



5A_001



BORING LOG

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Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 1	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 1352		Date/Time Total Depth Reached 2-23-11 / 1401	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (# 30005) (1400)			
Geologist C. Carmichael				Checked by/Date [Signature] 5/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.4 ppm)			
Depth	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'				0.4 12	Sandy silt with gravel, (10YR, 3/3), dark brown, 55% silt, 30% fine to medium grained sand, 15% gravel (fill rock), semi-moist, soft, some rootlets, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 1
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-14-11 1355	Date/Time Total Depth Reached 3-17-11 1430
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30006 (4400) (2) 1/2 gallon bags + 1-4oz Jar		
Geologist C. Knight		Checked by/Date <i>[Signature]</i> 5/2/11	

Radiological Background S1 / 2525	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					surface: soil and grass		40.5' 2588
1.5		0.0	30		Sandy silt: Brown (7.5 YR 5/4), moist, med. stiff; no color, 35% fine sand, 65% silt, trace crushed medium gravel near surface, non cohesive, low plasticity	ML	2868
4.0		0.0	70				4005
		0.0	70				4853
		0.0	75				4994
2.0		0.0	66				5113
		0.0	40				5003
3.0		0.0	40				5131
		0.0	55				5119
4.0		0.0	50				5118
		0.0	70				5150
5.0		0.0	50		Same as above	ML	5206
		0.0	45				5291
6.0		0.0	55				5564
					gradational contact		

Radiological Background				Project Name	Project Number	Location	
51 / 25 25				SSFL Area IV Radiological Study	EP9038.01.22.04.03	1	
Depth	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
							Inches (CPM)
6.0			6.0	55	Silty Sand: Brown (10YR 5/3), moist, dense, no odor, 35% silt, 65% fine sand, trace medium sand, trace iron oxide staining	SM	5564
			6.0	55	Weathered Sandstone: Brownish yellow (10YR 6/6), moist, hard, no odor, mechanically weathered to SP, medium sand	Sp Pak	4745
7.0			6.0	70	refusal on sandstone @ 7.0'		NM
					No G.W. encountered		
					Target depth of 10' not reached		
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							



BORING LOG

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Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 2	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11/1421		Date/Time Total Depth Reached 2-23-11/1430	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (# 30007) (1430)			
Geologist C. Carmichael				Checked by/Date S. J. J. 5/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.5 gpm)			
Depth	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 Inches (CPM)
0.5'				0.5 12	Sandy silt with gravel, (10YR, 4/3), brown, 50% silt, 30% fine to medium grained sand, 20% gravel (fill rock), semi-moist, medium stiff, some rootlets, no odor. No groundwater encountered.	ML	

BORING LOG

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Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 1		Location ID 2	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 1.5'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-8-11 1515		Date/Time Total Depth Reached 3-8-11 1524	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 3000g (NO SAMPLE) (2) 1/2 gallon bags #1402 Jc			
Geologist C. Knight				Checked by/Date Chelle Carriquiry 16-14-11			
Radiological Background 55 / 2221		Radiological Equipment Used Pencake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.1 ppm)			

Depth	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 Inches (CPM)
0.0			0.1	50	Surface: native soil + grass		70.5 2551
0.5			0.1	40	Silty Sand; Fill: Yellowish brown (10YR 5/4) moist, medium dense, no odor, 10% angular 3/4" fill rock, 30% silt, 45% fine sand, 10% medium sand, 5% coarse sand	AS	4166
1.0			0.2	60	Sandstone: Brown (10YR 5/3), moist, hard, no odor, weathered mechanically to SP, fine grained sand	SP	5043
2.0			0.1	40	Refusal on sandstone 1.5' by 5'	Ref	5177
2.5					TD: 1.5'		
3.0					No GW encountered		
4.0					No Sample collected		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 3	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11/1405		Date/Time Total Depth Reached 2-23-11/1411	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30009) (1410)			
Geologist C. Carmichael				Checked by/Date [Signature] 5/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.4 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.5 12	Sandy silt with gravel, (10YR, 3/3), dark brown, 55% silt, 30% fine to medium grained sand, 15% gravel (fill rock), semi-moist, soft, some rootlets, no odor.	ML	
No groundwater encountered							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 3
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-8-11 1430	Date/Time Total Depth Reached 3-8-11 1455
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30010 (1440) (2) 1/2 gallon bags + 1 jar 402	
Geologist C. Knight		Checked by/Date [Signature] 5/2/11	

Radiological Background 5A / 2556	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)
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Depth	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 Inches
							+0.5 2633 (CPM)
0.5			0.0	85	Surface: native soil + gas Fill:		2960
			0.0	80	Silty Sand w/ gravel: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 15% angular coarse 3/4" gravel (fill), 20% coarse, 30% silt, 20% medium sand, 15% fine sand, mottled texture	AC/SM	4277
1.0			0.0	65	@ 10" bgs: Sandstone: light yellowish brown (10YR 6/4), slightly moist, hard, no odor, fine grained sandstone, weathers to SP		5093
			0.1	80			5551
2.0			0.1	74			5808
			0.1	50	refusal @ 3.0' bgs on sandstone No GW encountered		5322
3.0			0.1	40			NM
4.0							
5.0							
6.0							



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BORING LOG

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Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 4	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trawl / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 1332		Date/Time Total Depth Reached 2-23-11 / 1347	
Type of Sampling Device trawl / shovel		Samples Collected 2 1/2 gall bags, 1 4-oz jar (# 30011) (1345)		Checked by/Date [Signature] 5/2/11			
Geologist C. Carmichael							
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (Background = 0.4 ppm)			
Depth	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'				0.4 11	Silty sand with gravel, (10 YR, 3/3), 55% fine to medium grained sand, 30% silt, 15% gravel (fill rock), semi-moist, medium dense, some rootlets, no odor. No groundwater encountered.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP0038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 4
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-8-11 1140	Date/Time Total Depth Reached 3-8-11 1145
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30012 (NO SAMPLE) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date L. J. 5/2/11		

Radiological Background 44/2616	Radiological Equipment Used Pencake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.5			40	45	Fill; Silty Sand: Dark yellowish brown (10YR 4/4), med. dense, no odor, 40% silt, 60% fine sand, trace fine gravel Sandstone: Fine grained 0.4-0.5' hgt	AC/SM	4636
1.0					Refusal at 0.5' bgs on sandstone. No GW encountered No Sample Collected		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 5	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trussel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 1127		Date/Time Total Depth Reached 2-23-11 / 1135	
Type of Sampling Device trussel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30013) (1135)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 7-28-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.3 ppm)			
Depth	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'			0.3	12	Silt with sand and gravel, (10 YR, 3/3) dark brown, 60% silt, 20% fine to medium grained sand, 20% gravel (fill rock, asphalt), semi-moist, soft, some rootlets, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5/A group 1		Location ID 5	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth CK 4.5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-8-11 1020		Date/Time Total Depth Reached 3-8-11 1050	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 300M (1025) (2) 1/2 gallon bags + 1 4oz Jar			
Geologist C. Knight				Checked by/Date Phelisa Dail / 7-28-11			
Radiological Background SI / 2510		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			
Depth	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 Inches (CPM)
0.0		0.0	60	60	Surface: native ground + grass	AF	10.5 2566
0.5		0.0	65	65	Fill Silty sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, trace gravel/garnite, trace asphalt, 40% silt, 10% medium sand, 50% fine sand	SM	3303
1.0		0.0	55	55			4350
				35			4914
				40			5026
2.0		0.0	40	40			5026 5264
				30			5264 5329
3.0		0.0	25	25	weathered bedrock (sandstone and siltstone beds): brownish yellow (10YR 6/8), mechanically weathers to SP, fine sand w/ trace iron oxide staining, moist, hard, no odor	BL	5264 5331
				60			5329 5406
4.0		0.0	55	55	3.5' siltstone and mudstone: olive 5Y 4/4, moist, med. stiff weathered to CL, med plasticity, stiff, no odor, med dry strength	BL	5331 5473
				70	Refusal fine grained sandstone 4' 3" to 4' 6" refusal @ 4.5' bgs no GW encountered	N/M	

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 6	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 1112		Date/Time Total Depth Reached 2-23-11 / 1120	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (# 30015)(1120)			
Geologist C. Carmichael				Checked by/Date [Signature] 5/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.3 ppm)			
Depth	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.3 12	Silt with sand, (10YR, 3/4), brown, 75% silt, 25% fine to medium grained sand, common rootlets, semi-moist, soft, no odor.		ML	
				No groundwater encountered.			

Project Name: SSFL Area IV Radiological Study	Project Number EP0038.01.22.04.03	Subarea ID & Group 5A Group 1	Location ID 6
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-8-11 0920	Date/Time Total Depth Reached 3-8-11 0945
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 360 lb (0925) (2) 1/2 gallon bags + 1-4oz Jar		
Geologist E. Knight	Checked by/Date Chelsea Caille / 7-28-11		

Radiological Background 42 / 2765	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	45	Surface: native soil + grass	AS	3393
0.5			0.0	38	Fill: silty sand; light yellowish brown (2.5Y 6/4), moist, med. dense, no odor, 40% silt, 5% medium sand, 5% coarse, 50% fine sand, mottled	SM	4819
1.0			0.0	60			4965
			0.0	60			4899
2.0			0.0	50	Clay w/ silt: Olive brown (2.5Y 4/3), moist, medium stiff, no odor, 20% silt, 75% lean clay, cohesive, medium plasticity, med-high dry strength	CL	5211
			0.0	58	2' 2" weathered sandstone bedrock: light olive brown (2.5Y 5/6), moist, hard, no odor, mechanically weathers to SP, fine grained sand, trace oxidation staining	bedrock	5410
3.0			0.0	50			5281
					refusal @ 3.0' bgs		
					No GW encountered		
					TD 3.0'		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 7	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/0841		Date/Time Total Depth Reached 2-24-11/0850	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 14-oz jar (#30017) (0850)			
Geologist C. Carmichael				Checked by/Date J. McDaniel 5/2/11			
Radiological Background 12		Radiological Equipment Used up Rneter		PID Used Mini Rae 2000 (Background = 0.0 ppm)			
Depth	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'			0.3	12	Silt with sand, (10YR, 3/3), dark brown, 80% silt, 20% fine grained sand, some rootlets, trace sandstone fragments, soft, semi-moist, no odor. No groundwater encountered.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A / 1	Location ID: 7
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-7-11 0945	Date/Time Total Depth Reached: 3-7-11 1010
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30018 (1000) (2) 1/2 gallon bags + Jar 402		
Geologist: C. Knight	Checked by/Date: [Signature] 5/2/11		

Radiological Background: 36 / 2560	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.6 ppm)
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Depth	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 Inches (CPM)
			0.0	50	Surface: native soil / grass		4052604
0.5			0.6	50	Silty Sand: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 40% silt, 55% fine sand, 5% sand stone gravel, trace rutllots, trace mottling.	AS, SM	4494
1.0			0.6	40			4760
			0.6	35			5027
2.0			0.6	55			5061
			0.6	65			5084
3.0			0.6	50	Sandy Silt: dark yellowish brown (10YR 3/4), very moist, silt, no odor, 30% fine sand, 70% silt, slow dilatancy	ML	4923
			0.6	55			4987
4.0			0.6	50	Poorly graded Sand w/ silt & dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 25% silt, 75% fine sand, non cohesive	SP	4834
			0.6	50			4801
5.0			0.6	65			4842
			0.6	40			4843
6.0			0.6	45			4883

Radiological Background <u>3612560</u>				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>7</u>	
Depth	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			0.6	45	Same as above		4883
			0.6	35			4907
7.0			0.6	60			4901
			0.6	60			4856
8.0			0.6	50			4943
			0.6	60	Well graded sand: Brown (10YR 5/3) very moist, dense, no odor, 20% coarse, 40% medium sand, 40% fine sand, trace fine gravel		4848
9.0			0.6	65			5050
			0.6	50			4043
10.0			0.6	55	End boring TD 10.0' bgs No GW encountered		NM

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 8	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11 / 0903		Date/Time Total Depth Reached 2-24-11 / 0912	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 14-oz jar (#30019) (0912)			
Geologist C. Carmichael				Checked by/Date Steph Julia 5/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.2 ppm)			
Depth	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)
0.5'			03.12	Sandy silt, (10 YR, 4/3), brown, 70% silt, 30% fine to medium grained sand, common rootlets, semi-moist, medium stiff, trace sandstone fragments, no odor.			
				No groundwater encountered.			

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 8
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-7-11 0850	Date/Time Total Depth Reached 3-7-11 0920
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30020 (0400) (2) 1/2 gallon bags 1 Jar 4oz		
Geologist C. Knight	Checked by/Date Steve J. H. 5/2/11		

Radiological Background 38 cpm / 2855	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.1	50	Surface: native ground to grass	SM	3012
0.5			0.1	50	Silty Sand: dark yellowish brown (10YR 4/4), moist med. dense, no odor, 35% silt, 65% fine sand, trace cobbles		4443
1.0			0.1	55			4836
			0.1	65	Sandstone: Yellowish brown (10YR 5/6), moist, very dense, no odor, fine grained sandstone	Bedrock	4820
2.0			0.1	65			4902
					Refusal at 2.0' bgs		
					No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 9	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 0922		Date/Time Total Depth Reached 2-23-11 / 0941	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (# 30021) (0940)			
Geologist C. Carmichael				Checked by Date [Signature] 5/2/11			
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (background = 0.3 ppm)			

Depth	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	
							Inches	(CPM)
0.5'					Silt with sand, (10 YR, 3/3), dark brown, 75% fine silt, 25% fine to medium grained sand, moist, medium stiff, some rootlets, no odor.	ML		
No groundwater encountered.								

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 9
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-7-11 1120	Date/Time Total Depth Reached 3-7-11 1130
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30022C (NO SAMPLE) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date  5/2/11		

Radiological Background 42 / 2672	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.6 ppm)
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Depth	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 Inches (CPM)
			0.7	45	Surface gravel and native ground		10.5 3077
0.5			0.7	60	Sandstone: Pale brown (10YR 6/3), moist, hard, no odor, fine grained sandstone / trace coarse sand, weathered mechanically		3659
1.0			0.7	75			5905
2.0					Refuse @ 1.0' by S on sandstone No Sample Collected No GW encountered		6703
3.0							
4.0							
5.0							
6.0							



BORING LOG

Sheet 1 of 1

Project Name: <u>SSFL Area IV Radiological Study</u>		Project Number: <u>EP9038.01.22.04.03</u>		Subarea ID: <u>5A, group 1</u>		Location ID: <u>10</u>	
Drilling Company: <u>HGL</u>		Driller: <u>J. McDaniel</u>		Ground Elevation: <u>NA</u>		Total Drilled Depth: <u>0.5'</u>	
Drilling Equipment: <u>trawl / shovel</u>		Borehole Diameter: <u>NA</u>		Date/Time Drilling Started: <u>2-23-11/0903</u>		Date/Time Total Depth Reached: <u>2-23-11/0915</u>	
Type of Sampling Device: <u>trawl / shovel</u>		Samples Collected: <u>2 1/2 gall bags, 1 4-oz jar (#30023) (0915)</u>		Checked by/Date: <u>[Signature] 5/2/11</u>			
Geologist: <u>C. Carmichael</u>							
Radiological Background: <u>12</u>		Radiological Equipment Used: <u>up R meter</u>		PID Used: <u>Mini Raz 2000 (Background = 0.3 ppm)</u>			
Depth	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'				0.3 12	Sand with silt, (10YR, 4/6), reddish-brown, 85% fine to medium grained subangular sand, 15% silt, semi-moist, dense, no odor (weathered sandstone). Bedrock hit at 5"-6". No groundwater encountered.	Sm	

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 9A group 1	Location ID 10
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-7-11 1145	Date/Time Total Depth Reached 3-7-11 1225
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30024 (1150) (2) 1/2 gallon bags + 1 - 4oz Jar		
Geologist C. Knight	Checked by/Date [Signature] 6/1/11		

Radiological Background 48 / 2859	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.7 ppm)
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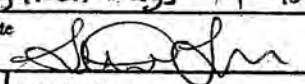
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: grass and per gravel		105 2643
0.5			0.6	40			3224
0.5			0.6	50	Poorly graded sand: brownish yellow (10YR 6/6) moist, dense, no odor, fine sand	SP	4656
1.0			0.6	60			5818
1.0			0.6	60	Sandstone and siltstone: very pale brown (10YR 7/3) dry, hard, w odor, fine grained sandstone w/ interbedded siltstone layer beds	SP	6105
2.0			0.6	70			6264
2.0					refused @ 2.0' bgs on sandstone		
3.0					TD: 2.0'		
4.0					No GW encountered		
5.0							
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 11	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trussel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 1054		Date/Time Total Depth Reached 2-23-11 / 1102	
Type of Sampling Device trussel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30025)(1100)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.2 ppm)			
Depth	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'				0.2 12	Sandy silt, (10YR, 4/4), brown, 65% silt, 35% fine to coarse grained sand, moist, common rootlets, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA Group 1	Location ID 11
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-8-11 0870	Date/Time Total Depth Reached 3-8-11 0850
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30026 (0830) (2) 1/2 gallon bags + 1 402 Jar		
Geologist C. Knight	Checked by/Date  6/1/11		

Radiological Background 33 / 2745	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches
0.5			0.0	70	Surface: grass + native ground		10.5/2685
			0.0	50	Silty sand: dark yellowish brown (10YR 4/4), moist, med dense, no odor, 35% silt, 15% medium, 50% fine sand	SM	4066
1.0			0.0	85	Weathered bedrock sandstone: olive yellow (2.5Y 6/8), moist, dense, no odor, mechanically weathers to S.M. fine sand (CIC)	Bedrock	5348
			0.0	56	with 30% silt, 70% fine sand		5237
2.0			0.0	30			4800
			0.0	35			4771
3.0					refusal @ 2.5 bgs on sandstone		4766
4.0					No Gw encountered		
5.0							
6.0							



5A_012



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 12	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 1026		Date/Time Total Depth Reached 2-23-11 / 1035	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30027) (1035)			
Geologist C. Carmichael				Checked by/Date 6/1/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (Background = 0.3 ppm)			
Depth	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'			03	12	Silt with clay and sand, (10 YR, 3/3), dark brown, 60% silt, 25% clay, 15% fine grained sand, common rootlets, semi-moist, medium stiff, medium hardness, no odor. No groundwater encountered.	ML	

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A and group 1	Location ID 12
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-7-11 1540	Date/Time Total Depth Reached 3-7-11 1550
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30028 (1545) (2) 1/2 gallon bags + 1 4oz Jar		
Geologist C. Knight	Checked by/Date [Signature] 6/1/11		

Radiological Background 60 / 2670	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.5 ppm)
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Depth	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)
							Inches
			0.5	30	Surface: native soil & grass		2496
			0.5	45	Fill: Silty sand: dark yellowish brown (10YR 4/4), moist, med. stiff, no odor, 10% clay, 30% fine sand, 55% silt, cohesive, low plasticity, no dilatancy	AC, ML	2792
			0.5	50			4067
			0.5	40			4515
			0.5	40	Fill: Silty Sand: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 5% coarse, 30% silt, 10% medium sand, 55% fine sand, asphalt trace	AC, SM	4744
			0.5	50			4902
			0.5	70	Weathered sand stone: Yellowish brown (10YR 5/6), very moist, hard, no odor. Mechanically weathered to SP fine sand	CK	55405
					Refusal @ 3.0' bgs no GW encountered		5546

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 13	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11/0945		Date/Time Total Depth Reached 2-23-11/0955	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30029) (0955)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.3 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0312	Silt with sand, (10YR, 3/4), dark brown, 75% silt, 25% fine grained sand, common rootlets, moist, soft, no odor. No groundwater encountered.	ML	

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 1	Location ID 13
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-7-11 1450	Date/Time Total Depth Reached 3-7-11 1500
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30030 (1500) (2) 1/2 gallon bags + 1 4oz Jar		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 6/1/11		

Radiological Background 41 / 2782	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.4 ppm)
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Depth	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	Inches	Borehole Gamma Readings (CPM)
							70.5	2369
								(CPM)
							3076	
0.5			0.5	55	Surface: native soil	SM		
			0.5	55	Silty Sand; dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 40% silt, box fine sand, trace roots near surface		432	
1.0			0.5	50			4659	
			0.5	40			5013	
2.0			0.5	60	1' 8" weathered sandstone: yellow (10YR 7/6), moist, hard, no odor, fine grained sandstone w/ interbedded siltstone beds		5074	
			0.5	60			5111	
3.0			0.5	70	2' 8" OK Refusal @ 3.0' bgs No GW encountered		5194	
4.0								
5.0								
6.0								



5A_014

Sheet 1 of 1

Exceeding Expectations					
Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A Group: <u>1</u> Location ID: <u>14</u>	
Drilling Company:		Driller:		Ground Elevation: <u>NA</u> Total Depth Drilled: <u>NA</u> ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started: Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: <u>30031 (no sample collected)</u> two 1/2 Gallon Bags	
Geologist:				Checked By / Date:	
Radiological Background: <u>NA</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: <u>NA</u> 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) Feet bgs.
0.5 1.0 2.0 3.0 4.0 5.0 6.0			NO SAMPLE COLLECTED - Boring not advanced - Steel Plate, no access		1 2 3 4 5 6



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 15
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-4-11 0824	Date/Time Total Depth Reached 3-4-11 0920
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30032 (0830) (2) 1/2 gallon bags + 1 4oz Jar		
Geologist C. L. Knight	Checked by/Date <i>[Signature]</i> 4/15/11		

Radiological Background 52 / 2754	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.5			0.0	45	Surface: native ground/grass		0.0 = 3746
0.5			0.0	64	Silty Sand: dark yellowish brown (10YR 4/6), moist, med. dense, no odor, 35% silt, 5% coarse, 15% medium, 45% fine sand, trace rootlets	SM	0.5 = 4573
1.0			0.0	76			1.0 = 4659
			0.0	30			1.5 = 4692
2.0			0.0	30			2.0 = 4760
			0.0	55	Sand w/ silt: dark yellowish brown (10YR 4/6), moist, med. dense, no odor, 25% silt, 5% coarse, 5% medium, 65% fine sand, iron oxide stained pockets	SM	2.5 = 4817
3.0			0.0	70			3.0 = 4684
			0.0	75	weathered sandstone: mechanically weathered to SP: very pale brown (10YR 7/4), moist, med dense, no odor, fine sand	SP	3.5 = 4646
4.0			0.0	55	refusal @ 4.0' bgs		4.0 = 4703
5.0					No GW encountered		
					Target depth of 10.0' not reached		

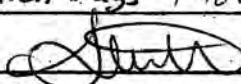
Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 16	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11/0830		Date/Time Total Depth Reached 2-23-11/0850	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30033) (0850)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/1/11			
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background = 0.0ppm)			
Depth	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 Inches (CPM)
0.5'			0.2 12	3" of asphalt on top. Sandy silt, (10YR, 3/6), reddish-brown, 60% silt, 30% fine to medium grained sand, 10% rock fragments (sandstone/siltstone, asphalt), moist, soft, no odor. No groundwater encountered.		ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 17	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment traverse / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11/1317		Date/Time Total Depth Reached 2-23-11/1326	
Type of Sampling Device traverse / shovel				Samples Collected 2 1/2 gall bags, 4-oz jar (#30035) (1325)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/1/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.2 ppm)			
Depth	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'			0.3	12	Sandy silt, (10YR 3/4), dark brown, 60% silt, 35% fine to medium grained sand, 5% rock fragments (sandstone, pea gravel), semi-moist, soft, common rootlets, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5/A Ground 1		Location ID 17	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 2.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-8-11 1330		Date/Time Total Depth Reached 3-8-11 1340	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30036 (1335) (2) 1/2 gallon bags + 1 4oz Jar			
Geologist C. Knight				Checked by/Date Chelsea Carnichael / 7-28-11			
Radiological Background 37 / 2883		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
			0.0	60	Surface: grass		+0.5 2682
0.5			0.0	75	Fill: silty sand w/ gravel: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 15% angular 3/4" gravel, 10% coarse, 15% medium sand, 60% fine sand, trace asphalt, red concrete trace, 15% silt 45%	AL / SM	3335
1.0			0.0	80			4097
			0.0	46			4459
			0.0	75	Sandstone: light olive brown (2.5Y 5/4), moist, hard, no odor, weathers to SP fine sand	SA / Rck	4638
2.0					refusal @ 2.0' bgs		5262
					No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 18	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11 / 1302		Date/Time Total Depth Reached 2-23-11 / 1312	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (# 30037) (1310)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/1/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (Background=0.2ppm)			
Depth	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0212	Sandy silt, (10 YR, 3/4), brown, 60% silt, 30% fine to medium grained sand, 10% rock fragments (sandstone, gravel fill), semi-moist, medium stiff, some rootlets, no odor. No groundwater encountered.		ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA group 1	Location ID 18
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3/8/11 / 1110	Date/Time Total Depth Reached 3/8/11 / 1115
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 360 38 (NO SAMPLE) (2) 1/2 gallon bags - 1 4025ar		
Geologist C. Knight	Checked by/Date  6/1/11		

Radiological Background 45/2522	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	60	Silty Sand: Dark yellowish brown (10YR 4/6), moist, med. dense, no adol, 35% silt, 65% fine sand	SM		4142
1.0			0.10	40	Sandstone at 1.0' bgs fine sand grains			4672
2.0					Refusal @ 1.0' bgs on sand stone			
3.0					No Cas encountered			
4.0					No sample collected			
5.0								
6.0								



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 19	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-23-11/1007		Date/Time Total Depth Reached 2-23-11/1015	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30039) (1015)			
Geologist C. Carmichael				Checked by/Date 6/1/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (background = 0.3 ppm)			
Depth	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'				03 12	Silt with sand, (10 YR, 3/3), dark brown, 75% silt, 20% fine to coarse grained sand, 5% asphalt pieces, moist, soft, no odor. No groundwater encountered.	ML	

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 9
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-7-11 1400	Date/Time Total Depth Reached 3-7-11 1420
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30040 (1410) (2) 1/2 gallon bags + 1-4oz Jar	
Geologist C. Knight		Checked by/Date [Signature] 6/1/11	

Radiological Background 53 / 2645	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.3 ppm)
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Depth	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)
							Inches
					Surface: V-ditch		125 2676
0.5			0.3	95	Poorly graded sand: dark yellowish brown (10YR 3/4), moist, loose, no odor, 80% fine sand, 10% medium, 10% silt.	SP	3132
1.0			0.3	40			41231
			0.3	50	Weathered sandstone: Yellowish brown (10YR 5/8), moist, hard, no odor, fine grained sand, trace iron oxide staining.		4442
2.0			0.3	40			5022
					Refusal @ 2.0' bgs TD 2.0' No GW encountered		5264
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 20	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/0845		Date/Time Total Depth Reached 2-17-11/0911	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30279) (0900)			
Geologist C. Carmichael				Checked by/Date Dups: 2057 (MS), 30376 (lab), 30376 (field) 2/1/11			
Radiological Background 5		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background=0.0cpm)			
Depth	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	Silt with sand, (10 YR, 3/3), dark brown, 85% silt, 15% fine grained sand, common rootlets, semi-moist, soft, no odor.	ML	
No groundwater encountered.							

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA 15	Location ID 20
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2'6"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/24/11 / 1402	Date/Time Total Depth Reached 2/24/11 / 1405
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected ID = 30280 / time: 1420 (2) 1/2 gallon bags		
Geologist Stephen Longyear	Checked by/Date Chelsea Carmichael / 7-28-11		
Radiological Background SS / 7546	Radiological Equipment Used Pencake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	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 Inches (CPM)
			0.0	55	0-2' SP SAND (very dark brown 10M 2/2)		0.0 = 2947
			0.0	67	15% clay, 15% silt, 70% fine-med. grained sand		0.5 = 4120
			0.0	55	(0-10" plant material - roots & grass)		1.0 = 4411
			0.0	75	low plasticity, very soft, dry		1.5 = 4760
			0.0	88	2'-2'6" SP SAND (light yellowish brown 2.5Y 6/4)		2.0 = 4857
			0.0	63	5% silt, 95% fine-med. grained sand indurated @ base, dry (micaceous, weathered sandstone)	SP	2.5 = 4510
					TO = 2'6" bgs (refusal) sandstone		3.0 = 8
					NO GW encountered		3.5 = 8
							4.0 = 8
							4.5 = 8
							5.0 = 8
							5.5 = 8



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 21	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/0940		Date/Time Total Depth Reached 2-17-11/0950	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30281) (0950)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background=0.09cpm)			
Depth	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'				0.015	Silt with sand, (10YR, 3/4), dark brown, 80% silt, 15% fine grained sand, 5% rock fragments (sandstone), common rootlets, semi-moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA / S	Location ID 21
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/24/11 / 0916	Date/Time Total Depth Reached 2/24/11 / 0920
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected ID 30282 / Alva: 0940 (2) 1/2 gallon bags [Dup's: 30385 @ 2' + 1' 10" 30386 @ 1' 10" + 1' 10" 30387 matrix]	
Geologist Stephanie Lepore Montrose		Checked by/Date Chelsea Carrivickal / 7-28-11	

Radiological Background 42 / 2701	Radiological Equipment Used Pancake / Deionhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	51	0'-9" SC SAND with clay (very dark brown 10YR 2/2) 10% silt, 20% clay, 70% fine-med. grained sand plant material (roots & grass), low plasticity, soft, dry, loose	SC	0.0 = 3039
			0.0	90	Color change at 2" to (dark brown 10YR 3/3)		0.5 = 4217
1.0			0.0	71	9'-1'8" SC clayey SAND (brown 7.5Y 4/4) 5% silt, 30% clay, 65% fine-med. grained sand denser, med. plasticity, firm, dry	SC	1.0 = 4751
			0.0	63			1.5 = 4766
2.0			0.0	74	1'8"-2'11" SC clayey SAND with silt (yellowish brown 10YR 5/6) 30% clay, 20% silt, 50% fine-coarse grained sand, med. plasticity, hard, dense, dry	SC	2.0 = 5027
			0.0	42			2.5 = 5053
3.0			0.0	55	2'11"-3'10" CL sandy CLAY (light olive brown 2.5Y 5/4) 45% clay, 15% silt, 40% fine-coarse grained sand med.-high plasticity, hard, dry	CL	3.0 = 5085
			0.0	75			3.5 = 5136
4.0			0.0	54	3'10"-4' SP SAND (yellowish brown 10YR 5/8) 10% silt, 90% fine-med. grained sand 10YR 5/8 loose, dry, non-plastic	SP	4.0 = 5346
					TDC 4' bgs (refusal)		
					NO GW encountered		

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A_group5		Location ID 22	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/0922		Date/Time Total Depth Reached 2-17-11/0931	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30283) (0930)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 14		Radiological Equipment Used up Rntr		PID Used Mini Rn 2000 (Background: 0.0cpm)			
Depth	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 Inches (CPM)
0.5'			0.0	14	Silt with sand, (10 VR, 3/4), dark brown, 70% silt, 20% fine grained sand, 10% rock fragments (brick, sandstone), common rootlets, dry, soft, no odor.	ML	
					No groundwater encountered.		

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA / S	Location ID 22
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/24/11 / 1046	Date/Time Total Depth Reached 2/24/11 / 1050
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 10 30284 / hme 1115 (2) 1/2 gallon bags		
Geologist Stephane Lepere M.D.rose		Checked by/Date Chelsea Carmichael / 7-28-11	

Radiological Background 41 / 2434	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	62	0-1' SP SAND (dark brown 10YR 3/3)		0.0 = 3152
			0.0	55	15% clay, 15% silt, 70% fine-med. grained sand	SP	0.5 = 4155
			0.0	75	plant material (roots & grass), worms low plasticity, very soft, dry		1.0 = 4758
			0.0	89	1'-1'11" ML sandy SILT with clay (strong brown 7.5YR 4/6)		
			0.0	89	20% clay, 45% silt, 35% fine-med. grained sand	ML	1.5 = 4802
			0.0	75	loose, low plasticity, soft, dry		
			0.0	81	1'11" - 3'7" LL Sandy CLAY (yellowish brown 10YR 5/8)		2.0 = 4902
			0.0	81	45% clay, 15% silt, 40% fine-coarse grained sand	CL	2.5 = 4871
			0.0	83	dense, med.-high plasticity, hard, dry		3.0 = 5040
			0.0	68	3'7" - 4'11" SP SAND (brownish yellow 10YR 6/8)		3.5 = 5034
			0.0	70	Silt, 95% fine-med. grained sand	SP	4.0 = 4976
			0.0	65	trace clay, non-low plasticity, very soft, loose, weathered bedrock (sandstone)		4.5 = 4862
			0.0	73	4'11" - 5' No Recovery		5.0 = 4728
					TD = 5' bgs (refusal)		
					No GW encountered		

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group SA 15	Location ID 23
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1'6"
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/24/11 1205	Date/Time Total Depth Reached 2/24/11 1209
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected to 3028 ft no sample (too shallow) (2) 1/2 gallon bags		
Geologist Stephanie Lapina-Monville		Checked by/Date Chelsea Cull / 7-28-11		

Radiological Background SS / 2405	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	60	SAND with silt 0-6" SM silty sand (very dark brown 10YR 2/2) 15% clay, 85% silt, 65% fine med. grained sand	SM	0.0 = 3480
			0.0	75	plant material (roots + grass), low plasticity, very soft, dense, dry 6"-11.5" SP SAND (pale yellow 2.5Y 7/4) 10% silt, 90% fine med. grained sand loose, dry, micaceous	SP	0.5 = 4276
1.0			0.0	77	11.5"-1' SM silty sand (very dark brown 10YR 2/2) 15% clay, 85% silt, 65% fine med. grained sand (pale yellow 2.5Y 7/4) 1'1"-1'2" SP SAND (pale yellow 2.5Y 7/4) 10% silt, 90% fine med. grained sand loose, dry, micaceous	SM SP	1.0 = 4822
			0.0	63	1'2"-1'5" SM silty sand (very dark brown 10YR 2/2) 15% clay, 85% silt, 65% fine med. grained sand (pale yellow 2.5Y 7/4) 1'5"-1'6" SP SAND (pale yellow 2.5Y 7/4) 5% silt, 95% fine med. grained sand, loose, dry	SM SP	1.5 = 5036
2.0					TD = 1'6" (refused)		2.0 = 8
					NO GW encountered		2.5 = 8
					NO sample collected		3.0 = 8
3.0							3.5 = 8
4.0							4.0 = 8
							4.5 = 8
5.0							5.0 = 8
							5.5 = 8

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 24	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11 / 1026		Date/Time Total Depth Reached 2-16-11 / 1036	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30287) (1035)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/1/11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.0 ppm)			
Depth	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'			0.015		Silt with sand, (10 YR, 4/3), brown, 80% silt, 20% fine to medium grained sand, common rootlets, semi-moist, soft, no odor.	ML	
No groundwater encountered.							

Project Name: SSFL Area IV Radiological Study		Project Number: EP9038.01.22.04.03		Subarea ID & Group: SA / S		Location ID: 24	
Drilling Company: Boart Longyear		Driller: D. Hansen		Ground Elevation: NA		Total Drilled Depth: 3'8"	
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1 3/4"		Date/Time Drilling Started: 2/22/11 / 11:56		Date/Time Total Depth Reached: 2/22/11 / 12:00	
Type of Sampling Device: 1 3/4" macrocore acetate liner				Samples Collected: 10 30288 / 1 time 1220 (2) 1/2 gallon bags			
Geologist: Stephane Lepage Montreux				Checked by/Date: Chelsea Carmichael / 7-28-11			
Radiological Background @ 60 / 2405		Radiological Equipment Used: Pancake / Downhole		PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.0	0.0	68			0-9" SM silty SAND (dark brown 10YR 3/3) 10% clay, 25% silt, 65% fine-grained sand plant material (roots & grass) low plasticity, very soft, dry	SM	0.0 = 2896	
0.0	0.0	77			9"-1'8" SM silty SAND with clay (strong brown 7.5YR 4/6) 20% clay, 25% silt, 55% fine-med. grained sand dense wood (tree) debris, low plasticity, soft, dry	SM	0.5 = 4119	
1.0	0.0	64			1'8"-2'1" SM silty SAND with clay (strong brown 7.5YR 4/6) 20% clay, 30% silt, 50% fine-med. grained sand low plasticity, soft, dry, dense	SM	1.0 = 4681	
2.0	0.0	82			2'1"-2'4" SP SAND (brassy yellow 10YR 6/8) 10% silt, 10% clay, 80% fine-med. grained sand plant material (roots) loose, low plasticity, very soft, dry	SP	1.5 = 5754	
3.0	0.0	65			2'4"-2'11" CL silty CLAY with sand (light yellowish brown) 35% silt, 40% clay, 25% fine-grained sand med plasticity, hard, dry, slate layers interbedded	CL	2.0 = 5388	
4.0	0.0	67			2'11"-2'11" SP SAND (light yellowish brown) 5% silt, 10% clay, 85% fine-med. grained sand loose, non-low plasticity, very soft, dry	SP	2.5 = 5732	
5.0	0.0	63			2'11"-3'8" SP SAND (light yellowish brown) 5% silt, 10% clay, 85% fine-med. grained sand loose, non-low plasticity, very soft, dry	SP	3.0 = 6022	
6.0	0.0	75					3.5 = 5015	
TD = 3'8" bgs (refusal) NO GW encountered								4.0 = 0 4.5 = 0 5.0 = 0 5.5 = 0

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 25	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11/1323		Date/Time Total Depth Reached 2-16-11/1331	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30289) (1330)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.0 ppm)			
Depth	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	Silt with sand, (10 YR, 3/3), dark brown, 75% silt, 20% fine grained sand, 5% gravel (fill, sandstone), rootlets common, semi-moist, medium stiff, no odor.	ML	
					No groundwater encountered.		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SA / 5	Location ID: 25
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5'8"
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/21/11 1105H	Date/Time Total Depth Reached: 2/21/11 1103
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: rd 30290 / time 1130 (2) 1/2 gallon bags		
Geologist: Stephane Lapierre Montrose	Checked by/Date: Chelsea Carmichael / 7-28-11		

Radiological Background
55 / 2528

Radiological Equipment Used:

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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	Inches	Borehole Gamma Readings (CPM)
								10.5 = 2572 (CPM)
		0.0	60		0'-7" SM SAND with silt (very dark brown 10YR 2/2)			0.0 = 2875
		0.0	80		20% silt, 15% clay, 65% fine-coarse grained sand plant material (grass & roots), moist, low plasticity, soft	SM		0.5 = 3959
1.0		0.0	75		7"-1'7" SM silty SAND (dark yellowish brown 10YR 3/4)			
		0.0	80		25% silt, 15% clay, 60% fine-coarse grained sand moist, low plasticity, soft, moist	SM	1.0 = 4375	
		0.0	80				1.5 = 4616	
2.0		0.0	60		1'7"-3'5" SC clayey SAND (dark yellowish brown 10YR 4/6)			2.0 = 4683
		0.0	58		10% silt, 25% clay, 65% fine-med. grained sand low-med. plasticity, soft, dry	SC	2.5 = 4618	
3.0		0.0	79				3.0 = 4703	
		0.0	62		3'5"-4'9" SP SAND (yellowish brown 10YR 5/6)			3.5 = 4537
4.0		0.0	56		10% silt, 10% clay, 80% fine-coarse grained sand very low plasticity, very soft, dense, moist	SP	4.0 = 4402	
		0.0	55		moist		4.5 = 4098	
5.0		0.0	63		4'9"-5' NO Recovery			5.0 = 4201
		0.0	72		5'-5'7" SM silty SAND (yellowish brown 10YR 5/6)	SM		5.5 = 4398
					15% clay, 25% silt, 60% fine-coarse grained sand dense, moist, low plasticity, soft			
					dark brown (10YR 3/3) staining surrounding wood pieces in soil			
					TD = 5'8" bgs (refused)			
					No Gw encountered			
					(note: rained over weekend)			
					5'7"-5'8" very pale brown 10YR 7/4			
					SP SAND 10% silt, 90% fine-coarse grained sand trace gravel - sub angular to sub rounded large ch.			

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 26	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11/ 10:42		Date/Time Total Depth Reached 2-16-11/ 1055	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30291) (1055)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.0 ppm)			
Depth	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'			0.014		Sandy silt with rock fragments, (10 YR 3/3) brown, 55% silt, 30% fine to medium grained sand, 15% rock fragments (sandstone), moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: BP9038.01.22.04.03	Subarea ID & Group: SA 15	Location ID: 26
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 4'6"
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/22/11 1039	Date/Time Total Depth Reached: 2/22/11 1044
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected ID 30292 / Time: 1110 (2) 1/2 gallon bags		
Geologist: Stephane Lepage Motrose	Checked by/Date: Chelsea Carmichael / 7-28-11		

 Radiological Background
53 / 2383

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
			0.0	60	0-5" SC sand with clay 20% clay, 5% silt, 75% fine coarse grained sand, dense, low plasticity, soft, moist	SC	0.0 = 2466
			0.0	54	5'-6" asphalt		
			0.0	63	6"-9" SC sand with clay 20% clay, 5% silt, 75% fine coarse grained sand, dense, low plasticity, soft, moist	SC	0.5 = 2777
1.0			0.0	63	9"-1'11" SC clayey sand 25% clay, 15% silt, 60% fine med. grained sand, dense, low plasticity, soft, saturated, wood chips throughout, rocks	SC	0.5 = 4097
			0.0	69	1'4" color change to (dark yellowish brown 10YR 3/6) 1'5"-1'6" wood chunk	SC	1.0 = 4490
2.0			0.0	71	1'11"-2'8" SC clayey sand with silt (yellowish brown 10YR 5/4) 20% silt, 25% clay, 55% fine-med. grained sand dense, low plasticity, soft, saturated	SC	1.5 = 4701
			0.0	87			2.0 = 4676
			0.0	87			2.5 = 4804
3.0			0.0	63	2'8"-3'3" CL sandy CLAY with silt (dark yellowish brown 10YR 3/6) 40% clay, 20% silt, 40% fine-coarse grained sand med-high plasticity, hard, dry	CL	3.0 = 4590
			0.0	68	3'3"-3'5" fine sandstone fine-coarse grained sand, dry (pale yellow 2.5Y 7/4)		
			0.0	68			3.5 = 4721
4.0			0.0	53	No Recovery		4.0 = 4945
			0.0	62			4.5 = 5374
5.0					TD = 4'6" bgs (refused) No GW encountered (recent rains - encountered saturated soils)		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 27	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11 / 1056		Date/Time Total Depth Reached 2-16-11 / 1105	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30293) (1105)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background=0.0ppm)			
Depth	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'				14	Silt with sand, (10 YR, 3/3), brown, 85% silt, 15% fine grained sand, moist, medium stiff, some rootlets, no odor. No groundwater encountered.	WL	

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA 15	Location ID 27
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4'6"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/22/11 / 0930	Date/Time Total Depth Reached 2/22/11 / 0935
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 10 30294 / time: 0955 (2) 1/2 gallon bags		
Geologist Stephane Lapierre Moutre	Checked by/Date Michael Carmona / 1-7-28-11		
Radiological Background 56 / 2659	Radiological Equipment Used Pancake / Down-hole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	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 Inches (CPM)
			0.0	75	0'-1'3" SC SAND with clay (dark yellowish brown) 65% fine-med. grained sand 20% clay, 15% silt, low plasticity, soft 10HR 3/4	SC	0.0 = 3000
			0.0	65	(0'-5" plant material - grass & roots) dense, moist (5'-1'3" saturated)		0.5 = 4119
1.0			0.0	80			1.0 = 4546
			0.0	67	1'3" - 1'10" SC SAND with clay (dark yellowish brown) 20% clay, 5% silt, 75% fine-med. 10HR 4/4 Saturated, low plasticity, soft,	SC	1.5 = 4723
2.0			0.0	60	1'10" - 2'7" CL sandy CLAY (dark yellowish brown) 5% silt, 50% clay, 45% fine-med. grained sand, hard, med-high plasticity, clay	CL	2.0 = 4769
			0.0	76			2.5 = 5024
3.0			0.0	100	2'7" - 3'5" SC clayey SAND (pale yellow 2.5Y 7/4) 40% clay, 5% silt, 55% fine-coarse grained sand, dense, indurated, med-high plasticity, hard clay	SC	3.0 = 5189
			0.0	80	3'5" - 4'4" SC clayey SAND (pale yellow 2.5Y 7/3)	SC	3.5 = 5360
4.0			0.0	75	30% clay, 10% silt, 60% fine-med. grained sand, med plasticity, firm, dry, dense, indurated		4.0 = 5356
			0.0	65	4'4" - 4'6" NO Recovery		4.5 = 5406
5.0					TO = 4'6" bgs (refused) NO GSS encountered (Note: recent rains - encountered saturated soil)		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 28	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11/1251		Date/Time Total Depth Reached 2-16-11/1305	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30295) (1305')			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.10 ppm)			
Depth	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'			0.015		Silt with sand, (10 YR, 4/3), brown, 75% silt, 25% fine grained sand, some rootlets, dry, medium stiff, no odor.	WL	
					No groundwater encountered.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SA 7 S	Location ID: 28
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 4'6"
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/21/11 / 0935	Date/Time Total Depth Reached: 2/21/11 / 0940
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected ID: 30296 / Time 1010 (2) 1/2 gallon bags		
Geologist: Stephanie Lepeye Montrose		Checked by/Date: Chelsea Carmichael / 7-28-11	

Radiological Background: 46 / 2570	Radiological Equipment Used: Pencake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
		0.0	63	0-5"	SM silty sand (dark brown 10YR 4/3)	SM	0.0 = 2812
		0.0	80	5"-11"	100% silt, 10% clay, 60% fine-med. grained sand, very soft, moist plant material (roots or stems), worms (dark brown 10YR 4/3)	SM	0.5 = 4088
1.0		0.0	82	1"-2'7"	SM silty sand (dark yellowish brown 10YR 3/6)	SM	1.0 = 4692
		0.0	58		10% silt, 15% clay, 75% fine-med. grained sand, non to low plasticity, very soft, dry, dense	SP	1.5 = 4742
2.0		0.0	61				2.0 = 4902
		0.0	52				2.5 = 4704
3.0		0.0	59	2'7"-3'4"	SC clayey sand (dark yellowish brown 10YR 4/6)	SC	3.0 = 4762
		0.0	62	3'4"-4'7"	10% silt, 25% clay, 65% fine-coarse grained sand, low-med. plasticity, soft, dry (brownish yellow 10YR 6/6)	SP	3.5 = 4865
4.0		0.0	71		10% silt, 90% fine-coarse grained sand, loose, dry	SP	4.0 = 5178
		0.0	59				4.5 = 5097
5.0					TD = 4'6" (refusal) (recovery = 4'7") NO GW encountered (note: rained over weekend)		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 29	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11 / 1308		Date/Time Total Depth Reached 2-16-11 / 1318	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30297) (1318)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.0 ppm)			
Depth	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)
0.5'			0014	Silt with sand and rock fragments, (10YR, 4/4), brown, 60% silt, 20% fine grained sand, 20% rock fragments (Brick, sandstone), semi-moist, medium stiff, some rootlets, no odor.		ML	
No groundwater encountered.							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA / S	Location ID 29
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/21/11 1355	Date/Time Total Depth Reached 2/21/11 1402
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected ID 30298 / Ans: 1355 1430 (2) 1/2 gallon bags		
Geologist Stephen Lepore Montrose	Checked by/Date Phyllis Carmichael 7-28-11		

 Radiological Background
42 / 2051

 Radiological Equipment Used
Pancake / Downhole

 PID Used
Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches +0.5= 2300 (CPM)
0.0	0.0	48	0.0	48	0-6" SP SAND (dark yellowish brown 10YR 4/4) 15% silt, 15% clay, 70% fine-coarse grained sand, low plasticity, soft, red concrete, plant material (grass & roots), wood chips (tree bark) moist	SP	0.0= 2609
0.0	0.0	71	0.0	71	6"-2'7" SC SAND with clay (dark yellowish brown) 10YR 3/4	SC	0.5= 3748
1.0	0.0	75	0.0	75	10% silt, 20% clay, 70% fine-med. grained sand	SC	1.0= 4334
2.0	0.0	62	0.0	62	soft, dense, low plasticity, moist roots		1.5= 4720
2.0	0.0	68	0.0	68			2.0= 5059
3.0	0.0	82	0.0	82	2'7"-3'3" CL sandy clay (yellowish brown 10YR 5/6) 50% clay, 10% silt, 40% fine-coarse grained sand Charcoal throughout, med. plasticity, hard, dry	SC	2.5= 4932
3.0	0.0	76	0.0	76	3'3"-3'6" SC SAND with clay (yellowish brown 10YR 5/6) 10% silt, 20% clay, 70% fine-med. grained sand soft, dense, low plasticity, moist	SC	3.0= 5032
4.0	0.0	75	0.0	75	3'6"-4' SE clayey sand (very pale brown 10YR 7/4) 25% clay, 10% silt, 65% fine-med. grained sand, indurated dry interbedded silt layers throughout	SC	3.5= 5204
4.0	0.0	68	0.0	68			4.0= 6495
					TD= 4' bgs - (refusal)		4.5= P
					NO GW encountered		5.0= P
							5.5= P

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 5	Location ID 30
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 2-17-11/0830	Date/Time Total Depth Reached 2-17-11/0839
Type of Sampling Device trowel/shovel	Samples Collected 2 1/2 gall bags (# 30299) (0838)		
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 6/1/11	

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (background = 0.0cpm)
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Depth	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 Inches (CPM)
0.5'			0.0	14	Silt with sand, (10 YR, 3/4), dark brown, 85% silt, 15% fine grained sand, trace gravel (fill, sandstone), common rootlets, semi-moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038-01-22-04.03	Subarea ID & Group: SA 1 5	Location ID: 30
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/21/11 1525	Date/Time Total Depth Reached: 2/21/11 1529
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected 10 30 300 / 1 hr: 1555 (2) 1/2 gallon bags		
Geologist: Stephanie Lepore Minter	Checked by/Date: Chelsea Cail 1/7-28-11		

Radiological Background: 41 / 2139	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	65	0-5" ^{SP SAND} 15% clay, 15% silt, 70% fine-grained sand, low plasticity, soft, moist (dark yellowish brown 10YR 4/4)	SP	0.0 = 2969
			0.0	52	5"-2'7" SP SAND (dark yellowish brown 10YR 4/4)		0.5 = 4451
1.0			0.0	72			1.0 = 4849
			0.0	69	15% silt, 15% clay, 70% fine-med. grained sand, dense, low plasticity, soft dry, roots @ roots	SP	1.5 = 5001
2.0			0.0	61			2.0 = 5037
			0.0	75			2.5 = 4884
3.0			0.0	70	2'7"-3'3" SC SAND with clay (yellowish brown 10YR 5/6) 5% silt, 20% clay, 75% fine-coarse grained sand, low plasticity, soft, dry, dense	SC	3.0 = 4878
			0.0	65	3'3"-5' SC clayey sand (brownish yellow 10YR 6/6)		3.5 = 5106
4.0			0.0	61	5% silt, 40% clay, 55% fine-coarse grained sand, indurated (compact), med.-high plasticity, hard, dry	SC	4.0 = 5631
			0.0	70			4.5 = 5758
5.0			0.0	52	TO = 5' bgs (refusal) NO GW encountered		5.0 = 5885
							5.5 = 5

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 31	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11/1109		Date/Time Total Depth Reached 2-16-11/1115	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30301) (1115)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 200 ppm)			
Depth	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'			0.013		Sandy silt with rock fragments, C10YR 4/4 brown, 55% silt, 30% fine grained sand, 15% rock fragments (gravel), moist, medium stiff, rootlets common, no odor.	ML	
No groundwater encountered.							

