Reached: 4/20/12 1315	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90229 (1315)			
Geologist: Robbins Goldman				Checked By / Date: C. J. [Signature] 4/23/12			
Radiological Background: 14/64		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	14.5/96	Silty sand: very dark grayish brown (10YR 3/2), 65% fine sand, 35% silt, dry, very loose, non-cohesive, no odor or staining, trace rootlets no GW encountered TD = 0.5' bgs location moved ~25' due to steep terrain GPS position: 6345801.67E 1908017.26N	SM	
1.0			0.1	15.5/90			
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: W6T	Location ID: 173
Drilling Company: HGL	Driller: J LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4-16-12 1507	Date/Time Total Depth Reached: 4-16-12 1520	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90231 (1523) 90259 (NA)	
Geologist: m Birney	Checked By / Date: <i>[Signature]</i> 4-17-12			

Radiological Background: B / NA / 52	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13/54	surface: tall grass			
0.5			0.0	13/54	silty sand, very dark gray (7.5gr 3/1) 65% fine sand, 35% silt, loose, semi moist, channel present, trace rootlets, mica flakes, no odor, no staining, non cohesive,	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

T11 = 0.5' bgs
no groundwater encountered

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 174	
Drilling Company: HydroGeoLogic		Driller: J Le Vangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 4-9-12 1435		Date/Time Total Depth Reached: 4-9-12 1445	
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90232 (1442)			
Geologist: M Birney				Checked By / Date: Chiff / 4-10-12			

Radiological Background: 15 / 60		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm	
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	15 / 72	<p>Surface: scattered grass + stumps</p> <p>Silty sand 65% fine sand, 25% silt, 10% med sand, med dense, siltstone ^{chert} _{mb}, non cohesive, semi moist, rootlets, no odor no staining</p>	SM	
0.5			0.0	15 / 54			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

TD 0.5' bgs.
no groundwater

SSFL BORING LOG



NBZ_176

of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 176
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/11/12 135	Date/Time Total Depth Reached: 4/11/12 1345	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs)		90234 (1345)	
Geologist: L Robbins Goldman	Checked By / Date: C Garcia 4/12/12			

Radiological Background: 5/5	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs.)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			15/60	sub/pancake	Surface = sparse grass + soil		
0.5			17/144		Clayey silt w/ gravel: yellowish brown (10YR 4/4), 60% silt, 20% clay, 20% siltstone angular gravel moist, very soft, no odor or staining, trace mica flakes, trace charcoal flakes	SM ML	
1.0					NO GW encountered		
2.0					TD = 0.5' bgs		
3.0					location not moved		
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 17A		
Drilling Company: HGL		Driller: C. Knight		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.		
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/18/12 050		Date/Time Total Depth Reached: 4/18/12 4/19/12 1106		
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90237 (1100)				
Geologist: LRobbins Goldman				Checked By / Date: Chiff Thuy 4-20-12				
Radiological Background: 4/63		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft. bgs.)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings (CPM)
					<p>Surface: exposed soil, leaf litter, wooden twigs</p> <p>silty sand: dark brown (10YR 3/3), dry, noncohesive, very loose, mica flakes, trace rootlets, leaf litter + sticks, 85% fine sand, 15% silt</p> <p>TP = 0.5' bgs no GW encountered location not moved</p>			
0.0			14/12				SM	
0.5			17/108					
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 182	
Drilling Company: HGL		Driller: J Le Vangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4-11-12 1026		Date/Time Total Depth Reached: 4-11-12 1034 0.5	
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 94040 (1035)			
Geologist: M Birney				Checked By / Date: Calleon Jorica 4/12/12			
Radiological Background: 11 / 107		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.5	13/103	<p>Surface: scattered grass + small bushes</p> <p>silty sand, very dark brown (10 yr 2/2)</p> <p>moist, 60% fine sand, 25% silt, 15% med sand, trace rootlets, non cohesive, loose, no odor, no staining</p>	Sm	
1.0			0.1	12/84			
2.0							
3.0							
4.0							
5.0							
6.0							

TD 0.5' bgs
no groundwater

SSFL BORING LOG



NBZ_185

1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west na (19)	Location ID: 185
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4/1/12 1038	Date/Time Total Depth Reached: 4/9/12 (1048)	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90243 (1050)	
Geologist: K. Goldman	Checked By / Date: Cliff Kuyler 4-10-12			

Radiological Background: 15 / 78	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	14		0.0	UR pancake	Surface: soil, dense grass, senscent		
0.5	72		0.0	14	Sandy silt w/ clay: dark brown (10YR 3/3), 65% fine sand, 10% med. sand, 15% clay, 10% silt, moist, low plasticity, low dense, no odor or staining, rootlets (trace)	SM	
1.0	102				no GW encountered TD = 0.5' bgs location not moved		
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

west

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ		Group: RFA		Location ID: 186	
Drilling Company: HydroGeoLogic		Driller: J. LeVangie		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.			
Drilling Equipment: Trowel/shovel		Borehole Diameter: NA		Date/Time Drilling Started: 4/10/12 1025		Date/Time Total Depth Reached: 4/10/12 1035			
Type of Sampling Device: Trowel/shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90244 (1035)					
Geologist: L. Robbins Goldman				Checked By / Date: Cliff Knight 4-11-12					