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SA / 5	Location ID: 31
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/22/11 / 0827	Date/Time Total Depth Reached: 2/22/11 / 0833
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 10 30302 / 1 line 0855 (2) 1/2 gallon bags		
Geologist: Stephanie Lapeyre Montrose	Checked by/Date: Christina Paul / 2-28-11		

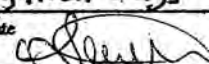
Radiological Background
48 / 2612

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches
					0-1" silty sand (very dark brown 10YR 2/1)		
		0.0	65		1"-11" SM silty sand (dark yellowish brown 10YR 4/4)	SM	0.0 = 3097
		0.0	83		15% clay, 35% silt, 50% fine-grained sand dense, plant material (roots), low plasticity, very soft, moist	SM	0.5 = 4320
1.0		0.0	90		11"-2'4" CL sandy clay (dark yellowish brown 10YR 4/4)		1.0 = 4539
		0.0	73		45% clay, 15% silt, 40% fine-med. grained sand, med-high plasticity, hard, dry	CL	1.5 = 4928
2.0		0.0	54				2.0 = 5026
		0.0	75				2.5 = 4993
3.0		0.0	68		2'4"-4'5" CL sandy clay (yellowish brown 10YR 5/6)		3.0 = 5181
		0.0	75		45% clay, 15% silt, 45% fine-coarse grained sand, med-high plasticity, hard, dry	CL	3.5 = 5139
4.0		0.0	70				4.0 = 5336
		0.0	72				4.5 = 5329
		0.0	75		4'5"-5' SC clayey sand (brownish yellow 10YR 6/8)	SC	5.0 = 5413
5.0					TO = 5' bgs (refusal) NO GW encountered		5.5 = @

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 32	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11/0955		Date/Time Total Depth Reached 2-16-11/1006	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30303) (1005)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.0 ppm)			
Depth	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 Inches (CPM)
0.5'				0.014	Sandy silt (10 YR, 3/3), dark brown, 70% silt, 30% fine grained sand, common rootlets, moist, soft, no odor.	ML	
No groundwater encountered.							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 5		Location ID 32	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 4.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-18-11 0835		Date/Time Total Depth Reached 4-18-11 0920	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30440 (0840) 30414 (1) 1/2 gallon bags (C) 30413 (field DDP) NT			
Geologist C. Knight				Checked by/Date  6/1/11			
Radiological Background 58 / 2005		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
					Surface: Soil and grade		405 2855
0.5		0.0	55		Silty Sand: Dark yellowish brown (10P1R 3/4) moist, medium dense, no odor, 35% silt, 10% medium sand, 55% fine sand, trace rootlets near surface	SM	3132
1.0		0.0	54				4317
		0.0	58				5022
		0.0	70		1'4" weathered Sandstone: Olive yellow (2.5Y 6/6) moist, dense, no odor, Mechanically weathered to SP, fine grained sandstone.	SP	5258
2.0		0.0	70		1'8" 1cm root in sandstone	SP	5445
		0.0	68				5613
3.0		0.0	70				6276
		0.0	65				6442
4.0		0.0	65		Siltstone bed ~ 2" thick at terminus of boring		5987
5.0					Refusal on Sandstone at 4.0' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: <u>5</u>	Location ID: <u>33</u>	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: <u>NA</u> ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached: (30304) NO sample collected	
Type of Sampling Device:				Samples Collected: two 1/2 Gallon Bags		(30439) NO sample collected	
Geologist:				Checked By / Date:			
Radiological Background: <u>NA</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: <u>NA</u> 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					NO SAMPLE COLLECTED			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
					- Boring not advanced - Archeological zone, no ground disturbance			



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 34	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/1022		Date/Time Total Depth Reached 2-17-11/1027	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30305) (1025)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background=0.0cpm)			
Depth	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	Silt with sand, (10YR, 3/4), dark brown, 85% silt, 15% fine grained sand, few rootlets, semi-moist, medium stiff, no odor, low hardness, no plasticity. No groundwater encountered.	ML	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group SA / 5	Location ID 34
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5'
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/22/11 / 1438	Date/Time Total Depth Reached 2/22/11 / 1443
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected ID 30306 time: 1510 (2) 1/2 gallon bags		
Geologist Stephanie Capelyn Montrose		Checked by/Date Chelsea Currell / 7-28-11		
Radiological Background 63 / 2528		Radiological Equipment Used Pancake / Downhole PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)		

Depth	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 Inches (CPM)
0.0	0.0	63	0-9"	SM silty SAND with clay (dark yellowish brown) 104R 3/6 20% clay, 30% silt, 50% fine-med. grained sand dense, low plasticity, soft, moist	SM	0.0 = 3321 0.5 = 4761	
1.0	0.0	65	9"-1'6"	SC SAND with clay (dark yellowish brown) 104R 4/6 20% clay, 15% silt, 65% fine-med. grained sand dense, low plasticity, soft, moist	SC	1.0 = 5130	
1.0	0.0	58	1'6"-2'	SC clayey SAND (light olive yellowish brown) 2.54 5/3 30% clay, 5% silt, 65% fine-med. grained sand, dense, med. plasticity, firm, dry	SC	1.5 = 5165	
2.0	0.0	77	2'-3'	CL sandy CLAY (dark yellowish brown) 104R 4/6 50% clay, 5% silt, 45% fine grained sand med-high plasticity, hard, dry	CL	2.0 = 5542 2.5 = 5432	
3.0	0.0	60	3'-5'	SC clayey SAND with silt (pale yellow) 2.54 7/4 30% clay, 20% silt, 50% fine-med. grained sand med plasticity, hard, dry Slate layers interbedded	SC	3.0 = 5742 3.5 = 6078 4.0 = 6298 4.5 = 6158 5.0 = 6339	
4.0	0.0	63					
5.0	0.0	55					
6.0	0.0	66					
					TPE 5' bgs (refusal) NO GWS encountered		5.5 = 8

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 35	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/1037		Date/Time Total Depth Reached 2-17-11/1045	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30307) (1045)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background = 0.0 ppm)			
Depth	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	Silt with sand (10YR, 3/4), dark brown, 85% silt, 15% fine grained sand, common rootlets, semi-moist, medium stiff, no odor.	ML	
No groundwater encountered.							

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01-22-04.03	Subarea ID & Group: SA 1.5	Location ID: 35
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/22/11 1538	Date/Time Total Depth Reached: 2/22/11 1544
Type of Sampling Device: 1 3/4" macrocore acetate liner		Samples Collected 10 30308 / time: 1610 (2) 1/2 gallon bags	
Geologist: Stephanie Lapeyre Montrose		Checked by/Date: Julia C. / 7-28-11	

Radiological Background
S3 / 2388

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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)
							Inches
		0.0	75		0-1'4" SC SAND with clay (dark brown 10YR 3/3)		0.0= 2932
		0.0	88		(0-3" plant material - roots & grass) 5% silt, 20% clay, 75% fine-med. grained sand	SC	0.5= 4181
1.0		0.0	60		dense, low plasticity, soft, dry		1.0= 4613
		0.0	68		1'4"-2'10" ML Sandy SILT with clay (brown 7.5YR 4/4)		1.5= 4794
2.0		0.0	65		30% silt, 25% clay, 45% fine-med. grained sand, low-med. plasticity, firm, dry	ML	2.0= 4822
		0.0	55				2.5= 4753
3.0		0.0	83		2'10"-3'6" SP SAND (yellowish brown 10YR 5/6)	SP	3.0= 4857
		0.0	51		18% clay, 10% silt, 75% fine-med. grained sand, low plasticity, soft, moist		3.5= 4629
4.0		0.0	58		3'6"-4'4" SC clayey SAND (yellowish brown 10YR 5/6)	SC	4.0= 4915
		0.0	76		40% clay, 5% silt, 55% fine-coarse grained sand, med. plasticity, hard, dry		4.5= 5203
		0.0	62		4'4"-4'10" SC clayey SAND with silt (pale yellow 2.5Y 7/4)	SC	
5.0		0.0			30% clay, 20% silt, 50% fine-med. grained sand med. plasticity, hard, dry, slate layers interbedded		5.0= 5835
		0.0			4'10"-5' No Recovery		
					TD = 5' bgs (refusal)		
					No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 5	Location ID 36
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 2-17-11/1354	Date/Time Total Depth Reached 2-17-11/1405
Type of Sampling Device trowel/shovel	Samples Collected 2 1/2 gall bags (#30309) (1405)		
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 6/1/11	

Radiological Background 14	Radiological Equipment Used up R meter	PID Used Mini Ra2 2000 (Background = 0.0 ppm)
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Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.015	Silt with sand and rock fragments, (10 YR, 3/4), 70% silt, 15% fine grained sand, 15% rock fragments, (concrete, sandstone/siltstone), common rootlets, soft, semi-moist, no odor. No groundwater encountered.	ML		

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SA / 5	Location ID: 36
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/23/11 / 0946	Date/Time Total Depth Reached: 2/23/11 / 0950
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 10 30310 / time: 1015 (2) 1/2 gallon bags		
Geologist: Stephane Laperey Motreux	Checked by/Date: Charles Caff / 7-28-11		

Radiological Background: SI / 2554	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	80	0-4" SM silty sand + 25% silt, 10% clay, 65% fine med. grained sand (dark brown 10YR 3/3) trace gravel - subangular, plant material (roots & twigs), low plasticity, soft, dark, dry	SM	0.0 = 3070
			0.0	69	4"-11" SM silty sand (dark yellowish brown 10YR 4/4)	SM	0.15 = 4317
1.0				66	25% silt, 10% clay, 65% fine med. grained sand plant debris (twigs), dense, low plasticity, dry, soft	SM	1.0 = 4733
				56	18" - red concrete debris and trace gravel - subangular		1.5 = 4987
2.0				58	1'11"-3'2" SC clayey sand with silt (brown 7.5YR 4/4)	SC	2.0 = 5204
				59	30% clay, 20% silt, 50% fine med. grained sand low med. plasticity, firm, dry	SC	2.5 = 5137
3.0				51	same as above	SC	3.0 = 5061
				75	3'2"-3'6" CL sandy clay with silt (yellowish brown 10YR 5/8) 40% clay, 30% silt, 30% fine med. grained sand - coarse grained sand med. plasticity, hard, dry	CL	3.5 = 5250
4.0				60	3'6"-4'2" SP SAND (yellow 10YR 7/6) 10% silt, 90% fine med. grained sand non plastic, loose, dry	SP	4.0 = 5261
5.0				56	4'2"-5' NO recovery		4.5 = 5271
				63			5.0 = 5153
					TD = 5' bgs (refusal) NO GW encountered		

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group SA 15	Location ID 37
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5'
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/23/11 1109	Date/Time Total Depth Reached 2/23/11 1114
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 10 30312 / time: 1140 (2) 1/2 gallon bags		
Geologist Stephanie Lepore Montrose		Checked by/Date Chelsea Ca-ll / 7-28-11		
Radiological Background 49 / 2353		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
0.0	0.0	45	0.0	45	0-5" SP SAND (dark brown 10YR 3/3) 15% silt, 15% clay, 70% fine-coarse grained sand, soft, dry plant material (roots + grass), trace gravel-sub rounded, low plasticity	SP	0.0 = 2688
0.0	0.0	39	0.0	39	5"-6" concrete		0.5 = 3946
1.0	0.0	51	0.0	51	6"-1'11" SM silty SAND with clay (dark brown 10YR 3/3)	SM	1.0 = 4329
2.0	0.0	56	0.0	56	25% silt, 20% clay, 55% fine-med. grained sand low plasticity, soft, dry, dense		1.5 = 4982
2.0	0.0	77	0.0	77	1'11"-2'10" SC clayey SAND (brown 7.5YR 4/4) 2'1" trace charcoal pieces		2.0 = 5198
3.0	0.0	66	0.0	66	10% silt, 25% clay, 65% fine-coarse grained sand low plasticity, soft, dry, dense	SC	2.5 = 5130
3.0	0.0	45	0.0	45	2'10"-4'10" CL sandy CLAY (yellowish brown 10YR 5/4) 3'2" trace charcoal pieces, wood (tree)		3.0 = 5154
4.0	0.0	80	0.0	80	10% silt, 45% clay, 45% fine-coarse grained sand, med. plasticity, hard, dry mottling	CL	3.5 = 5184
4.0	0.0	90	0.0	90			4.0 = 5245
4.0	0.0	65	0.0	65			4.5 = 5363
5.0	0.0	70	0.0	70	4'10"-5' - NO Recovery		5.0 = 5553
TD = 5' bgs (refusal)							5.5 = 0
NO GW encountered							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 38	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/1339		Date/Time Total Depth Reached 2-17-11/1345	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30313) (1345)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.0 ppm)			
Depth	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 Inches (CPM)
0.5'			0.0	15	Silt with sand and rock fragments, (10 YR, 3/4), 70% silt, 15% fine grained sand, 15% rock fragments (concrete, sandstone, brick, asphalt), common rootlets, semi-moist, soft, no odor.	ML	
No groundwater encountered.							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA / S		Location ID 38	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 2/23/11 / 0836		Date/Time Total Depth Reached 2/23/11 / 0847	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected ID 30314 (2) 1/2 gallon bags + mi 0905			
Geologist Stephane Lapierre, Montrose				Checked by/Date Chelise [signature] 2-28-11			
Radiological Background 50 / 2268		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd 0.0 ppm)			

Depth	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 Inches (CPM)
			0.0	73	0-9" silty sand (dark brown 10YR 3/3)		0.0 = 2884
			0.0	64	30% silt, 35% fine-grained sand, fine-grained subangular wood (tree debris), 15% clay, low plasticity, soft, dry plant material (roots + grass), red concrete debris, grey concrete debris	SM	0.5 = 3839
			0.0	68	9"-10" concrete		1.0 = 4169
			0.0	62	10"-2'2" SL SAND with clay (brown 10YR 4/3)	SL	1.5 = 4909
			0.0	76	10% silt, 20% clay, 70% fine-med. grained sand, low plasticity, soft, dense, dry		2.0 = 5093
			0.0	85	2'2"-3'4" CL sandy clay with silt (brown 7.5YR 4/4)	CL	2.5 = 5080
			0.0	68	30% silt, 35% clay, 35% fine-med. grained sand low-med. plasticity, firm, dry		3.0 = 5157
			0.0	74	3'4"-4'9" silty sand (yellowish brown 10YR 5/8)		3.5 = 5061
			0.0	64	30% silt, 70% fine-med grained sand non plastic, loose, dry	SM	4.0 = 5185
			0.0	68			4.5 = 5248
			0.0	65	4'9"-5' NO Recovery		5.0 = 5387
					TD = 5' bgs (refused) NO GW encountered		5.5 = 5387

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 39	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/1056		Date/Time Total Depth Reached 2-17-11/1105	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30315) (1105)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 15		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Background = 0.0 cpm)		
Depth	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'				0.015	Silt with sand, (10 VR, 3/4), dark brown, 85% silt, 15% fine grained sand, trace rock fragments (sandstone), common rootlets, semi-moist, soft, no odor.	ML	
No groundwater encountered.							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA / 5		Location ID 39	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 10'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 1553 4/22/11		Date/Time Total Depth Reached 2/23/11 1558	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 10 30316 / time 1635 (2) 1/2 gallon bags			
Geologist Stephanie Lapuy-Montrose				Checked by/Date Phobus Cal 1/7-28-11			
Radiological Background 49 / 2444		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.10 ppm)			

Depth	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 Inches (CPM)
0.0	0.0	59	0-4"	SM silty sand 25% silt, 15% clay, 60% fine med. grained sand 3/3 plant material (roots, grass), low plasticity, soft, dry, dense	SM	0.0 = 3703	
0.0	0.0	82	4'-1'1"	SP SAND 10% silt, 15% clay, 75% fine med. grained sand 3/3 low plasticity, soft, dry, dense	SP	0.5 = 4864	
1.0	0.0	93	1'1"-2'7"	SC clayey sand (strong brown 7.5YR 4/6) 25% clay, 15% silt, 60% fine coarse grained sand, low plasticity, firm, dry	SC	1.0 = 4984	
2.0	0.0	68				1.5 = 4988	
	0.0	100				2.0 = 5045	
	0.0	74				2.5 = 5063	
3.0	0.0	52	2'7"-4'10"	SC SAND with clay (yellowish brown 10YR 5/6) 25% clay, 10% silt, 65% fine coarse grained sand, low plasticity, soft dry, dense	SC	3.0 = 5008	
	0.0	63				3.5 = 5040	
4.0	0.0	59				4.0 = 4933	
	0.0	69				4.5 = 5074	
5.0	0.0	72	4'10"-5'1"	NO Recovery		5.0 = 5380	
	0.0	75	5'1"-6'7"	SM silty sand with clay (dark yellowish brown 10YR 4/6) 25% silt, 20% clay, 55% fine med. grained sand, low plasticity, soft, dry	SM	5.5 = 5419	
			6'7"-8'1"	same as above			

Radiological Background 49 / 2444				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 39	
Depth	Interval	Recovery	PTD	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)
							Inches
			0.0	78	Same as above 6'7" - 8'4" SP SAND (light yellowish brown 10YR 6/4) 15% silt, 15% clay, 70% fine-med. grained sand, low plasticity, very soft loose, dry	SM	6.0 = 5331
			0.0	65			6.5 = 5396
7.0			0.0	51		SP	7.0 = 5447
			0.0	66			7.5 = 5415
8.0			0.0	71	8'4" - 9'3" SP SAND 10% silt, 10% clay, 80% fine-med. grained sand, low plasticity, very soft, loose, dry		8.0 = 5459
			0.0	88		8.5 = 5403	
9.0			0.0	59	9'3" - 10' NO Recovery		9.0 = 5210
	NR		0.0	88		9.5 = 5211	
	NR		0.0	55	TD = 10' bgs NO GW encountered		10 = 4636
10.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 40	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11 / 1309		Date/Time Total Depth Reached 2-17-11 / 1316	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30317) (1315)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.0 ppm)			
Depth	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	Silt with sand, (10 YR, 3/4), dark brown, 85% silt, 15% fine grained sand, common rootlets, soft, semi-moist, no odor.	ML	
No groundwater encountered.							

BORING LOG

Sheet 1 of 2

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A / 5	Location ID 40
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/23/11 / 1428	Date/Time Total Depth Reached 2/23/11 / 1437
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 10, 30318 / time: 1515 (2) 1/2 gallon bags		
Geologist Stephanie Lapere Montrose		Checked by/Date Charles Bell / 17-28-11		
Radiological Background 43 / 7407		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches + 0.5 = 2483 (CPM)
0.0	0.0	66	0-1'4" SP SAND	(dark brown 10YR 3/3)	SP	0.0 = 3144	
0.0	0.0	61	10% silt, 15% clay, 75% fine-med. graded sand			0.5 = 4681	
1.0	0.0	33	low plasticity, soft, dry, dense plant material (roots & grass)			1.0 = 5001	
0.0	0.0	64	1'4" - 4'2" SC clayey SAND	(Strong brown 7.5YR 4/6)	SC	1.5 = 5004	
2.0	0.0	56	25% clay, 15% silt, 60% fine-coarse graded sand, trace plant/tree debris throughout, low-med. plasticity, firm, hard, dry			2.0 = 5136	
0.0	0.0	68				2.5 = 5052	
3.0	0.0	66				3.0 = 4892	
0.0	0.0	83	3'8" plant debris (tree bark)			3.5 = 4975	
4.0	0.0	72	4' tree debris (wood/hwig)			4.0 = 4919	
0.0	0.0	62	4'2" - 5' SC SAND with clay (yellowish brown 10YR 5/6)		SC	4.5 = 4993	
0.0	0.0	77	25% clay, 10% silt, 65% fine-coarse graded sand low plasticity, firm, soft, dry, dense			5.0 = 4581	
5.0	0.0	64	5' - 6'10" SM silty SAND with clay (dark yellowish brown 10YR 4/6)		SM	5.5 = 4689	

Radiological Background 43 / 2407					Project Name SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Location 40	
Depth	Interval	Recovery	PTD	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			
							Inches	(CPM)		
				72				6.0 = 4590		
				65	Same as above	SM		6.5 = 4511		
7.0				56	6'10" - 8'5" SP SAND (light yellowish brown 104R 6/4)			7.0 = 4271		
				70	15% silt, 15% clay, 70% fine-med. grained sand, low plasticity, very soft, dry, loose, plant debris	SP		7.5 = 4077		
8.0				68				8.0 = 3669		
				56	8'5" - 10' SP SAND (pale yellow 2.5Y 7/3)			8.5 = 3587		
9.0				60				9.0 = 3410		
				85	20% silt, 10% clay, 80% fine-med. grained sand, loose, low plasticity, very soft, dry	SP		9.5 = 3247		
10.0				90				10. = 3147		
					TD = 10 ft. bgs					
					No Gw encountered					



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BORING LOG

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Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 41	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-16-11/0930		Date/Time Total Depth Reached 2-16-11/0940	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#80319) (0940)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 14		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Background=0.0 cpm)		
Depth	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	Sandy silt, (10YR, 3/3), dark brown, 70% silt, 30% fine grained sand, rootlets common, dry, soft, no odor.	ML	
No groundwater encountered.							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 5		Location ID 41	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-15-11 1500		Date/Time Total Depth Reached 4-15-11 1540	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30320 (1505) (1) 1/2 gallon bags			
Geologist Erin Knight				Checked by/Date [Signature] 6/1/11			
Radiological Background 48 / 2556		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
					Surface: gravel + soil		+0.5' 2625
0.5		NR	0.0	48			3393
1.0		NR	0.0	50			4515
1.5		NR	0.0	55			4786
2.0		NR	0.0	59			4889
2.5			0.0	63	Silt with sand; light yellowish brown (10YR 6/4), slightly moist, soft, no odor, 15% fine sand, 85% silt, non cohesive, low plasticity, very compressible near surface, trace rootlets near surface	ML	4812
3.0			0.0	62			4955
3.5			0.0	59	CK		4938
4.0			0.0	68	Safety Silt: Silty Sand: Yellowish brown (10YR 6/6), moist, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand	SM	4939
4.5			0.0	65			4897
5.0			0.0	68	Weathered Sandstone: Yellow (10YR 7/6), moist, dense, no odor, 10% medium sand, 90% fine sand, trace siltstone	SP	4812
5.5					Refusal on Sandstone at 5.0'		4919
6.0					No GW encountered		



5A 042

BORING LOG

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Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A/Group 5		Location ID 42	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/1009		Date/Time Total Depth Reached 3-2-11/1016	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30321) (1015.)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.3ppm)			
Depth	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'			0.3	13	Silt, (10 YR, 3/2); dark brown, 90% silt, 10% fine grained sand, common rootlets, soft, semi-moist, no odor.	ML	
					No groundwater encountered.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 42	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 4.5'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 5-16-11/1030		Date/Time Total Depth Reached 5-16-11/1059	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1 1/2 gall bag (#30322) (1130)			
Geologist C. Carmichael				Checked by/Date J. Robbins/Jedman 7/19/11			
Radiological Background 3416, 62 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rac 2000 (0.0 ppm)			

Depth	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	
							Inches	(CPM)
			0.0	120			0.5	3460
			0.0	85	Silty sand, (10 YR, 4/3), brown, 70% fine sand, 30% silt, dry, loose, few rootlets, no plasticity or hardness, 0.5' no odor.	SM		0 4808
			0.0	95	Sand with silt and clay (10 YR, 3/3), dark brown, 50% fine to medium grained sand, 25% silt, 25% clay, semi-moist, medium dense, very low plasticity, no hardness, no odor.	SM	5341	
1'				90			5571	
				85	2' Gradational Contact		5094	
2'				60	Sand with clay (10 YR, 3/6), reddish-brown, 75% fine to medium grained sand, 25% clay, dry, medium dense, no odor, very low plasticity and hardness, some iron-oxide tinting.	SC	5171	
				85			5007	
3'				85			5032	
				97	Same as above, except more sand: 85% fine to medium grained sand, 15% clay (weathered bedrock)		5158	
				65			5029	
4'							4961	
5'					Refusal hit at 4.5'			
6'					No groundwater reached.			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 43	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/0945		Date/Time Total Depth Reached 3-2-11/0950	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30323) (0950)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/1/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background=0.2 ppm)			

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.2/12	Silt with clay and sand, (10YR, 4/4), brown mottled with light brown, 60% silt, 25% clay, 15% fine grained sand, common rootlets, semi-moist, soft, low-medium hardness and plasticity, no odor. No groundwater encountered.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 5	Location ID 43
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 5.5'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 5-16-11/1214	Date/Time Total Depth Reached 5-16-11/1244
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#30324) (1250)		
Geologist C. Carmichael	Checked by/Date J. Robbins/Medman 7/20/11		

Radiological Background 3279, 69 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 2000 (0.0 ppm)
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Depth	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	Inches	Borehole Gamma Readings (CPM)
			0.0	95				0.5 - 3215
			0.0	115				
1'				90	Sand with clay and silt, (10 YR, 3/3), dark brown, 60% fine to medium grained sand, 20% silt, 20% clay, trace sandstone rock fragments, trace rootlets in top 1", semi-moist, medium dense, very low plasticity and hardness, no odor, some iron-oxide tinting.	SM		
				75				4879
2'				65				5204
				75				5415
								5327
3'				82	Same as above, except reddish-brown (10 YR, 3/4).			5196
				75				5129
4'				65				5054
				65				5020
5'				95				5107
				75	Same as above, except mottled texture with sand and clay/silt. (apparent bedrock at refusal)			5020
								5114
6'					Refusal at 5.5'.			

No groundwater reached.

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 44	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/0957		Date/Time Total Depth Reached 3-2-11/1005	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30325) (1005)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/1/11			
Radiological Background 12 / 0.2 (PID)		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.2cpm)			
Depth	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'				03.12	Silt with sand; (10 YR, 3/3), dark brown, 85% silt, 15% fine grained sand, some rootlets, semi-moist, medium stiff, trace gravel-sized sandstone rock fragments, no odor.	ML	
					No groundwater encountered.		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 5	Location ID 44
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-15-11 1145	Date/Time Total Depth Reached 4-15-11 1200
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30 326 (1150) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date [Signature] 6/2/11	

 Radiological Background
50 / 2440

 Radiological Equipment Used
Pancake / Downhole

 PID Used
Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches
					surface: soil		+0.5' 26.58 (CPM)
0.5			6.0	54	Sandy silt; dark yellowish brown (10YR 4/4), moist, med. stiff, no odor, 40% fines sand, 60% silt, trace rootlets	ML	3114
1.0			0.0	54			4293
			0.0	60	Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 40% silt, 5% coarse sand, 10% medium sand, 45% fine sand, trace root hairs	SM	5089
			0.0	65			5398
2.0			0.0	58			5329
			0.0	64			5346
3.0			0.0	69	2' 10" weathered Bedrock: Very Pale brown (10YR 7/4), dry, dense, no odor, mechanically weathered to SP, 10% medium sand, 60% fine sand	SP	5219
			0.0	71			5153
4.0			0.0	68			5183
5.0					Refusal on Sandstone at 4.0' bgs No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 45	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11 / 0930		Date/Time Total Depth Reached 3-2-11 / 0940	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30327) (0940)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background = 0.2 ppm)			
Depth	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'			0.2	12	Silt with sand, (10YR, 3/3), dark brown, 80% silt, 20% fine grained sand, common rootlets, semi-moist, soft, no odor.	ML	
					No groundwater encountered.		

BORING LOG

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Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA / S	Location ID 45
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2'6"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/7/11 / 0919	Date/Time Total Depth Reached 2/7/11 / 0928
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 10 30001 / 1m = 0945 (2) 1/2 gallon bags		
Geologist Stephanie Lopey Montrose	Checked by/Date Charles [Signature] / 7-28-11		

Radiological Background 48 / 2915	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.40 ppm)
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Depth	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 Inches (CPM)
							+0.5 = 3001
			0.0	63	0-4" SM SAND with silt (roots & gravel) (dark yellowish brown 10YR 4/4) 15% clay, 20% silt, 65% fine med. graded sand	SM	0.0 = 3379
			0.0	81	4"-1'4.5" low plasticity, soft, dry (dark yellowish brown 10YR 4/4) SM SAND with silt 15% clay, 20% silt, 65% fine med. graded sand, low plasticity, soft, dry	SM	0.5 = 4699
1.0			0.0	90	1'4.5"-2'6" SP SAND (yellowish brown 10YR 5/4) 10% silt, 90% fine-medium graded sand	SP	1.0 = 5226
			0.0	48			1.5 = 5000
2.0			0.0	61			2.0 = 4869
			0.0	57			2.5 = 4695
3.0					TD = 2'6" bgs (refusal)		
					NO GW encountered		
4.0							
5.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 46	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11 / 0910		Date/Time Total Depth Reached 3-2-11 / 0920	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30328) (0920)			
Geologist C. Carmichael				Checked by/Date DAP's: 30399 (MS), 30397 (lab), 30398 (field - no time) 6/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background=0.1 ppm)			
Depth	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.1 13	Silt with sand, (10YR, 3/3), dark brown, 80% silt, 15% fine grained sand, 5% sandstone rock fragments, semi-moist, soft, common rootlets, no odor.		ML	
				No groundwater encountered.			

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA / 5	Location ID 46
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3' 11"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/7/11 / 1030	Date/Time Total Depth Reached 2/7/11 / 1036
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected ID 30002 / time 1055 (2) 1/2 gallon bags		
Geologist Stephanie Lepeine Montrose		Checked by/Date Chelsea Cail / 7-28-11	

Radiological Background 67 / 3008	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	52	0-8" SM silty sand with clay (dark yellowish brown 10YR 4/4) 20% clay, 25% silt, 55% fine-med. grained sand plant material (roots), trace gravel - sub-angular low plasticity, soft, dry	SM	0.0 = 3387
			0.0	78			0.5 = 4615
			0.0	88	8" - 1' 11" SP sand (yellowish brown 10YR 5/6) 15% silt, 85% fine-med. grained sand non plastic, loose, dry	SP	1.0 = 5084
			0.0	94			1.5 = 5422
			0.0	78	1' 11" - 3' 2" SC clayey sand with silt (brownish yellow 10YR 6/6) 25% clay, 20% silt, 55% fine grained sand low plasticity, soft, dry slaty slate interbedded	SC	2.0 = 5784
			0.0	63			2.5 = 5794
			0.0	46			3.0 = 5759
			0.0	56	3' 2" - 3' 11" SP sand (brownish yellow 10YR 6/6) 10% silt, 90% fine-med. grained sand loose, non plastic, dry	SP	3.5 = 6135
			0.0	86			3' 11" → 6176
					TD = 3' 11" bgs (refusal)		4.0 = 6176
					No Gw encountered		4.5 = 6176
							5.0 = 6176
							5.5 = 6176

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: 5	Location ID: 47	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: (30329) NO sample + (30330) NO sample two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		NA 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					NO SAMPLES COLLECTED - Boring not advanced - Located in archeological zone, no ground disturbance		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 5	Location ID 48
Drilling Company HGL	Driller S. Williford	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 3-2-11 / 0850	Date/Time Total Depth Reached 3-2-11 / 0902
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gall bags (# 30331) (0900)		
Geologist C. Carmichael	Checked by/Date <i>[Signature]</i> 6/2/11		
Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background = 0.0 ppm)	

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.012	Silt with sand, (10YR, 3/3), dark brown, 85% silt, 15% fine grained subrounded sand, common rootlets, trace sandstone fragments, semi-moist, soft, no odor. No groundwater encountered.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 5	Location ID: 48
Drilling Company: HGL	Driller: I. Stone	Ground Elevation: NA	Total Drilled Depth: 2' 8"
Drilling Equipment: Hand Auger	Borehole Diameter: 3"	Date/Time Drilling Started: 4-15-11 1353	Date/Time Total Depth Reached: 4-15-11 1430
Type of Sampling Device: Hand Auger	Samples Collected: 30003 (1410) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: [Signature] 6/2/11		

Radiological Background
74 / 2954

Radiological Equipment Used
Pancake / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches +0.5' 2887 (CPM)
			0.0	75	Surface (grass and soil)		
0.5		0.1	71		Silt, dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% fine sand, 90% silt, non-cohesive, low plasticity, trace rootlets	ML	3285 4332
1.0		0.2	85		Silty Sand & Brown (10YR 5/3), moist, medium dense, no odor, 35% silt, 5% coarse sand, 10% medium sand, 50% fine sand, trace rootlets	SM	4864 4943
2.0		0.3	70		Weathered Sandstone: Very pale brown (10YR 7/4), moist, dense, no odor, weathers to SP, fine-grained sandstone	SP	5104
		0.3	75				5088
3.0					Refusal on sandstone at 2' 8"		
4.0					No GW encountered		
5.0							
6.0							

BORING LOG

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Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA / S		Location ID 48	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 4'	
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 2/7/11 / 1149		Date/Time Total Depth Reached 2/7/11 / 1158	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected -10 30003 / time 1215 (2) 1/2 gallon bags NO SAMPLE			
Geologist Stephanie Lepeyre Montrose				Checked by/Date Chelsea Pail / 7-28-11			
Radiological Background 67 / 3272		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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	Inches	Borehole Gamma Readings (CPM)
			6.0	67	0-1'1" SE SAND with clay (brown 10YR 4/3)		0.0 = 3183	
			0.0	80	plant material (grass & roots)	SC	0.5 = 4080	
			0.0	70	20% clay, 15% silt, 65% fine-med grained sand trace gravel - subangular, soft, low plasticity, dry		1.0 = 5055	
			0.0	90	1'1" - 2' SM SAND with silt (brown 7.5YR 4/4)	SM	1.5 = 5279	
			0.0	75	10% clay, 20% silt, 70% fine-med grained sand micaceous, low plasticity, soft, dry		2.0 = 5119	
			0.0	59	2' - 4' SP SAND (yellowish brown 10YR 5/6)	SP	2.5 = 5103	
			0.0	81	10% silt, 90% fine-coarse grained sand non plastic, loose, dry		3.0 = 5226	
			0.0	85	micaceous		3.5 = 5058	
			0.0	75			4.0 = 5183	
					TD ± 4' bgs (refusal)		4.5 = 8	
					NO GW encountered		5.0 = 8	
					NO SAMPLE (30003) moved to new location and sampled on 4-15-11 due to likely remediation zone (LAR)			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 5	Location ID 49
Drilling Company HGL	Driller P. Skeath	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 2-18-11/0816	Date/Time Total Depth Reached 2-18-11/0824
Type of Sampling Device trowel/shovel	Samples Collected 2 1/2 gall bags (#20332) (0820)		
Geologist C. Carmichael	Checked by/Date 6/2/11		

Radiological Background 15	Radiological Equipment Used up R meter	PID Used Mini Rax 2000 (Background = 0.2 ppm)
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Depth	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'				0.2 15	Silt with sand, (10 YR, 3/3), dark brown, 85% silt, 15% fine grained sand, common rootlets, soft, semi-moist, no odor. No groundwater encountered.	ML	

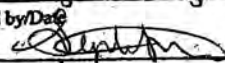
BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA / 5	Location ID 49
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/7/11 / 1444	Date/Time Total Depth Reached 2/7/11 / 1449
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected ID 30004 / Time: 1515 (2) 1/2 gallon bags		
Geologist Stephanie Lapeyre Montrose	Checked by/Date Michael Paul / 7-28-11		

Radiological Background 39 / 2862	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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	Inches	Borehole Gamma Readings (CPM)
								+0.5 = 2734
								(CPM)
			0.0	99	0'-1'11" SM silty SAND w/ clay (brown 10YR 4/3)		0.0 = 3016	
			0.1	73	(0'-8" plant material - roots & grass)		0.5 = 4277	
					20% clay, 30% silt, 50% fine-med. grained sand		1.0 = 4601	
			0.2	48	low plasticity, soft, dry		1.5 = 4584	
			0.1	56			2.0 = 4765	
			0.0	45	1'11" - 2'11" SM silty SAND (dark yellowish brown 10YR 4/4)	SM	2.5 = 4860	
					15% clay, 30% silt, 55% fine-med. grained sand, low plasticity, soft, dry		3.0 = 4865	
			0.0	80	2'4" - 2'11" moist			
			0.1	95	2'11" - 3' 3" SAND (yellowish brown 10YR 5/6)	SP		
					10% silt, 90% fine-med. grained sand, non plastic, loose, dry			
					TD = 3' bgs (refusal)			
					NO Gw encountered			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 50	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/1417		Date/Time Total Depth Reached 2-17-11/1426	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30333) (1425)			
Geologist C. Carmichael				Checked by/Date  6/2/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (Background=0.0ppm)			
Depth	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 Inches (CPM)
0.5'				0.015	Silt with sand, (10 YR, 3/3), dark brown, 80% silt, 20% fine grained sand, common rootlets, semi-moist, soft, trace weathered sandstone, no odor.	ML	
No groundwater encountered.							

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA / S		Location ID 50	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 2/24/11 / 1458		Date/Time Total Depth Reached 2/24/11 / 1502	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 10 30334 / Time: 1525 (2) 1/2 gallon bags			
Geologist Stephanie Lepore-Montrose				Checked by/Date Michael C. Hill / 7-28-11			
Radiological Background 60 / 2535		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches +0.5 = 2550 (CPM)
1.0	0'-1'1"	00	59	59	SP SAND (dark yellowish brown 10YR 3/4) 15% clay, 15% silt, 70% fine - med. grained sand, trace gravel - subrounded, loose, low plasticity, very soft, plant material (grass & roots). dry	SP	0.0 = 2975 0.5 = 4410
1.5	1'1"-1'9"	00	68	68	SM silty SAND with clay (brown 7.5YR 4/4) 20% clay, 25% silt, 55% fine - med. grained sand rootlets, low plasticity, soft, dense, dry	SM	1.0 = 4824 1.5 = 4913
2.0	1'9"-4'2"	00	65	65	CL sandy CLAY (yellowish brown 10YR 5/8) 40% fine - coarse grained sand, 15% silt 45% clay, rootlets, med - high plasticity, hard, dry	CL	2.0 = 4833 2.5 = 4894
3.0		00	62	62			3.0 = 5107
3.5		00	60	60			3.5 = 5113
4.0		00	54	54			4.0 = 5086
4.5		00	63	63			4.5 = 5041
5.0		00	57	57	4'2"-4'11" SP SAND (brownish yellow 10YR 6/8) 5% silt, trace clay, 95% fine - med. grained sand, non plastic, loose, dry	SP	5.0 = 5053
		00	55	55			
		00	90	90	4'11"-5' refusal TP = 5' bgs (refusal) No GW encountered		



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 51	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-17-11/1433		Date/Time Total Depth Reached 2-17-11/1441	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30335) (1440)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.0 ppm)			
Depth	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	Silt, (10 YR, 3/4), dark brown, 90% silt, 10% fine grained sand, common rootlets, semi-moist, soft, trace rocks (weathered sandstone), no odor, very low hardness, no plasticity. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA 15	Location ID S1
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2'8"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/23/11 1218	Date/Time Total Depth Reached 2/23/11 1227
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 10 30336 / time 1245 (2) 1/2 gallon bags		
Geologist Stephane Lepage-Montrose	Checked by/Date Chelma Cail / 7-28-11		

Radiological Background 39 / 2460	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkqd: 0.0 ppm)
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Depth	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 Inches +0.5 = 2380 (CPM)
			0.0	80	0-4" SP SAND 15% clay, 15% silt, 70% fine-med. grained sand plant material (grass + roots), low plasticity, soft, dense, dry	SP	0.0 = 2627
			0.0	75	4"-5" concrete		0.5 = 3873
					5"-8" SP SAND 5% silt, 95% fine-med. grained sand, loose, dry	SP	
					8"-9" SC clayey sand 35% clay, 15% silt, 50% fine-med. grained sand, dense, low plasticity, firm, dry	SC	
1.0			0.0	43	9"-1' SP SAND 10% silt, 90% fine-med. grained sand, indurated, dry	SP	1.0 = 4963
			0.0	50	1'-1'7" SM silty sand with clay 25% silt, 20% clay, 55% fine-med. grained sand slate layers interbedded - slate: (dark yellowish brown 10YR 4/4) low plasticity, firm, dry	SM	1.5 = 5346
2.0			0.0	53	1'7"-2'2" SP SAND 10% silt, 90% fine-med. grained sand loose, dry	SP	2.0 = 5448
			0.0	100	2'2"-2'7" ML sandy silt with clay 25% clay, 30% silt, 45% fine-med. grained sand slate layers interbedded - (light olive brown 2.5Y 5/4) low-med. plasticity, firm, dry	ML	2.5 = 5323
					2'7"-2'10" SP SAND 10% silt, 90% fine-med. grained sand, loose, dry, non plastic	SP	
3.0					TD = 2'8" (refusal)		3.0 = 0
					(recovery = 2'10")		3.5 = 0
					NO GW encountered		4.0 = 0
4.0							4.5 = 0
5.0							5.5 = 0

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 52	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/1127		Date/Time Total Depth Reached 2-18-11/1135	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30337) (1135)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background=0.4 ppm)			
Depth	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 Inches (CPM)
0.5'			0.4	12	Silt with sand, (10 YR, 3/4), dark brown, 80% silt, 20% fine to medium grained sand, common rootlets, semi-moist, soft, no odor.	ML	
No groundwater encountered.							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 5	Location ID 52
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-15-11 0830	Date/Time Total Depth Reached 4-15-11 0945
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30338 (0840) (1) 1/2 gallon bags	
Geologist C. Knight		Checked by/Date [Signature] 6/2/11	

Radiological Background
50 / 2569

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
0.5		0.0	50	52	Sandy Silt: dark yellowish brown (10YR 3/4), moist, med. stiff, no odor, 30% fine sand, 70% silt, cohesive, low plasticity, trace rootlets near surface.	ML	2878
1.0		0.0	49	52			3918
2.0		0.0	55	52			4594
3.0		0.0	50	55			4808
4.0		0.0	59	56	2 1/4" Silty Sand: Strong brown (7.5YR 4/6), moist, med. dense, no odor, 35% silt, 5% coarse sand, 10% medium sand, 50% fine sand, trace rootlets	SM	4795
5.0		0.0	63	50			4739
6.0		0.0	73	59	4 1/4" Sandy Clay with Silt: Brown (7.5YR 4/4), moist, med. stiff, no odor, 15% silt, 15% fine sand, 15% med. sand, 55% clay, low plasticity, non-cohesive, medium toughness	CL	4926
7.0		0.0	65	59			4963
		0.0	50	63	gradational contact Poorly graded sand with silt: Yellowish brown (10YR 5/6), moist, med. dense, no odor, 20% silt, 80% fine sand	SP/SL	4949
		0.0	45	73			5005
		0.0	50	65			4918
		0.0	50	45			5036
		0.0	50	45			5039

Radiological Background 50/2569				Project Name SSPL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Location 52	
Depth	Interval	Recovery	FTD	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		
							Inches	(CPM)	
6.0			0.0	43	Same as above SP	SP	5039		
			0.0	65			4937		
7.0			0.0	65	weathered sandstone: yellow (10YR 7/6), dry, hard, no color, mechanically weathers to SP, fine grained sandstone	SP	5065		
8.0					Refusal on sandstone at 7.0' bgs				
					No GW encountered				
9.0									
10.0									
11.0									
12.0									
13.0									

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 53	
Drilling Company HGL		Driller J McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/1315		Date/Time Total Depth Reached 2-18-11/1325	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30339) (1320)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 14 mR, 0.4 μR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.4 μR)			
Depth	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 Inches (CPM)
0.5'			0.4 14		silt w/ sand, dark brown (10YR 3/3), moist, soft, 85 % silt, 15 % fine sand; few roots etc, no odor		
					TD 0.5'		
					NO GW		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA / S		Location ID S3	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 4'	
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 2/25/11 0857		Date/Time Total Depth Reached 2/25/11 0901	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 10 30340 / time 0925 (2) 1/2 gallon bags			
Geologist Stephanie Lapeyre Montrose				Checked by/Date [Signature] / 7-28-11			
Radiological Background S3 / 2760		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
0.0	56	0.0	66	0-1'1" SM silt, sand with clay (dark brown 10YR 3/3) 20% clay, 25% silt, 55% fine-med. grained sand (0-7" plant material - roots & grass) low plasticity, very soft, dry	SM	0.0 = 3266 0.5 = 4372	
1.0	75	0.0	57	1'1"-2'2" SP SAND (dark yellowish brown 10YR 4/4) 15% clay, 15% silt, 70% fine-med. grained sand low plasticity, very soft, dry plant debris (rootlets and twigs)	SP	1.0 = 4841 1.5 = 5062	
2.0	65	0.0	85	2'2"-3'7" CL sandy CLAY with silt (brownish yellow 10YR 6/6) 25% silt, 45% clay, 30% fine-med. grained sand med-high plasticity, hard, dry	CL	2.0 = 5138 2.5 = 5115 3.0 = 5204	
3.0	70	0.0	62	3'7"-4' SP SAND (brownish yellow 10YR 6/6) 10% silt, 90% fine-med. grained sand non plastic, loose, dry	SP	3.5 = 5310 4.0 = 5085	
4.0	61	0.0		TO = 4' bgs (refused) No Gw encountered (note: raining during drilling and sampling)			
5.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID / group: 5A / 5	Location ID: 54
Drilling Company: HGL	Driller: J. McDaniel	Ground Elevation: NA	Total Drilled Depth: 0.5'
Drilling Equipment: trowel / shovel	Borehole Diameter: NA	Date/Time Drilling Started: 2-21-11 1445	Date/Time Total Depth Reached: 2-21-11 1455
Type of Sampling Device: trowel / shovel	Samples Collected: 2 1/2 gal bags 30341 (1450)		
Geologist: C. Knight	Checked by/Date: [Signature] 6/2/11		

Radiological Background: 11mR	Radiological Equipment Used: up R meter	PID Used: Mini Rac 2000 background (0.5 ppm)
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Depth	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 Inches (CPM)
0.5'				12	Silty Sand; Brown (10YR 3/4), moist, loose, no odor, 30% silt, 70% fine sand, rootlets. No GW encountered	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SA 1 S	Location ID: 54
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 2/25/11 1013	Date/Time Total Depth Reached: 2/25/11 1024
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: ID 30342 / 1st 1120 (2) 1/2 gallon bags		
Geologist: Stephen Lepore Montez	Checked by/Date: Charles Cantel / 7-28-11		

Radiological Background: 62 / 2495	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.0	0.0	73			0'-1'3" SM silty sand with clay (dark brown 10YR 3/3)	SM	0.0 = 3445
0.0	0.0	82			20% clay, 25% silt, 55% fine-med grained sand low plasticity, soft, loose, dry plant material - roots & grass	SM	0.5 = 4391
1.0	0.0	65			1'3"-2'11" SC clayey sand (brown 7.5 YR 4/4)	SC	1.0 = 4791
0.0	0.0	95			15% silt, 25% clay, 60% fine-med grained sand 1/4" - charcoal pieces	SC	1.5 = 4892
2.0	0.0	73			low plasticity, soft, dry, dense		2.0 = 4731
0.0	0.0	88					2.5 = 4789
3.0	0.0	70			2'11"-3'11" SC sand with clay (yellowish brown 10YR 5/4)	SC	3.0 = 4681
0.0	0.0	58			10% silt, 20% clay, 70% fine-coarse grained sand low plasticity, very soft, med dense, dry	SC	3.5 = 4815
4.0	0.0	66			3'11"-4'10" SP sand (yellowish brown 10YR 5/4)	SP	4.0 = 4876
0.0	0.0	64			15% silt, 10% clay, 75% fine-coarse grained sand low plasticity, very soft, loose, dry	SP	4.5 = 4943
5.0	0.0	75			4'10"-5' NO Recovery		5.0 = 5025
0.0	0.0	55			5'-6'4" SP sand (brownish yellow 10YR 6/6)	SP	5.5 = 5183
					5% silt, 10% clay, 85% fine-coarse grained sand loose, low plasticity, very soft, clay	SP	

Radiological Background 62 / 2495				Project Name SSPL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Location 54	
Depth	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		
							Inches	(CPM)	
			00	70	Same as above	SP	6.0 =	5193	
			00	63	6'4" - 8'4" (light yellowish brown) SP SAND 2.57 6/4 Ⓟ	SP	6.5 =	4983	
7.0			00	85			7.0 =	4994	
			00	46	5% silt, 10% clay 85% fine coarse grained sand 100% very soft low plasticity, dry		7.5 =	4855	
8.0			00	75			8.0 =	4978	
			00	58	8'4" - 9'10" SP SAND (yellowish brown 10% 5/4)		8.5 =	5028	
9.0			00	73	5% silt, 15% clay, 80% fine med. grained sand dense, low plasticity, soft, dry Ⓟ iron staining (iron oxide)	SP	9.0 =	5152	
			00	63			9.5 =	5224	
10.0			00	85	9'10" - 10' NO RECOVERY TO = 10' bgs NO GW encountered (note: raining during drilling & sampling)		10.0 =	5175	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 5A / 5	Location ID 55
Drilling Company HGL	Driller J. McDaniels	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 2-21-11 1415	Date/Time Total Depth Reached 2-21-11 1425
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gal. bags 30343 (1420)		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 6/2/11		

Radiological Background B _{gr} R	Radiological Equipment Used up R meter	PID Used Mini Rae 2000	background (0.4 ppm)
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Depth	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 Inches (CPM)
0.5'			0.5	12	Silty Sand; Brown (10YR 3/4), moist, loose, no odor, 30% silt, 70% fine sand, rootlets No GW encountered	SM	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA 1 S	Location ID 55
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3' 1"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/25/11 / 1215	Date/Time Total Depth Reached 2/25/11 / 1218
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected id 30344 / time: 1235 (2) 1/2 gallon bags		
Geologist Stephanie Lepore-Antrose	Checked by/Date Chelsea Carl / 7-28-11		

Radiological Background 41 / 2526	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd 10.10 ppm)
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Depth	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 Inches +0.5 = 2610 (CPM)
0.0	0.0	0.0	60	0-1'3" SM silty sand with clay (dark brown 10YR 3/4)			0.0 = 2968
0.0	0.0	0.0	55	20% clay, 25% silt, 55% fine-med. grained sand		SM	0.5 = 4326
1.0	0.0	0.0	65	low plasticity, soft, moist plant material (grass, roots)			1.0 = 4803
0.0	0.0	0.0	61	1'3"-2' SC sand with clay (brown 2.5YR 4/4)		SC	1.5 = 4976
2.0	0.0	0.0	75	20% clay, 10% silt, 70% fine-med. grained sand			2.0 = 5316
0.0	0.0	0.0	54	2'-3' CL sandy clay (brownish yellow 10YR 6/5)		CL	2.5 = 5976
3.0	0.0	0.0	44	45% clay, 15% silt, 40% fine-med. grained sand med.-high plasticity, hard, dry interbedded slate layer			3.0 = 6008
				3'-3'1" SP sand 10% silt, 90% fine-med. grained sand, 100% dry 6/6 SP			3.5 = 6008
				TO = 3' 1" bgs (refusal)			4.0 = 6008
				No GW encountered			4.5 = 6008
				(note: raining while drilling and sampling)			5.0 = 6008



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group 5A / 5		Location ID 56	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-21-11 1355		Date/Time Total Depth Reached 2-21-11 1405	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gal bags 30345 (1400)			
Geologist C. Knight				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 24R		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 background (0.5 ppm)			
Depth	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'				0.5-12	Silty Sand: Brown (10YR 3/4), moist, loose, no odor, 40% silt, 60% fine sand, rufflets, plastic bottle ~ 6" hys. No GW encountered	SM	

BORING LOG

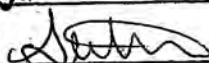
Sheet 1 of 2

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA / 5	Location ID 56
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/25/11 / 1459	Date/Time Total Depth Reached 2/25/11 / 1508
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1) 30346 / time 1540 (2) 1/2 gallon bags		
Geologist Stephanie Lerner Muthose	Checked by/Date Charles Carmichael / 7-28-11		
Radiological Background 48 / 2667	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	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 Inches (CPM)
0.0		42			0-1'9" SM silt, STAYID with clay (dark brown 10YR 3/3)		10.5 = 2525
0.0		60			20% clay, 25% silt, 55% fine-med. grained sand low plasticity, soft, moist (saturated at surface)	SM	0.0 = 2631
0.0		70			(0-9" plant material - grass & roots) moist		0.5 = 4112
0.0		52					1.0 = 4649
0.0		75			1'9" - 4'2" ML sandy SILT (brown 7.5YR 4/4) with clay		1.5 = 4670
0.0		67				ML	2.0 = 4690
0.0		55			20% clay 35% silt, 45% fine-med. grained sand low plasticity, soft, dry		2.5 = 4874
0.0		60					3.0 = 4749
0.0		48					3.5 = 4896
0.0		45			4'2" - 5' No Recovery		4.0 = 5150
0.0		60			5-6'7" ML sandy SILT with clay (brown 7.5YR 4/4)		4.5 = 5042
0.0		50			25% clay, 35% silt, 40% fine-med. grained sand low-med. plasticity, firm, dry	ML	5.0 = 5002
							5.5 = 5208

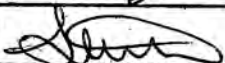
Radiological Background <u>48 / 2667</u>				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>56</u>	
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							Inches (CPM)
			0.0	40	same as above	ML	6.0 = 5108
			0.0	45	6'7" - 7'2" CL sandy clay with (yellowish brown) silt 10% 5/4	CL	6.5 = 5254
7.0			0.0	70	35% clay, 30% silt, 35% fine-coarse grained med.-high plasticity, hard, clay	CL	7.0 = 5144
			0.0	60	7'2" - 8' SM silty sand with (light yellowish brown) clay 2.5% 6/3	SM	7.5 = 5232
8.0			0.0	44	20% clay, 50% fine-coarse grained sand, 30% silt Strong brown 7.5% R 5/8 staining throughout low plasticity, soft, dry	SM	8.0 = 5165
					TD = 8' bgs (refused)		8.5 = 5108
					No GW encountered		9.0 = 5108
9.0					(Note: raining during drilling & sampling)		9.5 = 5108
							10.0 = 5108

BORING LOG

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 5A / 5	Location ID 57
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 2-21-11 11:55	Date/Time Total Depth Reached 2-21-11 12:10
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gal bags 30347 (1200)		
Geologist C. Knight	Checked by/Date  6/2/11		

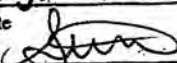
Radiological Background 12 MR 2000	Radiological Equipment Used up R meter	PID Used Mini Rac 2000 background (0.3 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'				0.4 2MR	Silty Sand: Brown (10YR 5/4), moist, loose, no odor, 40% silt, 60% fine sand, rootlets no GW encountered	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 5	Location ID 57
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-14-11 0844	Date/Time Total Depth Reached 4-14-11 0915
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30348 (0845) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date  6/2/11		

Radiological Background 416 / 2892	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches +0.5' 2753 (CPM)
0.5		0.0	50		Surface: soil and grass		3256
1.0		0.0	59		Sandy Silt: dark yellowish brown (10YR 4/4), moist, soft, no color, 30% fine sand, 70% silt, low plasticity, non-cohesive,	ML	4552
1.5		0.0	63		10" Siltstone: Yellow (10YR 7/6), dry, dense, no color, interbedded layers of siltstone and mudstone.	SC	5139
2.0		0.0	57			SC	5372
2.5		0.0	54			SC	5717
3.0		0.0	56			SC	5173
3.5					Refusal on siltstone at 2.5' bgs No GW encountered		
4.0							
4.5							
5.0							
5.5							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 5A / 5	Location ID 58
Drilling Company HGL	Driller J. McDainel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 2-21-11 1335	Date/Time Total Depth Reached 2-21-11 1345
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gal bags 36349 (1340)		
Geologist C. Knight	Checked by/Date  6/2/11		

Radiological Background 12ppR cpm	Radiological Equipment Used up R meter	PID Used Mini Raz 2000 background (0.3 ppm)
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Depth	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'				12	Silty Sand: Brown (10YR 3/4), moist, loose, no odor, 35% silt, 65% fine sand, rootlets No GW encountered	SM	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 5	Location ID 58
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 40'
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-14-11 0930	Date/Time Total Depth Reached 4-14-11 1020
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30350 (0935) 12 1/2 gallon bags		
Geologist C. Knight		Checked by/Date <i>[Signature]</i> 6/2/11		
Radiological Background 46 / 2745		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkqd:0.0 ppm)

Depth	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 Inches (CPM)
			0.0	41	Surface: soil and grass		10.5' 2720
0.5		0.0	46		Sandy silt: dark yellowish brown (10YR 4/4) moist, soft, no odor, 30% fine sand, 70% silt, low plasticity, non cohesive, rootlets near surface	ML	3052
1.0		0.0	47				4380
		0.0	49				4717
		0.0	52				4963
2.0		0.0	56		Sandstone (weathered) brownish yellow (10YR 6/6), moist, dense, no odor mechanically weathered to SP, 50% medium sand, 50% fine sand		4872
		0.0	60		2" siltstone bed 2" thick		4844
3.0		0.0	62		3' fine grained sandstone		4817
		0.0	65		Siltstone: brownish yellow (10YR 6/6), dry, hard, no odor, thin laminae of siltstone with trace mudstone		5024
4.0					Refusal on siltstone at 4.0' bgs		5833
5.0					NO GW encountered		
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 5A / 5	Location ID 59
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 2-21-11 1115	Date/Time Total Depth Reached 2-21-11 1125
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gal bags 30351 (1120) 30374 lab dup 30380 30381 (field dup - no time) MS		
Geologist C. Knight	Checked by/Date [Signature] 6/2/11		

Radiological Background 12.6 uR/hr	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 background (0.5 ppm)
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Depth	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 Inches (CPM)
0.5'				0.6 12.6 uR/hr	Silty Sand: Brown (10 YR 3/4), moist, loose, no odor, 35% silt, 65% fine sand, rootlets	Sm	
					No low encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 5	Location ID 59
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-14-11 1035	Date/Time Total Depth Reached 4-14-11 1110
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30352 (10M) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date [Signature] 6/2/11		

 Radiological Background
47 / 2689

 Radiological Equipment Used
Pancake / Downhole

 PID Used
Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
0.5			0.0	50	Silt with sand: Brown (7.5YR 4/4), moist, soft, no odor, 25% fine sand, 75% silt, trace rootlets near surface, non cohesive, low plasticity		2884
			0.0	54			4250
1.0			0.0	59		ML	4789
			0.0	64			4937
2.0			0.0	66	1' 9" silty sand: strong brown (7.5YR 5/8), moist, medium dense, no odor, 35% silt, 65% fine sand	SM	5007
			0.0	58			5058
3.0			0.0	60	Weathered sandstone: Pale yellow (2.5Y 7/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace interbedded siltstone beds		5004
			0.0	62			5121
4.0			0.0	55			4995
5.0					Refusal on sandstone at 4.0' bgs No GW encountered		



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group 5A / 5		Location ID 60	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-21-11 1050		Date/Time Total Depth Reached 2-21-11 1100	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gal bags 303 53 (1055)			
Geologist C. Knight				Checked by/Date 6/2/11			
Radiological Background 12 uR cpm		Radiological Equipment Used uR meter		PID Used Mini Rae 2000 background (0.5 ppm)			
Depth	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 Inches (CPM)
0.5'				0.612	Poorly graded sand w/ silt; brown (10YR 3/4), moist, loose, no odor, 80% fine sand, 20% silt, rootlets	SP/SM	
					No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 5	Location ID 60
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-13-11 1455	Date/Time Total Depth Reached 4-13-11 1515
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30354 (1500) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date C. Knight 4/17-28-11		

Radiological Background 49 / 2624	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.5		0.0	54		Sandy Silt: dark yellowish brown (10YR 4/4), moist, soft to medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt, trace roots in upper surface bags - Krotovina, bioturbation gopher/squirrel burrows	CR	2986
1.0		0.0	61			SM	41407
		0.0	66			ML	5144
		0.0	69				5296
2.0		0.0	63		Same as above		5280
		0.0	54				5277
3.0		0.0	63			SM	5373
		0.0	60				5326
4.0		0.0	62		Silty Sand: strong brown (7.5YR 4/6), moist, medium dense, no odor, 35% silt, 5% coarse sand, 10% medium sand, 50% fine sand		5231
		0.0	65				5228
5.0		0.0	63				5224
		0.0	56			SM	5339
6.0		0.0	54		Same as above		5441

Radiological Background 44/ 2624				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 60	
Depth	Interval	Recovery	PTD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
							Inches (CPM)
6.0			0.0	59	Same as above	SM	5441
			0.0	54	7'7"		5489
7.0			0.0	57	Weathered siltstone (grayish brown (2.5Y 5/2), moist, medium stiff, no odor, crumbled/fractured siltstone and mudstone (claystone) with iron oxide lining fractures, trace sandstone lenses lenses, mechanically weathered to ML and CL.	SC	5501
			0.0	50			5527
8.0			0.0	58			5457
			0.0	63	roots at terminal of boring 3mm diameter		6532
			0.0	65	increase density		
9.0			0.0	65	Sandstone: fine grained at end of boring		6790
					Refusal on siltstone at 9.0' bgs		
					No GW encountered		
10.0							
11.0							
12.0							
13.0							

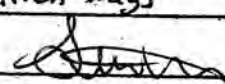
Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 5A / 5	Location ID 61
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 2-21-11 1025	Date/Time Total Depth Reached 2-21-11 1035
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gal bags 30355 (1030)		
Geologist C. Knight	Checked by/Date [Signature] 6/2/11		

Radiological Background 12 uR 2000	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 background (6.5 ppm)
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Depth	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 Inches (CPM)
0.5'				0.5 12	Silty Sand: Brown (10YR 3/4), moist, loose, no odor, 35% silt, 65% fine sand, rootlets & earth worms. No Gw encountered	SM	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 5	Location ID 61
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0'
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-13-11 1345	Date/Time Total Depth Reached 4-13-11 1430
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30356 (1350) 1 1/2 gallon bags		
Geologist C. Knight		Checked by/Date  6/2/11		
Radiological Background 50 / 2660		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
			0.0	49	Surface: grain and soil		1015 2652
0.5		0.0	45		Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 35% silt, 10% medium sand, 55% fine sand, trace rootlets near surface	SM	3410
1.0		0.0	48				4576
		0.0	52				4907
		0.0	48				5147
2.0		0.0	43				5051
		0.0	45		Same as above	SM	5021
		0.0	44				5156
3.0		0.0	48		3' 8" Sandy Silt: dark yellowish brown (10YR 4/4), moist, med. stiff, no odor, low plasticity, 35% fine sand, 5% medium, 60% silt	ML	5147
		0.0	55		Weathered sandstone: Very pale brown (10YR 8/2), moist, dense, no odor, Mechanically weathered to SP, fine grained sandstone, iron oxide staining		5269
4.0		0.0	55				5247
5.0		0.0			Refusal on sandstone at 5' bys No GW encountered		4976

Project Name: SSFL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group 5A / 5		Location ID 62	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-21-11 0900		Date/Time Total Depth Reached 2-21-11 0910	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gal bags 30367 (0905)			
Geologist C. Knight				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 16 cpm		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 background (0.1 ppm)			
Depth	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'				16	Silty Sand: Dark brown (10YR 3/3), moist, loose, no odor, 30% silt, 65% fine to medium sand, 5% fine sandstone gravel, rootlets No GW encountered	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A / Group 5		Location ID 62	
Drilling Company HGL		Driller T. Morse P. Skelton		Ground Elevation NA		Total Drilled Depth 1.2'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 4-22-11/0901		Date/Time Total Depth Reached 4-22-11/0920	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1 1/2 gall bag (#30358) (w/a)			
Geologist C. Carmichael				Checked by/Date Steve 6/2/11			
Radiological Background 58,3115 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rae 2000 (Background=0.0 ppm)			
Depth	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 Inches (CPM)
1'			0.0	50	Sand, (10YR, 5/4), orange-ish brown, 95% fine to medium grained sand, 5% sandstone rock fragments, dry, medium dense, no plasticity or hardness, no odor. (eroded bedrock)	SP	3525 0.5-4164 5355 5911 5620
2'					No groundwater encountered.		
3'					Refusal at 15"		
4'					No sample collected		
5'							
6'							

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 5A / 5	Location ID 63
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 2-21-11 0955	Date/Time Total Depth Reached 2-21-11 1005
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gal bags 30359 (1000)		
Geologist C. Knight	Checked by/Date [Signature] 6/2/11		

Radiological Background 16 cpm	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 background (0.13 ppm)
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Depth	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'				04 16	Sand with silt: (Brown L104R 4/3), moist, loose, no odor, 15% silt, 10% medium sand, 75% fine sand, rootlets. No GW encountered	SP/SM	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A / Group 5		Location ID 63	
Drilling Company HGL		Driller T. Morse P. Skerrett		Ground Elevation NA		Total Drilled Depth First attempt / second attempt 1.3' / 2'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 4-22-11/0946		Date/Time Total Depth Reached 4-22-11/1005	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1 1/2 gall bag (#30360) (1005)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/2/11			
Radiological Background 49,338 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Ra2 2000 (Background = 0.2 ppm)			
Depth	Interval	Recovery	RPD	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 Inches (CPM)
			0.2	80			
			0.0	85	Silty sand, (10 YR, 4/4), brown, 70% fine to medium grained sand, 30% silt, some rootlets medium dense, dry, no plasticity or hardness, no odor.	SM	0.5 5538 5315 0 5315 4339
1'			0.0	70	Sand, (10 YR, 5/4), orange-ish brown, 95% fine to medium grained sand, 5% rock fragments - sandstone, dry, medium dense, no plasticity or hardness, no odor.	SP	5538 5542 5487
2'			0.0	70			
			0.0	67			
					Refusal at 2'		
					Gw not encountered		
3'							
4'							
5'							
6'							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group 5A / 5	Location ID 64
Drilling Company HGL	Driller J. McKinnel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel / shovel	Borehole Diameter NA	Date/Time Drilling Started 2-21-11 0926	Date/Time Total Depth Reached 2-21-11 0936
Type of Sampling Device trowel / shovel	Samples Collected 2 1/2 gal bags 30361 (0930)		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 6/2/11		

Radiological Background 6 cpm	Radiological Equipment Used up R meter	PID Used Mini Rac 2000 background (0.3 ppm)
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Depth	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 Inches (CPM)
0.5'				0.4 16	Sand w/ silt : Brown (10YR 4/3), moist, loose, no odor, 15% silt, 10% medium sand, 75% fine sand, rootlets, No GW encountered	SP	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A/5		Location ID 64	
Drilling Company HGL		Driller T. Morse P. Skiff		Ground Elevation NA		Total Drilled Depth 4'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 4-22-11/1034		Date/Time Total Depth Reached 4-22-11/1120	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1 1/2 gall bag (#30362) (1110)			
Geologist C. Carmichael				Checked by/Date Sept 6/2/11			
Radiological Background 74, 3427 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Raz 2000 (Background: 0.0 ppm)			
Depth	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 Inches (CPM)
1'			0.0	45	Silty sand, (10YR, 4/3), brown, 65% fine sand, 35% silt, some rootlets, dry, loose, very low plasticity, no hardness, no odor.	SM	0.5-3539
			0.0	60			5287
			0.0	55			5485
			0.0	91			5583
			0.0	78			5492
2'			0.0	85	Sand with clay, (10YR, 4/6), orange-ish brown, 85% fine to medium grained sand, 15% clay, dry, medium dense, low plasticity and hardness, no odor. (weathered bedrock)	SC	5549
			0.0	50			5397
			0.0	50			5014
3'					Refusal at 4' Groundwater not encountered		5062
4'							
5'							
6'							

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 5	Location ID: 65
Drilling Company: Boart Longyear		Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 6.0'
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 7-14-11 1155	Date/Time Total Depth Reached: 7-14-11 1300
Type of Sampling Device: 1 3/4" macrocore acetate liner		Samples Collected: 30363 (1200) 1 (2) 1/2 gallon bags		
Geologist: C. Knight		Checked by/Date: 6/2/11		
Radiological Background: S1 / 2572		Radiological Equipment Used: Pancake / Downhole		PID Used: MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		Inches (CPM)
			0.0	45	Surface is asphalt, next to B029		2631
			0.0	45	3" Asphalt		2880
0.5			0.0	45	Silt with sand: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 25% fine sand, 7.5% silt, low plasticity, slow dilatancy, non cohesive, trace mottling, trace rootlets	AF/ML	4239
1.0			0.0	46			4808
			0.0	50			5318
2.0			0.0	50			5259
			0.0	53	2'3" Poorly graded sand: very pale brown (10YR 7/4), moist, med. dense, no odor, 10% sandstone gravel, 20% medium sand, 70% fine sand, abundant mottling	AF/SP	5286
3.0			0.0	57			5387
			0.0	55			5474
4.0			0.0	50	3'7" Silty sand with gravel: Brown (10YR 5/3), moist, medium dense, no odor, 15% red sandstone angular gravel, 35% silt, 5% coarse sand, 10% medium sand, 35% fine sand, trace roots and mottling	AF/SM	5465
			0.0	53			5210
5.0			0.0	58	No recovery		5271
			0.0	57	Weathered siltstone: light yellowish brown (2.5Y 6/3), dry, dense, no odor, thin (mm) laminae of siltstone	SE/SL	5410
6.0			0.0	60			6031

Refusal on siltstone at 6.0' bgs
No GW encountered

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 66	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11 / 1316		Date/Time Total Depth Reached 3-1-11 / 1325	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30157) (1325)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.1 ppm)			
Depth	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 Inches (CPM)
0.5'			0.214		Sand with silt and rock fragments, (10YR, 3/4), brown, 60% fine grained sand, 25% silt, 15% rock fragments, (siltstone, fill gravel), semi-moist, loose, no odor, some rootlets. No groundwater encountered	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 3	Location ID: 66
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Drilled Depth: 275'
Drilling Equipment: Geoprobe 6600 (CL)	Borehole Diameter: 1 3/4" 3.0"	Date/Time Drilling Started: 4-6-11 1355	Date/Time Total Depth Reached: 4-6-11 1428
Type of Sampling Device: handauged 1 3/4" macrocore acetate liner (CL)	Samples Collected: 30158 (1400) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: [Signature] 6/2/11		

Radiological Background
66 / 3212

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkgd: 0.6 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5		0.0	60	60	Surface: grass and soil		10.5' 2965
1.0		0.0	65	65	silt sand: lg. lt. yellowish brown (LOYR 6/4), moist, medium dense, no odor, 40% silt, 5% coarse sand, 5% medium sand, 50% fine sand, trace rootlets near surface	SM	3301
2.0		0.1	70	70			4631
		0.2	65	65			5108
		0.1	70	70			5221
		0.0	100	100	weathered sandstone: Pale yellow (2.5Y 7/4), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone, trace mudstone	SP	5421
3.0					Refusal on sandstone at 25' bys No GW encountered		5580
4.0							
5.0							
6.0							

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SA group 3	Location ID: 6D
Drilling Company: HGL	Driller: P. Skerfve	Ground Elevation: NA	Total Drilled Depth: 2.0'
Drilling Equipment: Hand Auger	Borehole Diameter: 1 3/4" 3.0" (C)	Date/Time Drilling Started: 4-6-11 1155	Date/Time Total Depth Reached: 4-6-11 1225
Type of Sampling Device: hand auger	Samples Collected: 30154 (1200)		
Geologist: C. L. Knight		Checked by/Date: [Signature] 6/2/11	

Radiological Background: 66 / 2634	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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	Inches	Borehole Gamma Readings (CPM)
0.0			0.0	60	Surface is red and soil		105	3068
0.5			0.0	55	Silty sand & dark yellowish brown (10YR 4/4) moist, med dense, no odor, 35% silt, 5% medium sand, 5% coarse sand, 55% fine sand	SM	4417	3694
1.0			0.0	50	Weathered Bedrock: light yellowish brown (10YR 6/4) moist, hard, no odor	Bedrock	5179	
2.0			0.0	65			5298	
2.0					Refusal at 2.0' on sandstone No GW encountered		5284	
3.0								
4.0								
5.0								
6.0								

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 3	Location ID: 68
Drilling Company: HGL Boart Longyear CR	Driller: T. Morse D. Hansen	Ground Elevation: NA	Total Drilled Depth: 2.5'
Drilling Equipment: Handauger Geoprobe 6600 CR	Borehole Diameter: 1 3/4" 3.0"	Date/Time Drilling Started: 4-6-11 1438	Date/Time Total Depth Reached: 4-6-11 1510
Type of Sampling Device: Hand auger 1 3/4" macrocore acetate liner	Samples Collected: 30160 (1440) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: [Signature] 6/2/11		

Radiological Background
68 / 209

Radiological Equipment Used
Pencate / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
					Surface: gravel & soil			2734
0.5			0.0	68	5.1% Sand: Brown (10YR 5/3), moist, medium dense, no odor, 35% silt, 5% angular gravel, 5% medium sand, 55% fine sand, trace rootlets near surface	SM		2995
1.0			0.5	69				4212
			0.2	69	Sandy silt: light yellowish brown (2.5Y 6/4), moist, stiff, no odor, 40% fine sand, 10% angular siltstone gravel, 50% silt, low plasticity, low toughness	ML		4920
			0.3	65				5472
2.0			0.1	67	Weathered siltstone: light yellowish brown (2.5Y 6/4), moist, hard, no odor, weathers to ML siltstone, interbedded with fine grained sandstone.	ML		5866
			0.0	81				6459
					refusal at 2.5' by son siltstone			
					No GW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 3	Location ID: 69
Drilling Company: HGL Boart Longyear (C)	Driller: T. Morse D. Hansen (C)	Ground Elevation: NA	Total Drilled Depth: 2.0
Drilling Equipment: Hand auger Geoprobe 6600 (C)	Borehole Diameter: 1 3/4" 30 (C)	Date/Time Drilling Started: 4-6-11 1520	Date/Time Total Depth Reached: 4-6-11 1555
Type of Sampling Device: Hand auger 1 3/4" macrocore acetate liner (C)	Samples Collected: 30161 (1525) (1) 1/2 gallon bags	Geologist: C. Knight	
Radiological Background: 75 / 3025		Radiological Equipment Used: Pancake / Downhole	
PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)		Checked by/Date: [Signature] 6/2/11	

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USGS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	75	surface soil & gravel		10.5' 2933
0.5			0.0	55	silt/sand: Brown (10YR 5/3), moist, med. clasts no odor, 35% silt, 40% angular siltstone, 10% medium sand, 45% fine sand, trace rootlets near surface	SM	3658
1.0			0.0	69	weathered siltstone and sandstone light yellowish brown (2.5Y 6/4), moist, hard, no odor, mechanically weathered to SP w/ gravel, interbedded siltstone and fine grained sandstone, angular siltstone gravel	SP w/ gravel	4877
			0.0	61			5270
2.0			0.0	71	2' 1"		5403
					Refusal on siltstone/sandstone @ 2' 1" bgs		5304
					No GW encountered		
3.0							
4.0							
5.0							
6.0							

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA group 3	Location ID 70
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-1-11 0836	Date/Time Total Depth Reached 4-1-11 0855
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30162 (0840) (1) 1/2 gallon bags		
Geologist E. Knight	Checked by/Date [Signature] 6/2/11		

Radiological Background 50 / 2838	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches +0.5' 2724 (CPM)
			0.0	66	Surface; grass and soil		3013
0.5			0.0	77	Poorly graded sand; Yellowish brown (10YR 5/6), moist, medium dense, no odor, 5% coarse sand, 5% medium sand, 90% fine sand	SP	4412
1.0			0.0	75	Weathered Sandstone: Yellowish brown (10YR 5/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	5125
			0.0	67			5542
			0.0	66			
2.0			0.0	65	Refusal on Sandstone at 2.0' bgs No GW encountered		6058
3.0							
4.0							
5.0							
6.0							

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP0038.01.22.04.03	Subarea ID & Group: 5A group 3	Location ID: 71
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 6.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-1-11 1213	Date/Time Total Depth Reached: 4-1-11 1305
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30163 (1215) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date:  6/2/11		

Radiological Background
15 / 3045

Radiological Equipment Used

Pancake

Downhole

PID Used

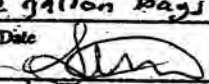
Mini-RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
					AF: Artificial Fill		
					Surface grass and soil on fill pad		40.5' 2878 (CPM) 3200
0.5		0.0	63		Fill: silty sand/clay: yellowish brown (10YR 5/6) moist, medium dense, no odor, 10% angular sandstone gravel (fine to coarse), 35% silt, 10% clay, 40% fine sand, 5% medium sand, abundant mottling, trace rootlets near surface, fill rock (granite) gravel near surface	AF SM	4732 5859 5859 (CL)
1.0		0.0	90				5880
		0.0	105				6222
2.0		0.0	80				
		0.0	83		2'3" Silt: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% fine sand, 10% clay, 80% silt, low plasticity, low toughness, slow dilatancy	ML	6564
3.0		0.0	73		2'4" Clay: dark yellowish brown (10YR 4/4), moist, stiff, no odor, 10% fine sand, 10% silt, 80% clay, low plasticity, medium toughness, high dry strength	CL	6658
		0.0	75				6281
4.0		0.0	84				6216
		0.0	73				6459
		0.0	75		4'5" Sandy clay: dark yellowish brown (10YR 4/4), moist, stiff, no odor, 60% clay, 10% coarse sand, 10% medium sand, 20% fine sand, low plasticity, medium toughness, sandstone inundated with clay	CL	6793
5.0		0.0	70		5'2" gradational contact Sandstone: pale yellow (5Y 8/4), dry, dense, no odor, mechanically weathers to SP, 20% medium sand, 80% fine sand	SP S	7071
6.0		0.0	65				7071

TD = 6' bgs

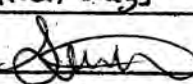
No GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 72	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11/0957		Date/Time Total Depth Reached 3-1-11/1005	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30164) (1005)			
Geologist C. Carmichael				Checked by/Date [Signature] 6/2/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.0cpm)			
Depth	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'				0.212	Sand with rock fragments, (10 YR, 4/6), orangey-brown, 70% fine to coarse grained sand, 25% rock fragments (sandstone/siltstone), 5% silt, some rootlets, semi-moist, loose, no odor.	SW	
No groundwater encountered.							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 72	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 7.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-1-11 1105		Date/Time Total Depth Reached 4-1-11 1215	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30165 (115) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date  6/2/11			
Radiological Background 41 / 2987		Radiological Equipment Used Pancake / Downhole		PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)			

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
			0.0	78	Surface: grass and soil		40.5	2845
			0.0	82				
0.5			0.0	90	Poorly graded sand with gravel; Fill: (light olive brown (2.5Y 5/4), moist, med. dense, no odor, 20% gravel, sandstone angular fine to coarse gravel), 10% silt, 10% coarse sand, 5% medium sand, 55% fine sand, trace rootlets, abundant mottling	AF/SP	4651	5694
1.0			0.0	90			5819	
2.0			0.0	75			5798	
			0.0	58			5765	
3.0			0.0	70			5792	
			0.0	80	Soft: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% fine sand, 10% clay, 80% silt, low plasticity, low toughness, slow dilatancy, trace fine sandstone gravel, trace rootlets	ML	6002	
4.0			0.0	75			6313	
			0.0	80			6291	
5.0			0.0	75	Clay with sand: dark yellowish brown (10YR 4/4), moist, med. stiff, no odor, 20% fine sand, 10% silt, 70% clay, low plasticity, medium toughness	CL	6004	5974
			0.0	65	Silty sand w/ clay: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 25% clay, 30% silt, 5% coarse, 10% medium sand, 30% fine sand	SM		5908
6.0			0.0	45				

Radiological Background				Project Name	Project Number	Location	
				SSFL Area IV Radiological Study	EP9038.01.22.04.03	72	
Depth	Interval	Recovery	PID	Description	USCS Symbol	Borehole Gamma Readings (CPM)	
				(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)			
6.0			0.0	Weathered Sandstone: Olive yellow (2.5Y 6/8), moist, dense, no odor, mechanically weathered to SP, fine grained Sandstone	Ss fine	5908	
			0.0			70	5970
7.0			0.0			75	5915
				Refusal on sandstone at 7.0' bgs			
				No GW encountered			
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 73	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 2.5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-31-11 1445		Date/Time Total Depth Reached 3-31-11 1215	
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 20166 (1150) 1 (2) 1/2 gallon bags					
Geologist C. Knight		Checked by/Date  6/2/11					
Radiological Background #8 / 2048		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches 10.5' 2447 2447 2483 @ (CPM)
0.5			0.1	25	Surface & soil and grass		
1.0			0.1	70	Fill: Silty Sand with gravel (dark yellowish brown (10YR 3/4) moist, medium dense, no odor, 15% angular granite gravel, 35% silt, 5% coarse sand, 10% medium sand, 35% fine sand, mottled, trace rootlets	AF SM	4928
2.0			0.1	70	" Poorly graded Sand: light olive brown (2.5Y 5/4) moist, dense, no odor, 10% coarse sand, 20% medium sand, 20% fine grained sand, subangular grain size	SP	5632
			0.1	70	Silt: Brown (7.5Y 4/3) moist, medium st. fl., no odor, 10% fine sand, 90% silt, non cohesive, low plasticity		5241
2.0			0.1	65	Sandstone: Pale yellow (2.5Y 7/4) moist, hard, no odor, 10% coarse sand, 20% medium sand, 70% fine sand, subangular grains	ML Sandstone	6710
			0.1	50			6168
3.0					Refusal on sandstone at 2.5' bgs No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 3	Location ID: 74
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 1.5
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-31-11 1340	Date/Time Total Depth Reached: 3-31-11 1910
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30167 (+345) NO SAMPLE (2) 1/2 gallon bags ^{OK} due to shatter refusal		
Geologist: C. Knight	Checked by/Date: Charles Carroll / 7-28-11		

Radiological Background: 42 / 3082	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.5			80	50	Surface: Soil / Fill Silty sand: Fill: Brown (10YR 5/3), moist, med dense, no odor, 30% silt, 10% angular granite fill rock, 20% medium sand, 40% fine sand, mottled	AF SM	4557
1.0			65	65	Poorly graded sand w/ gravel: Brown (10YR 5/3) moist, dense, no odor, 20% fine grained sandstone gravel, 10% silt, 10% medium sand, 60% fine sand	SP	5666
			70	70	Sandstone: Olive Brown (2.5Y 4/3), moist, hard, no odor, fine grained sandstone		6601
2.0					Refusal at 1.5' bgs on sandstone No sample collected for lab No GW encountered		
3.0							
4.0							
5.0							
6.0							



BORING LOG

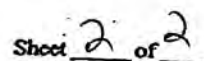
Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 3	Location ID 75			
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5			
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-31-11 1415	Date/Time Total Depth Reached 3-31-11 1450			
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30169 (1420) 1 (2) 1/2 gallon bags					
Geologist C. Knight		Checked by/Date J. [Signature] 6/2/11					
Radiological Background 53 / 3003		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			
Depth	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 Inches (CPM)
0.5		0.0	65		Surface: soil and grass		105 2897
1.0		0.0	70		Fill: Silty Clay: dark yellowish brown (10YR 4/6), moist, stiff, no odor, 35% silt, 10% fine sand, 55% clay, medium toughness, low plasticity, medium dry strength	AF / CL	3490
2.0		0.0	70				5373
		0.0	70				6025
		0.0	70				6381
2.0		0.0	65		2'2" trace red brick		6456
		0.0	60				6613
3.0		0.0	75		Sandstone: Brownish yellow (10YR 6/6), moist, hard, no odor, fine grained sandstone, trace siltstone near CL/sandstone contact	AF / CL	6886
		0.0	70				6834
4.0					Refusal on sandstone at 3.5' bgs		
					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 76	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11/1014		Date/Time Total Depth Reached 3-1-11/1022	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30170) (1022)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (background = 0.3 ppm)			
Depth	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'				0.3 13	Silty gravel Gravelly sand with silt (10 YR, 3/3), dark brown, 50% fine to medium grained sand, 30% gravel (fill gravel, asphalt), 20% silt, semi-moist, medium dense, no odor.	SW ^{ca} SM	
No groundwater encountered.							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A Group 3		Location ID 76	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 7.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-1-11 0910		Date/Time Total Depth Reached 4-1-11 1050	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30171 (0915) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 57 / 2874		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)			

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches +0.5' 3094 (CPM) 3407
0.5		0.1	62		Surface is grass and soil		
1.0		0.1	60		Silty Clay with sand & Fill; Strong brown (7.5YR 5/6) dry, medium stiff, no odor, 5% medium sand, 10% fine sand, 30% silt, 55% clay, low plasticity, low toughness, cohesive, trace rootlets	AF/CL	4404
		0.1	60				5534
		0.1	60				6786
2.0		0.1	63				6898
		0.1	75		Same as above	AF/CL	6882
3.0		0.1	78		3' Silty Sand: Fill; Brown (10YR 5/3), dry, medium dense; no odor, 30% silt, 10% coarse, 20% medium, 40% fine sand, mottled	AF/SM	6226
		0.1	67				6767
4.0		0.1	68		3' 10" Weathered siltstone; light yellowish brown (2.5Y 6/4), dry, dense, no odor, mechanically weathered to ML, 10% fine sand, 40% silt, cohesive, interbedded	ML/SS	6463
		0.1	50				6055
5.0		0.1	53		Weathered sandstone; pale yellow (2.5Y 8/4), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone, iron oxide stains	SP	5921
		0.1	60				5893
6.0		0.1	71				5962



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A./Group 3		Location ID 77	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11/1043		Date/Time Total Depth Reached 3-1-11/1051	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30172) (1050)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 6/2/11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.3 ppm)			
Depth	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'				0.314	Clayey sand, (10YR, 6/6), light orange- ish brown, 65% fine grained sand, 30% clay, 5% rock fragments (siltstone/sandstone), semi-moist, medium dense, some rootlets, no odor.	SC	
No groundwater encountered.							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 77
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-31-11 1542	Date/Time Total Depth Reached 3-31-11 1410
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30173 (1546) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date [Signature] 6/2/11		

Radiological Background 44 / 3213	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches +0.5' 3195 (CPM) 3536
0.5			00	60	Surface soil		
1.0			00	75	Silt with sand & light yellowish brown (2.5Y 6/4), moist, medium stiff, no odor, 25% fine sand, 75% silt, cohesive, low plasticity	ML	6164
1.5			00	75	Weathered siltstone: light yellowish brown (2.5Y 6/3), dry, stiff, no odor, interbedded layers of siltstone 1-2 mm thick, with trace mudstone interbedded	B	6844
2.0			00	65		SC	7355
2.5			00	50		CL	8029
3.0			00	70	Mudstone: light brownish gray (2.5Y 6/2), dry, hard, no odor, fractured	NP	8286
3.0			00		Refusal on Mudstone at 3.0' bgs		
4.0					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 78	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11 / 1103		Date/Time Total Depth Reached 3-1-11 / 1115	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30174) (1115)			
Geologist C. Carmichael				Checked by/Date CC / 6-13-11			
Radiological Background # 3		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bgnd: 0.3ppm)			

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.3	12	Clayey ^{SC} Sand with gravel and clay (10YR, 5/4), brown, 55% fine grained sand, 25% clay, 20% gravel (gravel fill, asphalt, siltstone), semi-moist, medium dense, some rootlets, no odor. No groundwater encountered	SC		

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 78
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2'8"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-31-11 1455	Date/Time Total Depth Reached 3-31-11 1548
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30175 (1500) 102 1/2 gallon bags	
Geologist C. Knight		Checked by/Date Chelsea Carmichael 16-13-11	

Radiological Background
40 / 3175

Radiological Equipment Used
Pancake / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches +0.5 3087 (CPM)
0.5			0.0	40	Surface soil and grass		4158
			0.0	40	Silty Sand: light olive brown (2.5Y 5/4), dry, med. dense, no odor, 40% silt, 60% fine sand	SM	6072
1.0			0.0	40	Weathered siltstone: light yellowish brown (2.5Y 6/3), moist, stiff, no odor, interbedded layers of siltstone 1-2 mm thick, trace rootlets, some interbedded mudstone	SC	6698
			0.0	60			6706
2.0			0.0	60			6806
			0.0	65	Mudstone: light brownish gray (2.5Y 6/2), dry, hard, no odor, fractured		6874
3.0							
4.0							
5.0							
6.0							

Refusal on Siltstone at 2'8"

No GW encountered

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 79	
Drilling Company: HGL		Driller P. Skerth		Ground Elevation NA		Total Drilled Depth 5' 2"	
Drilling Equipment hand auger		Borehole Diameter 3"		Date/Time Drilling Started 4-7-11 1040		Date/Time Total Depth Reached 4-7-11 1145	
Type of Sampling Device hand auger				Samples Collected 30176 (1045) (1) 1/2 gallon bags			
Geologist L. Knight				Checked by/Date Chetan Pillai/7-28-11			
Radiological Background 50 / 2968		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.1 ppm)			

Depth	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	
							Inches	(CPM)
					Surface - gravel and soil		40.5'	2848
								3200
0.5		0.1	70		Silty Sand: Brown (10YR 4/3), moist, loose, no odor, 30% silt, 5% sandstone gravel, 10% coarse sand, 15% medium sand, 40% fine sand, abundant root sand rootlets	AC / SM		4518
1.0		0.1	70		Silty sand with gravel: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 40% silt, 15% angular sandstone gravel, 10% medium sand, 35% fine sand, trace roots	AC / SM		5100
		0.1	65					5451
2.0		0.1	70		Silt with sand: dark yellowish brown (10YR 4/4), moist, med. stiff, no odor, 25% fine sand, 75% silt, low plasticity, non cohesive.	ML		5311
		0.1	60					5481
3.0		0.1	60		Silty Sand with gravel: Brown (10YR 4/3), moist, medium dense, no odor, 30% silt, 15% angular sandstone gravel, 5% coarse sand, 10% medium sand, 40% fine sand	SM		5604
		0.2	80					5525
4.0		0.1	52					5511
		0.1	61					5372
5.0		0.1	64					5433
Refusal on sandstone at 5' 2". No GW encountered								

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 80	
Drilling Company: HGL		Driller P. Skathi		Ground Elevation NA		Total Drilled Depth 4'3"	
Drilling Equipment hand auger		Borehole Diameter 3"		Date/Time Drilling Started 4-7-11 0930		Date/Time Total Depth Reached 4-7-11 1030	
Type of Sampling Device hand auger				Samples Collected 30177 (0940) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelres Cornill / 7-28-11			
Radiological Background 59 / 2926		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)			

Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	UNCS Symbol	Borehole Gamma Readings Inches 10.5' 2886 (CPM)
0.5			0.1	60	Silty Sand: dark yellowish brown (10YR 4/4), moist, loose, no odor, 35% silt, 5% coarse, 10% medium sand, 50% fine sand, trace rootlets near surface, trace asphalt	SM	3087
1.0			0.2	68	Clay: Brown (10YR 4/3), medium stiff, moist, no odor, 10% silt, 10% fine sand, 80% clay, low plasticity, medium to tough mass, cohesive	CL	4053
1.5			0.2	74			4826
2.0			0.2	68	Silty Sand: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 30% silt, 5% coarse sand, 10% medium sand, 55% fine sand.	SM	4990
2.5			0.2	78			5560
3.0			0.3	68	Weathered Sandstone: yellowish brown (10YR 5/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace siltstone angular gravel	CL	5350
3.5			0.2	78			5531
4.0			0.3	55			5412
4.5			0.2	55			5391
5.0					Refusal on sandstone 4'3" bgs No GW encountered		

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 81	
Drilling Company: HGL		Driller P. S. Knight		Ground Elevation NA		Total Drilled Depth 3'3"	
Drilling Equipment hand auger		Borehole Diameter 3"		Date/Time Drilling Started 4-7-11 0830		Date/Time Total Depth Reached 4-7-11 0910	
Type of Sampling Device hand auger				Samples Collected 3017B (0840) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Carmichael / 6-13-11			
Radiological Background 76 / 3308		Radiological Equipment Used Pancake / Downhole		PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5		0.1	70	65	Surface soil and gravel		4051 3297
1.0		0.1	75		Silty sand: dark yellowish brown (10YR 3/6), moist, loose, no odor, 40% silt, 5% coarse, 5% medium sand, 50% fine sand, trace rootlets near surface	SM	3700
2.0		0.2	70				4079
		0.2	75				5298
		0.2	70				5161
		0.2	70				5001
3.0		0.2	70		2'3" weathered sandstone: light yellowish brown (10YR 6/4), hard, moist, no odor, mechanically weathered to SP, fine grained sandstone	SP	4796
					3'3" End boring, refusal at 3'3" on sandstone No GW encountered		4622

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP0038.01.22.04.03	Subarea ID & Group G/A group 3	Location ID 82
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-30-11 1525	Date/Time Total Depth Reached 3-30-11 1538
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30179 (1530) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Cantel / 4-13-11		

Radiological Background 36 / 3059	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches +0.5 2614 (CPM) 3129
0.0		0.0	35		Surface: Soil on fill pad with grass		
0.5		0.0	50		Fill: Silty Sand: Olive brown (2.5Y 4/4), moist, medium dense, no odor, 5% angular fine to coarse gravel, 30% silt, 20% medium sand, 10% coarse sand, 35% fine sand	AF / SM	4789
1.0		0.0	60				5113
		0.0	55				5094
2.0		0.0	60		2' concrete debris		4964
		0.0	45				5190
3.0		0.0	65	3' 5"	Fill: 3' 5" to 3' 9" Clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% fine sand, 10% silt, 80% clay, low plasticity, med. toughness, high dry strength	AF / CL	5412
4.0		0.0	60		Fill: Silty Sand: light yellowish brown (10YR 6/4), moist, medium dense, no odor, 10% coarse sand, 10% medium sand, 30% silt, 50% fine sand, trace asphalt, trace volcanic gravel	AF / SM	5531
		0.0	60				5327
5.0		0.0	74		Refusal on fill at 5.0'		5306
					No GW encountered		

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP0038.01.22.04.03	Subarea ID & Group: 5A group 3	Location ID: 83
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-30-11 1350	Date/Time Total Depth Reached: 3-30-11 1515
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30180 (1400) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Phebe Carl / 4-13-11		
Radiological Background: 45 / 2754	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	55	Surface: soil on fill pad		3630
0.5		0.0	0.0	62	Fill: Poorly graded sand with gravel; light olive brown (2.5Y 5/6), moist, medium dense, no odor, 15% angular fine to coarse gravel (quartzite or sandstone), 5% coarse sand, 10% medium sand, 70% fine sand, moderately mottled, trace concrete	AF/ SP	4582
1.0		0.0	0.0	45			5053
			0.0	85			5220
2.0		0.0	0.0	55	2" concrete debris	AF/ SP	5381
			0.0	65	2 7/8" 3/4" angular sandstone gravel, fine grained		5460
3.0		0.0	0.0	58	2 5/8" silty sand packet light olive brown (2.5Y 5/6), moist, medium dense, no odor, 40% silt, 60% fine sand	AF/ SM	5586
			0.0	62	3 3/8" subrounded quartzite gravel 3/4" diameter		5509
4.0		0.0	0.0	60	Same as 0.5' description: Fill: Poorly graded sand with gravel	AF/ SP	5786
			0.0	83			5862
5.0		0.0	0.0	75	4 1/4" subrounded fine to coarse sandstone gravel, fine grained		5959
			0.0	54		AF/ SP	6065
6.0		0.0	0.0	58	6" Angular 1 1/4" coarse grained sandstone gravel		6082

Radiological Background 45/2754				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 83		
Depth	Interval	Recovery	PD	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	
							Inches	(CPM)
0.0			0.0	58	Same as above SP/AF	AF		6082
			0.0	65		SP		6196
2.0			0.0	65	6'8" 1 3/4" diameter coarse grained sandstone gravel 6'9" Siltstone beds, highly weathered			6140
			0.0	75	7'2" Fill: Silt, Sand: light yellowish brown (10YR 6/4), dry, medium dense, no odor, 35% silt, 65% fine sand, trace gravel	AF/SM		6070
8.0			0.0	55	7'7" Angular coarse grained 3/4" diameter sandstone gravel	AF		6288
			0.0	75	9'6" Angular fine grained 1/4" diameter sandstone gravel	SM		6195
9.0			0.0	81	Same as above AF/SM, dry, medium dense, no odor	AF/SM		6294
			0.0	55				6343
10.0			0.0	53				6327
Total depth = 10.0' bgs								
No GW encountered								

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A 3		Location ID 85	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 7 ft	
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4/4/11 0854		Date/Time Total Depth Reached 4/4/11 0900	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30182 - 0920 (1) 1/2 gallon bags Dip 30411 (1) 1/2 gallon bag			
Geologist I. Stone				Checked by/Date Chelsea Corninckley 16-13-11			
Radiological Background 58 / 2644		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches 0.5' = 2551 (CPM)
0.5		0.0	60		Sandy Silt, Dark yellowish brown (3/4 10YR) w/ clay (0-0.5'). 30% fine sand, 60% silt, 10% clay, dry, low strength, low tough, trace roots, no odor or staining	ML	2848
1.0		0.0	70		Silty Clay, Dark grayish brown (4/2 10YR) (0.5'-1.5') 60% clay, 35% silt, 5% fine sand, dry, med. tough, med strength, med plasticity, trace roots, no odor or staining	CL	4012
2.0		0.0	70		Silty Sand, Dark Brown (3/2 7.5YR) (1.5'-2.6') 60% fine sand, 40% silt, dry, low-med dense, no odor or staining	SM	4601
3.0		0.0	75		Silty Sand, Strong Brown (4/6 7.5YR) (2.6'-5.2') 70% fine sand, 30% silt, low-med dense, dry, no odor or staining	SM	5129
4.0		0.0	50				5454
5.0		0.0	45				5394
6.0		0.0	40				5569
7.0		0.0	40				5575
8.0		0.0	45				5687
9.0		0.0	70				5899
10.0		0.0	60				6301
11.0		0.0	40		Sand w/silt, Yellowish Brown (5/8 10YR) 90% fine sand, 10% silt, dry, med-high dense, no odor or staining	SP	6358
12.0		0.0	60				6120

Radiological Background 5812644					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 5A, 3, 85
Depth	Interval	Recovery	PD	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	60	Same as above	SP	6120
			0.0	65			6227
7			0.0	60			5581
					TD: 7 ft bgs no gw encountered		
8							
9							
10							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 86	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1141		Date/Time Total Depth Reached 2-28-11/1146	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, #30183 (1145)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-13-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (plcd: 0.2 ppm)			
Depth	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'			0.2	14	Sandy silt, (10 YR, 3/3), brown, 70% silt, 30% fine to medium grained sand, some rootlets, semi-moist, soft, no odor.	ML	
					No groundwater encountered.		