Radiological Background: 13/3203/56		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm					
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	14/66	Surface: grass + soil		
0.5			0.0	13/84	Silty sand: dark brown (10YR 3/3), 75% fine sand, 25% silt, moist, noncohesive, no odor or staining, low dense	SM	
1.0					total depth 0.5' bgs no GCL encountered		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: well	Location ID: 189
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/8/12 1100	Date/Time Total Depth Reached: 4/18/12 1118	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90747(1110)	
Geologist: Robbins Goldman	Checked By / Date: Riff Knott 4/19/12			

Radiological Background: 125 / 75	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	125 / 75	Surface: Grass		
0.5			0.0	14 / 60	Silty sand: very dark brown (10YR 3/2), 60% fine sand, 40% silt, dry, noncohesive, very loose, trace rootlets, trace charcoal, mica flakes	SM	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

TD = 0.5' bgs
 NO GW encountered
 location moved due to nesting birds
 GPS: 6344473.09E
 1907139.77N

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 191 192
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4/9/12 1105	Date/Time Total Depth Reached: 4/9/12 (1113)	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90249 (1115)	
Geologist: LKGoldman	Checked By / Date: Cliff / 4-10-12			

Radiological Background: 13.5 uR / 80 cpm	Radiological Equipment Used: Micro R / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13/84	Surface: sparse weeds, exposed soil			
0.5			0.0	14.5/90	Silty sand w/ gravel: yellowish brown (10YR 5/4), 65% fine sand, 15% med sand, 10% silt, 10% subangular siltstone gravel, dry, loose, med. dense, non plastic, no odor or staining, trace rootlets + sticks	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

no GW encountered
TD=0.5' bgs
location not moved

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: NBZ	Group: West	Location ID: 193	
Drilling Company: HGL		Driller: C. Knigul		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel		Borehole Diameter: N/A		Date/Time Drilling Started: 4/19/12 10	Date/Time Total Depth Reached: 4/19/12		
Type of Sampling Device: Trowel/Shovel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 90149 (140)			
Geologist: L Robbins Goldman				Checked By / Date: Dell Hunt 4-20-12			
Radiological Background: 14/90		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	14/108	Surface: Silty sand: 75% ^{fine} sand, 25% silt, very dark brown (10YR 2/2), dry, noncohesive, very loose, trace rootlets, mica flakes	SM	
1.0			0.0	15/102			
2.0					TD = 0.5' bgs no GW encountered location not moved moved due to poison oak saplings GPS position: 6345936.78 E 1908406.60 N		
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG



NBZ_194

Sheet 1 of 1

East

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: 1416	Location ID: 194 (old location 106)
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 4/2/12 1423	Date/Time Total Depth Reached: 4/2/12 1428	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		9064 (1430)	
Geologist: LR Goldman	Checked By / Date: Cliff Knight 4/4/12			

Radiological Background: 12/05	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	12/78	<p>← <i>Micro pancake</i> Description <i>Artificial Air</i> (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</p> <p>Surface = soil, grass + wood chips (~1")</p>	AF SM		
0.5			0.0	13/66	<p>Silty sand: dark brown (10 YR 3/3), 65% fine sand, 35% silt, moist, low dense, low plasticity, no odor or staining, slightly cohesive, trace rootlets, trace debris: rubber flake (1mm) (1mm-2mm), glass piece (~25mm), charcoal pieces (1mm-2mm) (1mm-2mm)</p>			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

no GW encountered
not moved

SSFL BORING LOG



NBZ_195

Sheet of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 195 (old location #117)
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/24/12 1531	Date/Time Total Depth Reached: 3/26/12 1537	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90175 (1540)	
Geologist: L Robbins Goldman	Checked By / Date: WJ / M 3-28-12			

Radiological Background: 14 / 84	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			14 / 96		<p>MR7 pancake</p> <p>silty sand: dark yellowish brown (10YR 3/6), 70% fine sand, 20% silt, 10% clay, moist, cohesive, no odor or staining, charcoal flecks, trace rootlets, med. dense</p> <p>total depth = 0.5'</p> <p>no groundwater encountered</p>	SM		
0.5			0.0					
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

GPS location:
6350129.24E
1910058.59N

SSFL BORING LOG

east

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: R-6	Location ID: 196 (old location #125)
Drilling Company: HydroGeoLogic	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: 3/26/12 1130	Date/Time Total Depth Reached: 3/26/12 1135	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90183 (1138)	
Geologist: LR Goldman	Checked By / Date: [Signature] 3-28-12			