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A 3	Location ID 86
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4 ft
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4/4/11 1119	Date/Time Total Depth Reached 4/4/11 1127
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30184 - 1150 (1) 1/2 gallon bags		
Geologist I Stone		Checked by/Date Chelsea Conill / 4-13-11		
Radiological Background 54 / 2661		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5		0.0	60		Sandy silt, Dark yellowish brown (3/4 10YR) (0'-1')			2701
		0.0	70		60% silt, 35% fine sand, 5% clay, dry, low tough, low strength, no odor or staining	ML		4127
1.0		0.0	65		Silty Sand, Reddish Brown (4/4 5YR) (1'-2')			5154
		0.0	55		65% fine sand, 30% silt, 5% clay, dry, low-med dense; no odor or staining	SM		5275
2.0		0.0	65					5315
		0.0	75		Sand w/silt, Reddish Yellow (6/6 7.5YR) (2'-3')			5407
3.0		0.0	45		90% fine sand, 10% silt, dry, med dense	SP		5683
		0.0	70		Sandy silt w/clay, Yellowish Brown (5/6 10YR) (3'-3'5")			6058
4.0		0.0	80		35% fine sand, 55% silt, 10% clay, dry, low tough, low strength	ML		6214
		0.0	80		Siltstone (cemented), Brown (5/3 10YR) (3'5"-4')			5884
					90% fine sand, 10% silt, dry, med-high density, no odor or staining	SP		
TD= 4ft bgs								
no gw encountered								

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 87	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1154		Date/Time Total Depth Reached 2-28-11/1205	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags #36185 (1205)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-13-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)			
Depth	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'			0.314		Silt with sand, (10YR, 3/3), dark brown, 75% silt, 25% fine to medium grained sand, some rootlets, semi-moist, soft, no odor. No groundwater encountered.	ML	

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A 3		Location ID 87	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 3ft	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4/4/11 1022		Date/Time Total Depth Reached 4/4/11 1027	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30186 - 1045 (1) 1/2 gallon bags			
Geologist I. Stone				Checked by/Date Chelsea Canell/6-13-11			
Radiological Background 46 / 2437		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches 0.5' = 2679 (CPM)
0.5			0.0	45	Sandy silt, dark yellowish brown (3/4 60%) (0-8")		2923
1.0			0.0	60	60% silt, 35% fin sand, 5% clay, dry, low strength, low toughness, no odor	ML	4503
1.5			0.0	70	Silty sand, or silting, Brown (5/4 7.54R) (8"-1'8")		5096
2.0			0.0	75	65% fin sand, 35% silt, dry, med dense, no odor or silting.	SM	5058
2.5			0.0	70	Silty clay, Brown (5/3 10.4R) 65% clay (1'8"-2'1")		5113
3.0			0.0	60	Sand w/silt med tough, med plasticity (2'1"-3')	CL	5393
3.5			0.0	60	light yellowish brown (6/4 10.4R), dry, med-high dense, no odor or silting, 90% fin sand, 10% silt	SC	5759
					TD = 3 ft bgs no gas encountered		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 88	
Drilling Company HGL		Driller I. Stone		Ground Elevation NA		Total Drilled Depth 45	
Drilling Equipment hand auger		Borehole Diameter 3"		Date/Time Drilling Started 4-7-11 1506		Date/Time Total Depth Reached 4-7-11 1540	
Type of Sampling Device hand auger				Samples Collected 30187 (1510) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Paul / 6-13-11			
Radiological Background 84 / 3128		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)			

Depth	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	
							Inches	(CPM)
					surface: grass and soil		40.5'	2844
0.5			0.0	75	Silty sand: dark yellowish brown (10YR 4/4), moist, loose, no odor, 40% silt, 55% fine sand, 5% angular gravel, trace rootlets near surface	SM		3838
1.0			0.0	70	same as above: SM			4577
			0.0	77				5015
			0.0	77				5018
2.0			0.0	46	2.0 Silty sand Partly is ^{is} red sand with silt: Dark yellowish brown (10YR 5/8), very moist, 15% silt, 5% coarse sand, 10% medium sand, 70% fine sand, medium dense, no odor	CK SM		5105
			0.1	75				5149
3.0			0.0	74				5032
			0.0	53				4988
4.0			0.1	58	Same as above			5035
			0.1	63	Weathered sandstone: yellowish brown ^{5Y} (10YR 5/4), moist, hard, no odor, mechanically weathered to SP, 5% coarse, 10% medium, 85% fine sand	DM SP		5214
5.0					Refusal on Sandstone at 4.5' bgs No GW encountered			

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 89	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 10.0	
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-31-11 0950		Date/Time Total Depth Reached 3-31-11 1045	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected: 30188 (0955) 1 (2) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Coill / 4-13-11			
Radiological Background 53 / 2492		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)			

Depth	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		0.1	60		Surface: Soil		1052756
1.0		0.1	45		Fill: Silty Sand with gravel: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 30% silt, 15% angular sandstone gravel, 55% fine sand; mottled	AF / SM	3418
		0.1	60		4" hys: debris in SM (drywall/gypsum board, asphalt, charcoal), volcanic gravel, trace fibrous material, glass shards	AF / SM	4001
		0.1	60		1' 8" End debris		4002
2.0		0.1	60		Fill: Silty sand w/gravel: Brown (10YR 5/3), moist, medium dense, no odor, 20% subrounded coarse grained sandstone gravel, 30% silt, 5% coarse, 10% medium sand, 35% fine sand, abundant mottling	AF / SM	4289
		0.1	50				5282
		0.1	30				5882
3.0		0.1	40				6012
		0.1	35				5943
4.0		0.1	30				5612
		0.1	40				5526
5.0		0.1	40				5633
		0.1	50				5644
6.0		0.1	50				5379

No Recovery

Same as above: Fill: Silty Sand with gravel

Radiological Background 53 / 2992				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 89	
Depth	Interval	Recovery	PTD	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings Inches (CPM)
6.0			0.2	55	Same as above	AS / SM	5377
7.0			0.2	80	6' 10" Sandy Silt: dark yellowish brown (10YR 4/4), very moist, soft, no odor, 40% fine sand, 60% silt, non cohesive, low plasticity	ML	5158
			0.2	80			5189
8.0			0.2	85	7' 8" large sandstone cobble 4" diameter, fine grained sandstone		5114
			0.2	75	Sandy Silt: same as above, saturated	ML	5220
9.0			0.2	65			5063
			0.2	55	5' 7" Sandstone: Brownish yellow (10YR 6/8), moist, dense, no odor, 20% medium grained, 80% fine grained sandstone		5002
10.0			0.2	75			5138
					End boring at 10' on sandstone Target depth reached of 10' bgs NO GW encountered		5109

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group GA group 3	Location ID 90
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.5
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-30-11 1030	Date/Time Total Depth Reached 3-30-11 1100
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected: 30189 (1035) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date Chelsea Cammidge / 4-13-11		
Radiological Background 60 / 3267		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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	55	Surface; soil		10.5 2880
0.5		0.0	68		Fill; silty sand; dark yellowish brown (10YR 4/4) moist, medium dense, no odor, 35% silt, 5% fine gravel, 5% medium sand, 55% fine sand, trace mottled texture	AF, SM	2928
1.0		0.0	75		1" 1/2-inch fill rock gravel, angular		4527
		0.0	98				5127
		0.0	85				5635
2.0		0.0	90		2.6" Angular sandstone gravel		5447
		0.0	105				5502
		0.0	69				5513
		0.0	110				5700
4.0		0.0	75		weathered sandstone? Pale olive (5Y 6/4) moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	AF, SM	5740
		0.0	55				5708
5.0		0.0	75				6101
					Refusal on sandstone at 5.5' bgs No GW encountered		NM

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID a1
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-24-11 0955	Date/Time Total Depth Reached 3-24-11 1020
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected: 30190 (1000) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 6-13-11		

Radiological Background
42 / 2907

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
			0.0	47	Surface Soil		10.5' 2984
0.5			0.0	61	Silty Sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 10% medium sand, 55% fine sand,	SM	3134
1.0			0.0	80			4827
			0.0	75			5372
2.0			0.0	75	1' 9" weathered sandstone: olive yellow (2.5Y 6/8), moist, dense, no odor, 10% medium sand, 90% fine sand, mechanically weathered to SP		5402
			0.0	58			5277
3.0					Refusal on sandstone at 2.5' bgs Target interval of 5-10' not reached No GW encountered		5080
4.0							
5.0							
6.0							

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 92
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-25-11 1030	Date/Time Total Depth Reached 3-25-11 1040
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30191 (1030) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by Date Chelsea Carmichael / 16-13-11		
Radiological Background 58 / 2722		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	46	Surface: soil and grass		105 2890
			0.0	43	Silty Sand w/gravel (dark olive brown (2.5Y 3/3), moist, medium dense, no odor, 18% angular fine to coarse gravel or concrete, 35% silt, 10% medium sand, 40% fine sand, trace mottling trace clay	AF, SM	3925
0.5			0.0	70	8" bgs: 5" of concrete		5311
1.0			0.0	73	1" bgs: 1.25" diameter angular sandstone gravel		5603
2.0			0.0	65	2' 2" Weathered Sandstone: Olive yellow (2.5Y 6/8), moist, very dense, no odor, mechanically weathered to SP, fine grained weathered sandstone, trace iron oxide staining	SP, NO, CL	5708
			0.0	86			5746
			0.0	70			5782
3.0			0.0	65			559
			0.0	59			5339
4.0			0.0	59	Refusal on sandstone at 4' bgs		5198
5.0					No GW encountered		
					Target depth and sampling interval of 5-10' bgs not reached		

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 3		Location ID 93	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-30-11 1145		Date/Time Total Depth Reached 3-30-11 1220	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30192 (1150) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Cail / 4-13-11			
Radiological Background 61 / 3160		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	69	Surface: soil		+0.5' 2873
0.5		0.0	75		Silty Sand: light olive brown (2.5Y 5/4), moist, medium dense, no odor, 30% silt, 10% angular medium gravel (fill crushed rock), 5% coarse sand, 10% medium sand, 45% fine sand	AF / SM	5071
1.0		0.0	62				5324
		0.0	53				5471
2.0		0.0	70				5687
		0.0	55				5475
3.0		0.0	80		3' pocket of fine granite gravel 1" thick		5324
		0.0	75		3' 8" to 4' 1" debris: Angular 3/4" crushed fill gravel, charcoal, trace drywall, red brick, drywall CL		5557
4.0		0.0	85		4' 1" Poorly graded sand: pale yellow (2.5Y 7/3), dry, dense, no odor, fine grained sand, metal shard ~ 2" long, 100% fine sand CL	AF / SP	5562
		0.0	70		4' 8" Sandstone: Pale yellow (2.5Y 7/3), hard, dry, no odor, metal shard ~ 2" long, fine grained sandstone CL		5965
5.0		0.0	65		Refusal on sandstone at 5.0' bgs No GW encountered		5684

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 94
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-31-11 0815	Date/Time Total Depth Reached 3-31-11 0915
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30193 (0820) 1 (2) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date Chelsea Bell / 6-13-11		
Radiological Background 49 / 2553		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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	25	Surface: Soil fill material on pad and grass		2659
0.5		0.0	50		Fill: Silty Sand with gravel: light yellowish brown (2.5Y 6/3), moist, medium dense, no odor, 15% fine to coarse angular gravel (siltstone, sandstone, concrete), 30% silt, 5% coarse sand, 10% medium sand, 40% fine sand, mottled	AF SM	5174
1.0		0.0	75				5323
		0.0	55				5403
2.0		0.0	60		Fill: Clayey Sands with gravel: Brown (10YR 5/3), moist, medium dense, no odor, 35% clay, 15% angular fine to coarse gravel (sandstone, crushed fill rock), 5% medium sand, 45% fine sand, mottled	AF SC	5386
		0.0	65				5421
3.0		0.0	55		3" 4" fine grained 1 3/4" diameter sandstone gravel,		5623
		0.0	65				5703
4.0		0.0	70		4" 6" red concrete and charcoal		5854
		NR	70		No Recovery		5833
5.0		0.0	55		Fill: poorly graded sand with gravel: light yellowish brown (10YR 6/4) slightly moist, medium dense, no odor, 10% silt, 15% subangular fine to coarse gravel (volcanic gravel, sandstone, siltstone, trace asphalt, 75% fine sand	AF SP	5612
		0.0	55		5' 8" 1.5" of charcoal		5585
6.0		0.0	60				6136

Radiological Background 49 / 2553				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 94	
Depth	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	60		6" to 6" abundant volcanic gravel		6136
		0.0	55		Same as above Af/SP	Af/SP	5821
7.0		0.0	80		7" charcoal pocket ~1" diameter		5738
		0.0	60		7" 5" 1/4" thick dry wall (gypsum board)		5904
8.0		0.0	75				5816
		0.0	76		Same as above Af/SP	Af/SP	6085
9.0		0.0	70				5959
		0.0	60				6240
10.0		0.0	80				6001
Total depth 10.0' bgs No GW encountered Target depth reached							

Project Name: SSFL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID / group 5A / 5		Location ID 45	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-21-11 1500		Date/Time Total Depth Reached 2-21-11 1510	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gal bags 30364 (1505)			
Geologist C. Knight				Checked by/Date Chickie Paul 16-13-11			
Radiological Background 12 pkr		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 background (0.5 ppm)			
Depth	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0512	Silty Sand w/ gravel: Brown (10YR 3/4), moist, loose, no odor, 15% gravel, 30% silt, 55% fine and medium sand, rootlets, asphalt pieces etc		SM	
				No GW encountered			



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 96	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/12:50		Date/Time Total Depth Reached 2-18-11/1300	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30365) (1256)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-13-11			
Radiological Background 12 CFR, 0.3 ppm		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000			
Depth	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 Inches (CPM)
0.5'			0.3	12	silty sand, dark brown (10YR 3/3), moist, soft, 45% silt, 55% med sand, few roots etc no odor	sm	
			0.3	12	TO 0.5' NO GW		

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: 5	Location ID: 97	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: (30366) - no sample two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		NA 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					NO SAMPLED NO COLLECTED - Boring not advanced - Located in archeological zone, no ground disturbance		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 98	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/1104		Date/Time Total Depth Reached 2-18-11/1112	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30367)(1112)			
Geologist C. Carmichael				Checked by/Date Chelsie Carmichael/2-13-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Excd: 0.4 ppm)			
Depth	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'			0.4	12	Sandy silt, (10 YR, 3/4), dark brown, 65% silt, 30% fine to medium grained sand, 5% rock fragments (sandstone), semi-moist, soft, no odor, common rootlets.	ML	
					No groundwater encountered.		

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 99	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/1027		Date/Time Total Depth Reached 2-18-11/1046	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30368) (1040 cc)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-13-11			
Radiological Background 12		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Bkgd: 0.3 ppm)		
Depth	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'			0.3	13	Sandy silt, (10 YR, 3/4), dark brown, 70% silt, 30% fine to medium grained subrounded sand, high organic and charcoal content, common rootlets, soft, semi-moist, no odor.	ML	
					No groundwater encountered.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 100	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/0847		Date/Time Total Depth Reached 2-18-11/0855	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30369) (0855)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-13-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bgd: 0.4 ppm)			
Depth	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'				0.4 15	Silt with sand, (10 YR, 3/4), dark brown, 75% silt, 20% fine to medium grained sand, 5% rock fragments (sandstone, concrete), moist, soft, no odor, common rootlets. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 101	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/0945		Date/Time Total Depth Reached 2-18-11/0955	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30370)(0955)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/16-13-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.4 ppm)			
Depth	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 Inches (CPM)
0.5'				0.413	Silt with sand, (10 YR, 3/4), dark brown, 80% silt, 20% fine grained sand, common rootlets, semi-moist, soft, no odor.	ML	
					No groundwater encountered.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 102	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/0917		Date/Time Total Depth Reached 2-18-11/0925	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30371) (0925)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-13-11			
Radiological Background 15		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Bkgd: 0.4 ppm)		
Depth	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 Inches (CPM)
0.5'				0.415	Silt with sand, (10 VR, 3/4), dark brown, 85% silt, 15% fine grained sand, common rootlets, semi-moist, soft, no odor.	ML	
No groundwater encountered.							

Project Name: SSFL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 103	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11/1330		Date/Time Total Depth Reached 3-1-11/1340	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30194) (1340.)			
Geologist C. Carmichael				Checked by/Date Chelsey Carmichael / 6-13-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.3ppm)			
Depth	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 Inches (CPM)
0.5'				0.3 12	Silty sand, (10YR, 3/4), dark brown, 65% fine to coarse grained subrounded sand, 35% silt, some rootlets, moist-wet, loose, no odor. No groundwater encountered.	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 104	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trawl / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11 / 1348		Date/Time Total Depth Reached 3-1-11 / 1356	
Type of Sampling Device trawl / shovel				Samples Collected 2 1/2 gall bags (#30195), (1355)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael 16-13-11			
Radiological Background 12		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Bkgd: 0.3 ppm)			
Depth	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'			0.3	13	Silty sand, (10YR, 3/3), brown, 65%. fine to coarse grained sand, 35%. silt, some rootlets, moist, loose, no odor.	SM	
No groundwater encountered.							

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 105	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1421		Date/Time Total Depth Reached 2-28-11/1430	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, #30196 (1430)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 16-13-11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)			
Depth	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'				02 15	Silt with sand, (10 YR, 3/3), dark brown, 80% silt, 20% fine to medium grained sand, some rootlets, semi-moist, soft, trace asphalt and gravel, no odor. No groundwater encountered.	ML	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 106	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1402		Date/Time Total Depth Reached 2-28-11/1410	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, #30197 (1410)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-13-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.012	Silt with sand, (10YR, 3/3), dark brown, 75% silt, 25% fine to medium grained sand, some rootlets, trace weathered sandstone fragments, semi-moist, soft, no odor.		MIL	
				No groundwater encountered.			



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BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 107	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1438		Date/Time Total Depth Reached 2-28-11/1445	
Type of Sampling Device trowel/shovel				Samples Collected 14-oz jar 2 1/2 gall bags, 30079 (1445)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 16-14-11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.3 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.3	14	Silt with sand, (10 YR, 2/2), dark brown, 70% silt, 20% fine to medium grained sands, 10% gravel (sandstone, gravel fill, asphalt), soft, semi-meist, no odor, no plasticity or hardness. No groundwater encountered.		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 108	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1454		Date/Time Total Depth Reached 2-28-11/1505	
Type of Sampling Device trowel/shovel				Samples Collected 1 4-oz jar 2 1/2 gall bags, (#30080) (1505)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael 16-14-11			
Radiological Background 5		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.3ppm)			
Depth	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'				03/15	Sandy silt, (10 YR, 4/3), brown, 60% silt, 40% Fine to medium grained sand, some rootlets, moist, soft, trace rock fragments (asphalt, sandstone), no odor, no plasticity or hardness. No groundwater encountered.	ML	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 109	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1509		Date/Time Total Depth Reached 2-28-11/1515	
Type of Sampling Device trowel/shovel				Samples Collected 1 4-oz jar 2 1/2 gall bags, 20081 (1515)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael 16-14-11			
Radiological Background 16		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.3 ppm)			
Depth	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'			0.315		Silty sand, (10YR, 3/3), dark brown, 60% fine to coarse grained sand, 40% silt, trace gravel fill, piece of iron metal found, moist, medium dense, no odor, no plasticity or hardness. No groundwater encountered.	SM	

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 110	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1304		Date/Time Total Depth Reached 2-24-11/1320	
Type of Sampling Device trowel/shovel				Samples Collected MS (#30390), Lab DUP (#30388), FDC (#30389) 2 1/2 gall bags, 1 4-oz jar (#30082) (1320)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Ra2 2000 (Bkgd: 0.1 ppm)			
Depth	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'			0.2	12	Silt with sand, (10 YR, 3/3), dark brown, 80% silt, 20% fine to medium grained subrounded sand, common rootlets, soft, semi-moist, no odor, very low hardness, no plasticity. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID III	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1024		Date/Time Total Depth Reached 2-28-11/1035	
Type of Sampling Device trowel/shovel				Samples Collected 14-oz jar 2 1/2 gall bags, #30083 (1035)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-14-11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.116	Sandy silt, (10 YR, 3/2), dark brown, 55% silt, 45% fine to medium grained subrounded sand, some rootlets, moist-wet, soft, no odor, no plasticity or hardness. No groundwater encountered.	ML	

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 1	Location ID 112
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-11-11 0830	Date/Time Total Depth Reached 3-11-11 1200
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30041 (0940) 10-15' (2) 1/2 gallon bags + 1 4oz jar		
Geologist C. Knight	Checked by/Date Chelma C. Knight / 6-13-11		

Radiological Background 50 / 2824	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.10 ppm)
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Depth	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 Inches (CPM)
			0.1	80	Surface: Soil + gravel		3574
0.5		0.1	68		Fill: Silty Sand: yellowish brown (10YR 5/6), moist, med. dense, no odor, 5% fine to coarse gravel, 30% silt, 5% coarse sand, 20% medium sand, 40% fine sand	AF SM	4721
1.0		0.1	60				4924
		0.1	59		1.5' Sandstone cobble drilled through 4" thick, fine grained		5193
2.0		0.1	60		Fill: Poorly sorted sand w/ silt: Brown (10YR 5/3), moist, medium dense, no odor, 5% coarse sand, 15% silt, 10% medium sand, 70% fine sand, trace fine gravel	AF SP SM	5046
		0.1	85				5036
3.0		0.1	71				5141
		0.1	84				5192
4.0		0.1	78			AF SP	5276
		0.1	59				5741
5.0		0.1	75		No recovery		5243
		0.1	63		Fill: Poorly graded sand w/ silt: light yellowish brown (2.5Y 6/4), moist, med. dense, no odor, 15% silt, 5% coarse, 10% medium sand, 5% angular sandstone gravel, trace mottled texture, 65% fine sand	AF SP	5205
6.0		0.1	55				5278

Radiological Background 50/2824				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 112	
Depth	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	55	Same as above, trace mottled texture	Af	5278
			0.1	60		SP	5111
7.0			0.1	67			5199
			0.1	76			5099
8.0			0.1	82			5178
			0.1	67			5350
9.0			0.1	86			5103
			0.1	70	3" pocket of asphalt 9.5' to 9.7' hgs	Af	5101
10.0			0.1	79	Silty Sand: Brown (10YR 4/3), moist, medium dense, no odor, 30% silt, 10% coarse sand, 15% medium sand, 45% fine sand, trace asphalt	SP	5127
	AR		0.1	81	No recovery	Af	4980
11.0			0.1	67	Silty Sand: Fill: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 30% silt, 5% coarse sand, 10% medium sand, 5% fine angular gravel, 50% fine sand, trace mottled texture	SM	5149
			0.1	72			5151
12.0			0.1	62			5249
			0.1	65			5209
13.0			0.2	55			5155

Radiological Background 5072824					Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 112
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
13.0			0.2	55	Same as above	AF	5155
			0.2	63		SM	5226
14.0			0.2	75			5137
			0.2	57	Sandy silt; Fill 1 Yellowish brown (10YR 5/8), very moist, medium stiff, no odor 40% fine sand, 5% medium sand, 5% fine angular gravel, 50% silt, noncohesive, no plasticity, rapid dilatancy	AF/ML	5113
15.0			0.2	64			4674
Total depth 15.0' bgs No GW encountered Target depth reached							
16.0							
17.0							
18.0							
19.0							
20.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 113
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-11-11 1350	Date/Time Total Depth Reached 3-11-11 1519
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30042 (1355) (2) 1/2 gallon bags + 1 liter jar		
Geologist C. Knight	Checked by/Date Chelsea Cail / 6-13-11		

Radiological Background 48 / 2711	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.10 ppm)
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Depth	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)
							Inches +45 2850
			0.0	67	Surface: grass + soil		3224
0.5			0.0	80	Fill: Sandy silt: Yellowish brown (10YR 5/6), moist, med. dense, no odor, 35% fine sand, 5% med. sand, 5% angular 3/4" crushed gravel, 55% silt.	AF / ML	4467
1.0			0.0	77			4612
			0.0	83			4677
2.0			0.0	65	Fill: Clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% silt, 10% fine to coarse subangular gravel, 10% fine to coarse sand pockets, 70% lean clay, mottled	AF / CL	4725
			0.0	60			4755
3.0			0.0	54			4870
			0.0	72			4968
4.0			0.0	65			4982
			0.0	73			4781
5.0			0.0	85	Same as above		4866
			0.0	83	Fill: Silty Sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 30% silt, 10% medium sand, 60% fine sand, trace fine subrounded gravel.	AF / SM	4985
6.0			0.0	70			5056

Radiological Background 48/2711				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 113		
Depth	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	
							Inches	(CPM)
6.2			0.0	70		AR		5055
			0.0	55		SM		4985
7.0			0.0	82	Same as above w/ silt	AR		5204
			0.0	49	Fill: Poorly graded sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 10% silt, 10% fine to coarse subround (fill rock) gravel, 10% medium sand, 70% fine sand, mottled, trace siltstone 3mm gravel, trace angular sandstone gravel w/ 1/2"	SP		5338
8.0			0.0	71				5270
			0.0	70				5210
9.0			0.0	48				5249
			0.0	66				5395
10.0			0.0	75				5334
			0.0	65	No Recovery			5218
11.0			0.0	73		AR		5155
			0.0	63	Fill: Poorly graded sand w/ gravel: Yellowish brown (10YR 5/6), very moist, med. dense to dense, no odor, 10% medium sand 15% fine gravel, 75% fine sand, trace silt; trace sandstone gravel	SP		5138
12.0			0.0	53				5021
			0.0	52				5189
13.0			0.0	69				5245

Radiological Background 418 / 2711				Project Name SSPL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Location 113	
Depth Interval	Recovery	PTD	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			
						Inches	(CPM)		
5.0		0.0	64	Same as above	AF		5245		
		0.0	66		SP		5039		
14.0		0.0	74				4676		
		0.0	65				4457		
15.0		0.0	66	Well graded Sand; Grayish brown (10YR 5/2), very moist, med. dense to dense, no odor, 15% fine sand, 40% medium sand, 45% coarse sand, sub rounded grains	SW SP CL		4432		
16.0				Total Depth 15.0' bgs No GW encountered Target depth reached					
17.0									
18.0									
19.0									
20.0									



5A_114



BORING LOG

Sheet 1 of 2

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 1		Location ID 114	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 11	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-10-11 1415		Date/Time Total Depth Reached 3-10-11 1640	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30643 (1440) (2) 1/2 gallon bags + 1-4oz jar		Lab DUP: 30403 → 1440 Field DUP: 30404 → NT MS: 30405 → 1440	
Geologist C. Knight				Checked by/Date Chelsea Cail 16-13-11			
Radiological Background 40 / 2459		Radiological Equipment Used Pancake / Downhole		PID Used Mini-RAE 2000 (Bkgd: 0.1 ppm)			

Depth	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 Inches (CPM)
			0.1	40	surface: grass + soil fill		10.5' 2706 4394
0.5			0.1	45	Sandy Silt Fill: Yellowish brown (10YR 5/4), moist, soft-med. stiff, no odor, 25% fine sand, 10% med. fine sand, 10% clay, 55% silt, low plasticity, mottled w/ clay pockets, trace rootlets	AF	4027
1.0			0.1	53		ML	4751
			0.1	50			4870
			0.1	58			
2.0			0.1	48	Fill: Clay: Yellowish Brown (10YR 5/8), moist, stiff, no odor, 10% silt, 5% fine sand, 85% clay, cohesive, medium plasticity, high dry strength	AF	4803
			0.1	66		CL	4451
			0.1	60			4375
			0.1	75			4538
3.0			0.1	60			4399
4.0			0.1	35			4428
			0.1	67			4334
5.0			0.1	60			4813
			0.1	40			4671
6.0			0.1	69	- trace angular gravel @ 6.0' bgs		

Radiological Background 40/2459				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 114	
Depth	Interval	Recovery	RPD	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	62		4671	
7.0			0.1	80	AF	4480	
				6.5' Fill: Clay w/ silt: Yellowish brown (10YR 5/6), very moist, stiff, no odor, 15% silt, 85% clay, cohesive, med. plasticity, CaCO ₃ stringers, trace coarse sand	CL	4056	
			0.1	65		3999	
8.0			0.1	60		4082	
			0.1	82		4061	
9.0			0.1	62	Same as above increase in moisture		4087
			0.1	65		NM	
10.0			0.1	52	1st Perched GW	NM	
						Perched GW	
						1st	
						NM	
11.0					No Recovery concrete refusal	NM	



Sheet 1 of 3

Depth	Interval	Recovery	PID	Radio	Description	USCS Symbol	Borehole Gamma Readings
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		Inches (CPM)
			0.0	50	Surface: grass & fill material	AF	10.5' 2808
			0.0	60	Silty Sand: Yellowish brown (10YR 5/4) moist, med. dense, no odor, 5% gravel fine, 30% silt, 5% clay, 40% fine sand, 20% med. sand	SM	3822
			0.0	50	Fill: Clay: Dark yellowish brown (10YR 4/4) moist, stiff, no odor, 10% silt, 5% fine sand, 85% lean clay, trace mottling, trace rootlets, trace asphalt	AF/CL	4450
			0.0	45			4453
			0.0	45			4397
			0.0	45			4439
			0.0	50			4494
			0.0	60			4772
			0.0	50			5050
			0.0	70	Silty Sand: Yellowish brown (10YR 5/6) medium dense, moist, no odor, 5% coarse sand, 5% angular gravel or asphalt chunks, 30% silt, 20% medium sand, 40% fine sand	AF/SM	5143
			0.0	95			5066
			0.0	95			4996
			0.0	65	No Recovery		5090
			0.0	95	Same as 3r5' above	AF/SM	5113

Radiological Background 31/2435				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 115		
Depth	Interval	Recovery	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		USCS Symbol	Inches	Borehole Gamma Readings (CPM)
6.0		0.0	45	Fill Silt, Sand w/ gravel: yellowish brown (10YR 5/6) moist, med. dense, no odor 20% angular to subangular gravel, 30% silt, 5% coarse sand, 20% medium sand, 25% fine sand		AF/SM		5115
		0.0	70			SM		5062
7.0		0.0	75					5144
		0.0	50			AF		5063
		0.0	85	7.5 - 7.9' bgs Large 3/4" to fine asphalt pieces, dry		AF		5146
8.0		0.0	65	Fill/SM Same as 6' above w/ sandstone gravel.		AF/SM		5198
		0.0	45					5147
9.0		0.0	65					5127
		0.0	40					5367
10.0		0.0	80	No recovery				5218
		0.0	84					4822
11.0		0.0	85	Fill Poorly graded sand with gravel: yellowish brown (10YR 5/4), moist, medium dense, no odor, 10% silt, 15% fine to coarse gravel, 40% fine sand, 35% medium sand		AF/SP		4405
		0.0	50					4394
12.0		0.0	45					4395
		0.0	60					4242
13.0								

Radiological Background 31/2935				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 115	
Depth Feet	Interval	Recovery	RPD	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
							Inches (CPM)
13.5			0.0	60			4242
14.0			0.0	40	13.5' Fill: Asphalt, Poorly graded asphalt gravel: Black (10413 2/1), dry, medium dense, asphalt color, coarse and medium asphalt gravel pieces, 5% fine sand, 95% asphalt	AR	4303
			0.0	45		GP	4315
			0.0	50			4296
15.0			0.0	45	Target depth of 15' bgs reached Total Depth 15' bgs No GW encountered		NM



BORING LOG

Sheet 1 of 3

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 116
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-11-11 1050	Date/Time Total Depth Reached 3-10-11 1210
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30045 (1100') (2) 1/2 gallon bags + 1-402 Jar		
Geologist C. L. Wright	Checked by/Date Chelsea Carmichael / 6-14-11		

Radiological Background 63 / 2597	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)
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Depth	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 Inches (CPM)
			0.1	40	Surface grass		405' 2803
0.5			0.1	100	Fill: Silty sand; Yellowish brown (10YR 5/8), moist, loose, no odor, 10% coarse, 30% silt, 20% medium, 40% fine sand, trace angular gravel	AF SM	4221
1.0			0.1	80	7"-1.0" Clay: Fill: Brown (10YR 4/3), moist, stiff, no odor, 5% silt, 5% fine sand, 90% clay, cohesive, low plasticity.	AF CL	4632
2.0			0.1	45	Fill: Sandy silt; Pale brown (10YR 6/3), moist, med. dense, 25% fine and medium sand, 5% clay, 5% angular fill gravel, 65% silt, non cohesive, no plasticity, trace mottled texture	AF ML	4808
2.0			0.1	35			4819
3.0			0.1	75	2" Fill: Clay: Yellowish brown (10YR 5/6), moist, med. stiff, no odor, 5% fine sand, 5% silt, 90% clay, low plasticity, cohesive, trace rootlets	AF CL	4755
3.0			0.1	50			4803
4.0			0.1	45			4964
4.0			0.1	65			4993
5.0			0.1	60	trace roots		4853
5.0			0.1	80	No recovery		5123
6.0			0.1	25	Fill: Clay Same as above	AF CL	5076
6.0			0.1	60			5272

Radiological Background 63,2597				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 116		
Depth	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	Inches	Borehole Gamma Readings (CPM)
6.0			0.1	60	Same as above	AF/CL		5272
			0.1	25				4957
7.0			0.1	25	6' 9" Fill: Silty Sand: light yellowish brown (10YR 6/4), moist, med. dense, no odor, 30% silt, 5% fine gravel, 10% coarse sand, 30% medium sand, 25% fine sand	AR/SM		5173
			0.1	80				5278
8.0			0.1	100				5025
			0.1	60				5155
9.0			0.1	75				5188
		NR	0.1	85	No Recovery			5364
10.0			0.1	90	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 30% silt, 10% medium sand, 60% fine sand, trace gravel	AR/SM		5271
			0.1	90				5270
11.0			0.1	90				5272
			0.1	80				5099
12.0			0.1	95	Fill: Sandy Silt: Yellowish brown (10YR 5/8), moist, med. stiff, no odor, 35% fine sand, 5% medium sand, 60% silt, trace fine gravel	AF/ML		5195
			0.1	95				5120
13.0			0.1	70				5014

Radiological Background <u>63/2597</u>				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>116</u>	
Depth 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0	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
							Inches (CPM)
			0.1	70	Concrete 13-13.2"	AR	5011
			0.1	70	Silt w/ sand: Fill: Dark yellowish brown (10YR 4/4), moist, silt, no odor, 20% fine sand, 5% angular gravel, 75% silt.	ML	NM
			0.1	45	Concrete		NM
					No recovery		NM
							NM
					Last 4 down hole Gamma not taken due to refusal on concrete at 13' bgs		
					TD: 15'		
					No CIW encountered		



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 117
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-14-11 0820	Date/Time Total Depth Reached 3-14-11 0900
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30046 (0830) (2) 1/2 gallon bags + 14oz Jar		
Geologist C. Knight	Checked by/Date Chelsea Cull / 6-14-11		

Radiological Background
37 / 2733Radiological Equipment Used
Pancake / DownholePID Used
Mini RAE 2000 (Bkgd: 0.10 ppm)

Depth	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 Inches (CPM)
			0.0	60	3.5" Asphalt surface		405 2473
			0.0	50	Silty Sand & silt fill: Olive brown (2.5Y 4/3) moist, med. dense, no odor, 20% silt, 20% medium sand, 60% fine sand, mottled, trace gravel fine.	AF	3026
			0.0	50		SP	4036
			0.0	50		SM	4831
			0.0	60			5261
			0.0	50			5308
			0.0	40			5302
			0.0	65			5454
			0.0	65			5565
			0.0	65	@ 4' trace siltstone gravel		5430
			0.0	50			5328
			0.0	70	4' 10" Weathered Sandstone bedrock: Olive yellow (2.5Y 6/6) moist, hard, no odor, fine grained sandstone		5608
			0.0	45			5441
			0.0	50			5307

TD: 6.0' bgs, target depth not reached
 Refusal @ 6' bgs on sandstone
 No GW encountered

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 1	Location ID 118
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-14-11 0940	Date/Time Total Depth Reached 3-14-11 1025
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30047 (0945) (2) 1/2 gallon bags + 1.4oz Jar		
Geologist C. Knight	Checked by/Date Phillips Bill / 4-14-11		

Radiological Background 49 / 2073	Radiological Equipment Used Pencake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	60	Surface 3" Asphalt		5087
0.5		0.0	55		Fill: Poorly graded Sand w/ gravel: Olive yellow (2.5Y 6/6), moist, dense, no odor, 15% angular pea gravel, 10% medium sand, 75% fine sand	AF/SP	3854
1.0		0.0	46				4920
		0.0	40		with silt		5074
2.0		0.0	60		Poorly graded Sand: light olive brown (2.5Y 5/6), moist, dense, no odor, 10% silt, 10% angular fine grained sandstone gravel, 80% fine sand	SP	5351
		0.0	46				5301
3.0		0.0	30		Weathered Sandstone bedrock: light yellowish brown (2.5Y 6/4), moist, dense, no odor, fine grained sandstone		5331
		0.0	50			Ref. Pak	5272
4.0					refusal @ 3.5' logs on sandstone Total Depth 3.5' No GW encountered		
5.0							
6.0							

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 119	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11 / 1033		Date/Time Total Depth Reached 2-24-11 / 1040	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1 4oz jar (#30048)(1040)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.2 ppm)			
Depth	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'			0.2	14	Sandy silt with rock fragments, (10 YR, 4/4), 55% silt, 30% fine to medium grained sand, 15% asphalt fragments, soft, semi-moist, some rootlets, no odor, no plasticity or hardness. No groundwater encountered.	ML	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group SA group 1	Location ID 119
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5'
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-18-11 1040	Date/Time Total Depth Reached 4-18-11 1130
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30049 (1050) 1 (2) 1/2 gallon bags		
Geologist C Knight		Checked by/Date Chelsea Carnichael 4-14-11		
Radiological Background SI / 3243		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches +0.5' 2922 (CPM)
		0.0	63		Surface: asphalt v-ditch		
		0.0	61		2" Asphalt Surface		3094
0.5		0.0			Partly graded sand: dark yellowish brown (10YR 4/4), moist, dense, no odor, 10% silt, 1% gravel, 90% fine sand	SP	3653
1.0		0.0	68		Weathered Sandstone: light yellowish brown (10YR 6/4), moist, dense, no odor, fine grained sandstone, trace iron oxide staining	SP	4588
		0.0	67		Weathered Siltstone: light gray (10YR 7/2), moist, hard, no odor, 10% fine sand, 90% silt, Abundant iron oxide staining.	SP	4909
2.0		0.0	65				5161
		0.0	63				5534
3.0					Refusal on siltstone/sandstone at 2.5' bgs		
4.0					No GW encountered.		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 120	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1051		Date/Time Total Depth Reached 2-24-11/1105	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags, 1-4oz jar (#30050) (1105)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)			
Depth	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'				0.1 13	2"-3" of asphalt on top Sand with silt and rock fragments, (10 YR, 4/4), brown, 60% fine to medium grained sand, 25% silt, 15% asphalt fragments, semi-moist, medium dense, some rootlets, no odor, no plasticity or hardness. No groundwater encountered.	Sm	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 120
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-18-11 1010	Date/Time Total Depth Reached 4-18-11 1030
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 300.51 (2) 1/2 gallon bags - 11 No sample collected, 1.5' refusal		
Geologist C. Knight		Checked by/Date Chelsea Carnichael / 6-14-11		
Radiological Background 53 / 2627		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)

Depth	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 Inches (CPM)
0.0		0.0	63		Surface: Asphalt v-d. 76		4052616
0.5		0.0	60		2" Asphalt? Poorly graded sand w/ gravel light olive brown (2.5Y 5/6), moist, dense, no odor, 15% angular fine gravel, 20% medium sand, 65% fine sand	SP	2687
1.0		0.0	71		Weathered Sandstone: Pale yellow (2.5Y 7/4), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone, trace iron oxide staining	Refuse	3451
1.5		0.0	71				4167
2.0							4436
2.5					Refusal on sandstone at 1.5' bgs		
3.0					No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 121	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1006		Date/Time Total Depth Reached 2-24-11/1015	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30052) (1015)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.3 ppm)			
Depth	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'				0.214	Silty sand with sand with silt and rock fragments, (10YR, 4/4), brown, 70% fine to medium grained sand, 15% silt, 15% rock fragments (sandstone, gravel fill), medium dense, dry, some rootlets, no odor, no plasticity or hardness. No groundwater encountered.	SW-2A SM	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 1	Location ID 121
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-14-11 1110	Date/Time Total Depth Reached 3-14-11 1135
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30053 (1120) (2) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date Chelsea Carmichael 16-14-11		
Radiological Background 45/3295		Radiological Equipment Used Pancake / Downhole		PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
0.0			60	80	Surface: grass and soil		10.5 3179
0.5			60		Poorly graded sand w/ gravel: Olive brown (2.5Y 4/4), moist, medium dense, no odor, 5% silt, 20% angular sandstone gravel, 75% fine subrounded sand	SP	3759
1.0			65				5095
			70				5825
			70				6721
2.0			80		Sandstone: light gray (2.5Y 7/1), moist, dense, no odor, fine grained sandstone.	SP	7330
			60				7401
3.0			55		Refusal at 3.0' bgs on sandstone No Cw encountered		7291
4.0							
5.0							
6.0							

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 122	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/0948		Date/Time Total Depth Reached 2-24-11/1000	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30054), (1000)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.3 ppm)			
Depth	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'			0.2	15	Sand with rock fragments, (10 YR, 4/4), brown, 85%. Fine to medium grained sand, 15% rock fragments (sandstone, fill gravel, asphalt), dry, medium dense, some rootlets, no odor, no plasticity or hardness. No groundwater encountered.	SW	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A.group1	Location ID 122
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 8"
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 5-16-11/0914	Date/Time Total Depth Reached 5-16-11/0919
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#30055) (NO SAMPLE)		
Geologist C. Carmichael	Checked by/Date		

Radiological Background 67,3794 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000 (0.1 ppm)
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Depth	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	Inches	Borehole Gamma Readings (CPM)
			0.0	78				05-3754
			0.0	85				0-4121
1'					Sand with rock fragments, (10 VR, 6/4), light brown, some vegetation in top 2", 80% fine to coarse grained sand, 20% sandstone rock fragments, dry, dense, no odor, no plasticity or hardness. (Weathered bedrock).	SW		5075
2'					<u>No sample collected -</u> shallow refusal			
3'								
4'								
5'								
6'								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: 1	Location ID: 123	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: (30056) - NO sample two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: NA 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)
0.5					NO SAMPLED - Boring not advanced - Steel plate, no access		
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: 5A	Group: <u>1</u>	Location ID: <u>124</u>	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: <u>NA</u> ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: <u>(30057) - no sample</u> two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: <u>NA</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: <u>NA</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)
0.5					NO SAMPLES COLLECTED - Boring not advanced - steel plate, no access		
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: 5A	Group: 1	Location ID: 125	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: (30058) - no SAMPLE two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: NA 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)
0.5					NO SAMPLE COLLECTED - Boring not advanced - Location on steel plate, no access			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5a, Group 2	Location ID 126
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 02/25/11, 0850	Date/Time Total Depth Reached 02/25/11, 0859
Type of Sampling Device trowel/shovel	Samples Collected 30084, 30555 (2 1/2 gal bags) (400 g)		
Geologist P. Skreath		Checked by/Date Chelsea Carmichael 16-23-11 (PS)	

Radiological Background 0.0 ppm 13 mR	Radiological Equipment Used up R meter	PID Used Mini Rae 2000
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Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.1	13	Silt w/ sand, very dark greyish brown (10YR 3/2) moist, soft, 85 % silt, 15 % c. sand, common rootlets, no odor	ML		
					No GW to 0.5'			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA Group 2		Location ID 126	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 6.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-14-11 1150		Date/Time Total Depth Reached 4-14-11 1230	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30085 (1200) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Charles Campbell / 6-14-11			
Radiological Background 49 / 2468		Radiological Equipment Used Pancake / Dosimeter		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
			0.0	45	AF: Artificial Fill		3250
0.5		0.0	44		Fill: Silt w/ Sand: Brown (10YR 5/3), dry, soft, no odor, 20% fine sand, 10% angular concrete fine gravel, 70% silt, non cohesive,	AF / ML	3316
1.0		0.0	48		1'6" concn gravel concentration		4417
		0.0	43		Silt / Sand: Yellowish brown (10YR 5/6), moist, med-	SM	4423
2.0		0.0	48		dense, no odor, 35% silt, 5% coarse sand, 10% medium sand, 50% fine sand, trace rootlets		4906
		0.0	47				5456
3.0		0.0	48				5639
		0.0	52				5672
4.0		0.0	50		Partly graded sand with silt: strong brown (7.5YR 5/6), moist, medium dense, no odor, 10% silt, 75% fine sand, 5% coarse sand, 10% medium sand, abundant iron oxide staining	SP	5726
		0.0	55				6023
5.0		0.0	69		Weathered Sandstone: Brownish yellow (10YR 6/8), moist, dense, no odor, fine grained sandstone, trace iron oxide staining	SP	5853
		0.0	50				5931
6.0		0.0	60				6004
							5797

Refusal on Sandstone at 6.0' bgs.
No GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5a, Group 2	Location ID 127
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 02/25/11, 0905	Date/Time Total Depth Reached 02/25/11, 0915
Type of Sampling Device trowel/shovel	Samples Collected 30141, 0910 (2 1/2 gal bags)		
Geologist P. Skerath	Checked by/Date Chelsea Carmichael / 10-23-11		

Radiological Background

Radiological Equipment Used

PID Used

0.2 ppm, 14 ppb

up R meter

Mini Rae 2000

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.2 14	Silt w/ sand, very dark greyish brown (10YR 2.5/1) moist, soft, 85 % silt, 15 % fine sand some roots, no odor			
					NO GW TO 0.5'			

BORING LOG

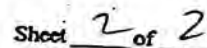
Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 127
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-19-11 1050	Date/Time Total Depth Reached 4-19-11 1130
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1100) 30086 (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea C. Knight / 4-14-11		
Radiological Background 53 / 3106	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: Soil and grass		10.5' 3101
0.5		0.0	45		Silt: Brown (10YR 5/3), moist, ^{CK} soft ^{CL} medium stiff, no odor, low plasticity, non cohesive, 60% silt, 40% fine sand.	ML	3777
		0.0	70				5009
1.0		0.0	75				5484
		0.0	71				5666
2.0		0.0	64		Sandy Silt: dark yellowish brown (10YR 3/4), moist, soft, no odor, 35% fine sand, 65% silt	ML	5635
		0.0	63				5708
		0.0	70				4901
3.0					2' 5" weathered sand: Pale yellow (2.5Y 7/4), moist, dense, no odor, fine grained sandstone		
					Refusal on sandstone at 3.0' bgs		
					No GW encountered		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 128
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-16-11 1150	Date/Time Total Depth Reached 3-16-11
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected: 30142 (1155) (2) 1/2 gallon bags + 1-4oz jar		
Geologist C. Knight		Checked by/Date Chelsea Crill 10-14-11		
Radiological Background 48 / 30142		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USGS Symbol	Borehole Gamma Readings (CPM)
					AF: Artificial Fill		
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface grass & soil		70.5 2733
							3115
0.5		0.4	65		Fill: Silty Sand: dark yellowish brown (10YR 4/4), moist, loose, no odor, 30% silt, 70% fine sand, trace rootlets	AF/SM	4606
1.0		0.4	55		— dashed —		5070
		0.4	65		Fill: Poorly graded Sand w/ silt: dark yellowish brown (10YR 4/4), moist, med dense, no odor, 5% sandstone angular gravel, 20% silt, 75% fine sand, trace mottled texture	AF/SM	5124
2.0		0.4	70				5135
		0.4	75				4885
3.0		0.4	80				5026
		0.4	50			AF/SP	4854
4.0		0.4	80		@ 3' 7" Asphalt piece 1" diameter 2" long		4870
		0.4	60		Fill	AF/SP	4741
		0.4	65		4' 6" Poorly graded Sand w/ gravel: (dark yellowish brown (10YR 4/4), 75% fine sand 25% asphalt and concrete gravel fine to coarse, med dense, moist, no odor		4896
5.0		0.4	65		Fill: Silty Sand: dark yellowish brown (10YR 3/6), moist, med dense, moist no odor, 35% silt, 65% fine sand, trace angular fine gravel	AF/SM	4998
6.0		0.4	50				4864



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 2		Location ID 129	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 10.0'	
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-16-11 1035		Date/Time Total Depth Reached 3-16-11 1100	
Type of Sampling Device 13 1/4" macrocore acetate liner				Samples Collected 30087 (1045) (2) 1/2 gallon bags + 1-4oz Jar			
Geologist C. Knight				Checked by/Date Chelsea Cail / 6-14-11			
Radiological Background 37 / 2852		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.5 ppm)			

Depth	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 Inches (CPM)
0.5		0.4	66		Surface: Soil + grass		40.5 2733
1.0		0.4	66		Fill: Sandy silt: dark yellowish brown (10YR 4/4), moist, ^{CK} soft, no odor, 35% fine sand, 65% silt, non cohesive, no plasticity, trace rootlets	AF ML	3115
2.0		0.4	65		Fill: Silty Sand: yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 67% fine subrounded gravel, mottled, 65% fine sand	AF SM	4606
3.0		0.4	70				5070
4.0		0.4	75				5124
5.0		0.4	80				5135
6.0		0.4	50		3' 6" ^{CK} Silty v		4885
7.0		0.4	80		Poorly graded Sand w/ gravel: dark yellowish brown (10YR 4/4), moist, dense, no odor, 20% silt, 26% angular asphalt gravel pieces (fine to medium), 55% fine sand.	AF SP SM	5026
8.0		0.4	60		4" 6" concrete 1/2" diameter		4854
9.0		0.4	65		No Recovery		4870
10.0		0.4	65		Same as 3' 6" above		4741
		0.4	65				4896
		0.4	50				4998
		0.4	50				4864

Radiological Background 37/2852				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 124	
Depth	Interval	Recovery	PD	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			0.4	50	F11: Poorly graded sand w/ silt and gravel; dark yellowish brown (10YR 4/4), moist, dense, no odor, 15% silt, 25% asphalt gravel, 60% fine sand	AF/SP	4867
			0.4	50			4823
7.0			0.4	70	@ 7' 5" of asphalt medium to fine gravel		5013
			0.4	55	Same as above	AF/SP	4779
8.0			0.4	60	@ 8' 4" of asphalt medium gravel		4826
			0.4	75	Same as above	AF/SP	4831
9.0			0.4	80	asphalt found to total depth recovered		4976
			0.4	85	no recovery		4978
10.0			0.4	90	Target depth of 10' reached no GW encountered		5145
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group SA group 2	Location ID 130
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-16-11 0830	Date/Time Total Depth Reached 3-16-11 0905
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected: 30/143 (0840) (2) 1/2 gallon bags + 1.402 Jar		
Geologist C. Knight		Checked by/Date Chelsea Carroll / 4-14-11		
Radiological Background 35 / 3051		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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)
							Inches 10.5 2727
							3726
0.5			0.4	75	Surface: grass + soil Fill / silt, Sand: Yellowish brown (10YR 5/6), moist, loose, no odor, 35% silt, 5% medium, 60% fine sand, mottled, trace rootlets	AF, SA	5051
1.0			0.4	70	8" bgs Sandy Silt: Dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, non cohesive, no plasticity, rapid dilatancy	ML	5403
			0.4	75			5647
2.0			0.4	75			5461
			0.4	75			5151
3.0			0.4	80			4991
			0.4	65	3' 5" weathered sandstone bedrock: light yellowish brown (2.5Y 6/4), moist, dense to hard, no odor, weathered mechanically to SP, fine grained sand	Bedrock	5116
4.0			0.4	50			5019
			0.4	50			5022
5.0			0.4	65	Refusal @ 5.0' bgs on sandstone No GW encountered		N/A
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5a, Group 2		Location ID 131	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 02/25/11, 1030		Date/Time Total Depth Reached 02/25/11, 1040	
Type of Sampling Device trowel/shovel				Samples Collected 30144, 1035 (2 1/2 gal bags) (4 oz jar)			
Geologist P. Skeath				Checked by/Date Chelsea Carmichael (6-23-11)			
Radiological Background 2.0 ppm, 13 mR		Radiological Equipment Used M/R meter		PID Used Mini Rac 2000			
Depth	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'				2.0 13	Silty sand, dark brown (10YR 3/3) moist, loose sand, 25% silt, 75% fine to med. sand, common rootlets, no odor	SM	
					No GW		

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA 2		Location ID 131	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5 ft	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3/15/11 1553		Date/Time Total Depth Reached 3/15/11 1557	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30145-1615 (2) 1/2 gallon bags, (1) 4oz jar			
Geologist I. Stone				Checked by/Date Chelsea C. Hill / 6-14-11			
Radiological Background 34 / 3042		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.3 ppm)			

Depth	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 Inches 0.5' = 2877 (CPM)
1		0.2	75		Silty Sand, Dark brown (3/3 10YR)		3758
		0.2	65		55% fine sand, 40% silt, 5% clay, trace roots, trace gravel, dry, med dense, no odor or staining	SM	4798
		0.2	65				5133
		0.2	55		(0-1 1/4") All		5186
2		0.2	50		Silty Sand, Strong brown (4/6 7.5YR)		5155
		0.2	35		65% fine sand, 35% silt, dry, med dense, no o+s, trace sandstone gravel,	SM	5344
3		0.2	60				5146
		0.2	70				5150
4		0.2	55		Silty Sand, Strong brown (5/6 7.5YR)		4858
		0.2	70		85% fine sand, 15% silt, dry med-high dense, no odor or staining	SM	4964
5		0.2	75		TD = 5 ft bgs no gw encountered		NM

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5a, Group 2		Location ID 132	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 02/25/11, 0930		Date/Time Total Depth Reached 02/25/11, 0930	
Type of Sampling Device trowel/shovel				Samples Collected 30146, 09125 (2 1/2 gal bags) (4 oz jar)			
Geologist P. Skerath				Checked by/Date Chelsea Carmichael / 6-23-11			
Radiological Background 0.132		Radiological Equipment Used up R meter		PID Used Mini Rae 2000			
Depth	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'				13	silty silt, dark brown (10YR 3/3) moist, soft, 40 % fine sand, 50 % silt, 10 % sandstone gravel, common rootlets, no odor NO GW TO 0.5'		

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A 2	Location ID 132
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3 ft
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3/15/11 1457	Date/Time Total Depth Reached 3/15/11 1500
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30147 - 1515 (2) 1/2 gallon bags, (1) 402 jar		
Geologist I. Shon		Checked by/Date Chelene C. Hill / 6-14-11		
Radiological Background 53 / 2973		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.2 ppm)

Depth	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 Inches 0.5' = 2662 (CPM)
		0.2	45		Silty Sand, Brown (4/3 7.5YR)		3218
		0.2	60		55% fine sand, 40% silt, 5% clay		3480
		0.2	80		dry, med dense, no odor or staining	SM	5142
					trace gravel,		
		0.2	60		(0-1'6") fill		5420
2		0.2	40		Sandy Silt, Strong brown (4/6 7.5YR)	ML	5673
					IS to 55% silt, 30% fine sand, 15% clay,		5706
		0.2	50		dry, low-med tough, low-med strength,		
					(1'6"-2'7") no o+s		
3		0.2	50		Sand w/ silt, Brownish yellow (6/6 7.5YR)	SP	5965
					(2'7"-3') 90% fine sand, 10% silt, dry, high dense, no o+s		
					TID = 3 ft bgs		
					no gw encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID SA, Group 2	Location ID 133
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 02/25/11, 1000	Date/Time Total Depth Reached 02/25/11, 1340
Type of Sampling Device trowel/shovel	Samples Collected 30148, W05 (2 1/2 gal bags) (4 oz jar)		
Geologist P. Skeath	Checked by/Date Chelsea Carrinckay / 10-23-11		

Radiological Background 12 WGR, W05 pgs	Radiological Equipment Used up R meter	PID Used Mini Rac 2000
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				10-13	silty silt, very brown (WGR 413) moist, soft, no % fine sand, 55 % silt 5 % sandstone gravel, common rootless, no odor			
					no GW			

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 1		Location ID 133	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-16-11 1420		Date/Time Total Depth Reached 3-16-11 1455	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected: 30149 (1430) (2) 1/2 gallon bags + 1-4oz jar			
Geologist C. Knight				Checked by/Date Chelsea Cail / 4-14-11			
Radiological Background 43 / 3034		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 6.0 ppm)			

Depth	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	52		Surface (soil) + grass		3557
0.5		0.0	75		Fill: Sandy silt: yellowish brown (10YR 5/4), moist, soft, no odor, 35% fine sand, 65% silt, non cohesive, low plasticity	AR / ML	4554
1.0		0.0	55		1'4" Fill: Silty sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 30% silt, 5% coarse sand, 5% medium sand, 10% fine angular gravel and asphalt pieces, 50% fine sand, mottled texture	AR / SM	5052
2.0		0.0	72				5145
		0.0	67				5291
3.0		0.0	55		3' Silt x v Poorly graded sand w/ silt: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 20% silt, 60% fine sand, 10% medium sand, 5% coarse sand, 5% fine asphalt gravel	AR / SP	5252
		0.0	81		3'9" Large asphalt pieces up to 3/4" diameter	SM	5399
4.0		0.0	73				5147
		0.0	66				5308
5.0		0.0	70		* Driller's note: Concrete in macrocore shoe causing refusal at 5' bgs on several attempts		5093
6.0					Total Depth: 5.0' bgs refusal on concrete No GW encountered		4947

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, Group 2	Location ID 134
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 02/25/11, 10:20	Date/Time Total Depth Reached 02/25/11, 10:20
Type of Sampling Device trowel/shovel	Samples Collected 30150, WIS (2 1/2 gal bags) (4 oz jar)		
Geologist P. Skreath	Checked by/Date Chelsea Carmichael / 10-23-11		

Radiological Background 1-5 ppm, 12 ne	Radiological Equipment Used up R meter	PID Used Mini Rac 2000
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Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'				15-12	silly sand, brown (10YR 4/3) moist, loose sand, 35% silt, 65% fine sand, common rustlers, no odor	SP		
					NO GW TO 0.5'			

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5/A group 2		Location ID 134	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 3.5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-16-11 1530		Date/Time Total Depth Reached 3-16-11 1545	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30151 (1535) (2) 1/2 gallon bags + 1-4oz Jar			
Geologist C. Knight				Checked by Date Chelsea Carmichael 16-14-11			
Radiological Background 52 / 2955		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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)
							Inches
					surface - grass + soil		106 2586
0.5		0.0	59		Fill: 5.1% Sand; dark yellowish brown (10YR 4/6), moist, med. dense, no odor, 40% silt, 55% fine sand, 5% fine gravel	AF/SM	2989
1.0		0.0	65				4193
		0.0	70				4872
2.0		0.0	90				5178
		0.0	95		2' 9" ~ 2.5" of asphalt over sandstone		5192
3.0		0.0	82		Sandstone (weathered); Brownish yellow (10YR 6/8), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone	Red Ark	5088
		0.0	100				5119
4.0					refusal @ 3.5' on sandstone		5304
5.0					No GW encountered		
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 135	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1439		Date/Time Total Depth Reached 2-24-11/1446	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30152)(1445)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)			
Depth	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'			0.1	12	Sandy silt, (10 YR, 3/4), dark reddish-brown, 55% silt, 40% fine grained sand, 5% gravel (gravel fill), semi-moist, medium dense, no odor, no plasticity or hardness. No groundwater encountered.	ML	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 135
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-17-11 1320	Date/Time Total Depth Reached 3-17-11
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30153 (1325) (2) 1/2 gallon bags + 402 Jars		
Geologist Ellenight	Checked by/Date Charles O'Neil / 4-14-11		

Radiological Background
47 / 2361

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.0 ppm)

Description

(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)

USCS Symbol

Borehole Gamma Readings
Inches
(CPM)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	62	Surface: 2" Asphalt		4052647
0.5			0.0	63	Silty Sand: Strong brown (7.5YR 5/6), moist, med dense, no odor, 35% silt, 10% coarse sand, 20% medium sand, 45% fine sand 10' (CR)		3198
1.0			0.0	58		SM	4617
			0.0	75			5197
			0.0	88			5397
2.0			0.0	71	2' 3" Weathered Sandstone: Yellow (10YR 7/8), dry, dense, no odor, mechanically weathers to SP, 5% coarse sand, 10% medium sand, 85% fine		5350
			0.0	66	refusal on sandstone at 5' bgs T.D.: 5.0' No GW encountered		5627
			0.0	80			5828
			0.0	62			5991
			0.0	65			5848
4.0			0.0	70			5963
5.0			0.0	70			5646

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 136	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1421		Date/Time Total Depth Reached 2-24-11/1431	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 1 4oz jar (#30088) (1430)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)			
Depth	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 Inches (CPM)
0.5'				0.1/13	Silty ^{ss} Sandy silt, (10 YR, 3/4), dark reddish-brown, 55% silt, 40% fine grained sand, 5% gravel (fill rock and sandstone), semi-moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA group 2	Location ID 136
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-17-11 1020	Date/Time Total Depth Reached 3-17-11 1115
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected: 30154 (1030) (2) 1/2 gallon bags + 4oz Jar 30406 L 313 1030 30407 field NT 30408 1/2 M/S 1030		
Geologist C. Knight	Checked by/Date Charles D. Knight 6-14-11 (CR)		

Radiological Background 46 / 2593	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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)
						Inches	
			0.0	62	Surface: 2" Asphalt		405 2999
0.5			0.0	64	Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 30% silt, 70% coarse, 10% medium, 50% fine sand		3289
1.0			0.0	56			4653
			0.0	62			5237
			0.0	62			5409
2.0			0.0	57	Weathered Sandstone Bedrock: Brownish yellow (10YR 6/8), dry, hard, no odor, mechanically weathered to SP, 80% fine grained sand, 20% medium sand, trace coarse sand trace trace from oxide staining (CL)		5529
			0.0	60			5681
3.0			0.0	82			5692
			0.0	57			5816
4.0			0.0	70	fine grained sandstone towards depth		5732
			0.0	80			5782
5.0			0.0	95	refusal on sandstone at 5'		5959
					Total depth 5.0' bgs		
					No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 137	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1522		Date/Time Total Depth Reached 2-24-11/1535	
Type of Sampling Device trowel/shovel		Samples Collected 2 1/2 gall bags, 14 oz jar (#30089)(1535)					
Geologist C. Carmichael		Checked by/Date Chelsea Carmichael/6-14-11					
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)			
Depth	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 Inches (CPM)
0.5'				0.2 12	Silt with sand, (10YR, 3/4), dark brown, 75% silt, 25% fine grained sand, common rootlets, semi-moist, soft, no odor, no plasticity or hardness. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A 2		Location ID 137	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5 ft	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3/15/11 0938		Date/Time Total Depth Reached 3/15/11 0942	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected: 30#55 - 1000 (2) 1/2 gallon bags (1) 4oz jar			
Geologist J. Stone				Checked by/Date Chelva Carnicchia/6-14-11			
Radiological Background 50 / 2819		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches 0.5' - 2809 (CPM)
1	0.3	80			Sandy silt, Dark yellowish brown (3/6 10YR) dry 60% silt, 35% fine sand, 5% clay, low strength, moist	ML	3655
	0.6	65			Silty Sand, yellowish brown (5/6 10YR) 55% fine sand, 40% silt, 5% clay low-med dense, no o/s.	SM	4765
	0.5	55			Slight mottling, dry		4979
	0.2	35			Silty Sand, strong brown (5/6 7.5YR)		5071
2	0.2	50			65% fine sand, 30% silt, 5% clay low-med dense, no o/s, slight mottling	SM	5064
	0.1	45					5299
3	0.1	70					5393
	0.1	65					5629
4	0.1	65			Silty Sand w/ silt brownish yellow (6/6 10YR) 85% fine sand, 15% silt, med-high dense, no o/s, dry	IS SP SM	5613
	0.1	65					5605
5	0.1	55			TD = 5 ft no gw encountered		5513

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 138	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1502		Date/Time Total Depth Reached 2-24-11/1510	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 14oz jar (#30090) (1510)			
Geologist C. Carmichael				Checked by/Date Chelsie Carmichael/6-14-11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.1 ppm)			
Depth	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'			0.1	13	Sandy silt, (10 YR, 3/4), dark reddish-brown, 60% silt, 40% fine to medium grained sand, some rootlets, semi-moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA 2		Location ID 138	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 7.5ft	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3/15/11 1335		Date/Time Total Depth Reached 3/15/11 1345	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected: 30156 - 1400 (2) 1/2 gallon bags, (1) 4oz jar			
Geologist I. Stone				Checked by/Date Chelsea Carmichael / 6-14-11			
Radiological Background 36 / 2753		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)			

Depth	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	
							Inches	(CPM)
		0.0	70		Silty Sand, Pink brown (3/3 10YR) 55% fine sand, 40% silt, 5% clay, dry, med dense, no odor or staining (0-1'3")	SM	0.5' = 2769	
		0.0	60				3799	
		0.0	45				4862	
		0.0	60		Silty Sand, Strong brown (4/6 7.5 YR) 65% fine sand, 30% silt, 5% clay, dry, med dense, no odor or staining (1'3" - 4'2.5")	SM	5317	
		0.0	80				5402	
		0.0	70				5403	
		0.0	65				5621	
		0.0	60				5617	
		0.0	65				5726	
		0.0	75		Sandy Silt, Brownish yellow (6/8 10YR) 55% silt, 40% fine sand, 5% clay, dry, low-med tough, low-med strength, no odor or staining (4'2.5" - 6')	ML	5855	
		0.0	80				5786	
		0.0	50				6127	
		0.0	50				6079	
		0.0	50				5990	

Radiological Background <u>36 / 2753</u>				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>SA, 2, 138</u>	
Depth	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)
				50	Sandy Silt, Brown (5/4 7.5R)		5990
				60	70% silt, 30% fine sand, dry, low-med tough, low-med strength. no o.s.	ML	5950
					(6'-6'11")		
7				75	Sand light yellowish brown (6/4 7.0YR)		5867
				65	95% fine-medium sand, 5% silt, dry, med-high dense, no o.s.	SP	5676
					(7'-7'6")		
8					TD = 7.5 ft bgs		
					no gw encountered.		
9							
10							

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 139
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-17-11 0809	Date/Time Total Depth Reached 3-17-11 0850
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30091 (0815) (2) 1/2 gallon bags + 1 402 Jar		
Geologist C. Knight	Checked by Date Charles Carmichael / 6-14-11		

Radiological Background 55 / 2621	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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)
							Inches
			0.0	55	Surface: grass and trace asphalt		2450
0.5			0.0	65	Silty Sand: Dark yellowish brown (10YR 4/6), moist, med. dense, no odor, 35% silt, 60% fine sand, 5% or trace asphalt towards surface.	SM	2978
1.0			0.0	76			4330
			0.0	60	Weathered Sandstone: Brownish yellow (10YR 6/8), moist, dense, no odor, weathered to SP, fine grained sand stone	SP	4940
3.0			0.0	75			4931
			0.0	50			5208
3.0			0.0	63			5275
			0.0	55			5448
4.0					refusal on sandstone 3.5' bgs		5614
5.0					No GW encountered		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A 2	Location ID 140
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7 ft
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3/15/11 1127	Date/Time Total Depth Reached 3/15/11 1134
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected: 30092 - 1200 (2) 1/2 gallon bags, (1) 4oz jar		
Geologist J. Sitar	Checked by/Date Chelsea Carmichael / 6-14-11		

Radiological Background
54 / 2831

Radiological Equipment Used

Pancake / Downhole

PID Used

MiniRAE 2000 (Bkgd: 0.1 ppm)

Depth	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 Inches 0.5' = 2644 (CPM)
1		0.1	50		Silty Sand, Dark brown (3/3 7.5YR), dry ²⁵ 55% fine sand, 40% silt, 5% clay, dry, low-med dense, no odor or staining (0-1'9") (fill) trace asphalt	SM	3180
		0.1	45				4644
		0.1	40				5229
		0.1	40				5523
2		0.1	70		Silty Sand, Stray Brown (4/16 7.5YR) 65% fine sand, 30% silt, 5% clay, dry, no o.s., med dense	SM	5859
		0.1	70				5941
3		0.1	75		(1'9"-3')		6142
		0.1	85		Sandy silt, Yellowish brown (5/8 10YR) 60% silt, 30% fine sand, 10% clay (3'-3'10") dry, low-med strength, low-med toughness, no o.s.	ML	6488
4		0.1	50		Sand, Brownish Yellow (6/6 10YR) 95% fine sand, 5% silt, dry, med ^{IF} dense, no odor or staining	SP	6754
		0.1	45				6854
5		0.1	40		(3'10"-7')		7039
		0.1	48				6907
6		0.1	56				6637

Radiological Background 54 / 2831					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 5A, 2, 140
Depth	Interval	Recovery	PD	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			0.1	56	Same as above (sand)	SP	6546
			0.1	120			6546
7			0.1	75			6555
					TD = 7 ft bgs no gw encountered		
8							
9							
10							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A 2	Location ID: 141
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 2.5 ft
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3/15/11 0826	Date/Time Total Depth Reached: 3/15/11 0829
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30093 - 0845 (2) 1/2 gallon bags (13402) jar		
Geologist: I. Stone	Checked by/Date: Chelsea Carmichael / 6-14-11		

Radiological Background: 54 / 2601	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
							2637
							0.0' = 2871
							0.5' = 4387
1					Silty Sand, Dark yellowish brown (3/4 @ 1/2), 55% fine sand, 40% silt, 5% clay, med dense, no odor or staining dry	SM	1.0' = 4980
							1.5' = 5068
2							2.0' = 4976
							2.5' = 5132
					Sand w/ silt - Brownish yellow (6/10 @ 1/2) dry 90% fine sand, 10% silt, med high dense, no odor or staining		
3					TD = 2.5 ft logs No gw encountered		
4							
5							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A 2		Location ID 142	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5 ft	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3/15/11 1036		Date/Time Total Depth Reached 3/15/11 1040	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected: 30094 - 1055 (2) 1/2 gallon bags, (1) 4oz jar			
Geologist I. Shue				Checked by/Date Chadwick / 6-14-11			
Radiological Background 42 / 2641		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches 0.5' = 2786 (CPM)
1	0.0	60			Silty Sand Dark brown (3/3 7.5 YR), 55% fine sand, 40% silt, 5% clay, dry, low-med dense, no ORS (0-1'3")	SM	3542
	0.0	45					4324
	0.1	40					5260
2	0.1	55			Silty Sand, Strong brown (7.5 YR 4/6), 65% fine sand, 30% silt, 5% clay, dry med dense, no ORS (1'3"-3')	SM	5447
	0.1	50					5742
	0.1	60					6074
3	0.1	55			Sandy Silt, Yellowish brown (5/6 10YR), 60% silt, 30% fine sand, 10% clay, dry, low-med strength, low-med foulty, no ORS. (3'-4.5')	ML	6189
	0.1	65					6820
	0.1	65					6608
4	0.1	70			Silty Sand Brownish yellow (6/6 10YR), (4.5'-5') 85% fine sand, 15% silt, dry, med-high dense, no ORS.	SM	6458
	0.1	55					6402
	TD= 5 ft bgs No gw encountered						

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 143	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1334		Date/Time Total Depth Reached 2-24-11/1345	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 14-oz jar (#30095)(1345)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/16-15-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)			
Depth	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'			0.2	12	Silt with sand, (10YR, 3/3), dark brown, 80% silt, 20% fine to medium grained sand, common rootlets, semi-moist, soft, no odor, very low hardness, no plasticity. No groundwater encountered.	ML	

Radiological Background <u>43/2859</u>				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>143</u>	
Depth	Interval	Recovery	RPD	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	50	Same as above	SP	5399
			0.0	60			5593
7.0			0.0	45	Poorly graded sand: Pale yellow (2.5Y 7/4) moist, med. dense, no odor, 5% silt, 95% fine sand, abundant iron oxide staining	SP	5281
			0.0	45			5126
8.0			0.0	65			5196
			0.0	60			5074
9.0			0.0	45	8'9" Weathered Sandstone: Pale yellow (2.5Y 8/4), dry, hard, no odor, fine grained sandstone		5217
					• Refusal on sandstone @ 9.0' bgs		
10.0					• No GW encountered, however a saturated zone was found near surface during seasonal wet weather		
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5a, Group 2		Location ID 144	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 02/25/11, 1100		Date/Time Total Depth Reached 02/25/11, 1100	
Type of Sampling Device trowel/shovel				Samples Collected PS 20074 30097, 1105 (2 1/2 gal bags) (402 jar)			
Geologist P. Skerath				Checked by/Date Chelsea Carmichael 10-23-11			
Radiological Background 1.2 ppm, 12 ppb		Radiological Equipment Used up R meter		PID Used Mini Rac 2000			
Depth	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 Inches (CPM)
0.5'				1.2 12	Silty sand, dark yellowish brown (WYR 3.4); moist; med. dense sand, 35% silt, 65% fine sand, no odor 2" of asphalt @ surface TD 0.5' NO GW	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 144
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-25-11 4124	Date/Time Total Depth Reached 3-25-11 1515
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30048 (1430) (2) 1/2 gallon bags		
Geologist C. L. Wright	Checked by/Date Chelder Drill / 6-15-11		

 Radiological Background
38 / 2914

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
			0.0	60	Surface: asphalt V-ditch 2" thick		10.5' 2308
0.5		0.0	55		Fill: Silty Sand; dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 30% silt, 15% coarse, 20% medium, 35% fine sand, trace fine gravel	AF / SM	3322
1.0		0.0	65				4171
		0.0	80				5249
		0.0	75				5478
2.0		0.0	80				5471
		0.0	70				5436
		0.0	75				5461
4.0		0.0	65		subrounded fine gravel (fill rock) at 4' 6"		5753
		0.0	80		4' 6"		6015
		0.0	85		Weathered Sandstone bedrock: Very pale brown (10YR 7/4), dry, medium dense, no odor, Mechanically weathered to SP, 15% medium, 5% coarse, 80% fine sand		6254
5.0		0.0	40				6380
		0.0	40				6512
6.0		0.0	40				6335

Radiological Background 38 / 2914				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 144	
Depth	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	Same as above; Weathered Bedrock Sandstone		6335
			0.0	35			6363
7.0			0.0	60			6425
			0.0	45			5776
8.0			0.0	55	Refusal at 8' on sandstone No GW encountered		5518
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 145	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/0940		Date/Time Total Depth Reached 2-28-11/0950	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 14-oz jar (30098) (0950)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/16-15-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	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'				0.015	Sandy silt, (10 YR, 3/4), dark brown, 60% silt, 40% fine to medium grained subrounded sand, common rootlets, dry, soft, no odor, trace asphalt and sandstone fragments. No groundwater encountered.	ML	

MS-30393
AD-30391
FD-30392
(0950)

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA group 2	Location ID 145
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-20-11 1515	Date/Time Total Depth Reached 4-20-11 1530
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30100 (+525) NO SAMPLE (1) 1/2 gallon bags (CR)		
Geologist C. Knight	Checked by/Date Chelsea Carl / 4-15-11		
Radiological Background 49 / 3335	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description AP ³ (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5			0.0	53	Surface: Asphalt v-ditch		10.5' 2881
1.0			0.0	60	1.5" Asphalt v-ditch		3155
			0.0	62	Silt: Fill: dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 10% fine sand, 90% silt	AP ML	4365
					Sandstone: very pale brown (10YR 7/3) dry, hard, no odor, fine grained sandstone		5269
2.0					Refusal at 1'4" on sandstone		
3.0					No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID SA, Group 2		Location ID 146	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 02/25/11, 1045		Date/Time Total Depth Reached 02/25/11, 1055	
Type of Sampling Device trowel/shovel				Samples Collected 30101, WSD (2 1/2 gal bags) (per spec)			
Geologist P. Skeath				Checked by/Date Chelsea Carnichael/6-23-11			
Radiological Background 1.4 ppm 134K		Radiological Equipment Used HP R meter		PID Used Mini Rae 2000			
Depth	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'				14.13	sand w/ silt, dark brown (10YR 3/3) moist, loose sand, 85% red sand, 15% silt, no odor	sm	
					2" of asphalt on surface		
					NO GW		
					TO 0.5'		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 146
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-16-11 0940	Date/Time Total Depth Reached 3-16-11 1800
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30102 (0945) (2) 1/2 gallon bags + 1-402 Jsg		
Geologist C. Knight	Checked by/Date Chelsea Cammichia / 6-15-11		

Radiological Background 46 / 2809	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.5 ppm)
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Depth	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 Inches (CPM)
			0.5	80	Surface: Asphalt V-ditch (3" Asphalt)		40.5 2798
0.5			0.5	60	Began sampling 1' - 4' bgs due to V-ditch		3436
1.0			0.5	55			4712
			0.5	60	Fill: Silt; Sand; dark olive brown (2.5Y 3/3), moist, med. dense, no odor, 35% silt, 10% medium sand, 5% coarse sand, 90% fine sand	AF, SM	5171
2.0			0.5	70	Sandy Silt; strong brown (7.5YR 4/6), moist, medium stiff, no odor, 40% fine sand, 60% silt, low plasticity, cohesive, slow dewatering	ML	5323
			0.5	60			5224
3.0			0.5	45			5424
			0.5	70			5576
4.0			0.5	75	Weathered sandstone bed rock; light yellowish brown (10YR 6/4), moist, dense, no odor, mechanically weathered to fine grained sand.	Bed rock	5597
							5605
					Refusal @ 4.0' bgs on sandstone		
					No GW encountered		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 2	Location ID: 147
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-20-11 1357	Date/Time Total Depth Reached: 4-20-11 1500
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30103 (400) TA (1500) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Charles Smith / 6-15-11		

Radiological Background
48 / 2734

Radiological Equipment Used

Pancake / Downhole

PID Used

MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
					AF: Artificial Fill		
0.5		0.0	50		Fill: Poorly sorted sand w/ silt: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 15% silt, 85% fine sand, mottled	AF	3563
1.0		0.0	49			SP	5007
		0.0	51			SM	5330
		0.0	56				5029
2.0		0.0	58		2' Silt with sand: dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 20% fine sand, 80% silt	ML	5339
		0.0	62				5404
3.0		0.0	70		2' 9" Silty Sand: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 35% silt, 65% fine sand	SM	5424
		0.0	72				5439
4.0		0.0	72				5477
		0.0	78				5377
5.0		0.0	72				5454
		0.0	98				5546
6.0		0.0	60				5705

Radiological Background 48/2734				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 147	
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	60	Same as above with iron oxide staining	SM	5705
			0.0	55	6'9"		5462
7.0			0.0	60	Poorly graded sand: Olive brown (2.5Y 4/3), very moist to saturated, medium dense, no odor, 10% medium sand, 5% silt, 85% fine sand, some iron oxide staining	SP	5361
			0.0	65			5226
8.0			0.0	62			5180
			0.0	60			5062
9.0			0.0	62			4870
			0.0	70			4819
10.0			0.0	76			5325
					Total Depth: 10.0' bgs		
					No GW encountered, very moist to saturated soil encountered 6'9" to 10' bgs.		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP0038.01.22.04.03		Subarea ID & Group 3A group 2		Location ID 148	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 10.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-20-11 1010		Date/Time Total Depth Reached 4-20-11 1815	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30104 (1020) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date [Signature] 6-15-11			
Radiological Background 48 / 2769		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)			

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	
						Inches	(CPM)
	0.0	44		Surface: soil and grass			
	0.0	54		Fill: poorly graded sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 10% silt, 20% medium sand, 70% fine sand, mottled, trace rootlets	AF/SP		3323 4706
	0.0	60		Sandy silt: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 30% fine sand, 50% silt, trace rootlets, low plasticity, cohesive	ML		5180 5369
	0.0	62					5349
	0.0	65					5457
	0.0	85		3'2" Silty Sand: strong brown (7.5YR 5/8), moist, medium stiff, no odor, 35% silt, 5% medium sand, 60% fine sand	SM		5450 5334
	0.0	64					5233
	0.0	70					5492
	0.0	62		No Recovery			5550
	0.0	71		Silty Sand: yellowish brown (10YR 5/6), moist, medium dense, no odor, 30% silt, 70% fine sand	SM		5460
	0.0	60					5446

Radiological Background 48/2769				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 148	
Depth	Interval	Recovery	PTD	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	60		Same as above	SM	5440
		0.0	60				5229
7.0		0.0	52		Poorly graded Sand: yellowish brown (10YR 5/4), very moist to saturated, medium dense, no odor, 5% coarse sand, 15% medium sand, 80% fine sand, trace iron oxide staining	SP	5126
		0.0	63				5125
8.0		0.0	75				4796
		0.0	80				5146
9.0		0.0	75		9'7" Sandstone: brownish yellow (10YR 6/6), moist, hard, slight color in gray material, fine grained sandstone, some iron oxide staining		4924
		0.0	70				5166
10.0		0.0	55		• Total depth: 10.0' bgs • No G.W. encountered, very moist to saturated material on top of bedrock	Bedrock	5743
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 2		Location ID 149	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 10.0'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-19-11 1110		Date/Time Total Depth Reached 4-19-11 1620	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30105 (1450) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Shelley Smith 6-15-11			
Radiological Background SO / 2764		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkqd: 0.0 ppm)			

Depth	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 Inches (CPM)
			0.0	55	Surface: grass and soil		40.5 3053
0.5		0.0	60		Silty @ Poorly graded sand with silt: yellowish brown (10YR 5/6), moist, medium dense, no odor, 15% silt, 5% coarse sand, 10% medium sand, 70% fine sand, mottled, trace roots near surface	AF SP SM	3922 5051 5468
1.0		0.0	65				5301
2.0		0.0	60				5440
2'3"		0.0	67		Silty Sand: Dark brown (10YR 3/3), moist, medium dense, no odor, 40% silt, 60% fine sand, trace rootlets	SM	5288 5282 5248
3.0		0.0	73				5330 5248
3'5"		0.0	63				5327 5330
4.0		0.0	70		Sandy Silt: Strong brown (7.5Y 4/6), moist, medium stiff, no odor, 35% fine sand, 65% silt, non cohesive, low toughness, slow dilatancy	ML	5448 5527
		0.0	73				5448
5.0		0.0	75				5446
		0.0	59				5426
6.0		0.0	65				5413

Radiological Background 5012764				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 149	
Depth	Interval	Recovery	PTD	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
							Inches (CPM)
6.0		0.0	65		Same as above		5413
		0.0	64			ML	5343
7.0		0.0	56				5119
		0.0	60		Partly graded Sand w/silt: dark yellowish brown (10YR 4/4), very moist, medium dense, no color, 15% silt, 85% fine sand, trace iron oxide staining	SP	5329
8.0		0.0	58				5216
		0.0	60				5571
9.0		0.0	59	9'1"			5530
		0.0	63		Sandy lean clay: Brown (10YR 5/3), moist, medium stiff, no color, 10% coarse sand, 10% medium sand, 15% fine sand, 10% silt, 55% clay, medium toughness, low plasticity, non cohesive	CL	5494
10.0		0.0	66				5439
Total depth 10.0' bgs							
No GW encountered							
11.0							
12.0							
13.0							

Radiological Background 48 / 3191				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 150	
Depth	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	75	Same as above	AC GW	4744
			0.0	65	6'7"		4850
7.0			0.0	60	^(CK) Silty Poorly graded sand with ^(CL) silt: dark brown (10YR 3/3), fine very moist, medium dense, no odor, 20% silt, 80% fine sand	^(CL) SP SM	5123
			0.0	57			5185
8.0			0.0	90	7'11"		4943
			0.0	80	Same as above: light yellowish brown (10YR 6/4), very moist, medium dense, 10% silt, 90% fine sand	SP	4956
9.0			0.0	55			4854
			0.0	75			4973
10.0			0.0	80			4790
Total depth 10'0" bgs No G.W. encountered, very moist zone 6'7" to 10' bgs							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 2	Location ID 151
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-6-11 0825	Date/Time Total Depth Reached 7-6-11 0920
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30107 (0830) (1) 1/2 gallon bags + 4 oz Jar		
Geologist C. Knight	Checked by Date Theresa Carl / 10-15-11		

Radiological Background 50 / 2890	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.1	15	surface: grass and soil		2784
0.5		0.1	45		Fill: Silty Sand with gravel: dark yellowish brown (10YR 4/6), moist, no odor, some rootlets, 55% fine sand, 5% medium sand, 5% coarse sand, 15% angular gravel, 20% silt, sandstone gravel (trace)	AF/SM	4250
1.0		0.1	50		1'3"		4778
		0.1	50		Sandy Silt: dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 40% fine sand, 60% silt, trace roots, non cohesive, low plasticity	ML	4899
2.0		0.1	40				4754
		0.1	45				4838
3.0		0.1	46				4918
		0.1	40				4819
4.0		0.1	55				5011
		0.1	60				5001
5.0		0.1	60				5116
		0.1	40		Same as above		4873
6.0		0.1	45				4951

Radiological Background 50 / 2890				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 151	
Depth	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
							Inches
6.0			0.1	50	① Silty Poorly graded sand w/ silt; Yellowish brown (10YR 5/4), moist, med. dense, no odor, 25% silt, 10% medium sand, 65% fine sand	SP	4751
7.0			0.1	50	6'7" Sandstone weathered: Brownish yellow (10YR 6/8), moist, hard, no odor, mechanically weathered to SP, 20% medium sand, 5% coarse sand, 75% fine sand, from oxide staining	SP	4725
8.0			0.1	65	Refusal @ 7.5' bgs on sandstone No GW encountered	SP	5029
9.0						SP	5190
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number FP9038.01.22.04.03	Subarea ID & Group 5A 2	Location ID 152
Drilling Company: Boert Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8 ft
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4/5/11 1339	Date/Time Total Depth Reached 4/5/11 1352
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30108-1435 (1) 1/2 gallon bags, (1) 4oz jar		
Geologist I. Stone	Checked by/Date Chelmer Cailf / 6-15-11		

Radiological Background 43 / 2580	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.2 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			33	50	Silty Sand, Dark brown (3/3 10YR) (0-1'8") 60% fine sand, 35% silt, 5% clay, dry, low dense, no odor or staining, trace roots.	SM		3010
1.0				40				4360
				40				4721
				35				4714
2.0				50	Sandy Silt, Reddish Brown (4/4 5YR) (1'8"-5'6") 55% silt, 40% fine sand, 5% clay, dry, low tough, low strength, no odor or staining	ML		4947
				55				4895
3.0				50				5229
				40				5126
4.0				40	Silty Sand, Dark yellowish brown (4/4 10YR) (5'6"-7'9") IS 65% fine sand, 35% silt, dry, low med dense, no odor or staining	SM		5101
				60				4980
5.0				55				4700
				40				4641
6.0				60				4574

Radiological Background 43 / 2580				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location SA, 2, 152	
Depth	Interval	Recovery	PD	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)
			6.3	60	Same as above except moist-very moist		IS 4647 4574
				60			IS 4574 4644
7				65		SM	IS 4699 4740
				60			IS 4740 4682
8				65		SAND, Brownish yellow (6/6 10%2); 98% fine med sand, 8% silt very dense no gw	SP
					TD = 8ft bgs no gw encountered	(7'9" - 8')	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A 2	Location ID 153
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.5 ft
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4/5/11 1125	Date/Time Total Depth Reached 4/5/11 1137
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30189 - 1210 (1) 1/2 gallon bags, (1) 4oz jar		
Geologist I. Stone	Checked by/Date Charles Carmichael / 6-15-11		

Radiological Background
53 / 2900

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkqd: 0.3 ppm)

Depth	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 Inches 0.5 = 2256 (CPM)
0.5			0.3	35	Silty Sand, Dark brown (7.5/104R) (0-3") 60% fine sand, 35% silt, 5% clay, trace gravel (max size 1/16"), trace roots, dry, low dense. (Fill)	SM	2891
1.0				45			4319
				60			4708
				55			4878
2.0				70			5002
				65			5030
3.0				40			4974
				50	Sandy Silt, Reddish Brown (4/4, 5YR) (3'-6'3") 60% silt, 55% silt, 40% fine sand, 5% clay, dry, low strength, low toughness, no odor or staining	ML	5063
4.0				50			5090
				40			5022
5.0				50			5032
				70			5037
6.0				70			5036

Radiological Background 53 / 2960				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 5A, 2, 153	
Depth	Interval	Recovery	PTD	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			6.3	70	Same as above	ML	5036
6.5			0.3	65	SAND, Brownish Yellow (6/8 (D ₅₀)) 95% fine sand; 5% silt; dry, very dense, no odor or staining	SP	NM
7.0					TD = 6.5 ft bgs no gw encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A 2	Location ID 154
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8 ft
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4/5/11 0955	Date/Time Total Depth Reached 4/5/11 1010
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30110-1100 (1) 1/2 gallon bags, (1) 4oz jar		
Geologist I. Stone	Checked by/Date Chelsea Carmichael / 6-15-11		

Radiological Background
51 / 2552

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkgd: 0.2 ppm)

Depth	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 Inches 0.5' = 2743 (CPM)
0.5		0.2	70		Silly Sand Dark Brown (3/2 7.5YR) (0-1')		2887
1.0		0.2	50		60% fine sand, 35% silt, 5% clay, dry; low dense, no odor or staining	SM	4275
		0.2	55				4774
2.0		0.2	70		Sandy Silt, Reddish Brown (4/3 5YR) (1'-5'7")		4845
		0.2	80		60% silt, 35% fine sand, 5% clay, dry, low strength, low density, toughness, no odor, or staining		5087
3.0		0.2	45				5245
		0.2	40				5145
4.0		0.2	45				5052
		0.2	50				5141
		0.2	60				5043
5.0		0.2	55		Slightly moist		4915
		0.2	45				4932
6.0		0.2	40		Silly Sand, Strong brown (4/6 7.5YR) (5'7"-6'5")		4996
		0.2	40		70% fine sand, 30% silt, moist-very moist, low-mud dense, no odor or staining	SM	

Radiological Background				Project Name	Project Number	Location	
51 / 2552				SSFL Area IV Radiological Study	EP9038.01.22.04.03	5A, 2, 154	
Depth	Interval	Recovery	PTD	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			0.2	40	Same as above		4996
			0.2	40	Sand w/ silt, ^{IS} Brownish Yellow (6/8 104R) (6'5"-8') 95% fine-med sand, 5% silt, dry, very tight ^{IS} dense, no odor or staining	SP	4854
7			0.2	50			4842
			0.2	55			4732
8			0.2	45			4675
					TD = 8ft bgs no gw encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA 2	Location ID 155
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 ft
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/4/11 1512	Date/Time Total Depth Reached 7/4/11 1527
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30111 - 1550 (1) 1/2 gallon bags (1) 4 oz jar		
Geologist I. Shure	Checked by/Date Chelsea Carnichael / 6-15-11		

Radiological Background
51 / 2834

Radiological Equipment Used
Pencate / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			50	50	Silty Sand, Dark Brown (3/3 10YR) (0-2'9") 65% fine sand, 30% silt, 5% clay, dry, low dense, no odor or staining	SM	3678	4046
1.0			45				4856	
2.0			55		Slightly moist		4777	
3.0			60				4802	
4.0			70				5052	
5.0			65		SAND, Brownish Yellow (6/6 10YR) (2'9"-3'6") 95% fine-med coarse sand, 5% silt, dry, high dense, no odor or staining	SP	4766	4740
6.0			45		TD = 3.5 ft bgs no gw encountered			

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A 2	Location ID: 156
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 4 ft
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4/5/11 0850	Date/Time Total Depth Reached: 4/5/11 0855
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30112-0920 (1) 1/2 gallon bags 1 jar 4oz		
Geologist: I. Stone	Checked by/Date: Chelsea Cornichon 16-15-11		

Radiological Background
53 / 2689

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches 0.5' = 2234 (CPM)
0.5		0.0	75		Silty Sand, Dark Brown (3/3 7.5YR) (0-3'10")		2788
1.0		0.0	75		60% fine sand, 35% silt, 5% clay, dry, low-med dense, no odor or asphalt debris. Staining. (Fill material)		4227
1.5		0.0	70				4599
2.0		0.0	80				4668
2.5		0.0	75		asphalt debris		4902
3.0		0.0	75				4911
3.5		0.0	55				5035
4.0		0.0	60		slightly moist		4853
4.5		0.0	65		Sand, Brownish Yellow (6/8 10YR), 95% sand, 5% silt, dry with dark, no odor or staining	Sp	5016
5.0					TD = 4 ft bgs No gw encountered		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A 2		Location ID 157	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 2.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4/4/11 1428		Date/Time Total Depth Reached 4/4/11 1430	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30113 - H55 (1) 1/2 gallon bags (1) 402 jar			
Geologist I. Stou				Checked by/Date Chelsea Carmichael 6-15-11			
Radiological Background 43 / 3058		Radiological Equipment Used Pancake / Downhole		PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)			

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	55	Sandy silt, is silty sand, Dark brown (3/2 7.5YR) 60% fine grained sand, 40% silt, dry, low dense, no odor or staining	SM		2376
			0.0	80				2647
1.0			0.0	65				4044
			0.0	50				4599
2.0			0.0	70	SAND, light yellowish brown (6/4 10YR) 95% fine and grained sand, 5% silt, dry, very dense	SP		5045
					TD = 2 ft bgs no jar encountered			5230

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 158
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-17-11 1435	Date/Time Total Depth Reached 3-17-11 1530
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected: 30114 (1440) (2) 1/2 gallon bags + 4oz jar		
Geologist C. Knight	Checked by/Date Chelsea Cronin 16-15-11		

Radiological Background 47 / 2195	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: asphalt debris, concrete debris		40.5' 2271
0.5		0.0	66		Sandy Silt: Strong brown (7.5YR 4/6), moist, medium dense, no odor, 30% fine sand, 5% medium sand, 65% silt, non cohesive, low plasticity	ML	2571
1.0		0.0	48				4250
		0.0	55				5182
		0.0	60				5244
2.0		0.0	57				5112
		0.0	75				5233
		0.0	56				5273
4.0		0.0	74		Same as above	ML	5522
		0.0	80		4' 7" weathered sandstone: brownish yellow (10YR 5/8), moist, dense, no odor, mechanically weathered to poorly graded sand w/ silt, fine grained sand (80%), 20% silt	Bed Rock	5866
5.0		0.0	72				5815
		0.0	76				5784
6.0		0.0	80				5717
							5719

Radiological Background 47/2195					Project Name SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Location 158	
Depth	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			
							Inches	(CPM)		
6.0			6.0	80	Some arakove, sandstone, trace iron-oxide stringers refusal on sandstone at 6.5' TD: 6.5' No GW encountered	By Val	5719			
6.5			6.5	71			5509			