Radiological Background: 14 / 84	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			14 / 60	14 / 60	Silty sand: dark yellowish brown, 85% fine to med sand, 15% silt, moist, no odor or staining, cohesive, no plasticity, abundant rootlets, potato bug; med. dense	SM		
0.5			0.0					
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

total depth = 0.5' bgs
no groundwater encountered

GPS location:
6350057.76 E
1910541.41 N

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: east	Location ID: 197
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 3/29/12 1340	Date/Time Total Depth Reached: 3/29/12 1350	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90186 (1355)	
Geologist: LR Goldman	Checked By / Date: Chris Knight 4-2-12			

Radiological Background: 13 / 87	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			13 / 66		Silty sand: dark brown (10YR 3/3), moist, low dense, no odor or staining, cohesive, low plasticity, trace rootlets, & trace charcoal flakes, 35% silt, 10% med. sand, 55% fine sand	SM	
0.5			0.0				
1.0					no GW encountered TD = 0.51 GPS location: 6350138.30E 1910138.16N		
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG



Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: <u>5C</u> NBZ <u>CSH</u>	Group:	Location ID: 198
Drilling Company: HydroGeoLogic	Driller: <u>J. LeVangie</u>	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/shovel	Borehole Diameter: NA	Date/Time Drilling Started: <u>4/3/12 1515</u>	Date/Time Total Depth Reached: <u>4/3/12 1525</u>	
Type of Sampling Device: Trowel/shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90200 (1525)	
Geologist: <u>LR Goldman</u>	Checked By / Date: <u>Cliff Thudt 4/4/12</u>			

Radiological Background: 15/83	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	<u>15/72</u>	Surface: twigs, sparse grass, soil, charred sticks			
0.5			0.0	<u>16/78</u>	Silty sand: dark yellowish brown (10YR 3/4), 80% fine sand, 20% silt, moist, cohesive, low dense, low plasticity, trace rootlets, trace charcoal flakes, mica flakes, quartz grains, no odor or staining.	SM		
1.0					trace siltstone cobble (~20mm)			
2.0					total depth = 0.05'			
3.0					no GW encountered			
4.0					Location GPS'd:			
5.0					6348948.03 E			
6.0					1910015.64 N			

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: #99 (old location #98)
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/23/12 0930	Date/Time Total Depth Reached: 4/23/12 0943	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90156 (0940)	
Geologist: Robbins Goldman		Checked By / Date: M/M/M/M Bin 4-23-12		

Radiological Background: 12.5/87	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs.)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			135/84		<p>MR/pancake</p> <p>Surface: exposed soil + sparse grass</p> <p>13/18 silty sand: dark yellowish brown (10YR 4/6), 80% fine sand, 20% silt, moist, noncohesive, no odor or staining, mica flakes, very loose</p> <p>no GW encountered TD = 0.5' bgs location not moved</p>	SM	

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: west	Location ID: 200 (old location #132)
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/20/12	Date/Time Total Depth Reached: 4/23/12 1038	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90190 (1035)	
Geologist: Robbins Goldman	Checked By / Date: M. Bin 4-23-12			

Radiological Background: 13 / 72	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.0			0.0	13/78	Surface: dense grass + soil			
0.5			0.0	13.5/66	silty sand; dark brown (10YR 3/3), 60% fine sand, 30% silt, 10% med sand, moist, noncohesive, very loose, no odor or staining, trace rootlets, trace charcoal flakes	SM		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

no GW encountered
TD=0.5' bgs
location not moved

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: NBZ	Location ID: 201 (old location 137)
Drilling Company: HGL	Driller: J. LeVangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/23/12 1058	Date/Time Total Depth Reached: 4/23/12 110	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90195 (1105) / 90263 (n/a)	
Geologist: Robbins Goldman	Checked By / Date: M. Pin 4-23-12			

Radiological Background: 13/88	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	13/84	Surface: leaf litter, exposed soil		
0.5			0.0	14.5	Sandy silt: dark brown (7.5YR 3/4), 65% silt, 35% fine sand, moist, soft, no odor or staining, trace rootlets + leaves	SM ML	
1.0				96			
<p>no GW encountered TD = 0.5' bgs location not moved</p>							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: NBZ	Group: West	Location ID: 202 (old location 153)
Drilling Company: HGL	Driller: J. Lefangie	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Trowel/Shovel	Borehole Diameter: N/A	Date/Time Drilling Started: 4/20/12 0955	Date/Time Total Depth Reached: 4/20/12 1008	
Type of Sampling Device: Trowel/Shovel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		90211 (1005)	
Geologist: L Robbins Goldman	Checked By / Date: [Signature] 4/23/12			

Radiological Background: 12 / 104	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	13	<p>MR/Pancake</p> <p>Surface: wooden trim, sparse weeds</p> <p>poorly graded sand w/ silt and gravel</p> <p>silty sand w/ gravel, dark yellowish brown (10YR 4/4), 70% fine sand, 10% med sand, 10% native sandstone gravel, 10% silt, very loose, non-cohesive, trace rootlets, dry</p>	SM ^(S) SP	
0.5			0.0	84			
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

no GW encountered
TD = 0.5' bgs
location not moved