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A Group 2		Location ID 159	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-18-11 0825		Date/Time Total Depth Reached 3-18-11 0915	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected: 30115 (0830) (2) 1/2 gallon bags + 1 4oz jar			
Geologist C. Knight				Checked by/Date Chelsea Carl / 6-15-11			
Radiological Background 47 / 2061		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
			0.0	55	Surface: wood chips and soil		70.5' 2344
0.5			0.0	57	Silty Sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 10% coarse, 20% medium sand, 35% fine sand, mottled	ML	2996
1.0			0.0	85			4477
			0.0	66	1' 6"		5273
2.0			0.0	57	Sandy Silt: dark brown (10YR 3/3), moist, med. stiff, no odor, 30% fine sand, 70% silt, non cohesive	ML	5453
			0.0	75			5477
3.0			0.0	65			5508
			0.0	75	3' 4"		5505
4.0			0.0	90	Silty Sand: Yellowish brown (10YR 5/8), dry, dense, no odor, 35% silt, 5% coarse, 10% medium, 50% fine sand, trace rootlets	SM	5630
			0.0	75			5670
5.0			0.0	80	Weathered: Very Pale brown (10YR 7/4), dry, hard, no odor Sandstone: Mechanically weathered to SP, fine sand		5792
					Refusal @ 5' on sandstone		5894

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 160
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-18-11 1355	Date/Time Total Depth Reached 3-18-11 1315
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30116 (1400) (2) 1/2 gallon bags + 1 - 4 oz Jar		
Geologist C. Knight	Checked by/Date Chelsea Paul / 6-15-11		

Radiological Background 40 / 2559	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches +0.5' 2539 (CPM) 3081
0.5		0.0	5A		Surface: asphalt debris / rubble		
1.0		0.0	65		Fill: Silty Sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 60% fine sand, 5% medium sand, mottled trace sandstone gravel.	AR / SM	4709
		0.0	85				5385
2.0		0.0	70		1' 11" Partly graded sandstone ^(PIC) Silty silt: Dark brown (10YR 3/3), moist, medium dense, no odor, 5% medium sand, 25% silt, 70% fine sand	SP / SM	5564
		0.0	80				5405
3.0		0.0	75		3' 2" Sandy silt: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 40% fine sand 60% silt, non cohesive, low plasticity	ML	5379
		0.0	58				5394
4.0		0.0	55				5603
		0.0	64				5469
5.0		0.0	71				5396
		0.0	48				5496
6.0		0.0	80				5427

Radiological Background 40 / 2559				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 160	
Depth	Interval	Recovery	PTD	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)
60			0.0	80	Same as above	ML	5127
			0.0	60			5592
70			0.0	55	----- gradational contact ----- Silty Sand: yellowish brown (10YR 5/8), moist, medium dense, no odor, 30% silt, 70% fine sand	SM	5892
			0.0	55	7'6" -----		6261
80			0.0	66	Weathered Sandstone bedrock; Brownish yellow (10YR 6/6), dry, no odor, 20% medium sand, 80% fine sand, Iron oxide staining		6121
			0.0	95			6031
90			0.0	58			5947
			0.0	75	Same as above: 100% fine sand		5758
100			0.0	81	End boring Total depth 100' bys No groundwater encountered Target depth reached		5834

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 161
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-18-11 1530	Date/Time Total Depth Reached 3-18-11 1630
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 3017 (1535) (2) 1/2 gallon bags + 1402 Jar		
Geologist C. Knight	Checked by/Date Chelsea Crill 16-15-11		

Radiological Background 10 / 2689	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	64	Surface: asphalt 2" thick		2743
0.5			0.0	64	Fill: Silty Sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 5% coarse, 15% medium sand, 45% fine sand, mottled, trace sand stone gravel	AS SM	3465
1.0			0.0	86			4917
			0.0	71			5486
2.0			0.0	84			5474
			0.0	70	2' 5" Silty poorly graded Sand of silt: Brown (10YR 4/3), moist, medium dense, no odor, 25% silt, 75% fine sand, trace roots	CL SM	5597
3.0			0.0	81			5630
			0.0	85			5483
4.0			0.0	74			5895
			0.0	68	4' 6" ——— dashed ——— Silty sand: Yellowish brown (10YR 5/4), dry, dense, no odor, 30% silt, 20% medium sand, 50% fine sand, rapid dilatancy	SM	5583
5.0			0.0	75			5778
			0.0	75			6128
6.0			0.0	64			6130
							6137

Radiological Background NO 2689				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 161
Depth Feet	Interval	Recovery Feet	Radiological 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
						Inches (CPM)
6.0		0.0	64	Same as above	SM	6137
		0.0	84			6191
7.0		0.0	62			5930
		0.0	98	Siltstone weathered: Brownish yellow (10YR 6/8), dry, hard, no odor, weathers to silty silt, 30% fine sand, 70% silt, low plasticity		6022
8.0		0.0	79	Sandstone weathered: Brownish yellow (10YR 6/8), dry, dense, no odor, weathers to SP, 80% fine sand, 5% silt, 15% medium sand trace coarse sand		5968
		0.0	85			6142
				refusal at 8' by son sandstone No GW encountered		
9.0						
10.0						
11.0						
12.0						
13.0						

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 162
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-21-11 0930	Date/Time Total Depth Reached 3-21-11 1030
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30118 (0935) (2) 1/2 gallon bags + 1 4oz Jar		
Geologist C. Knight	Checked by/Date Chelsea Cliff 10-15-11		

Radiological Background V15 / 2848	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
				51	Surface asphalt debris		105' 2529
0.5			0.0	70	Partly graded sand w/ silt; dark yellowish brown (10YR 3/6), saturated, loose, no odor, 10% medium sand, 20% silt, 70% fine sand, trace fine gravel, trace rocklets	CL	2755
1.0			0.0	60		SP	4442
			0.0	77		SM	5182
2.0			0.0	67			5442
			0.0	59	Partly graded sand; dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 5% coarse sand, 10% medium sand, 10% silt, 75% fine sand	SP	5555
3.0			0.0	45			5459
			0.0	59			5586
4.0			0.0	58	3' 9" Sandy silt; brownish yellow (10YR 6/8), moist, med. st. ff, no odor, 35% fine sand, 5% clay, 60% silt, cohesive, low plasticity	ML	5526
			0.0	62			5572
5.0			0.0	85	weathered sandstone; yellowish brown (10Y 5/8), moist, hard, no odor, weathers to SP mechanically, fine grained sandstone, iron oxide staining	Bed Rock	5608
			0.0	80			5533
6.0					refusal @ 5.5' bgs No bgs encountered, saturated from rain 1-2.5' bgs		N/A



Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP90038.01.22.04.03		Subarea ID & Group 5A group 2		Location ID 163	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5-5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-21-11 1050		Date/Time Total Depth Reached 3-21-11 1130	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30119 (1100) (2) 1/2 gallon bags + 1 402 Jar			
Geologist C. Knight				Checked by/Date Chadwick 4-15-11			
Radiological Background 65 / 2653		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)			

Depth Feet	Interval	Recovery	PID	Radiological CK	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.0					Surface asphalt		405	2520
0.1					Fill: Silty Sand: dark yellowish brown (10YR 4/4), saturated to very wet, loose, no odor, 30% silt, 10% sandstone angular gravel, 60% fine sand, mottled with silt (C)	AF/SM	4641	
0.1					Poorly graded Sand: dark yellowish brown (10YR 4/4), saturated, medium dense, no odor, 10% silt, 40% fine sand, rapid dilatancy.	SP	5062	
0.1							5240	
0.1							5200	
0.1							5295	
0.1					2' 7" Sandy Silt: Yellowish brown (10YR 5/8), moist, medium stiff, no odor, 30% fine sand, 5% medium sand, 65% silt, cohesive, low plasticity	ML	5201	
0.1							5114	
0.1					3' 8" Silty Sand: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 35% silt, 65% fine sand	SM	5294	
0.1					4' 6" Poorly graded Sand: Yellowish brown (10YR 5/8), moist, medium dense, no odor, fine grained sand (100%)	SP	5016	
0.1					Weathered Sandstone: brownish yellow (10YR 5/8), moist, hard, no odor, fine grained sandstone, mechanically weathered to SP	Bed Rock	4994	
0.1					Refusal at 5.5' bgs No GW encountered		N/A	

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 164
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-21-11 1400	Date/Time Total Depth Reached 3-21-11 1415
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30120 (N/A) (2) 1/2 gallon bags + 1.402 Jar		
Geologist C. Knight	Checked by/Date Chelsea Carrington 16-15-11		

Radiological Background 45 / 2424	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			00	50	2" asphalt: surface		2513
0.5			00	50	Sandstone: Brownish yellow (10YR 6/8), medst, hard, no cels, mechanically weathers to SP 10% medium sand, 90% fine sand.	SP	2670
1.0			00	60		SP	4194
			00	50		SP	4262
2.0					Total depth: 1.5 hrs Refusal on sandstone @ 1.5 hrs No GW encountered		4265
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 165
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15' 15'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-24-11 0220	Date/Time Total Depth Reached 3-24-11 1235
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30121 (NO SAMPLE) (2) 1/2 gallon bags + 1402g		
Geologist C. Knight	Checked by/Date Charles Knight / 4-15-11		

Radiological Background
29 / 2464

Radiological Equipment Used
Pancake / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.1 ppm)

Depth	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 Inches
					2" Asphalt surface		40.6 2556
0.5			0.0	84	Sandstone Bedrock: Oliveyellow (2.5 Y 6/6), med, hard, no odor, fine grained sandstone	B ₂	2563 (CPM)
1.0			1.0	90	CK CK CK CK	B ₂	3675
			8.0	45	Total depth 15' CK bgs	B ₂	4182
			8.0	45	No GW encountered		4666
			8.0	45	No sample collected for analysis		
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 8A 5A		Location ID 166	
Drilling Company HGL		Driller T. Morse P. Skeate		Ground Elevation 4-22-11 NA		Total Drilled Depth 4-22-11 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A		Date/Time Drilling Started 4-21-11 1342		Date/Time Total Depth Reached 4-21-11 1349	
Type of Sampling Device Stainless steel shovel				Samples Collected 4-oz jar 1 1/2 gall bag (#30122) (1348)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael 16-15-11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'				00 14	Sand, (10YR, 6/4), light brown/beige, 95% fine to medium grained sand, 5% sandstone rock fragments, dry, medium dense, no plasticity or hardness, no odor.	SW	
					No groundwater encountered.		

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 166
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 0.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-18-11 1200	Date/Time Total Depth Reached 3-18-11 1212
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30122 CNO SAMPLE for subsurface) (2) 1/2 gallon bags + 402 Jars		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 16-15-11		

Radiological Background 45 / 2843	Radiological Equipment Used Pencake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.5			0.0	62	Weathered Sandstone; Very Pale Brown (10YR 7/4), dry, hard, no color, mechanically weathers to SP, 5% coarse, 10% medium, 85% fine sand		2928
1.0				85	8" refusal on bedrock sandstone		4341
2.0					No GW encountered		4398 (8")
3.0							
4.0							
5.0							
6.0							



Sheet 1 of 1

$$\begin{array}{r} 5 \overline{) 3508} \\ 0 \overline{) 4161} \end{array}$$

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 168
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-18-11 1100	Date/Time Total Depth Reached 3-18-11 1140
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30124 (1110) (2) 1/2 gallon bags + 1-4oz Jar		
Geologist C. Knight	Checked by/Date Chelsea Carnichael/6-15-11		

Radiological Background 62/2208	Radiological Equipment Used Pencake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	20	Surface: Asphalt and clay pipe		+0.5' 2725
0.5			0.0	58	Sandy silt: Strong brown (7.5YR 4/6), moist, med. stiff, no odor, 5% clay, 20% fine sand, 10% medium sand, 65% silt, cohesive, low plasticity	ML	3234
1.0			0.0	65			4313
			0.0	66			4881
2.0			0.0	58	14" Silty sand: Strong brown (7.5YR 7.5 5/8), moist, med. dense, no odor, 35% silt, 65% fine sand, iron oxide staining	SM	5472
			0.0	55	2'6" Weathered Sandstone bedrock: Yellow (10YR 7/6), moist, dense, no odor, Mechanically weathered to SP, 10% medium sand, 90% fine sand, iron oxide staining	Bg	5527
3.0			0.0	59			5561
			0.0	95			5522
4.0			0.0	85			5244
					Refusal at 4' bgs on sandstone No LW encountered		4860
5.0							
6.0							

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 169
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-18-11 0955	Date/Time Total Depth Reached 3-18-11 1045
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30125 (1000) (2) 1/2 gallon bags + 1 -4oz Jar		
Geologist C. L. Knight		Checked by/Date Chelsea C. Smith / 6-15-11		
Radiological Background 49 / 2734		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
			0.0	51	Surface: 2" asphalt		105 2627 3121
0.5			0.0	74	Silty Sand: dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 40% silt, 60% fine sand.	SM	4177
1.0			0.0	63			5007
			0.0	72			5111
2.0			0.0	64			4964
			0.0	65	2'7" to 3" very wet to saturated		5013
3.0			0.0	70			5076
			0.0	73	3'2" Silty Poorly graded Sand w/ silt: Brownish yellow (10YR 6/8), moist, dense, no odor, 25% silt, 10% medium sand, 65% fine sand	SP SM	5179
4.0			0.0	85			4936
			0.0	65	Weathered Sand stone: Olive yellow (2.5Y 6/6), moist, hard, no odor, 10% coarse sand, 20% medium, 70% fine sand, weathered mechanically to SP	CK SP Bds Rock	4851
5.0			0.0	77	refusal @ 5' on sandstone No GW encountered		4801

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: 2	Location ID: 170	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached: 2-22-2011	
Type of Sampling Device:				Samples Collected: two 1/2 Gallon Bags		(30126) - no sample	
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: NA 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					NO SAMPLES COLLECTED - Boring not advanced - Deleted M.A. 20110222 - Located in a Likely Decontamination & Decommissioning Zone. TBW		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5a, Group 2	Location ID 171
Drilling Company HGL		Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel		Borehole Diameter NA	Date/Time Drilling Started 02/25/11, 1305	Date/Time Total Depth Reached 02/25/11, 1315
Type of Sampling Device trowel/shovel		Samples Collected 30127, 1310 (2 1/2 gal bags) 6.4 oz jar		
Geologist P. Skeath		Checked by/Date Chelsea Carmichael/16-23-11		
Radiological Background 0.4 ppm, 12 pc		Radiological Equipment Used up R meter	PID Used Mini Rac 2000	

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.4 12	silt w/ sand, ^(P2) dark brown (WYR 3/3), moist, soft, 15% c. sand, 85% silt, few rootlets, pieces of plastic found in pit, no odor			
					NO GW encountered			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 171
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-14-11 0905	Date/Time Total Depth Reached 4-14-11 0940
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30128 (0910) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Cronmichal / 4-15-11		
Radiological Background 45 / 2733	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.2 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.2	54	Surface: asphalt		+0.5' 2734
0.5			0.2	66	Silty Sand: dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 30% silt, 70% fine sand	SM	CK 2997
1.0			0.2	60			CK 2997 4092
			0.2	63			CK 4092 5038
			0.2	63			CK 5038 5182
2.0			0.2	57	1' 10" perched ^{CK} groundwater on top of sandstone		CK 5182 5097
			0.2	61	Weathered Sandstone: olive yellow (2.5Y 6/6), moist, dense, no odor, fine grained sandstone, some iron oxide staining		CK 5097 516
3.0			0.2	63			5194
4.0					Refusal on Sandstone at 3.0' bgs No GW encountered, Per		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, Group 2		Location ID 172	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 02/25/11, 1340		Date/Time Total Depth Reached 02/25/11, 1350	
Type of Sampling Device trowel/shovel				Samples Collected 30129, 1345 (2 1/2 gal bags) (4 oz jar)			
Geologist P. Skreath				Checked by/Date Aluksea Carmichael / 6-23-11			
Radiological Background 2.6 ppm, 11 mR		Radiological Equipment Used up R meter		PID Used Mini Rac 2000			
Depth	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'				2.6 11	Silty sand, dark brown (10YR 3/3), moist, loose sand, 40% silt, 60% fine sand, no odor	SM	
					4" asphalt w/ thin gravel fill underlying		
					NO GW		
					TD 0.5'		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 2		Location ID 172	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 4-18-11 1520		Date/Time Total Depth Reached 4-18-11 1630	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30/30 (1530) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 2065		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
0.0		0.0	52		Surface: soil and wood chips		105 2374
0.5		0.0	60		CB with sand Silty dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 25% fine sand, 55% silt, 35% silt, 65% fine sand, rapid dilatancy,	SM	2661
1.0		0.0	75				3241
		0.0	75				4562
		0.0	77				4720
2.0		0.0	71		Same as above except saturated	SM	4748
		0.0	74		2' 10" perched GW on top of sandstone		4855
3.0		0.0	70				4642
		0.0	68		Same as above	SM	4824
4.0		0.0	80				4860
		0.0	70		4' 6" weathered sandstone: yellowish brown (10YR 5/4), moist, dense, no odor, fine grained sandstone, some iron oxide staining	SM	4994
5.0		0.0			REFUSAL ON SANDSTONE AT 5.0' BGS		NM
					No GW encountered, perched GW on top of sandstone		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5a, Group 2		Location ID 173	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 02/25/11, 1330		Date/Time Total Depth Reached 02/25/11, 1330	
Type of Sampling Device trowel/shovel				Samples Collected 30131, 1335 (2 1/2 gal bags) (402 gal)			
Geologist P. Skreath				Checked by/Date Chelsea Carmichael/6-23-11			
Radiological Background 0.8 ppm, all MR		Radiological Equipment Used up R meter		PID Used Mini Rae 2000			
Depth	Interval	Recovery	PTD	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'				0.8 11	sandy silt, dark brown (10YR 4/3) moist, soft, 45% fine sand, 55% silt, common roots etc, no odor, metal scraps	PS SM	
					NO GW TO 0.5'		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 173
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-19-11 0830	Date/Time Total Depth Reached 4-19-11 0900
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30132 (NO SAMPLE) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Cull / 6-15-11		

 Radiological Background
52 / 2751

 Radiological Equipment Used
Pancake / Downhole

 PID Used
MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches
					Surface: Asphalt pieces		705 2792 (CPM)
0.5			0.0	44	Silt: Brown (10YR 5/3) moist soft, no odor, 5% coarse sand, 15% med. sand, 5% fine sand, 90% silt, non cohesive, low plasticity @	M	2877
1.0			0.0	54	Weathered Sandstone: light olive brown (2.5Y 5/4) moist, hard, no odor, fine grained sandstone	Sc	3816
			0.0	60			4627
2.0							5020
3.0							
4.0							
5.0							
6.0							

Refusal on sandstone at 1.5'
No GW encountered

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5a, Group 2		Location ID 174	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 02/25/11, 1405		Date/Time Total Depth Reached 02/25/11, 1415	
Type of Sampling Device trowel/shovel				Samples Collected 30133, 1410 (2 1/2 soil bags) (9 bags)			
Geologist P. Skeath				Checked by/Date Chelsea Carmichael/6-23-11			
Radiological Background 4.4 ppm, 12 net		Radiological Equipment Used WPR meter		PID Used Mini Rae 2000			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				4.4 12	Silly sand, dark brown (WPR 3/3), moist, loose sand, 40 % silt, 60 % fine sand, few rootlets, no odor	SM	
					NO GW TO 0.5'		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 174
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-18-11 1415	Date/Time Total Depth Reached 4-18-11 1450
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30134(1426) (1) 1/2 gallon bags + 402 Jar	
Geologist C. Knight		Checked by/Date Chelsea Carmichael 6-15-11	
Radiological Background 45 / 2554	Radiological Equipment Used Pancake / Dologhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
					Surface: Soil		10.5' 2650
0.5			0.0	61	Silt: dark yellowish brown (10YR 4/4), moist, soft, no odor,	ML	2940
			0.0	67	10% fine sand, 58% silt, trace roots near surface		4260
1.0			0.0	75	Silty Sand: Yellowish brown (10YR 5/4), moist, dense, no odor,		4910
			0.0	78	30% silt, 10% medium sand, 60% fine sand	SM	5050
2.0			0.0	68			5133
			0.0	65			5233
3.0			0.0	60	2'7" Weathered Bedrock: Brownish yellow (10YR 6/8), moist, dense, no odor, fine grained sandstone, trace iron oxide staining	Bedrock	5109
4.0			0.0	NM			NM
5.0					Refusal on sandstone at 3.5' bgs No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 175	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/0939		Date/Time Total Depth Reached 2-22-11/0950	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30209) (0950)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 10		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	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 Inches (CPM)
0.5'			0.0	10	Sandy silt, (10 VR, 3/2), dark brown, 60% silt, 40% fine to coarse grained subrounded sand, trace pea gravel, moist, too ^{too} soft, trace rootlets, no odor. Concrete hit at 4". No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 176	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/1136		Date/Time Total Depth Reached 3-2-11/1155	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30210) (1155)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 9		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.4 ppm)			
Depth	Interval	Recovery	PTD	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'				0.4 9	Silty sand, (10 YR, 4/3), brown with iron-oxide tinting (from rusty grate), 65% fine to medium grained sand, 35% silt, semi-moist, medium dense, no odor. 5" depth - concrete basin of drain. No groundwater encountered.	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 178	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/1116		Date/Time Total Depth Reached 3-2-11/1122	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30212) (1120)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 10		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.5 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) with gravel (ca)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.4 11	Silty Sandy silt, (10 YR, 4/4), brown, 55% silt, 30% fine to medium grained sand, 15% gravel fill and asphalt, dry, medium stiff, no odor. 5" depth - concrete barrier of drainage. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 179	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/1100		Date/Time Total Depth Reached 3-2-11/1105	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30213) (1105)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 10		Radiological Equipment Used up Ruler		PID Used Mini Rae 2000 (Bkgd: 0.4 ppm)			
Depth	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'				0.5 10	Silty sand with gravel, (10 YR, 4/4), brown, 55% fine grained sand, 30% silt, 15% gravel fill, dry, loose, no odor, no plasticity or hardness. 4" depth to concrete drain base. No groundwater encountered.	Sm	



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 180	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/1032		Date/Time Total Depth Reached 2-22-11/1041	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30214) (1040)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 11		Radiological Equipment Used up Rntr		PID Used Mini Rac 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy silt, (10 YR, 3/3), dark brown, 70% silt, 30% fine to coarse grained sand, common rootlets, semi-moist, soft, no odor, trace sandstone fragments and clay. No. groundwater encountered	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 180
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 510
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-22-11 1135	Date/Time Total Depth Reached 3-22-11 1230
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30215 (1145) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelms Airl 16-23-11		

Radiological Background 36 / 2570	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					1" Asphalt surface		10.5' 2318
0.5			00	70	Artificial Fill: Sandy silt: dark brown (10YR 3/3), moist, med. stiff, no odor, 10% fine angular gravel, 10% coarse sand, 10% medium sand, 10% fine sand, 10% clay, 50% silt, cohesive, low plasticity, very mottled, trace rootlets in near surface	AF / ML	3176
1.0			00	60			4606
			00	65			4894
2.0			00	65			5024
			00	65			4890
			00	60			4796
3.0			00	65	Same as above	AF / ML	4614
			00	50	3'-4" Well graded sand: light yellowish brown (10YR 6/4), saturated, loose, no odor, 70% silt, 20% coarse angular sand, 30% medium sand, 40% fine sand, sand is coarse grained	SW	4914
4.0			00	40	8' 10" Clay: Very dark grayish brown (10YR 3/2), moist, med. stiff, no odor, 10% fine sand, 5% medium sand, 20% silt, 65% clay, cohesive, medium plasticity	CL	4913
			00	40			4943
5.0			00	45	Refusal on 1" of sandstone, fine grained, med		4875
6.0					Refusal at 5.0' hgs on sandstone No GW encountered Small piece of cast iron pipe noted in separate macrocore advancement 3-4' hgs		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 181	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/1008		Date/Time Total Depth Reached 2-22-11/1020	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30216) (1020)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	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'				11	Silt with sand, (10 YR, 3/3), dark brown, 70% silt, 25% fine to coarse grained sand, 5% rock fragments (asphalt, pea gravel), piece of glass found, common rootlets, semi-moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 181
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 710
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-22-11 1400	Date/Time Total Depth Reached 3-22-11
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30217 (1415) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Charles Knight / 4-15-11		

Radiological Background 52 / 2560	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					Surface: soil w/ gravel		10.5' 2270 2467
0.5		AR	0.0	40			4039
1.0			0.0	50	Fill: Silty Sand Silty silt; dark yellowish brown (10YR 4/4), moist, loose, no odor, 25% silt, 5% angular medium crushed gravel, 50% fine sand, 20% medium sand, trace rootlets	AF SP SM	4539
			0.0	45			4732
2.0			0.0	25			4785
			0.0	35			4745
3.0			0.0	40			4709
			0.0	40			4850
4.0			0.0	45	Silty Sand w/ silt; dark yellowish brown (10YR 4/4), very moist, loose, no odor, 15% silt, 5% coarse sand, 15% medium, 65% fine sand, rapid dilatancy.	AF SP SM	4689
			0.0	40			4836
5.0			0.0	40	@ 5.0' 3 pieces of blue plastic sheeting	peached GW	4674
			0.0	65			4848
6.0			0.0	45	contact 6.0'		4804

Radiological Background 52 / 2560				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 181	
Depth	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	45	weathered sandstone: Yellowish brown (10YR 5/6) very moist, hard, no odor, mechanically weathered to SP, fine grained sandstone, trace iron oxide staining	Bd r c k	4804
7.0		0.0	50				5062
					Refusal on sandstone @ 7.0' bgs		NM
					Peeched GW from 6.0 - 6.5' bgs		
8.0							
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: 5A	Group: 4	Location ID: 182	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: two 1/2 Gallon Bags (30218) - NO sample			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: NA 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					NO SAMPLED NO COLLECTED - Boring not advanced - Located in likely remediation zone (LRZ)		
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: 5A	Group: 4	Location ID: 183	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: (30219) - no sample two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		NA 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)
0.5					NO SAMPLED - Boring not advanced - Located in likely remediation zone (LAZ)		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG



5A_184

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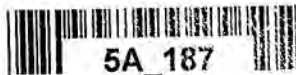
Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: <u>4</u>	Location ID: <u>184</u>	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: <u>NA</u> ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: <u>(30220) - no sample + (30221) - no sample</u>			
Geologist:				Checked By / Date:			
Radiological Background: <u>NA</u>		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		<u>NA</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)
0.5					NO SAMPLED - Boring not advanced - Located in sensitive Biological habitat (vernal pool)		
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: 5A	Group: 4	Location ID: 185	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: two 1/2 Gallon Bags (30222)-no sample + (30223)-no sample			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: NA 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					NO SAMPLED - Boring not advanced - Located in likely remediation zone (LRZ)		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 186	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11 / 1323		Date/Time Total Depth Reached 3-2-11 / 1331	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (#30224) (1330)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-15-11			
Radiological Background 2		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)			
Depth	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'				0.4 12	Silty sand with gravel, (10YR, 3/2), dark brown, 50% fine to coarse grained sand, 30% silt, 20% gravel (asphalt, fill gravel), moist-wet, medium dense, no odor. A ^{oe} Soil saturated.	SM	

Project Name: SSEL Area IV Radiological Study		Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 4	Location ID: 186
Drilling Company: Boert Longyear		Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 4.5
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4/7/11 12:15	Date/Time Total Depth Reached: 4/7/11 13:10
Type of Sampling Device: 1 3/4" macrocore acetate liner		Samples Collected: 30225 (1220) (1) 1/2 gallon bags 30412 (VT)		
Geologist: C. Knight		Checked by/Date: Chelsea Carmichael / 6-16-11		
Radiological Background: 60 / 2489		Radiological Equipment Used: Pancake / Downhole		PID Used: MiniRAE 2000 (Bkgd: 0.2 ppm)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					AF: Artificial fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface (Soil), former UST location		2684
0.5			0.2	65			3575
			0.3	64	Fill: Silty Sand: Olive brown (2.5Y 4/4), moist, medium dense, no odor, 10% coarse sand, 5% fine gravel, 40% silt, 20% medium sand, 2.5% fine sand, trace mottling	AF / SM	4412
1.0			0.3	65			5026
			0.3	66			5167
2.0			0.3	63			5086
			0.3	67	2' 1" Fill: Silt: dark olive brown (2.5Y 3/3), very moist, no odor, 10% angular medium to fine gravel, 90% silt, cohesive, low plasticity	AF / ML	5050
3.0			0.3	60			4447
			0.3	58			4901
4.0			0.3	58	4' 2" Sandstone: Yellow (2.5Y 7/6), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone		4862
			0.3	63			5675
5.0					Refusal on sandstone at 4.5' bgs No GW encountered		



BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 187	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/1432		Date/Time Total Depth Reached 3-2-11/1440	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30226) (1440)			
Geologist C. Carmichael				Checked by/Date [Signature] 4/15/11			
Radiological Background #10		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.5 ppm)			
Depth	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'				0.5/12	1" of weathered asphalt. Sand, (10YR, 4/6), orangeish-brown, 90% fine to coarse grained sand, 10% silt, trace gravel, moist-wet, medium dense, no odor. Silt at 6" depth and below. Groundwater encountered at ~4"	SW	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 4	Location ID 187
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.5'
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-11-11 1435	Date/Time Total Depth Reached 4-11-11 1465
Type of Sampling Device 1 3/4" macrocore acetate liner			Samples Collected 30227 (1446) (1) 1/2 gallon bags	
Geologist C. Knight			Checked by/Date Chelsea Carl / 6-15-11	
Radiological Background S1 / 2359		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
					AF: Artificial fill (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil, former VST location		2374 (CPM)
0.5		0.0	45		Fill: Silty Sand: dark yellowish brown (10YR 4/4) moist, medium dense, no odor, 35% silt, 5% coarse sand, 10% medium sand, 50% fine sand; trace angular gravel.	AF/SM	2459
1.0		0.0	50				3924
		0.0	47				4808
		0.0	55				5052
2.0		0.0	59				5089
		1.1	57				4625
3.0		1.7	55		2' 8" Fill: Silty Sand (CL) poorly graded sand with silt: light olive brown (2.5Y 5/4), moist, medium dense, no odor, 20% silt, 5% coarse, 25% medium sand, 50% fine sand	AF/SP/CL	4379
		1.3	63		3' 4" Fill: Silty Sand (CL) poorly graded sand with silt: greenish gray (6.5Y 1/1), very moist, medium dense, no odor, 15% silt, 5% coarse sand, 70% fine sand, 70% medium sand	AF/SP/CL	4132
4.0		1.3	63				3868
		1.3	55				4193
5.0		1.2	53		Fill: Silt with Sand: Very dark gray (2.5Y 3/1), very moist, medium stiff, no odor, 25% medium sand (greenish gray), 75% silt, non cohesive, low plasticity, mottled with medium sand packets.	AF/ML	4369
		3.0	60		Perched GW on sandstone		4230
6.0		0.1	55		contact at 6' by 5'		4782

Radiological Background <u>51/2359</u>				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>187</u>	
Depth	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
							Inches (CPM)
6.0			0.1	55	Sandstone: dark greenish gray (Gley 1.4/5.6), moist, dense, ^{slight} odor, mechanically weathered to SP, fine grained sandstone	SP, 2/4	4230
			0.1	63			4782
7.0					Refusal on sandstone at 6.5' bgs Perched GW @ 5' 7" on top of sandstone		
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 188	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/1354		Date/Time Total Depth Reached 3-2-11/1405	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30228) (1405)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-16-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.5 ppm)			
Depth	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'				0.612	Silt with sand, (10 YR, 3/3), dark brown, 80% silt, 15% fine grained sand, 5% gravel (fill and asphalt), semi-moist, stiff, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 188
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-11-11 1035	Date/Time Total Depth Reached 4-11-11 1140
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30229 (10410) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Carmichael / 6-16-11		

Radiological Background 52 / 2742	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bgkd: 0.3 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface Soil, former VST location	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5			0.2	57	Fill: Silty Sand: dark yellowish brown (10YR 4/4)	AF	2996
			0.2	55	moist, medium dense, no odor, 10% fine gravel, 40% silt, 50% fine sand	SM	4226
1.0			0.2	57			4979
			0.2	58			5048
2.0			0.2	60	1' 9" Fill: Silt with gravel: very dark grayish brown (10YR 3/2), moist, medium stiff, no odor, 10% fine sand, 15% siltstone gravel, 75% silt, cohesive, low plasticity	AF / ML	5125
			0.2	67			5174
3.0			0.2	60	3' siltstone gravel		4997
			0.3	63		AF / ML	4940
4.0			0.3	67	3' 9" siltstone gravel 1/2" thick, 1 3/4" diameter		4984
			0.3	68	4' 7" coarse sandstone gravel with iron oxide staining		5203
5.0			0.3	65	Sandstone: Greenish gray (5Y 4/5 G), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone		4897
			1.8	70	Refusal on sandstone @ 5.5' bgs. No GW encountered, perched GW above sandstone		4191

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 189	
Drilling Company HGL		Driller S. Williford		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-2-11/1413		Date/Time Total Depth Reached 3-2-11/1420	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30230) (1420)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 4/15/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background = 0.0ppm)			
Depth	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'				0.6 11	Silty sand, (10YR, 4/3), brown, 65% fine to coarse grained sand, 30% silt, 5% gravel fill, moist, medium dense, no odor. No groundwater encountered.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number: EP0038.01.22.04.03	Subarea ID & Group: SA group 4	Location ID: 189
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 9.5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-11-11 0850	Date/Time Total Depth Reached: 4-11-11 1020
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30231 (0900) (1) 1/2 gallon bags		
Geologist: C. Knight		Checked by/Date: Charles Caniff 16-15-11	
Radiological Background: 52 / 2267	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil, former VST location	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5		0.0	50	45	Fill: Poorly graded sand with gravel: Brown (10YR 5/3), moist, medium dense, no odor, 15% angular fine gravel, 5% coarse sand, 10% medium sand, 70% fine sand	AF	2739	
1.0		0.0	58	50		SP	3661	
		0.0	64	58		SP	4613	
2.0		0.0	63	64			5077	
		0.0	63	63			4962	
3.0		0.0	65	65	3' 5" Artificial Fill: Silt: dark yellowish brown (10YR 4/4), very moist, medium stiff, no odor, 10% fine sand, 90% silt at 4' bags hydrocarbon odor noted	AF	4985	
4.0		0.0	69	69		ML	4903	
		0.0	72	72		AF	4787	
5.0		0.0	75	75	Fill: Silt with sand: Very dark greenish gray (Gley 1 10Y 3/1), very moist, medium stiff, strong hydrocarbon odor (heavy end, diesel fuel), 15% fine sand, 85% silt, cohesive, low plasticity,	AF	4831	
		0.0	77	77		ML	4719	
		0.0	80	80			4688	
6.0		0.0	73	73			4646	
		0.0					4622	

Radiological Background 52 / 2267cpm				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 189	
Depth	Interval	Recovery	PTD	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
						Inches	(CPM)
6.0			3.6	73	Same as above	AP	4622
			10.0	64		ML	4682
7.0			5.1	58	7'0" metal wire		4565
			21.6	80	7'9" large asphalt fragment - 2" diameter		4618
8.0			138	68		AP	4666
			10.3	57		ML	4301
9.0			132	74	9'2" 2" diameter concrete debris		4627
			233	83	9'4" Sandstone: grayish green (Gley 1 5G 4/2), moist, hard, hydrocarbon color, mechanically weathered from to SP, fine grained sandstone		5240
10.0					Refusal on sandstone at 9.5' bgs		
					No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: 4	Location ID: 190	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached: 2-22-2011	
Type of Sampling Device:				Samples Collected: two 1/2 Gallon Bags (30232) - no sample			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: NA 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					NO SAMPLES COLLECTED		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

- Boring not advanced
- Deleted M.A. 20110222
- Reduce sample density within sewer junction box. One sample collected from Location 191

adequately characterized the junction box. JFW

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 191	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11/1436		Date/Time Total Depth Reached 3-1-11/1446	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30233) (1445)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-16-11			
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bgcd: 0.2 ppm)			
Depth	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'				0.3 10	Silty sand with gravel Sand with gravel and silt, (10 YR, 3/3), 65% fine to coarse grained subrounded sand, 20% silt, 15% gravel fill, wet, loose, no odor.	SW Sm	
					Soil saturated with water.		

SSFL BORING LOG



Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: <u>4</u>	Location ID: <u>192</u>
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: <u>NA</u> ft bgs.
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached: <u>2-22-2011</u>
Type of Sampling Device:				Samples Collected: two 1/2 Gallon Bags <u>(30234) - no sample</u>		
Geologist:				Checked By / Date:		

Radiological Background: <u>NA</u>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: <u>NA</u> 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						NO SAMPLE COLLECTED - Boring not advanced - Deleted MA. 20110222 - Reduced sample density within Sewer Junction box. One sample collected from location 191 adequately characterized the Sewer Junction Box. TBS			
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: 5A	Group: 4	Location ID: 193	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached: 2-22-2011	
Type of Sampling Device:				Samples Collected: two 1/2 Gallon Bags (30235) - no sample			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: NA 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					NO SAMPLED			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

- Boring not advanced

- Deleted MA 20110222

- Reduced sample density within sewer junction box. One sample collected from Location 191 adequately characterized the sewer junction Box.

POA

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 194	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel / shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11/1458		Date/Time Total Depth Reached 3-1-11/1505	
Type of Sampling Device trowel / shovel				Samples Collected 2 1/2 gall bags (# 30236) (1505)			
Geologist C. Carmichael				Checked by Date Chelsa Carmichael / 6-16-11			
Radiological Background 10		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.4 ppm)			
Depth	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'				0.4 11	Well graded sand with silt and gravel Gravelly sand , (10 YR, 2/2), dark brown, 60% fine to coarse grained sand, 30% gravel (pea gravel-fill), 10% silt, moist, loose, no odor.	SW	
No groundwater encountered.							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 195	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 3-1-11/1516		Date/Time Total Depth Reached 3-1-11/1525	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30237) (1525)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael 16-16-11			
Radiological Background 10		Radiological Equipment Used up Rntr		PID Used Mini Rac 2000 (Bkgd: 0.4 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.4/10	Sandy silt, (10YR, 3/3), dark brown, 65% silt, 35% fine to coarse grained sand, moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 196	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trawl / shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/0834		Date/Time Total Depth Reached 2-22-11/0845	
Type of Sampling Device trawl / shovel				Samples Collected 2 1/2 gall bags (#30238)(0845)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-16-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 12	3" of asphalt on top. Sandy silt with rock fragments, (10 YR, 3/4), brown, 50% silt, 30% fine grained sand, 20% rock fragments (sandstone, asphalt, gravel), semi-moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A_group4		Location ID 197	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/0906		Date/Time Total Depth Reached 2-22-11/0915	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30239) (0915)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-16-11			
Radiological Background 11		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)		
Depth	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 Inches (CPM)
0.5'				OD 11	Silt with sand and rock fragments (10YR, 3/3), brown, 65% silt, 20% fine grained sand, 15% cobbles (rounded), moist, soft, common rootlets, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 197
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-23-11 1110	Date/Time Total Depth Reached 3-23-11 1230
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30340 (1115) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chadler C. 1/6-15-11		

Radiological Background 53 / 2653	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches 10.5 2440 CL 2480 (CPM) 2700
0.5			0.0	54	Surface: grain and soil		2700
1.0			0.0	65	Fill: Silty Sand: dark yellowish brown (10YR 3/6), moist, medium dense, no odor, 5% angular fine gravel (fill rock), 30% silt, 10% medium sand, 5% coarse sand, 80% fine sand, trace mottled texture, trace rootlets near surface	SM	4799 4005
2.0			0.0	53			5024 4756
			0.0	55			5008 5125
			0.0	50			4785 5088
3.0			0.0	65	2'2" Silty Sand CL Poorly sorted sand w/ silt: dark yellowish brown (10YR 3/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand, rapid dilatancy	SP SM	5120 5288
			0.0	66			5127 5240
4.0			0.0	65	3'5" Silty Sand: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 10% coarse sand, 10% medium sand, 30% silt, 5% clay, 45% fine sand	SM	5086 5319
			0.0	71			5162 5477
			0.0	68			5255 5288
			0.0	65			5287 5354
5.0			0.0	73			5229 5385
			0.0	55			5142 5521
			0.0	60			
			0.0	72			
			0.0	55			
			0.0	65			
			0.0	75			
6.0			0.0	75			
			0.0	80			

Radiological Background 53/2653				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 197	
Depth	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	55	Same as above: Silty Sand	SM	5740 5521
			0.6	80			5107 5844
			0.7	85			
7.0			0.0	85	Sandy Silt w/ clay: yellowish brown (10YR 5/6), moist, medium stiff, no odor, 15% clay, 35% fine sand, 50% silt, cohesive, low plasticity, low toughness	ML	4428 6048
			0.0	75			
			0.0	58			5082 5925
			0.0	80			
8.0			0.0	74	weathered siltstone. Pale yellow (2.5Y 7/4), moist, hard, no odor, mechanically weathered to ML, cohesive, low plasticity, low toughness, interbedded layers of siltstone and mudstone.	SC	5015 6260
			0.0	85			
			0.0	66			5008 6224
			0.0	68			
9.0			0.0	67	weathered sandstone: light olive brown (2.5Y 5/6), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone	CL	5098 6242
			0.0	63			
			0.0	82			5113
							CL
10.0					Refused @ 9.5' by son sandstone/siltstone		
					No GW encountered		
11.0							
12.0							
13.0							

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 4	Location ID: 198
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 4.0'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-23-11 1335	Date/Time Total Depth Reached: 3-23-11 1415
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30241 (1345) (2) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Chelsea Carnicchia/6-16-11		

Radiological Background: 45 / 2510	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	55	Surface: Soil + grass		+0.5' 2400 3183
0.5			0.0	90	Fill: Silty Sand: Dark yellowish brown (10YR 4/6), moist, loose, no odor, 35% silt, 5% angular sandstone gravel, 10% medium sand, 60% fine sand, mottled	AF/SM	4639
1.0			0.0	55	1.0' Silty Sand: Dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 5% coarse, 5% medium sand, 30% silt, 60% fine sand	SM	5055
			0.0	65			5040
2.0			0.0	50	Silty gravel w/ sand: Brownish yellow (10YR 6/8) to Dark yellowish brown (10YR 4/6), moist, dense, no odor, intact	GM	5296
			0.0	60	Siltstones and sandstones weathered w/ silty sand mixed thruout. In-situ, 25% sandstone, 30% siltstone, 20% silt, 25% fine sand, inundated weathered bedrock zone		5383
3.0			0.0	45	3.0-4.0' Weathered Sandstone w/ siltstone: Olive yellow (2.5Y 6/6), moist, hard, no odor, mechanically weathered to SP & ML	SP & ML	5616
			0.0	60	20% siltstone beds, 80% fine sand		6065
4.0			0.0	50	refusal at 4.0' on sandstone		6014
					No GW encountered		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 4	Location ID: 199
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 3.5
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-24-11 0820	Date/Time Total Depth Reached: 3-24-11 0850
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30242 (0830) (2) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Chelsea Carmichael 16-16-11		

Radiological Background: 48 / 266	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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)
							Inches
			0.0	70	Surface: grass and soil		2794
			0.0	67	Fill: Silty Sand: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 30% silt, 5% coarse, 10% angular gravel and asphalt, 20% medium sand, 35% fine sand, trace asphalt and rootlets	AF/SM	3201
0.5			0.0	81	Silty sand: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 35% silt, 5% coarse, 10% medium sand, 50% fine sand	SM	4719
1.0			0.0	75			5390
			0.0	55	1' 8" Clay w/ silt and sand: yellowish brown (10YR 5/6), moist, stiff, no odor, 20% silt, 15% fine sand, 5% medium sand, 5% fine sand, 65% clay, cohesive, low plasticity	CL	5783
2.0			0.0	65	2' 3" Weathered siltstone: Very pale brown (10YR 7/4), dry, hard, no odor, mechanically weathered to ML, inter bedded siltstone and mudstone beds 20% clay, 80% silt		6118
			0.0	80	2' 9" Weathered sandstone: Very pale brown (10YR 7/4), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone	SP	6956
3.0			0.0	75			6826
					refusal on sandstone at 3.5' bgs		NM
4.0					No GW encountered		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 4	Location ID: 200
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 6.0
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-23-11 1440	Date/Time Total Depth Reached: 3-23-11 1530
Type of Sampling Device: 13 1/4" macrocore acetate liner	Samples Collected: 30243 (445) (2) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Chelsea Cornwall / 6-16-11		

Radiological Background
38 / 2516

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
0.5		0.0	0.0	40	Surface: native soil		40.5 2440
1.0		0.0	0.0	50	Sandy silt: Brownish yellow (10YR 6/8), moist, med. dense, no odor, 35% fine sand, 65% silt, non cohesive, low plasticity, trace rootlets	ML	3252
1.2		0.0	0.0	40	12" Sandey Clayw/silt: Yellowish brown (10YR 5/6), moist, sh. fl., no odor, 10% coarse sand, 5% medium, 15% fine sand, 15% silt, 55% clay, cohesive, low plasticity	CL	4815
2.0		0.0	0.0	65			5251
2.0		0.0	0.0	75			5532
3.0		0.0	0.0	80	2' 10" weathered siltstone: Pale yellow (2.5 Y 7/4), ^{ck} dry, hard, no odor, mechanically weathered to ML, 85% silt		5460
3.0		0.0	0.0	80	15% clay, trace bits of weathered clay stone		5207
4.0		0.0	0.0	55	4' weathered Sandstone: Yellow (2.5 Y 7/6), dry, ^{very} dense, no odor, mechanically weathered to SP, fine sand		5061
4.0		0.0	0.0	60			5159
5.0		0.0	0.0	65	-increase density of weathered Sandstone w/ depth		5050
5.0		0.0	0.0	50			5163
6.0		0.0	0.0	60			5067
							5072
							5064

refusal on sandstone @ 6' bgs
No LW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 4		Location ID 201	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 2.5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-23-11 0820		Date/Time Total Depth Reached 3-23-11 0850	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30244/0830 (2) 1/2 gallon bags			
Geologist C. L. Wright				Checked by/Date Chelsea Carmichael 16-16-11			
Radiological Background 50 / 2400		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 00 ppm)			

Depth	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	86	Surface: Soil and grass		405 2346
0.5			0.0	85	Fill: Silty Sand: Yellowish brown (10YR 5/6), moist, med. dense, no odor 40% silt, 5% coarse, 5% medium sand, 5% fine angular fill rock gravel crushed; 45% fine sand, trace rootlets	AF / SM	4011
1.0			0.0	63			4388
			0.0	85	17" weathered sandstone: Olive yellow (2.5Y 6/6), moist, hard, no odor, mechanically weathers to SP, fine grained sandstone	SP	4371
2.0			0.0	75			4741
			0.0	68	refusal on sandstone 2.5' bgs no GW encountered		4797

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 4	Location ID 202
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-12-11 1325	Date/Time Total Depth Reached 4-12-11 1415
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30245 (1330) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelva Carrincha / 6-16-11		

Radiological Background 61 / 2813	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches +0.5 2592 (CPM)
			0.0	45	surface: soil in Asphalt v-ditch (1" thick)		
0.5			0.0	65	Silt with Sand: dark yellowish brown (10YR 3/6), moist, silt, no odor, 10% fine sand, 90% silt, trace rootlets, non cohesive, low plasticity, low toughness	ML	2741 4135
1.0			0.0	58	Silty Sand: strong brown (7.5YR 5/8), moist, medium dense, no odor, 5% coarse sand, 10% medium sand, 35% silt, 10% clay, 40% fine sand	SM	4691 4989
2.0			0.0	60			5099
			0.0	60	2' 8" Abundant iron oxide staining		5194
3.0			0.0	62	Weathered Sandstone: light yellowish brown (2.5Y 6/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace rootlets, trace iron oxide staining	SP	5125 5297
4.0			0.0	63			5066
5.0					Refusal on sandstone at 4.0' hrs No GW encountered		

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 203
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 110
Drilling Equipment: Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-12-11 1535	Date/Time Total Depth Reached 4-12-11 1550
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30246 (1540) NO SAMPLE (1) 1/2 gallon bags (CK)		
Geologist C. Knight	Checked by/Date Charles Knight 4-16-11		

Radiological Background
53 / 2548

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.1 ppm)

Depth	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 Inches 10.5 2613 (CPM)
0.5		0.1	55		2" Asphalt: Silt CK		3190
		0.1	62		Silt: dark brown (10YR 3/3), moist, med stiff, no odor, 10% fine sand, 10% clay, 80% silt, low plasticity, noncohesive	ML	4347
1.0		0.1	61		Sandstone: Olive (5Y 5/6), moist, dense, no odor, fine grained sample	GS	4466
2.0					Refused on sandstone 1.0' bgs No GW encountered No Sample collected for Lab		
3.0							
4.0							
5.0							
6.0							

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study		Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 4	Location ID: 204
Drilling Company: Boart Longyear		Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: CK 5.0 5.0
Drilling Equipment: Geoprobe 6600		Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-13-11 0825	Date/Time Total Depth Reached: 4-13-11 0930
Type of Sampling Device: 1 3/4" macrocore acetate liner		Samples Collected: 30247 (0830) 1 (2) 1/2 gallon bags		
Geologist: C. Knight		Checked by/Date: Chelsea Carmichael / 6-16-11		
Radiological Background: 45 / 2421		Radiological Equipment Used: Pancake / Downhole		PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
			0.2	58	Surface: grass and soil		10.5 2562
0.5			0.2	58	Sandy Silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 30% fine sand, 5% clay, 65% silt, low plasticity, low toughness, ^{cl} cohesive	ML	2982
1.0			0.2	55			4269
			0.2	55			4611
			0.2	55			4768
2.0			0.2	60			4798
			0.2	62	2'4" Poorly graded sand with silt: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 25% silt, 5% medium sand, 70% fine sand,	SP	4974
3.0			0.2	62	2'5" rapid dilatancy		5055
			0.2	58	Sandy clay with silt: Brown (7.5YR 4/4), moist, medium stiff to stiff, no odor, 5% coarse sand, 10% medium sand, 15% fine sand, 15% silt, 65% clay, cohesive, low plasticity, medium toughness	CL	5168
4.0			0.2	65			5141
			0.2	63	4'3" Silty Sand: dark yellowish brown (10YR 4/4), moist, dense, no odor, 5% coarse sand, 10% medium sand, 30% silt, 65% fine sand, trace pin hole pores	SM	5362
5.0			0.2	70			5019
5.0					Refusal on Silty Sand at 5.0' bgs No GW encountered		

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 205
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-13-11 0958	Date/Time Total Depth Reached 4-13-11 1115
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30248 (1000) 1 (2) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date D. Hansen 4/16-11		
Radiological Background 40 / 2587		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches (CPM)
					Surface: Soil and grass		10.5' 2649
0.5			0.0	55	Silty Sand: Brown (7.5YR 4/4), moist, medium dense, no odor, 5% coarse sand, 10% medium sand, 30% silt, 55% fine sand, pin hole pore	SM	3019
1.0			0.0	60			4219
			0.0	62			4620
			0.0	64			4750
2.0			0.0	66			4904
			0.0	70	2' 5" Sandy clay with silt: strong brown (7.5YR 5/6), moist, med. dense, no odor, 5% coarse sand, 10% medium sand, 20% fine sand, 15% silt, 50% clay.	CL	4984
3.0			0.0	67			4941
			0.0	65	3' 3" Silty Sand: Brown (7.5YR 5/4), moist, med. dense, no odor, 10% coarse sand, 10% medium sand, 30% silt, 50% fine sand	SM	4830
4.0			0.0	68			4848
			0.0	43			5077
5.0			0.0	40	(CL) with silt		4906
			0.0	40	Poorly graded sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% silt, 90% fine sand, trace iron oxide staining	SP	5052
6.0			0.0	40			4929

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 206
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-12-11 1440	Date/Time Total Depth Reached 4-12-11 1525
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30249 (1445) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date Chelsea Carmichael / 6-16-11		
Radiological Background 45 / 2495		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					surface: grass + soil		+0.5' 2476
0.5		0.1	45		5' ^{ck} Silty Sandy silt: Dark yellowish brown (10YR 3/4), moist, med. stiff, no odor 30% fine sand, 5% medium sand, 5% clay, 60% ^{ck} silt, non cohesive, low plasticity	ML	3226
1.0		0.1	52				4469
		0.1	50				4745
		0.1	56				4795
2.0		0.1	57				4961
		0.1	57				4946
3.0		0.1	60		3' 0" Silty clay: Yellowish brown (10YR 4/4), moist, stiff, no odor, 35% silt, 10% fine sand, 55% clay, cohesive, low plasticity, medium toughness	CL	5037
		0.1	64				5011
4.0		0.1	65				5096
		0.1	62		4' 10" Weathered Sandstone: light yellowish brown (2.5Y 6/4), moist, dense, no odor, mechanically weathered to SP fine grained sandstone		5206
5.0		0.1	68				5237
Refusal on sandstone at 5.0' bgs No GW encountered							

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A Group 4		Location ID 207	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 4.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 7-12-11 1125		Date/Time Total Depth Reached 7-12-11 1215	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30250 (1130) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Carmichael/6-16-11			
Radiological Background G1 / 2540		Radiological Equipment Used Pancake / Dologhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
					Surface: grass		70.5' 2637
0.5		0.1	40		Silt w/ sand; Brown (7.5YR 4/2), moist, medium stiff, no odor, 20% fine sand, 80% silt, non cohesive, low plasticity, trace roots and rootlets	ML	2943
1.0		0.1	47				3992
		0.1	55				4590
		0.1	65				4684
2.0		0.2	60				4740
		0.2	58		Silty Sand; Yellowish brown (10YR 5/6), moist, medium dense, no odor, 35% silt, 65% fine sand	SM	4848
3.0		0.2	51		2' 8" weathered: Siltstone and Sandstone; Siltstone strong brown (7.5YR 5/8), moist, hard, no odor, Thin 2mm laminae of siltstone	SP	5005
		0.2	48		weathered Sandstone; Brownish yellow (10YR 6/8), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone		5017
4.0		0.2	52		Refusal on Sandstone at 4.0' bgs No GW encountered		5621
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 208
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-28-11 1600	Date/Time Total Depth Reached 8-28-11 1700
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30251 (1615) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Dail 10-16-11		

Radiological Background
47 / 2646

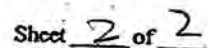
Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 0.1 ppm)

Depth	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)
					Artificial Fill		10.5' 2727
					Surface: grass and soil		3782
0.5			0.1	35	Silty sand: dark yellowish brown (10YR 3/6), moist, medium dense, no odor, 35% silt, 10% coarse sand, 10% medium sand, 40% fine sand, 5% fine gravel (3/16 in. angular fill rock)	AF, SM	4935
1.0			0.1	45			5107
			0.1	60			5286
2.0			0.1	45	2.0' Sandy silt: dark, ellavish brown (10YR 4/6) very moist to saturated, medium stiff, no odor, 40% fine sand, 60% silt, soil pumps when touched, low plasticity, slow dilatancy, non-cohesive	ML	5220
			0.1	40			5250
3.0			0.1	50			5220
			0.1	55	3' 5" Silty sand with clay: strong brown (7.5YR 5/6), moist, medium dense, no odor, 5% coarse sand, 15% clay, 80% medium sand, 30% silt, 40% fine sand	SM	5476
4.0			0.1	70			5358
			0.1	75			5411
5.0			0.1	65			5415
			0.1	60			5432
6.0			0.1	70			5478



BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP0038.01.22.04.03		Subarea ID & Group 5A group 4		Location ID 209	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-28-11 1509		Date/Time Total Depth Reached 3-28-11 1555	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30252 (1510) 10 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Carmichael / 6-16-11			
Radiological Background 47 / 2508		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.1 ppm)			

Depth	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 Inches (CPM)
0.0			0.1	40	surface (grass and soil)		+0.5' 2540
0.5			0.1	75	Silty sand; yellowish brown (10YR 5/8), moist medium dens, no odor, 35% silt, 65% fine sand	sm	4183
1.0			0.1	65			4859
			0.1	75			5033
2.0			0.1	50			5162
			0.1	75			5283
3.0			0.1	60	3' 1" Sandy silt; dark yellowish brown (10YR 4/6), moist medium stiff, no odor, 40% fine sand, 60% silt, low plasticity, non cohesive	ML	5234
			0.1	70			5558
4.0			0.1	50	4' 3" Weathered siltstone; yellow (10YR 7/8), dry, very stiff, no odor, mechanically weathered to ML, interbedded layers of siltstone	SP	5827
			0.1	70			5751
5.0			0.1	50	Weathered sandstone; yellow (10YR 7/8) dry, dense, no odor, mechanically weathered to SP, fine grained sandstone		6125
					Refusal on sandstone at 5.0' bgs		
					No GW encountered		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 4	Location ID 210
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 2-22-11/1311	Date/Time Total Depth Reached 2-22-11/1321
Type of Sampling Device trowel/shovel	Samples Collected 2 1/2 gall bags (#30253) (1320)		
Geologist C. Carmichael	Checked by/Date Chelsea Carmichael / 6-16-11		

Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.5'			0.0	12	Silty sand, (10YR, 3/6), brown, 55% fine to medium grained sand, 35% silt, 10% rock fragments (sandstone, asphalt, pea gravel), semi-moist, medium dense, no odor. No groundwater encountered.	SY	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA group 4	Location ID 210
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 25'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-28-11 0820	Date/Time Total Depth Reached 3-28-11 0850
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30254 (0830) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Richard Paul / 6-16-11		

Radiological Background NA / 2761	Radiological Equipment Used Pencake / Downhole	PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					AF: Artificial Fill		10.5' 2621
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		3256
0.5		0.1	95		Surface: soil and gran	AF	4532
1.0		0.1	65		Silty Sand: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 30% silt, 10% coarse, 10% med. fine sand, mottled, trace asphalt near surface	SM	5120
		0.1	70				5284
2.0		0.1	65		1 1/4" weathered sandstone; Brownish yellow (10YR 6/8), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone	SP	5595
		0.1	70				5513
3.0					Refusal on sandstone at 2.5' by 5		
4.0					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 211	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/1332		Date/Time Total Depth Reached 2-22-11/1341	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30255) (1340)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-16-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (Bkgd: 0.0 ppm)			
Depth	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 12	Silt with sand and clay, (10 YR, 3/4), brown, 50% silt, 25% fine to medium grained sand, 20% clay, 5% rock fragments (asphalt, sandstone), semi-moist, medium stiff, some rootlets, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 211
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-28-11 0910	Date/Time Total Depth Reached 3-28-11 0955
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30256 (0915) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Charles Paul / 6-16-11		

Radiological Background 34 / 2713	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.3 ppm)
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Depth	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)
							Inches
							105' 2578
							3573
0.5			0.3	40	Surface 5' red and soil Fill		
			0.3	50	Silty clay with sand: Brown (10YR 5/3) moist, stiff, no odor, 20% fine sand, 5% angular asphalt gravel, 30% silt, 45% clay	AF/CL	4741
1.0			0.3	65	Weathered siltstone: light olive brown (2.5Y 5/4); dry, medium stiff, no odor, mechanically weathered to ML, low plasticity, cohesive, iron oxide staining	SP	5284
			0.3	75			5598
2.0			0.3	70			5170
			0.3	60			5807
3.0			0.3	45	Weathered sandstone: Pale yellow (2.5Y 7/4); dry, hard, no odor, mechanically weathered to SP, fine grained sandstone, iron oxide staining		5858
			0.3	55			6090
4.0					Refusal on sandstone at 3.5' by 5		
					No GW encountered		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 212	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/1410		Date/Time Total Depth Reached 2-22-11/1421	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30257)(1420)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-16-11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (Bkgd: 0.0 ppm)			
Depth	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	13	Clayey sand, (10 YR, 6/2), light olive-brown, 60% fine to medium grained sand, 30% clay, 10% rock fragments (sandstone, gravel, asphalt), common rootlets, dry, medium stiff, no odor. No groundwater encountered.	SC	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 212
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth CK 18" 2.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-25-11 1040	Date/Time Total Depth Reached 3-25-11
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30358 (1045) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Cornish 6-16-11		

Radiological Background
42 / 2890

Radiological Equipment Used
Pancake / Downhole

PID Used
MiniRAE 2000 (Bkgd: 0.4 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.4	65	Surface: grass + soil Silty sand: Yellowish brown (10YR 5/6), moist, med dense, no odor, 30% silt, 70% fine sand	SM	3114	40.5 2664
1.0			0.4	65	Sandstone, weathered: light olive brown (2.5Y 5/6), moist, hard, no odor, mechanically weathered to SP, fine grained sand stone	SP	4325	4757
2.0			0.4	45			5015	
2.0			0.4	50			4932	
3.0					Refusal on sandstone at 2.0' bgs			
4.0					No GW encountered			
5.0								
6.0								

BORING LOG

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 213
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-25-11 0840	Date/Time Total Depth Reached 3-25-11 1015
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30259 (0845) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea C. Knight 16-16-11		

Radiological Background
43 / 2922

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkgd: 8.0 ppm)

Description

(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)

USCS Symbol

Borehole
Gamma Readings
Inches
(CPM)

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	80	with silt (OK)		10.5' 2864
					Surface: Soil and vegetation		4145
0.5			0.0	60	Poorly graded sand, dark yellowish brown (10YR 4/6), moist, loose, no odor	SP	5326
					10% silt; 80% medium sand, 10% fine sand		
1.0			0.0	70	Silty sand: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 5% coarse sand, 35% silt, 10% medium sand, 50% fine sand, abundant iron oxide staining	SM	5513
			0.0	65			5771
2.0			0.0	65			5770
			0.0	75			5706
3.0			0.0	40			5745
			0.0	40			5901
4.0			0.0	70			5943
			0.0	65	Same as above ML	SM	5945
5.0			0.0	70	Sandy silt: Yellowish brown (10YR 5/8), moist, medium stiff, no odor, 5% coarse sand, 10% medium sand, 25% fine sand, 60% silt, no dilatancy, low plasticity	ML	5902
			0.1	70			5748
6.0			0.1	75			6072

Radiological Background 43 / 2922				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 213		
Depth	Interval	Recovery	PTD	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	
							Inches	(CPM)
6.0			0.1	75	same as above	ML		6022
			0.1	65	5'6"			6017
7.0			0.1	70	Highly weathered siltstone: Pale yellow (2.5Y 7/4), moist, dense, no odor, interbedded siltstone beds with trace sandstone beds, abundant iron oxide staining	SL		6286
			0.1	65				6637
8.0			0.1	60				6235
			0.1	75	2" thick fine grained sandstone bed at 8'6" bgs			5874
9.0			0.1	55	Sandstone weathered: Pale yellow (2.5Y 7/4), moist, hard, no odor, fine grained sandstone refusal on sandstone at 9.0' bgs			5954
					No GW encountered			
10.0								
11.0								
12.0								
13.0								

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 4	Location ID 214
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 2-22-11/0834 ¹²³⁸	Date/Time Total Depth Reached 2-22-11/0845 ¹²³⁶
Type of Sampling Device trowel/shovel	Samples Collected 2 1/2 gall bags (#30260) ¹²³⁵ (0845 ¹²³⁵)		
Geologist C. Carmichael	Checked by/Date Chelsea Carmichael/6-16-11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	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	12	Sandy silt with rock fragments, (10YR 3/3) dark brown, 50% silt, 35% fine to coarse grained subrounded sand, 15% rock fragments (asphalt, sandstone, fill gravel), semi-moist, medium stiff, some rootlets, no odor. No groundwater encountered	ML	

BORING LOG

Sheet 1 of 2

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group GA group 4	Location ID 214
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.5
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-28-11 1140	Date/Time Total Depth Reached 3-28-11 1245
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30261 (1150) (2) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date Chelsea C. Knight / 6-16-11		
Radiological Background 56 / 2495		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.3 ppm)

Depth	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		0.3	65		Surface: asphalt debris and soil		CK 5226 4470
1.0		0.3	50		Fill: silty sand: yellowish brown (10YR 5/6), moist, medium dense, no odor, 35% silt, 10% coarse, 15% medium sand, 40% fine sand, trace asphalt near surface, mottled texture	AF, SM	CK 5195 5226
2.0		0.3	60				CK 5483 5195
3.0		0.3	65				CK 5248 5438
4.0		0.3	60				CK 5345 5248
5.0		0.3	55				CK 5188 5395
6.0		0.3	50		3'3" Sandy Silt: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 35% fine sand, 65% silt, non cohesive, low plasticity, slow dilatancy	ML	CK 5309 5188
7.0		0.3	46				CK 5302 5359
8.0		0.3	46				CK 5252 5302
9.0		0.3	75				CK 5193 5252
5.0		0.3	50		5'3" Silt with Sand: Brown (10YR 4/3), moist, medium stiff, no odor, 20% fine sand, 80% silt, iron oxide staining, cohesive, low plasticity, no dilatancy	ML	CK 5342 5133
6.0		0.3	50				CK 5376 5342
6.0		0.3	65				CK 5633 5376

Radiological Background 56 / 2495				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 214	
Depth	Interval	Recovery	PTD	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			0.3	65	Same as above	ML	5376
			0.3	46			5633
7.0			0.3	30			5663
			0.3	46			5651
8.0			0.3	65			5780
			0.3	40	8' 9" Weathered sandstone: light yellowish brown (2.5Y 6/4) dry, hard, no odor, mechanically weathers to SP, fine grained sandstone, iron oxide staining		5512
9.0			0.3	50			5731
			0.3	46			5611
10.0					End boring 9.5' hgs CK No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 215	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/1250		Date/Time Total Depth Reached 2-22-11/1300	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30262) (1300)			
Geologist C. Carmichael				Checked by/Date Chelsie Carmichael / 6-16-11			
Radiological Background 13		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)		
Depth	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 Inches (CPM)
0.5'			0.012		Sandy silt, (10 YR, 3/4), dark brown, 60% silt, 35% fine to medium grained sand, 5% rock fragments (sandstone, asphalt, some rootlets, semi-moist, medium stiff, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 215
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-28-11 1405	Date/Time Total Depth Reached 3-28-11 1500
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 302.63 (1410) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsie C. Hill / 6-16-11		

Radiological Background 52 / 2717	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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)
							Inches
							10.5' 2627
							3073
0.5		0.0	40		Surface: soil and gravel		
1.0		0.0	50		Fill: silty sand: dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 30% silt, 10% coarse sand, 15% medium sand, 5% fine angular gravel (fill rock), 40% fine sand, abundant mottling	AF / SM	4757
		0.0	55				5170
		0.0	60				5512
2.0		0.0	60				5291
		0.0	75		Sandy silt: Fill: Brown (10YR 4/3), moist, medium stiff, no odor, 35% fine sand, 60% silt, 5% angular gravel, mottled, sandstone and siltstone gravel	AF / ML	5204
3.0		0.0	65				5517
		0.0	60				5403
4.0		0.0	65				5448
		0.0	60				5388
5.0		0.0	60				5210
		0.0	30		5'6" weathered sandstone: yellow (2.5Y 8/6), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone		5205
6.0		0.0	40				5112

Radiological Background 521 2717				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 215	
Depth	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)
6.0			0.0	46	Same as above	3 1/2	5112
			0.0	90		mk	4999
7.0					Refusal on Sandstone at 6.5' bgs No GW encountered		
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 216
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-28-11 1000	Date/Time Total Depth Reached 3-28-11 1120
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30264 (1010) 1 (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Paul / 6-16-11		

Radiological Background
53 / 258

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkgd: 90 ppm)

Depth	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)
					AF: Artificial Fill		
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
0.0		0.0	45		Surface soil and grass		2995
0.5		0.0	30		Fill: Silty Sand: Dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 30% silt, 10% angular siltstone and asphalt gravel (fine to coarse gravel), 10% coarse sand, 15% medium sand, 45% fine sand, very mottled	AF, SM	4403
1.0		0.0	55				5130
		0.0	75				5361
2.0		0.0	55				5264
		0.0	75				504
3.0		0.0	80				4978
		0.0	85		3' 6" Silty sand with silt & dark yellowish brown (10YR 3/6), saturated to very moist, loose to medium dense, no odor, 80% fine sand, 20% silt	SP, SM	5028
4.0		0.0	60				4932
		0.0	50				4911
5.0		0.0	55		4' 10" Sandy silt: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 40% fine sand, 60% silt, non cohesive, no plasticity, trace roots	ML	4876
		0.0	30		5' 5" Poorly graded sand: light olive brown (2.5Y 5/3), saturated to very moist, no odor, fine grained sand (100%), loose	SP	4981
6.0		0.0	50				4995

Radiological Background <u>53/2581</u>				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>216</u>	
Depth	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
6.0			0.2	50	SP		4575
			0.0	55	SP		5240
7.0							
8.0							
9.0							
10.0							
11.0							
12.0							
13.0							

Same as above
6.3" Sandstone: Pale yellow (2.5 Y 7/4), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone, iron oxide staining
Refusal on sandstone @ 6.5' bgs
No GW encountered, some saturated zones at 6.0' and 4.0' bgs

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 4		Location ID 197 ⁶ 217	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-22-11/1442		Date/Time Total Depth Reached 2-22-11/1455	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30265)(1455)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-16-11			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	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'			0.012		Sandy silt Silt with sand (10 YR, 3/3), dark brown, 60% silt, 30% fine to medium grained sand, 5% clay, 5% rock fragments (sandstone), semi-moist, soft, no odor. Sandstone bedrock at ~5"-6" No groundwater encountered.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5A, group 4	Location ID 218
Drilling Company HGL	Driller J. McDaniel	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 2-22-11/1506	Date/Time Total Depth Reached 2-22-11/1517
Type of Sampling Device trowel/shovel	Samples Collected 2 1/2 gall bags (#30266)(1515)		
Geologist C. Carmichael		Checked by/Date Charles Carmichael/6-16-11	

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
0.5'			0.0	12	Sandy silt, (10 YR, 4/4), brown, 55% silt, 35% fine to medium grained sand, 10% rock fragments (sandstone), common rootlets, moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 219
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-29-11 1123	Date/Time Total Depth Reached 3-29-11 1152
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30198 (1125) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Charles Knight / 6-16-11		

Radiological Background
45 / 2820

Radiological Equipment Used
Pancake / Downhole

PID Used
Mini RAE 2000 (Bkgd: 0.1 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5			0.1	57	Surface soil and vegetation		10.5 2790
0.5			0.1	68	Fill: silty sand with gravel; very dark brown (7.5YR 2.5/3) to dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 30% silt, 15% sandstone/asphalt/concrete gravel, 15% medium sand, 10% coarse sand, 40% fine sand, mottled	AF / Sm	3608
1.0			0.1	72	6" bgs: fine concrete gravel ~1.5" thick		5123
			0.1	85			5598
			0.1	75			5800
2.0			0.1	85	Weathered Sandstone: Yellow (2.5Y 7/6), moist, hard, no odor mechanically weathered to SP fine grained sandstone	SP	6063
3.0							6123
4.0							
5.0							
6.0							

Target depth interval for sampling
5-10' bgs not reached
No GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 220
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-25-11 1203	Date/Time Total Depth Reached 3-25-11 1210
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30199 (1205) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Shelvia Carmichael 6-16-11		
Radiological Background 55 / 3070	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)	

Depth	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)
						Inches	
			0.0	75			10.5' 2705
			0.0	80			3469
0.5			0.0	80	Weathered Sandstone: Olive (5Y 4/3) to pale olive (5Y 6/3), moist, hard, no odor, mechanically weathered to SP fine grained sandstone, rounded grains, trace silt near surface		5196
1.0			0.0	80			5698
			0.0	100			5774
2.0			0.0	80			5736
3.0					* Refusal at 2.0' bgs on Sandstone * Target depth interval of 5-10' bgs not reached * No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A Group 1	Location ID: 221
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 4.5
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-29-11 1340	Date/Time Total Depth Reached: 3-29-11 1420
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30200 (1350) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Chelsea C. Call 16-16-11		

Radiological Background: 58 / 2856	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	45	Surface: Soil		3614
0.5		0.0	53		Fill: Poorly graded sand with gravel; dark brown (10YR 3/3) to Brown (10YR 5/3), moist, medium dense, no odor, 10% silt, 20% angular fine to coarse gravel (asphalt, concrete, fill rock, sandstone), 10% coarse sand, 20% medium sand, 40% fine sand, Abundant mottling and debris, trace charcoal	AF SP	5107
1.0		0.1	53				5534
		0.1	57				4803
2.0		0.1	60		1' 8" charcoal deposits	AF SP	3646
		0.1	63		2' 8" insulation debris and charcoal		2828
3.0		0.1	70		@ 3' large concrete gravel		3601
		0.1	68		3' 6" 1" lens of broken glass		8223
4.0		0.1	65		Weathered Sandstone: Pale olive (5Y 6/4), moist to very moist, dense to hard at depth, no odor, mechanically weathered to SP, fine grained sandstone	SP	3571
		0.1	67		Refusal on weathered sandstone at 4.5' bgs		4834
5.0					No GW encountered		

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A Group 3		Location ID 222	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 7.5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-30-11 0900		Date/Time Total Depth Reached 3-30-11 1010	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30201 (0906) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Charles Smith 6-16-11			
Radiological Background 40 / 2607		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkqd: 0.0 ppm)			

Depth	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 Inches (CPM)
					AF: Artificial Fill		40.5' 2679
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		2990
0.5			0.0	55	Surface Soil		
			0.0	46	Fill: Poorly graded sand with gravel; olive yellow (2.5Y 6/6), moist, medium dense, no odor, 10% coarse subangular sand, 15% angular gravel, 10% medium sand, 65% fine sand, mottled	AF/SP	4483
1.0			0.0	80			5342
			0.0	65	Fill:	AF/SP	5522
2.0			0.0	68	1' 9" Poorly graded sand: Pale olive (5Y 6/3), moist, medium dense, no odor, 10% angular sandstone gravel, 90% fine sand		5515
			0.1	55	Fill: Silty sand w/ gravel: dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 40% silt, 60% fine sand, slow dilatancy, no plasticity	AF/SM	5189
3.0			0.1	70	2' 11" Poorly graded sand: Olive gray (5Y 5/2), moist, dense, no odor, medium grained sand, Fill, 5% silt, 95% medium sand	AF/SP	5135
			0.1	75	Fill: Silty sand w/ gravel: dark yellowish brown (10YR 3/4), moist, medium dense, no odor, 20% angular gravel (fill rock), 30% silt, 50% fine sand, trace glass and carbon charcoal, mottled	AF/SM	5523
4.0			0.2	70			5508
			0.0	65	Fill: Poorly graded sand: Pale yellow (2.5Y 7/4), moist, dense, no odor, fine grained sand (100%)	AF/SP	5549
5.0			0.0	70			5628
			0.0	58	Fill Silty Sand: Very dark brown (10YR 2/2) very moist, medium dense, no odor, 40% silt, 60% fine sand	AF/SM	5571
6.0			0.0	60	6' 0" fine grained sand lens 1.5"		5453

Radiological Background 40/2607				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 222	
Depth	Interval	Recovery	PTD	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			6.0	60	3. (ty Sand with gravel) : light olive brown (2.5Y 5/3) moist, dense, no odor, fine grained sand, mottled, trace 3/4" fill	AF/SM	5453
			6.0	55	6" (crushed rock) gravel, 100% fine sand.		5608
7.0			6.0	82	Weathered Sandstone : Yellow (2.5Y 7/6), moist, hard, no odor, mechanically weathered to SP, 5% medium sand, 45% fine grained sandstone		5334
			6.0	80			5275
8.0					No GW encountered Refusal on sandstone at 7.5' bgs		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 223
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-24-11 0457	Date/Time Total Depth Reached 3-24-11 1120
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30267 (1000) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Cail / 6-16-11		

Radiological Background 41 / 2799	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.6 ppm)
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Depth	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 Inches +0.5' 2648 (CPM) 3123
0.5			0.1	65	Surface: grass + soil		
1.0			0.1	60	Fill: Sand with silt and gravel; light olive brown (2.5Y 5/4), moist, medium dense, no odor, 20% angular sandstone and concrete gravel (fine to coarse), 15% silt, 5% coarse sand, 60% fine sand	SP/Af	4621
			0.1	70			4736
			0.1	50			4774
2.0			0.1	80	at 2.5' bgs large concrete 1 3/4" diameter		5426
			0.1	65	at 3' angular silt/clay/sandstone gravel		5351
			0.1	60			5508
3.0			0.1	70	3' 9" silt: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% fine sand, 90% silt, cohesive, low plasticity	ML	5472
			0.1	60			5327
4.0			0.1	55	4' 10" Partly graded sand: strong brown (7.5YR 5/6), moist, medium dense, rounded grains, medium sand (100%)	SP	5305
			0.1	45	5' 5" silt: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% fine sand, 90% silt, cohesive, low plasticity	ML	5469
5.0			0.1	35			5617
6.0			0.1	35			5595

Radiological Background 41 / 2799				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 2 23	
Depth	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
6.0			0.1	35	Same as above	ML	5595 (CPM)
			0.1	40	6'6" Silty Sand: strong brown (2.5YR 4/6), moist, dense, no odor, 40% silt, 5% medium sand, 55% fine sand	SM	5672
7.0			0.1	70			5681
			0.1	60			5795
8.0			0.1	80	Same as above		5903
			0.1	60	8'6" Cik		6141
9.0			0.1	80	Weathered Sandstone Siltstone: Pale yellow (2.5Y 8/4), dry, hard, no odor, mechanically weathered to ML, 10% fine sand, 90% silt, inter bedded siltstone, mudstone, sandstone lenses	SC	6048
			0.1	70	9'6" Weathered Sandstone: Yellow (2.5Y 7/6), dry, dense, no odor, 15% coarse sand, 20% medium sand, 65% fine sand	SC	N/M
10.0					Refusal on sandstone/siltstone 9-5' by 5'		
					No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number FP0038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 224
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-24-11 1425	Date/Time Total Depth Reached 3-24-11 1515
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30268 (1450) (2) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date Chelsea Calkins (6-16-11)	

Radiological Background 411 / 2620	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					Surface: Soil and grass		40.5' 2681
					Silt & Sand		2734
0.5			0.0	60	Fill: Poorly graded sand with silt: light olive brown (2.5Y 5/4), moist, medium dense, no odor, 15% silt, 5% fine angular gravel, 80% fine sand; trace rootlets near surface, mottled to 2.5' bgs	SP SM	4463
1.0			0.0	35			6187
			0.1	55			5465
2.0			0.1	70			5607
			0.1	70	2' 6"		5555
3.0			0.1	70	Sandy silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 40% fine sand, 60% silt, low plasticity, slow dilatancy	ML	5507
			0.1	70			5515
4.0			0.1	60			5557
			0.1	50	- trace roots		5465
5.0			0.1	60	Weathered sandstone: strong brown (7.5YR 5/8), moist, dense, no odor, mechanically weathered to SM, 30% silt, 55% medium sand, 15% fine sand		5478
			0.1	55	Refusal on sandstone at 5.5' bgs No GW encountered	Bed rock	5422
6.0							

BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 4		Location ID 225	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 6.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-24-11 1335		Date/Time Total Depth Reached 3-24-11 1410	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30269(1345) (2) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelmer C. Knight / 6-16-11			
Radiological Background 38 / 2705		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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	Inches	Borehole Gamma Readings (CPM)
					surface is gravel and soil v and silt			0.5 - 255
0.5			0.0	45	Fill: Poorly graded sand with gravel; light olive brown (2.5Y 5/6), moist, medium dense, no odor, 20%	AF/SP	4523	0 - 2930
1.0				90	angular sandstone fine to medium gravel at varying depths 1-4' bgs, 10% silt, 70% fine sand, trace rutlets near surface, mottled		5338	
				90			5280	
2.0				55			5223	
				50			5299	
3.0				70			5372	
				80	Same as above	AF/SP	5475	
4.0				70	3' 11" silt: dark brown (10YR 3/3), moist, medium stiff, no odor, 10% angular sandstone and siltstone fine to medium gravel, 10% fine sand, 80% silt	ML	5655	
				55			5810	
5.0				50	5' 2" Sandstone: Pale yellow (2.5Y 7/4), moist, dense, no odor, mechanically weathered to SP, fine grained sand, trace siltstone beds	SP	5820	
				55			5828	
				40			5678	

Refusal on sandstone at 6' bgs
No GW encountered



BORING LOG

Sheet 1 of 2

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A 4	Location ID 226
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-24-11 125	Date/Time Total Depth Reached 3-24-11 125
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30270 (1135) (2) 1/2 gallon bags		
Geologist C. Wright	Checked by/Date Chelsea Carmichael / 6-16-11		

Radiological Background 45 / 2854	Radiological Equipment Used Pencake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.1 ppm)
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Depth	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 Inches (CPM)
			0.0	60	Surface: soil and gravel		2896
0.5			0.0	45	Fill: silty sand w/ gravel; yellowish brown (10YR 5/6), moist, medium dense, no odor, 15% angular sandstone and siltstone fine to coarse gravel, 30% silt, 10% clay, 45% fine sand, trace rootlets	AF/SM	4453
1.0			0.0	65			5122
			0.0	50			5323
2.0			0.0	65			5319
			0.0	65			5271
3.0			0.0	80	3.0' large 3/4" siltstone angular gravel		5475
			0.0	65	3.5' 3/4" sandstone angular gravel		5305
4.0			0.0	50	clay with silt: dark yellowish brown (10YR 4/4), moist, med. stiff, no odor, 25% silt, 10% fine sand, 65% clay, low plasticity, cohesive, trace pea sandstone gravel	CL	5224
			0.0	50			5377
5.0			0.0	50	No recovery		5187
			0.0	40	Silt: dark yellowish brown (10YR 3/4), moist, med. dense, no odor, 10% clay, 10% fine sand, 80% silt, low plasticity, low toughness, no dilatancy, non-cohesive	ML	5165
6.0			0.0	35	contact 6.0' bgs		5221

Radiological Background 45/2854				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 226	
Depth	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
6.0			0.0	35	Weathered siltstone: light yellowish brown (2.5Y 6/4), moist, hard, no odor, mechanically weathered to ML, interbedded lenses of siltstone, ^{CL} beds of pale yellow (2.5Y 8/3) siltstone at 6'6" - 7' bgs	SP	5221 (CPM)
			0.0	40			3829
7.0			0.0	65			4526
			0.0	50	Weathered Sandstone: Olive yellow (2.5Y 7/6), moist, hard, no odor, mechanically weathered to SP, 90% fine grained, 10% medium grained sand	SP	4601
8.0					refuse on sandstone/siltstone at 7.5' bgs		
					No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number EP0038.01.22.04.03	Subarea ID & Group SA group 4	Location ID 227
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-12-11 0935	Date/Time Total Depth Reached 4-12-11 1030
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30271 (0940) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Charles Knight / 4-16-11		
Radiological Background 62 / 2663	Radiological Equipment Used Pancake / Downhole	PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)	

Depth	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)
					Surface Soil + gravel		705' 2695
0.5		0.1	52		Fill: Silty Sand: Yellowish brown (10YR 5/4) moist, medium dense, no odor, 5% subrounded fine gravel, 10% coarse sand, 10% clay, 30% silt, 40% medium sand, 35% fine sand, trace mottling, trace rootlets near surface	AF / SM	3009
1.0		0.1	63		1' 3" ck Silty sand		4273
		0.1	64		Pearly grained sand with silt & dark yellowish brown (10YR 4/4) moist, medium dense, no odor, 20% silt, 80% fine sand	SP / SM	4694
		0.1	67				4855
2.0		0.1	73				5007
		0.1	69				5126
3.0		0.1	66		2' 10" weathered Sandstone: Yellowish brown (10YR 5/8) moist, dense, no odor, Mechanically weathered to SP, 6% silt, 45% fine sand, iron oxide staining	SP / SC	5286
		0.1	63				5593
4.0		0.1	65				5588
5.0					Refusal on Sandstone at 4.0' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 228
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started (10/14/11) 0835	Date/Time Total Depth Reached (10/14/11) 0920
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected (1) 1/2 gallon bags		30272 (0840)
Geologist C. Knight	Checked by/Date Chelsea Paul / 10-16-11		

Radiological Background 50 / 3241	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					Surface: Soil and gravel		+0.5' 2838
0.5			0.1	50	Fill: Artificial Fill		3305
1.0			0.1	52	Fill: Silty Sand: dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 40% silt, 5% coarse, 10% medium sand, 45% fine sand, trace rootlets, trace mottled texture	AF/SM	4511
			0.1	48			4916
			0.1	53			4999
2.0			0.2	58	1' 10" ck silty sand Poorly graded sand with silt: yellowish brown (10YR 5/6), moist, medium dense, no odor, 20% silt, 80% fine sand,	SM SP	5158
			0.2	52			5225
3.0			0.2	57	2' 11" w/silt ck Poorly graded sand: brownish yellow (10YR 6/6), moist, medium dense, no odor, 10% silt, 90% fine sand, trace iron oxide staining	SP	5282
			0.3	58			5519
4.0			0.2	58	Weathered Sandstone: brownish yellow (10YR 6/8), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, some iron oxide staining, trace silt	SP	5301
5.0					Refusal @ 4' bgs on Sandstone No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 229
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-22-11 / 0930 @	Date/Time Total Depth Reached 3-22-11 / 0940 @
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30273 (NO SAMPLE) (2) 1/2 gallon bags refusal at 1.5' bgs		
Geologist C. L. Knight	Checked by/Date Chelsa Carl / 6-16-11		

Radiological Background S3 / 2424	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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	55	Surface 2" Asphlt, 4" silty sand: Yellowish-brown (10YR 5/6), moist, dense, no odor, 40% silt, 10% medium sand, 50% fine sand	sf	2640
1.0			0.0	50	Weathered sand stone: Yellow (10YR 7/8), moist, dense, no odor, mechanically weathered to SP, 10% coarse, 10% medium, 80% fine sand, trace iron oxide staining	sf	2917
			0.0	65			4953
			0.0	70			3311
2.0					Refusal @ 1.5' bgs on sandstone		5454
3.0					No GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group: 4	Location ID: 230	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: (30274) no sample two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters			PID Used: Mini Rae 2000 - Background: NA 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)
0.5					NO SAMPLE COLLECTED - Boring not advanced - Located in likely remediation zone (UE)		
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 3A group 4	Location ID 231
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-22-11 1030	Date/Time Total Depth Reached 3-22-11 1050
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30275 (1025) (2) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Carnichael / 6-16-11		

Radiological Background 55 / 2693	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches +0.5' 2337 (CPM) 2637
0.5			0.0	45	Surface: 2" Asphalt		
1.0			0.0	50	Fill: 5:1 1/2 sand w/ gravel: yellowish brown (10YR 5/8), moist, dense, no odor, 35% silt, 15% angular fine to coarse crushed gravel, 10% coarse sand, 20% medium sand, 20% fine sand, mottled	AF/SM	4470
			0.0	50			5155
			0.0	70	small plastic wire sheathing @ 1-5' bgs		5432
2.0			0.0	75	2" 4"		5765
			0.0	60	Weathered Sandstone: yellow (10YR 7/8), moist, dense, no odor, mechanically weathered to S.P. fine grained sand	Sp/Gr	5916
3.0			0.0	55	hard siltstone at end of boring		6045
					Refusal on sandstone at 3.0' bgs NO GW encountered		
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 4		Location ID 232	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 2-5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 1/4"		Date/Time Drilling Started 3-22-11 0840		Date/Time Total Depth Reached 3-22-11 0915	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30276 (0850) (2) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Chelsea Carmichael / 6-17-11			
Radiological Background 33 / 2623		Radiological Equipment Used Pencate / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches
			0.0	50	Surface: 2" asphalt		45 2571 3156 (CPM)
05			0.0	60	Fill: Silty Sand w/ gravel: dark yellowish brown (10YR 3/4), moist, medium dense, no odor 95% silt, 15% angular crushed gravel (fine to coarse), 10% coarse sand, 10% medium sand, 30% fine sand, gravel is angular sandstone or granite	AF/SM	4688
10			0.0	40		5112	
			0.0	75		5258	
20			0.0	70		5186	
			0.0	50	2 1/4" weathered siltstone and sandstone: yellowish brown (10YR 5/8), moist, dense, no odor, mechanically weathered to SP and ML fine grained sandstone; cohesive, low plasticity siltstone.	SP ML	5185
30					Refusal on sandstone @ 2.5' bgs No GW encountered		
40							
50							



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 233	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/0921		Date/Time Total Depth Reached 2-24-11/0930	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30059) (0930)			
Geologist C. Carmichael				Checked by/Date Philip Carmichael/6-17-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.3 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.3	12	Sandy silt, (10 YR, 3/4), reddish-brown, 60% silt, 30% fine to medium grained sand, 10% gravel (fill rock, sandstone fragments), medium stiff, semi-moist, common rootlets, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 233
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-4-11 0940	Date/Time Total Depth Reached 3-4-11 1018
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30060 (0950) (2) 1/2 gallon bags	
Geologist C. Knight		Checked by/Date  5/19/11	

Radiological Background 48 / 2506	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
			0.0	60	surface + native soil / grass		0.0 = 3895
0.5			0.0	45	Sandy Silt: Dark yellowish brown (10YR 4/6), moist, med stiff, no odor, 5% fine gravel, 5% coarse, 10% medium sand, 60% silt, 20% fine sand, trace mottled texture, trace fill fine gravel,	AR	0.5 = 4660
1.0			0.0	60		ML	5018
			0.0	70			4827
2.0			0.0	65			4784
			0.0	76			5076
3.0			0.0	80	Sandy Silt: Dark yellowish brown (10YR 4/6), moist, med stiff, no odor, 65% silt, 20% fine, 10% medium, 5% coarse sand	ML	4968
			0.0	85			5010
4.0			0.0	30			5060
			0.0	80			5016
5.0			0.0	35	Poorly graded Sand: Yellowish brown (10YR 5/6), moist, medium dense, no odor, 5% silt, 5% medium sand, 90% fine sand	SP	5062
			0.0	45			4988
6.0							

Radiological Background <u>48/2506</u>				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>233</u>	
Depth	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	63	SP: Same as above	SP	6.0 = 4931
			0.0	70	iron oxide staining		6.5 = 4867
7.0			0.0	75	change color to light yellowish brown (10YR 6/4); some iron oxide staining	SP	5058
			0.0	60			4995
8.0			0.0	40			5055
			0.0	35	weathered sandstone: mechanically weathered to poorly graded sand; light yellowish brown (10YR 6/4); med. dense, no odor, fine sand	SP	4999
9.0			0.0	60			4919
			0.0	80			4831
10.0			0.0	50	refusal @ (10) Total Depth 10.0' bgs Target depth reached No GW encountered		4934

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 234
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-3-11 1450	Date/Time Total Depth Reached 3-3-11 1600
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30061 (1513) 1515 (2) 1/2 gallon bags (15)		
Geologist C. Knight	Checked by/Date [Signature] 4/15/11		

Radiological Background SI / 2590	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.6 ppm)
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Depth	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 Inches (CPM)
			0.6	60	Surface grass		165 2546
0.5			0.6	50	Fill: Silty sand w/ gravel; dark yellowish brown (10YR 5/8), moist, medium coarse, no odor, 30% silt, 15% angular fill gravel, 30% medium sand, 15% fine sand, 10% coarse sand	AF	3004
1.0			0.6	55		SM	3956
			0.6	45			4794
2.0			0.6	55			4922
			0.6	55	Same as above		5105
3.0			0.6	50	Silty Sand: dark yellowish brown (10YR 4/4), moist, medium silt, no odor 45% silt, 5% medium, 50% fine sand	SM	5212
			0.6	60			5460
4.0			0.6	50			5360
			0.6	70			5252
5.0			0.6	70			5333
			0.6	50			5129
6.0			0.6	60	Same as above		4992
			0.6	60			5206

Radiological Background 51/2590					Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 234
Depth	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			0.6	66	Same as above	SM	5206
			0.6	64			5110
7.0			0.6	50	Poorly graded sand; brownish yellow (10YR 5/8), moist, medium dense, no color 10% medium sand, 90% fine sand	SP	4968
			0.6	60			4866
8.0			0.6	50			4899
			0.6	60			4976
9.0			0.6	70	Weathered sandstone increasing coarser sand grains and iron oxide staining		4842
			0.6	50			4821
10.0			0.6	46			4718
TD: 10' bgs No GW encountered Target depth of 10' reached							

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 1	Location ID: 235
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 9.5
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 3-3-11 1335	Date/Time Total Depth Reached: 3-3-11 1410
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30062 (745) (2) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: [Signature] 4/15/11		

Radiological Background: 42/2706cpm	Radiological Equipment Used: Pancake / Downhole	PID Used: Mini RAE 2000 (Bkgd: 0.3 ppm)
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Depth	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)
						Inches	
					Surface: grass		40.5 2590
					Fill: silty sand w/ gravel; Yellowish brown (10YR 5/8), moist, medium dense, no odor, 35% silt, 35% fine sand, 15% fine to medium gravel (volcanic and angular), 15% medium sand, 5% coarse sand, trace asphalt, mottled	AR/SM	3336
0.5			0.3	60			4431
1.0			0.3	55			4828
			0.3	65			4985
2.0			0.3	70	@ 2' bgs yellow plastic caution tape		4863
			0.3	45	@ 2' 4" pink concrete gravel pieces		4830
3.0			0.3	35	Sandy silt: Fill: Dark brown (10YR 3/3), moist to very moist, med. stiff, no odor, 5% coarse, 5% medium, 25% fine sand, 60% silt, 5% angular medium to fine gravel, some trace mottled texture	AR/ML	4870
			0.3	35			4853
			0.3	50			
4.0			0.3	50			4738
			0.3	70			
			0.3	70			4758
			0.3	65			
5.0			0.3	65			4384
			0.3	60			
			0.3	60	5.5' large concrete angular gravel		4661
			0.3	30			
6.0			0.3	30			4873
			0.3	60			

Radiological Background 42/2706				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 235		
Depth	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	Inches	Borehole Gamma Readings (CPM)
6.0			0.4	60		SP		4873
			0.4	55	@ 6.5' Sand: yellowish brown (10YR 5/6), moist, med. dense, medium stiff, no odor, 45% fine sand, 55% silt	ML		4552
7.0			0.4	65		ML		4938
			0.4	40	gradational contact Silty sand: yellowish brown (10YR 5/6), moist, med. dense, no odor, 35% silt, 65% fine sand	SM		4977
8.0			0.4	60				5037
			0.4	80	Poorly graded sand: Yellowish brown (10YR 5/6), moist, med. dense, no odor, fine sand, trace oxidation stains	SP		5175
9.0			0.4	60				5254
			0.4	40	refusal @ 9.5' by 5			5172
10.0					TD: 9.5'			
					No GW encountered			

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A Group 1	Location ID 236
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-3-11 0855	Date/Time Total Depth Reached 3-3-11 0950
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30063 (09:00) (2) 1/2 gallon bags + 1 402 Jar		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 4/15/11		

Radiological Background 45 / 2426	Radiological Equipment Used Pancake / Downhole	PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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)
						Inches	
			0.0	35	Surface 3" Asphalt		2751
0.5			6.0	50	Fill Well graded sand w/ silt; light olive brown (2.5Y 5/6), moist, med. dense, no odor, 20% coarse sand, 15% silt, 20% medium sand, 5% fine sand, 5% gravel fine, mottled	SW	3672
1.0			0.0	60			4739
			0.0	50			5153
2.0			0.0	40			5375
			0.0	60			5460
3.0			0.0	40			5365
			0.0	60	Sandy silt: Very dark grayish brown (10YR 3/2), moist, med. stiff, no odor, 35% fine sand, 5% medium sand, 60% silt, non cohesive, slow dilatancy, no plasticity	ML	5373
4.0			0.0	65	5' 7" Silt w/ sand: Very dark brown (10YR 2/2), moist, med. stiff no odor, 5% medium sand, 25% fine sand, 70% silt, slow dilatancy, non cohesive, non plastic, trace coarse sand	ML	5387
			0.0	55	Siltstone and sandstone fragments (greenish gray (6.5Y 6/6) mixed throughout Sandy silt @ 4',	ML	5419
5.0			0.0	55	Sandy silt: Very dark brown (10YR 2/2), moist, med. stiff, trace/slight color, 30% fine sand, 5% med. sand, 5% coarse sand, 60% silt, non plastic, slow dilatancy, cohesive	ML	5406
			0.0	45			5351
6.0			0.0	60			5310

Radiological Background 45/2428				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 236	
Depth	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	66			5310
			0.0	55	Same as above	ML	5514
7.0			0.1	50			5527
			0.1	60			5580
8.0			0.1	55	Silty Sand: dark yellowish brown (10YR 4/4), med. dense, no odor, 20% silt, 10% medium sand, 70% fine sand, some mica flakes.	SM	5389
			0.1	60			5437
9.0			0.1	50			5454
			0.1	70			5385
10.0			0.1	75			5336
					TD: 10' hgs No GW encountered Target depth reached		



BORING LOG

Sheet 1 of 2

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A / 1		Location ID 237	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 10'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 2/28/11 1438		Date/Time Total Depth Reached 2/28/11 1451	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 10 30064 / trace 1530 (2) 1/2 gallon bags / (1) 402 jar			
Geologist Stephanie Lepore Montrose				Checked by/Date Charles C. / 6-12-11			
Radiological Background 48 / 2880		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			
Depth	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 Inches + 0.5 = 2487 (CPM)
			0.0	60	0'-2" SW SAND 15% silt, 80% fine-grained sand (dark greyish brown 10YR 4/2)	SW	0.0 = 3227
			0.0	63	2"-1 1/1" SM silty SAND (dark yellowish brown 10YR 4/6)		0.5 = 4487
			0.0	73	25% silt, 75% fine-grained sand	SM	1.0 = 5072
			0.0	80	Sandstone (pieces) gravel (well indurated sand) non plastic, 100% dry		1.5 = 5174
			0.0	75	1 1/1"-2' SP SAND (dry pale brown 10YR 7/4) 5% silt, 95% fine-grained sand, indurated / compact, dense, dry		2.0 = 5137
			0.0	53	2'-2 1/1" SP SAND (dark yellowish brown 10YR 4/4) 10% silt, 90% fine-grained sand, trace clay	SP	2.5 = 5070
			0.0	56	2 1/1"-3' Sandstone (fine-coarse grained brownish yellow 10YR 6/6) non plastic, 100% dry		3.0 = 5187 4917
			0.0	52	3'-4 1/3" SP SAND (dark brown 7.5YR 3/2) 15% silt, 15% clay, 70% fine-med. grained sand	SP	3.5 = 4958
			0.0	60	plant debris (rootlets & twigs) low plasticity, very soft, med. dense, dry		4.0 = 5127
			0.0	85	4 1/3"-5' No Recovery		4.5 = 5071
			0.0	79	5'-6 1/1" ML sandy SILT (brown 7.5YR 4/4)		5.0 = 5187
			0.0	55	30% fine-coarse grained sand, 25% clay 55% silt, low plasticity, soft, dry	ML	5.5 = 5166

Radiological Background					Project Name	Project Number	Location
48 / 2880					SSFL Area IV Radiological Study	EP9038.01.22.04.03	237
Depth	Interval	Recovery	PD	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)
					Some on above		6.0 = 5254
			6.0	65	6'1" - 8'1" ML sandy SILT (yellowish brown 10YR 5/6) with clay		6.5 = 5163
7.0			0.0	58	20% clay, 30% fine-coarse grained sand 50% silt	ML	7.0 = 5261
			0.0	61	low plasticity, soft, dry 7'5 some on above - color change to (very pale brown 10YR 7/4)		7.5 = 5340
8.0			0.0	68	8'1" - 9'11" SM silty SAND with clay (pale brown 10YR 6/3)		8.0 = 5470
			0.0	67	20% clay, 30% silt, 50% fine-coarse grained sand (trace coarse grained sand)	SM	8.5 = 5499
9.0			0.0	75	low plasticity, very soft, dry		9.0 = 5657
			0.0	81			9.5 = 5652
10.0			0.0	87	9'11" - 10' NO Recovery		10.0 = 5883
					TD = 10' bgs		
					NO GW encountered		



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA 1	Location ID 238
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2'6"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 2/28/11 1331	Date/Time Total Depth Reached 2/28/11 1337
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected ID 30065 / time 1355 (2) 1/2 gallon bags / (1) 4 oz jar		
Geologist Stephanie Lapin Montrose	Checked by/Date Chelsea Cail / 6-17-11		

Radiological Background 49 / 2885	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					SW SAND 15% silt, 80% fine coarse grained sand (dark grayish brown)	SW	10.5 = 2552
	0'-2"		0.0	54	0'-2" asphalt 5% gravel - Subangular subrounded		0.0 = 2694
	2'-1'2"		0.0	62	2'-1'2" SP SAND (yellowish brown 10YR 5/4)	SP	0.5 = 4013
			0.0	104	10% silt, 10% clay, 80% fine coarse grained sand (trace coarse grained sand) trace asphalt debris, trace gravel - Subangular & med. dense, low plasticity, dry, soft subrounded		1.0 = 4946
			0.0	55	1'2" - 2'8" SP SAND (brownish yellow 10YR 6/6)	SP	1.5 = 5044
			0.0	60	5% silt, 95% fine coarse grained sand, (trace coarse grained sand) loose, dry, non-plastic		2.0 = 5011
			0.0	68	Micaceous		2.5 = 4921
					TD = 2'6" (refusal)		3.0 = 0
					No Gw encountered		3.5 = 0
					[recovery to 2'8"]		4.0 = 0
							4.5 = 0
							5.0 = 0
							5.5 = 0

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 4		Location ID 239	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-23-11 0900		Date/Time Total Depth Reached 3-23-11 0930	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30277 (0905) (2) 1/2 gallon bags			
Geologist C. L. Wright				Checked by/Date Chelsea Carmichael 16-17-11			
Radiological Background 59 / 2504		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

Depth	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	
							Inches	(CPM)
							10.5"	2.522
								3364
0.5		0.0	0.0	35	Surface grain and soil			
				70	Fill: Silty Sand: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 10% fine rounded gravel (fill rock), 35% silt, 5% coarse, 10% medium sand, 40% fine sand	AR / SM		4646
1.0		0.0	0.0	65				5040
				71	Silt w/ Sand: Brown (7.5YR 4/4), moist, medium stiff, no odor, 10% fine sand, 5% clay, 85% silt, noncohesive, low plasticity	ML		5025
2.0		0.0	0.0	55				5230
				87				5293
3.0		0.0	0.0	55	2' 8" Silty Sand: Brownish yellow (10YR 6/8), moist, medium dense, no odor, 5% coarse sand, 30% silt, 10% medium sand, 55% fine sand	SM		5313
				87				5432
4.0		0.0	0.0	55				5582
				80	4' 3" Weathered Sandstone: Brownish yellow (10YR 6/8), moist, hard, no odor, mechanically weathered to SP, fine grained sand	SP		5773
5.0		0.0	0.0	75				NM
					Refusal on Sandstone @ 5.0' bgs No GW encountered			



BORING LOG

Sheet 1 of 2

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 4	Location ID 240
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-23-11 0955	Date/Time Total Depth Reached 3-23-11 1030
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30278 (1000) (2) 1/2 gallon bags 30409 (NT) field DUP		
Geologist C. Knight	Checked by/Date Chelsea Cull / 6-12-11		

Radiological Background
42 / 2545

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini RAE 2000 (Bkqd: 0.0 ppm)

Description

(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)

USCS Symbol

Borehole
Gamma Readings

10.5' 2410

(CPM)

3052

4399

5024

5098

4985

5120

5177

5086

5262

5255

5287

5229

SM

5140

Depth	Interval	Recovery	PID	Radiological
0.0			0.0	55
0.5			0.0	80
1.0			0.0	61
			0.0	55
2.0			0.0	53
			0.0	66
3.0			0.0	65
			0.0	68
4.0			0.0	63
			0.0	55
5.0			0.0	70
			0.0	65
6.0			0.0	75

Surface: grass + soil

Fill: Silty sand (dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 10% angular crushed medium gravel, 30% silt, 5% coarse sand, 15% medium sand, 40% fine sand, trace mottled texture, trace sandstone gravel

2.0'

Silty Sand: Brown (10YR 4/3), moist, medium dense, no odor, 5% coarse sand angular, 10% medium grained sand, 30% silt, 55% fine sand, pinhole pores

Same as above

Radiological Background 42/2545				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 240
Depth	Interval	Recovery	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	75	Same as above:	SM	5140
		0.0	67			5107
7.0		0.0	65	Trace fine subrounded gravel		4978
		0.0	58			5082
8.0		0.0	74			5015
		0.0	66		SM	5008
9.0		0.0	67	8' 10" Poorly graded sand: Yellowish brown (10YR 5/8), saturated, med-dense, no odor, 52% silt, 45% fine sand	SP	5098
		0.0	80	9' 6" Silty sand (60) Poorly graded sand with silt: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 25% silt, 75% fine sand, no plasticity, rapid dilatancy, low toughness	SP	5112
10.0		0.0	67			NM
				Total depth 10.0' bgs		
				No GW encountered		
11.0						
12.0						
13.0						
14.0						
15.0						



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 241	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/1048		Date/Time Total Depth Reached 2-18-11/1056	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30372) (1055)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-21-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.3ppm)			
Depth	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 Inches (CPM)
0.5'			0.3	14	Silt with sand, (10YR, 3/4), dark brown, 80% silt, 20% fine to medium grained sand, common rootlets, cable found, semi-moist, soft, no odor. No groundwater encountered.	ML	



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 5		Location ID 242	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-18-11/1117		Date/Time Total Depth Reached 2-18-11/1125	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (#30373) (1125)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-21-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Bkgd: 0.4 ppm)			
Depth	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'				0.4/12	Silt with sand, (10 YR, 3/4), dark brown, 80% silt, 20% fine to medium grained sand, common rootlets, semi-moist, soft, no odor. No groundwater encountered.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA Group 5	Location ID 242
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-14-11 1510	Date/Time Total Depth Reached 4-14-11 1555
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 36374 (1515) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Chelsea Carnichael / 6-21-11		

Radiological Background 51 / 2554	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					surface: soil and grass		
0.5		0.0	45		Silt: Brown (10YR 5/3), moist, soft, no odor, 10% fine sand, 90% silt, low plasticity, some rootlets near surface	ML	2681
1.0		0.0	46				3825
		0.0	56		8" Silty Sand: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 5% coarse sand, 15% medium sand, 30% silt, 50% fine sand	SM	4721
		0.1	60				4788
2.0		0.1	59				4788 4733
		0.1	61				4753 4971
3.0		0.1	60		Weathered Sandstone: light yellowish-brown (10YR 6/4), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone, trace iron oxide staining		4922
		0.1	66				4755
4.0					Refusal on Sandstone at 3.5' bgs		
					No GW encountered		
5.0							
6.0							

5A_243

BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5A group 5	Location ID: 243
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 5.5'
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 4-15-11 0955	Date/Time Total Depth Reached: 4-15-11 1045
Type of Sampling Device: 1 3/4" macrocore acetate liner	Samples Collected: 30375 (1000) (1) 1/2 gallon bags		
Geologist: C. Knight	Checked by/Date: Phyllis Paul 10-21-11		

Radiological Background 39 / 2836	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.1 ppm)
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Depth	Interval	Recovery	P.D.	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	
							Inches	(CPM)
					Surface (grass and soil)		49.5'	2600
0.5		0.2	39		Silt with sand: Strong brown (7.5YR 4/6), moist, med. stiff, no odor, 25% fine sand, 75% silt, non cohesive, low plasticity, trace rootlets near surface	ML		3029
		0.2	40					4363
1.0		0.2	40					4698
		0.2	39					4872
2.0		0.2	45		2' 1" Silt, Sand: Brown (7.5YR 8/4), moist, medium dense, no odor, 30% silt, 5% coarse sand, 10% medium sand, 56% fine sand, trace rootlets	SM		4924
		0.2	52				5030	
3.0		0.2	55				4928	
		0.2	60				5035	
4.0		0.2	64				4967	
		0.2	65		4' 5" ^{cl} Poorly graded sand ^{with silt} . Yellowish Brown (10YR 5/6), moist, med. dense, no odor, 10% silt, 10% medium sand, 80% fine sand, trace rootlets	SP		4855
5.0		0.2	60				5020	
		0.2	68		Weathered Sandstone? Very pale brown (10YR 8/4), dry, hard, no odor, fine grained sandstone,	SP		5232
					Refusal on sandstone at 5.5' bgs no GW encountered			

5A_244

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA 1	Location ID 244
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 11'6"
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3/1/11 / 0841	Date/Time Total Depth Reached 3/1/11 / 0927
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected ID 30066 / km: 1010 / 1030067 6 1/2 gallon bags / (2) 402 ml / km 1015		
Geologist Stephanie Lepore Montrose	Checked by/Date Chelsea Coyle / 6-24-11		

Radiological Background 50 / 2743	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.10 ppm)
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Depth	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 Inches +0.5= 2611 (CPM)
0.0			0.0	58	0-3" asphalt		6.0= 2792
			0.0	75	3"-6" asphalt debris SW SAND 10% gravel - subangular subrounded, 90% fine coarse grained sand, look, d	SW	0.5= 3722
			0.1	85	6"-1'8" SM silty sand 40% silt, 60% fine-coarse grained sand, trace gravel subangular & subrounded	SM	1.0= 4627
			0.1	82	1'2"-concrete non plastic, loose, dry		1.5= 5368
			0.1	78	1'8"-2'3" SM silty sand - (dark yellowish brown) 10% clay, 35% silt, 55% fine-coarse grained sand loose, low plasticity, very soft, dry, trace gravel subangular & subrounded	SM	2.0= 5502
			0.1	107	2'3"-5' ML Sandy SILT with clay (brown 7.5R 4/4)	ML	2.5= 5328
			0.1	80	20% clay, 35% fine-med. grained sand, 45% silt		3.0= 5019
			0.1	60	low plasticity, firm, dry		3.5= 4908
			0.1	75			4.0= 5007
			0.1	80			4.5= 5024
			0.1	74	5'-5'2" SM silty sand with clay (brown 7.5R 4/4) 20% clay, 30% silt, 50% fine-med. grained sand	SM	5.0= 4987
			0.1	70	5'2"-5'6" ML clayey SILT with sand (yellowish brown 10YR 5/4) 45% silt, 30% clay, 25% fine-med. grained sand med. dense, low plasticity, firm, dry	ML	5.5= 4989
					5'6"-7'1" ML clayey SILT with sand (yellowish brown 10YR 5/6) 45% silt, 30% clay, 25% fine-med. grained sand med. dense, low plasticity	ML	
					asphalt debris on outside of core, firm, dry		

Radiological Background				Project Name	Project Number	Location
50 / 2743				SSFL Area IV Radiological Study	EP9038.01.22.04.03	244
Depth	Interval	Recovery	PTD	Description	USCS Symbol	Borehole Gamma Readings
				(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	Inches	(CPM)
7.0			0.1 67			6.0 = 5047
			0.1 93	Same as above	ML	6.5 = 5085
			0.1 80	7'1" - 8'4" SC clayey sand (yellowish brown 10YR 5/4)		7.0 = 5116
			0.1 71	25% clay, 10% silt, 65% fine-med. grained sand asphalt debris on outside of core	SC	7.5 = 5081
8.0			0.1 66	low plasticity, soft, dry, dense		8.0 = 5008
			0.1 65	8'4" - 9'9" SM silty sand with clay (brownish yellow 10YR 6/6) 20% clay, 30% silt, 50% fine-med. grained sand mottled with light yellowish brown 2.5Y 6/4		8.5 = 4883
9.0			0.1 57	slaty layers interbedded mottled	SM	9.0 = 5010
			0.1 57	low-med. plasticity, firm, dry dense		9.5 = 5244
10.0			0.1 62	9'9" - 10' NO Recovery		10.0 = 6001
			0.1 75	10' - 10'6" SE clayey sand (yellowish brown 10YR 5/4) 25% clay, 10% silt, 65% fine-med. grained sand low plasticity, soft, dry, dense, asphalt debris on outside of core	SC	10.5 = 6093
11.0			0.1 73	10'6" - 10'11" SM silty sand with clay (brownish yellow 10YR 6/6) 20% clay, 30% silt, 50% fine-med. grained sand slaty layers interbedded, mottled with light yellowish brown 2.5Y 6/4	SM	11.0 = 6245
			0.1 78	10'11" - 11'6" SP SAND (brownish yellow 10YR 6/6) 5% silt, 95% fine-med. grained sand loose, dry	SP	11.5 = 5655
12.0				TO = 11'6" bgs (refusal) NO GW encountered		
13.0						



5A_245



BORING LOG

Sheet 1 of 5

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SA 1 1		Location ID 245	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 30'	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3/1/11 1130		Date/Time Total Depth Reached 3/1/11 1240	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 10 30068 / 1 hr 1555 / 10 30069 (2) 1/2 gallon bags / (2) 400g jar time: 1600			
Geologist Stephane Lepere Norcross				Checked by/Date Philip Carmichael / 10-21-11			
Radiological Background 53 / 2377		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)			

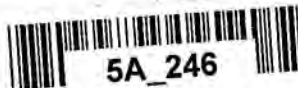
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches + 0.5 = 2523 (CPM)
			0.0	67	0-3" Asphalt		0.0 = 3367
			0.0	76	3"-6" SW SAND 100% dm (very dark gray 10YR 3/1) asphalt debris, 10% gravel - subangular & subrounded, 90% fine coarse sand	SM	0.5 = 4499
			0.0	86	6"-14" 2'11" SM silty SAND (dark yellowish brown 10YR 4/6) (see 1'4"-2'11" description)	SM	1.0 = 5119
			0.0	83	1'3"-1'4" sandstone (laminated sand) fine-coarse grained		1.5 = 5333
			0.0	97	1'4"-2'11" SM silty SAND trace gravel - subangular & subrounded (dark yellowish brown 10YR 4/6) 15% clay, 30% silt, 55% fine-coarse grained sand	SM	2.0 = 5238
			0.0	84	asphalt around core low plasticity, soft, dry, med dense		2.5 = 5287
			0.0	55	2'11"-3' slate		3.0 = 5362
			0.0	62	3'-4'9" SM silty SAND (dark brownish yellow 10YR 4/6) 15% clay, 30% silt, 55% fine-coarse grained sand	SM	3.5 = 5424
			0.0	75	asphalt debris around core trace gravel - subangular & subrounded low plasticity, soft, dry, med dense		4.0 = 5323
			0.0	65			4.5 = 5268
			0.0	75	4'9"-5' 100 Recovery		5.0 = 5248
			0.0	63	5'1"-5'5" SM silty SAND (dark yellowish brown 10YR 4/6) 15% clay, 30% silt, 55% fine-coarse grained sand; trace gravel subangular & subrounded low plasticity, soft, dry, med dense	SM	5.5 = 5266
					5'5"-5'6" asphalt debris		
					5'6"-5'10" SP SAND (dark yellowish brown 10YR 4/6) 10% silt, 10% clay, 80% fine-coarse grained sand low plasticity, dry soft, loose, dry	SP	
					5'10"-9' SP SAND (olive brown 2.5Y) 15% clay, 15% silt, 70% fine-coarse grained sand 4/13 low plasticity, very soft, med dense, dry trace gravel - subangular & subrounded	SP	

Radiological Background					Project Name	Project Number	Location
53 / 2377					SSPL Area IV Radiological Study	EP9038.01.22.04.03	245
Depth	Interval	Recovery	PTD	Radiological	Description	USCS Symbol	Borehole Gamma Readings
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		Inches (CPM)
6.0			0.0	79	SP SAND (Olive brown 2.5Y 4/3)		6.0 = 5215
			0.0	90	15% silt, 15% clay, 70% fine-coarse grained sand, trace gravel - subangular & subrounded	SP	6.5 = 5225
7.0			0.0	95	low plasticity, very soft, med. dense, dry		7.0 = 5280
			0.0	75	7'4" - 7'9" sandstone gravel pieces (well indurated sand) interbedded		7.5 = 5415
8.0			0.0	85	7'9" plant material (twig)		8.0 = 5197
			0.0	65	8'-8'3" grey staining - no HC odor	SP	8.5 = 5294
9.0			0.0	53	9'-9'5" sandstone, micaceous (very pale brown 10YR 7/4) fine-coarse grained		9.0 = 5298
			0.0	65	4'5" - 10' SP SAND (very dark grey 10YR 3/1)	SP	9.5 = 5276
10.0			0.0	54	15% clay, 10% silt, 75% fine-med. grained sand, low plasticity, soft, med. dense, dry		10.0 = 5376
			0.0	34	9'9" - 9'10" sandstone (well indurated sand) interbedded grey staining - no HC odor	SC	10.5 = 5370
11.0			0.0	65	10' - 10'5" SC clayey sand with silt (olive brown 2.5Y 4/4) 25% clay, 25% silt, 50% fine grained sand	SM	11.0 = 5415
			0.0	56	10'5" - 10'11" SM silty sand (light olive brown 2.5Y 5/4) 10% clay, 30% silt, 60% fine-med. grained sand		11.5 = 5239
12.0			0.0	57	10'11" - 11' asphalt debris	SP	12.0 = 5380
			0.0	45	11' - 15' SP SAND (light olive brown 2.5Y 5/4)		12.5 = 5449
13.0			0.0	75	10% silt, 10% clay, 80% fine-med. grained sand		13.0 = 5316
					5% trace gravel - subangular & subrounded pieces of sandstone throughout (well indurated sand)		
					low plasticity, soft, dry, loose		

Radiological Background 53/2377					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 245
Depth	Interval	Recovery	PTD	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 Inches (CPM)
14			0.0	75	Same as above	SP	13.00 5316
			0.0	64			13.50 5441
			0.0	80			14.00 5303
			0.0	72			14.50 5392
15			0.0	58	15'-16'11" SM silty sand (olive brown 2.5Y 4/3) 15% clay, 30% silt, 55% fine-med. grained sand low plasticity, soft, dry, med. dense	SM	15.00 5263
			0.0	55			15.50 5349
16			0.0	75	15'11" color change to yellowish brown 10YR 5/4		16.00 5518
			0.0	45	16'2" color change to light olive brown 2.5Y 5/3		16.50 5262
			0.0	80			17.00 5184
17			0.0	67	16'11"-19' SP sand (olive brown 2.5Y 4/3) Very dark grayish brown 10YR 3/2	SP	17.50 5301
			0.0	55	15% clay, 10% silt, 75% fine-med. grained sand med. dense, soft, dry low plasticity trace gravel - subangular & subrounded		18.00 5198
18			0.0	42			18.50 5295
19			0.0	55			19.00 5107
			0.0	49	19'-19'11" SP sand 10% silt, 90% fine-med. grained sand, loose, dry (brownish yellow) 19'1"-20' SP sand (olive brown 2.5Y 4/3) 15% clay, 10% silt, 75% fine-med. grained sand med. dense, soft, dry, low plasticity green staining - no MC odor	SP	19.50 5034
20			0.0	69			20.00 5071
			0.0	82			

Radiological Background					Project Name	Project Number	Location
S3 / 2377					SSFL Area IV Radiological Study	EP9038.01.22.04.03	245
Depth	Interval	Recovery	PD	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)
21		0.0	82		20' - 21'6" SM silty sand (olive brown 2.5Y 4/4) (20-25% clay) with clay (25-30% silt) 25% clay, 25% silt, 50% fine-med. grained sand, dense, low-med. plasticity, firm, dry	SM	20. = 5071 20.5 = 4992
22		0.0	65		21'6" - 23'8" SM silty sand (brown 10YR 4/3) 15% clay, 30% silt, 55% fine-med. grained sand 22' - 22'11" dark staining (very dark gray 10YR 3/1) and green staining dark low plasticity, soft, dry, med. dense no HC odor	SM	21 = 5147 21.5 = 5268 22 = 5330 22.5 = 5276
23		0.0	78		23'8" - 24' SANDSTONE (brownish yellow 10YR 6/6) (well indurated sand) fine-med. grained		23 = 5152 23.5 = 4982
24		0.0	86		24' - 24'8" SM silty sand (brown 10YR 4/3) 15% clay, 30% silt, 55% fine-med. grained sand low plasticity, soft, dry, med. dense	SM	24 = 5102 24.5 = 4887
25		0.0	75		24'8" - 25' SP SAND (light yellowish brown 2.5Y 6/4) 10% silt, 90% fine-med. grained sand non plastic, loose, dry	SP	25 = 4908
26		0.0	70		25' - 25'7" SM silty sand (olive brown 2.5Y 4/3) 15% clay, 35% silt, 50% fine-med. grained sand low plasticity, soft, dry, dense	SM	25.5 = 4890
27		0.0	65		25'7" - 28'8" SM silty sand (dark grayish brown 2.5Y 4/2) 10% clay, 35% silt, 55% fine-med. grained sand Saturated	SM	26 = 4867 26.5 = 5035
27		0.0	72		low plasticity, very soft,		27 = 5121

Radiological Background				Project Name	Project Number	Location
Depth	Interval	Recovery	PID	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		Borehole Gamma Readings (CPM)
53	2377					245
28			72	Same as above		27 = 5121
			80			27.5 = 5114
			50			28 = 5248
			60			28.5 = 5138
29			58	28'8" - 29'10" SM silty sand (yellowish brown 10% silt)		29 = 5006
			75	10% clay, 40% silt, 50% fine-med. grained sand low plasticity, soft, moist trace gravel - subangular & subrounded pieces of sandstone		29.5 = 5003
30			68	29'10" - 30' Sandstone (fine-med. grained) (very pale brown 8/10% silt)		30 = 5153
				TD = 30' bgs. (refusal)		
				GW = 25'7" - 28'8"		



BORING LOG

Sheet 1 of 2

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 246
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-2-11 1025	Date/Time Total Depth Reached 3-2-11 1220
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30070 (1025) 30571 (1130) (2) 1/2 gallon bags + 14oz Jar		
Geologist C. Knight	Checked by/Date Chelva Cail 10-26-11		

Radiological Background 40 / 2540 cpm	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches (CPM)
					Surface: 3" Asphalt		10.5
0.5			0.0	60	Fill: Sand w/ silt Silty Sand ck. Dark yellowish brown (10R 4/4), moist, medium dense, no odor, 20% silt, 5% clay, 40% fine sand, 35% medium sand, some mottling noted, trace glass shards (5mm thick)	ck SP SM	3463
1.0			0.1	55			4595
			0.1	70			5116
			0.1	75			5265
2.0			0.1	65	2.5' glass shards		5240
			0.1	75			5244
3.0			0.1	75	3' 3" concrete (possible spread footing)		4993
			0.1	60		AS	4991
4.0			0.1	65	9' 10" ck silt and Poorly graded sand w/ gravel: light yellowish brown (2.5Y 6/4), moist, med. dense, no odor, 10% silt, 15% sandstone gravel, 15% fine sand, 5% coarse, 55% medium sand trace mottling texture	SP	4920
			0.1	65			4983
5.0			0.1	60			5148
			0.1	50			5044
6.0			0.1	60	Same as above		5058

Radiological Background 40/2540				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 246	
Depth	Interval	Recovery	PD	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	60			5058
			0.1	55		SP	5118
7.0			0.1	65	Same as above		5095
			0.1	55	Silty with sand, very dark grayish brown (2.5Y 3/2), moist, med. stiff, no odor, 20% fine sand, 80% silt, low plasticity, non cohesive	ML	5067
8.0			0.1	55			5101
			0.1	50			4968
9.0			0.1	65	8' 8" Silty Sand: dark brown (10YR 3/3), moist, med. dense, no odor, 40% silt, 60% fine sand, slow dilatancy, slight cohesion, low plasticity to no plasticity	SM	4904
			0.1	50	coarsens downwards		4855
10.0			0.1	70	Sandstone: gradational contact - Pale olive (5Y 6/4), moist, med. dense, no odor, 10% fine sand, 70% medium sand, 20% coarse sand	SP	4999
				NR	No Recovery refusal @ 10.5 lbs on sandstone		
11.0					TD: 10.5'		
					No GW encountered		
					Target depth of 40' logs not reached		
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 1	Location ID 247
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 12.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-2-11 1405	Date/Time Total Depth Reached 3-2-11 1544
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30072 (1415) 30073 (1420) (2) 1/2 gallon bags 1-402 Jar		
Geologist C. Knight	Checked by/Date		

Radiological Background 42/2486	Radiological Equipment Used Pancake / Downhole	PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)
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Depth	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	Inches	Borehole Gamma Readings (CPM)
								40.5 2402
								2740
0.5			0.0	45	3" Asphalt Surface	CK		
1.0			0.0	65	Fill: Silt ^y Sand w/ silt: light yellowish brown (10YR 6/4), moist, med. dense, no odor, 25% silt, 15% fine sand, 60% medium sand, mottled severely	SM		4098
1.5			0.0	45				5246
2.0			0.0	65				5362
2.5			0.0	50				5137
3.0			0.0	50				5225
3.5			0.0	75				5085
4.0			0.0	75	Silty Sand: Yellowish brown (10YR 5/4), moist, med. dense, no odor, 35% silt, 10% gravel sandstone, 15% fine sand, 40% med. sand	SM		4854
4.5			0.0	70	Silt: Dark yellowish brown (10YR 4/4), moist, no odor, 15% fine sand, 85% silt, low plasticity, cohesive	ML		4763
5.0			0.0	80				4620
5.5			0.0	50				4760
6.0			0.0	35				4901
6.5			0.0	60	contact @ 6.0'			4635

Radiological Background 42/2487				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 247		
Depth	Interval	Recovery	RPD	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	60	Sandy silt w/ clay: Very dark grayish brown (2.5Y 3/2), moist, med. stiff, no odor, 30% fine sand, 15% clay, 55% silt, low plasticity, cohesive, trace sandstone fragments, slight organic odor	ML	4835	
			0.0	75		4796		
7.0			0.0	75		4931		
			0.0	80		4822		
8.0			0.0	85		5033		
			0.0	55	Same as above		5061	
9.0			0.0	50		4964		
			0.0	55		5090		
10.0			0.0	60		CK sandstone: mechanically weathers to SP: light yellowish brown (2.5Y 6/3) dry, hard, no odor, fine sand	SP	4993
			0.0	75		weathered sandstone: light yellowish brown (2.5Y 6/4), moist, med. dense, no odor, 80% fine sand, 20% medium sand	SP	5143
11.0			0.0	60	Siltstone: greenish gray (10G 5/1), moist, med. stiff, no odor, interbedded siltstone w/ some fine sandstone		5431	
			0.0	55		6056		
12.0			0.0	55	Sandstone: Mechanically weathers to SP: light yellowish brown (2.5Y 6/3) dry, hard, no odor, 90% fine sand, 10% medium sand roots found CK	SP	6393	
refusal @ 12.0' bgs								
TD: 12.0'								
No GW encountered								
3E anomaly detected at 12' bgs								

SSFL BORING LOG



Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5A	Group:	Location ID: 248	
Drilling Company:		Driller:		Ground Elevation: NA		Total Depth Drilled: NA ft bgs.	
Drilling Equipment:		Borehole Diameter:		Date/Time Drilling Started:		Date/Time Total Depth Reached:	
Type of Sampling Device:				Samples Collected: (30074)-no sample + (30075)-no sample two 1/2 Gallon Bags			
Geologist:				Checked By / Date:			
Radiological Background: NA		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background:		NA 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)
0.5					NO SAMPLE COLLECTED			
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

- Boring not advanced

- Location deleted due to conflict with underground utility

- EPA ^{TSW} ~~concerned~~ concerned with the presence of underground utilities

Dow



BORING LOG

Sheet 1 of 2

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 7	Location ID 249
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-3-11 1030	Date/Time Total Depth Reached 3-3-11 1200
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30076 (1035) 300400 (1035) VAB (2) 1/2 gallon bags 300401 (QUT) Field 300402 (1035) M/S		
Geologist C. Knight	Checked by/Date 4/15/11		

Radiological Background 47 / 2549	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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)
					surface is soil		40.5 2364
0.5			0.2	60	Silty Sand (Brown 10YR 5/3), moist, med. dense, no odor; 35% silt, 5% coarse, 10% medium, 50% fine sand, trace fine gravel, mottled, fill material	AF/SM	5124 4536 (14)
1.0			0.2	46			5354 5124 (14)
			0.2	60			5412 5354 (14)
2.0			0.2	50			5249 6410 (14)
3.0			0.2	50	2' 4" Fill: Sandy silt w/ gravel: Greenish gray (Gley 1 6/5 G), moist, med. stiff, light odor, 30% fine sand, 5% med. sand, 15% greenish sandstone gravel angular, 60% silt, non cohesive, no plasticity, fill material	AF/ML	5250 5249 (14)
			0.2	70			5157 5280 (14)
			0.2	50	Silt color changes to olive brown (2.5 4/3),		5252 5157 (14)
4.0			0.2	55	3.5' - Silt w/ sand: Dark yellowish brown (10YR 4/4), 20% fine sand, 80% silt, moist, med. stiff, no odor		5374 5252 (14)
			0.2	60			5385 5374 (14)
5.0			0.2	60			53 5385 (14)
			0.3	65	Partly graded sand: brownish yellow (10YR 6/6), moist, med. dense, no odor, 60% fine sand, 10% coarse, 30% medium sand.	SP	5384
6.0			0.3	65			5182

Radiological Background 47 / 2549				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 249	
Depth	Interval	Recovery	RPD	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			0.3	65	same as above	SP	5182
			0.3	70			5276
2.0			0.3	66			5152
			0.3	60			5174
8.0			0.3	60			5186
			0.3	50			5275
9.0			0.3	50	9.0' - <u>gradational contact</u> weathered sand stone: weathers chemically to SP same as above with increased coarse sand		5173
			0.3	70			5270
10.0			0.3	70			5193
TO 110.0' bgs No Gw encountered Target depth reached							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 250	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1019		Date/Time Total Depth Reached 2-24-11/1028	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags (# 30077) (1028)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-21-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)			
Depth	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)
0.5'			0.215	Silty sand with gravel, (cc) Sand with silt and rock fragments, (10 YR, 4/4), brown, 70% fine to medium grained sand, 15% silt, 15% rock fragments (sandstone mainly, fill gravel), dry, medium dense, common rootlets, no odor. No groundwater encountered.		SW SM	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 1		Location ID 250	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 2'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 3-10-11/1604		Date/Time Total Depth Reached 3-10-11/1640	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 2 1/2 gall bags, (#30078) (1640)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael / 6-21-11			
Radiological Background 60,387 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rac 2000 (Bkgd: 0.7 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0'			0.7	60			0.5 - 4018
1'			0.8	82	Sand (10 YR, 5/4), light brown, 95% fine to medium grained sand, 5% silt, loose, dry, no plasticity or hardness, no odor.	SW	4518
			0.8	94			4707
			0.8	57			4922
2'			0.8	70			4827
3'					Refusal hit at 2' (Sandstone bedrock) No GW. reached.		
4'							
5'							
6'							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 251	
Drilling Company HGL		Driller J. McDaniel		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-24-11/1400		Date/Time Total Depth Reached 2-24-11/1411	
Type of Sampling Device trowel/shovel				Samples Collected 2 1/2 gall bags, 1 4-oz jar (#30135)(1410)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-21-11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Raz 2000 (Bkgd: 0.3 ppm)			
Depth	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'				0.2 12	Sandy silt, (10 YR, 3/4), dark reddish brown, 60% silt, 40% fine to very fine grained sand, semi-moist, soft, no odor. 3" of asphalt on top. No groundwater encountered.	ML	

BORING LOG

Sheet 1 of 1

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 251
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-17-11 0910	Date/Time Total Depth Reached 3-17-11 0940
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30136 (0915) (2) 1/2 gallon bags + 1-402 Jar		
Geologist C. Knight	Checked by/Date P. Hansen 16-21-11		

Radiological Background 53 / 2824	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	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 Inches
			0.0	57	Surface asphalt 2.5"		405 2724 (CPM)
0.5			0.0	73	Sandy Silt: dark yellowish brown (10YR 4/6), moist, med. stiff, no odor. 30% fine sand, 70% silt	ML	3146
1.0			0.0	56			4436
			0.0	65			5003
2.0			0.0	63	weathered Sandstone: light yellowish brown (10YR 6/4), dry, hard, no odor, mechanically weathered to SW, 20% coarse sand, 40% medium sand, 40% fine sand	SP 5 CK	4441
			0.0	85			5295
3.0					Refusal on sandstone @ 2.5'		5498
4.0					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group 5A group 2		Location ID 252	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.5	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 3-21-11 1430		Date/Time Total Depth Reached 3-21-11 1515	
Type of Sampling Device 1 3/4" macrocore acetate liner				Samples Collected 30137 (1440) (2) 1/2 gallon bags + 1 - 402 JG1			
Geologist C. Knight				Checked by/Date Chelsea Cail/6-21-11			
Radiological Background 43 / 2463		Radiological Equipment Used Pancake / Downhole		PID Used MiniRAE 2000 (Bkgd: 0.0 ppm)			

Depth	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 Inches (CPM)
			0.0	56	Surface asphalt 2"		+0.5 2974
0.5			0.0	64	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 35% silt, 66% fine sand, mottled	AF/SM	4530
1.0			0.0	80	Partly graded sand ^{ck} silt: dark yellowish brown (10YR 4/4), moist, med. dense, no odor, 25% silt, 5% coarse, 5% medium, 65% fine sand, rapid dilatancy	CK SP	5011
			0.0	66		SM	5182
2.0			0.0	55			5126
			0.0	48			5201
3.0			0.0	58			5122
			0.0	63			5219
4.0			0.0	64	Sandy silt: Brown (7.5YR 5/4), moist, medium stiff, no odor, 45% fine sand, 55% silt, slow dilatancy, non cohesive.	ML	4981
			0.0	53	Silt w/ sand and clay: Brown (7.5YR 5/4), moist, med. stiff, no odor, 15% fine sand, 20% clay, 65% silt, cohesive, low plasticity	ML	4845
5.0			0.0	45	Weathered Sandstone: light yellowish brown (10YR 6/4), moist, hard, no odor, mechanically weathers to SP, fine grained sandstone		4914
			0.0	70			4264
6.0					Refusal at 5.5' on Sandstone no core encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 30-25 253	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/ 1107		Date/Time Total Depth Reached 2-28-11/ 1120	
Type of Sampling Device trowel/shovel				Samples Collected 1 4-oz jar, 2 1/2 gall bags, #30138 (1120)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/16-21-11			
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.1ppm)			
Depth	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)
0.5'			0.1 13	Silt with sand, (10YR, 2/2), dark brown, 75% silt, 25% fine to medium grained sand, common rootlets, semi-moist, soft, no odor.		ML	
				No groundwater encountered.			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 2		Location ID 253	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 9'	
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"		Date/Time Drilling Started 4-22-11/1503		Date/Time Total Depth Reached 4-22-11/1604	
Type of Sampling Device 2 3/4" hand auger				Samples Collected 1 4-oz jar, (#30139) (1650) 1 1/2 gall bag (#30139) (1650)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-21-11			
Radiological Background 53, 3163 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rac 2000 (Bkgd: 0.0 ppm)			
Depth	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 Inches (CPM)
			0.0	75			0.5 - 3256
			0.0	55	Silty sand, (10 YR, 3/3), dark brown, 60% fine grained sand, 40% silt, semi-moist, medium dense, some rootlets in surficial 3", no plasticity or hardness, no odor.	SM	4949
1'				95	Clayey sand (10 YR, 3/4), dark reddish-brown, 70% fine sand, 30% clay, semi-moist, medium dense, low plasticity and hardness, no odor.	SC	5188
				95			5431
2'				75	Sand with clay (same as above, except 85% fine sand, 15% clay)		5498
				80			5433
3'				55	Clayey sand (same as 1'-2')		5386
				63			5491
				71			5358
				87			5388
5'				56			5467
				61			5374
6'				65			5524

Radiological Background 53,316.3 cpm					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 167-253
Depth	Interval	Recovery	PTD	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)
7'			0.0	78	Sand with clay (same as 2'-3', except mottled texture with sand and reddish clay)	SC	5824
				56			5620
				54			5588
8'				87			5631
				54			5870
9'			V	64	Sand (weathered bedrock at 8.75')		5674
					Refusal at 9'		
					No GW encountered.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A group 2		Location ID 254	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 5-16-11/1653		Date/Time Total Depth Reached 5-16-11/1700	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (#30441) (1700)			
Geologist C. Carmichael				Checked by/Date Julian Robbins/Gedman 8/31/11			
Radiological Background 13		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	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 Inches (CPM)
0.5'				0.013	Silty sand, (10 YR, 4/4), brown, 65% fine sand, 35% silt, dry, loose, some rootlets, trace sandstone rock fragments, no hardness or plasticity, no odor. No groundwater reached.	SM	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 2	Location ID 254
Drilling Company: Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5'
Drilling Equipment: Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-18-11 1210	Date/Time Total Depth Reached 4-18-11 1245
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30/40 (1215) 1/2 gallon bags + 402 Jar		
Geologist C. Knight		Checked by/Date Phelicia Paul / 6-21-11		
Radiological Background 44 / 2332		Radiological Equipment Used Pancake / Downhole		PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.0			0.0	50	Surface: Soil and gravel		2641
0.5			0.0	55	Silt: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 10% fine sand, 90% silt, non cohesive, low plasticity, low toughness	ML	2744
1.0			0.0	56	113"		4262
1.5			0.0	55	Silty Sand: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 30% silt, 10% clay, 10% coarse sand, 15% medium, 35% fine sand	SM	4669
2.0			0.0	50			5029
2.5			0.0	47	32" Clay: light olive brown (2.5Y 5/3), moist, medium stiff, no odor, 10% fine sand, 10% clay, high plasticity, medium toughness, cohesive, 100% clay (fat)		5138
3.0			0.0	48	34" weathered sandstone: Brownish yellow (10YR 6/8), moist, dense, no odor, 10% fine sand, 20% medium sand, 10% clay, 60% fine sand	CH	5425
3.5			0.0	59	Refusal on sandstone at 3.5' bgs No GW encountered		5569
4.0							5803
4.5							
5.0							
5.5							
6.0							



BORING LOG

Sheet 1 of 1

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 255	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/1553		Date/Time Total Depth Reached 2-28-11/1600	
Type of Sampling Device trowel/shovel				Samples Collected 14-oz jar, 2 1/2 gall bags #30202 (1600)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-21-11			
Radiological Background 15		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				02 15	Sand, (10 YR, 4/4), brown, 95% fine to coarse grained subangular sand, 5% silt, moist, loose, few rootlets, no odor. No groundwater encountered	SW	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 265
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-29-11 1410	Date/Time Total Depth Reached 3-29-11 1510
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30203 (1450) 30410 (NT) field DUP (1) 1/2 gallon bags + 14oz jar		
Geologist C. L. Knight	Checked by/Date Chelsea Carmichael/6-21-11		

Radiological Background 45 / 2635	Radiological Equipment Used Pancake / Downhole	PID Used Mini-RAE 2000 (Bkgd: 0.1 ppm)
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Depth	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	43			10.5 263
0.5		0.1	44		Poorly graded sand: olive yellow (2.5Y 6/6), moist, loose, no odor, 80% medium sand, 15% coarse sand, 5% fine sand, subrounded grains	SP	3004
1.0		0.1	58		7" Weathered sandstone: light yellowish brown (2.5Y 6/4), moist, hard, no odor, 15% medium sand, 5% coarse sand, 80% fine sand, abundant iron oxide staining	SP	4136
		0.1	60				5102
		0.1	57				5317
2.0		0.1	63				5532
		0.1	70				5595
3.0					Refusal on sandstone at 2.5' bgs		
4.0					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, Group 3		Location ID 256	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2/26/08 11:0852		Date/Time Total Depth Reached 2/26/08 11:0901	
Type of Sampling Device trowel/shovel				Samples Collected 14-oz jar, 2 1/2 gall bags #30204 (0900)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-21-11			
Radiological Background 13		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	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)
0.5'			0.1 12	Silty sand Sand with silt, (10YR, 4/6), orangeish-brown, 85% fine to coarse grained subangular sand, 15% silt, semi-moist, loose, some rootlets, no odor, trace asphalt. No groundwater encountered.		SW SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 57 Group 3	Location ID 256
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-29-11 1535	Date/Time Total Depth Reached 3-29-11 1615
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected 30205 (1545) (1) 1/2 gallon bags, 1 4-oz jar (CA)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 16-21-11		

Radiological Background 44 / 2545	Radiological Equipment Used Pancake / Downhole	PID Used Mini RAE 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.0			0.0	47	Surface: vegetation and soil			705 2604
0.5			0.0	34	Poorly graded sand: light yellowish brown (2.5Y 6/4), moist, med. dense, no odor, 60% fine sand, 40% medium sand.	SP		3069
1.0			0.0	53	Weathered Sandstone: olive yellow (2.5Y 6/6), moist, hard, no odor, mechanically weathers to SP, 60% medium sand, 40% fine sand, trace rootlets	SP		4578
1.5			0.0	57				5072
2.0			0.0	64				5526
2.5			0.0	64				5378
3.0					Refusal on Sandstone at 2.5' bgs			5229
4.0					No C ₂ W encountered			
5.0								
6.0								

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5A, group 3		Location ID 257	
Drilling Company HGL		Driller P. Skeath		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment trowel/shovel		Borehole Diameter NA		Date/Time Drilling Started 2-28-11/0916		Date/Time Total Depth Reached 2-28-11/0934	
Type of Sampling Device trowel/shovel				Samples Collected 14-oz jar, Lab-30394, Field-30395, MS-30396 2 1/2 gall bags, #30206 (0930)			
Geologist C. Carmichael				Checked by/Date Chelsea Carmichael/6-21-11			
Radiological Background 12		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)			

Depth	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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.212		Silty sand with gravel Sand with silt and rock fragments, (10 YR, 3/4), brown, 65% fine to coarse grained sand, 20% rock fragments (fill gravel and sandstone), 15% silt, common rootlets, semi-moist, loose, no odor. No groundwater encountered.	SW SM		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SA Group 3	Location ID 257
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5'
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 3-30-11 0820	Date/Time Total Depth Reached 3-30-11 0855
Type of Sampling Device 1 3/4" macrocore acetate liner		Samples Collected 30207 (0825) (1) 1/2 gallon bags, 1 4-oz jar @	
Geologist C. Knight		Checked by/Date Phelma Smith 10-21-11	

 Radiological Background
47/3036

 Radiological Equipment Used
Pancake / Downhole

 PID Used
Mini RAE 2000 (Bkgd: 0.0 ppm)

Depth	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	Inches	Borehole Gamma Readings (CPM)
								105' 2796
								(CPM)
				50	Surface: Soil silty sand @	SM		3936
0.5			0.0	55	Poorly-sorted sand with silt: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 15% silt, 10% medium sand, 75% fine sand, trace rootlets	SP		5064
1.0			0.0	50	Weathered Sandstone: brownish yellow (10YR 6/6), moist, dense to hard, no odor, 5% coarse, 10% medium, 85% fine grained sandstone, subrounded grains	SC		5344
			0.0	50				5550
2.0			0.0	70	10% coarse, 20% medium, 70% fine grained sandstone, subrounded grains			5826
			0.0	70				5522
3.0			0.0	75	2' 5" 100% fine grained sandstone to 3.5' hgs.			5670
			0.0	60				NA
4.0					Refusal on Sandstone at 3.5' hgs			
					No GW encountered			
5.0								
6.0								

BORING LOG

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 258
Drilling Company HGL		Driller I. Stone	Ground Elevation NA	Total Drilled Depth 7.0'
Drilling Equipment 1 hand auger		Borehole Diameter 3"	Date/Time Drilling Started 4-7-11 1310	Date/Time Total Depth Reached 4-7-11 1440
Type of Sampling Device hand auger		Samples Collected 30208 (1320) (1) 1/2 gallon bags, 1 4-oz jar (C)		
Geologist C. Knight		Checked by/Date Chelsea Carmichael 4/6-21-11		
Radiological Background 50 / 2756		Radiological Equipment Used Pancake / Downhole		PID Used Mini-RAE 2000 (Bkgd: 0.0 ppm)

Depth	Interval	Recovery	PD	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 Inches (CPM)
					Surface: soil and gravel on a steep slope		45' 2737
0.5		0.0	72		Fill: Silty sand: dark yellowish brown (10YR 4/4), moist medium dense, no odor, 35% silt, 5% coarse sand, 10% medium sand, 50% fine sand, trace rootlets	AF	2748
1.0		0.0	55			SM	3220
		0.0	50				3827
2.0		0.0	55		Fill: Silty clay: dark yellowish brown (10YR 3/4), moist, medium st. AP no odor, 5% fine sand, 5% medium sand, 30% silt, 60% clay, low plasticity, cohesive, medium toughness, trace rootlets	AF/CL	4051
		0.0	40				4225
		0.1	50		Same as above ICL: Fill		4215
3.0		0.0	60				4266
		0.0	55				4341
4.0		0.0	45				4321
		0.0	60				4485
5.0		0.0	74		Same as above ICL: Fill, mottled texture, trace sandstone gravel	AF/CL	4383
		0.0	65				4360
6.0		0.0	50				4448

Radiological Background <u>50/2756</u>				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location <u>258</u>	
Depth	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	50	Same as above : CL	AP/CL	4448
			0.1	61	Weathered sandstone: light yellowish brown (2.5Y 6/4), med. to hard, no color, mechanically weathered to sp. finegrained sandstone		4603
7.0			0.0	63			4714
8.0					Refusal on sandstone at 7.0 logs No GW encountered		
9.0							
10.0							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5A group 3	Location ID 244 ck 2.59
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.0
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 4-1-11 1450	Date/Time Total Depth Reached 4-1-11 1515
Type of Sampling Device 1 3/4" macrocore acetate liner	Samples Collected #30067 (1500) #30442 (1500) (1) 1/2 gallon bags, 14-oz jar (cc) (cc)		
Geologist C. Knight	Checked by/Date Chelsea Carmichael 16-21-11		

Radiological Background
59 / 2706

Radiological Equipment Used

Pancake / Downhole

PID Used

Mini-RAE 2000 (Bkgd: 0.0 ppm)

Depth	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 Inches 10.5' 2769 (CPM)
0.5		0.0	65		Surface Gravel and Soil Silty sand! Brownish yellow (10YR 6/6), moist, loose, no odor, 35% silt, 10% medium sand, 55% fine sand,	SM	4424
1.0		0.0	75		1 3/4" weathered Sandstone? Yellowish brown (10YR 5/8), moist, dense, no odor, fine sandstone	SM	4717
2.0		0.0	55		Refusal on Sandstone at 2.0' bgs No GW encountered	SM	4747
3.0							4840
4.0							
5.0							
6.0							