

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN ^{group 1} 4283	Location ID 1			
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 5-25-11/0943	Date/Time Total Depth Reached 5-25-11/0950			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4oz jar 1 1/2 gall bag (#50001) (0950)					
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/13/11					
Radiological Background 11		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'				0.012	Clayey sand, (10 YR, 3/4), dark brown, 65% fine sand, 35% clay, dry, common rootlets, medium dense, 2 pieces of glass and 1 piece of plastic found, no plasticity or hardness, no odor. No groundwater reached	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 1	Location ID 1
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-17-11 1040	Date/Time Total Depth Reached 5-17-11 1140
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 5002 (1) 1/2 gallon bags + 4 oz jar		4045
Geologist C. Knight	Checked by/Date J. Robbins / 7/13/11		

Radiological Background 46 / 2432	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0) ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	50	Surface: gravel and soil		10.5' 2310
0.5			0.0	50	Clay: dark brown (10YR 3/3), moist, medium stiff, no odor, 5% silt, 95% clay, low plasticity, cohesive, medium toughness, medium dry strength	CL	3387
1.0			0.0	30		4369	
			0.0	60	Some rootlets down to 2.0' bgs		4660
2.0			0.0	68		4726	
			0.0	59			4798
3.0			0.0	50			4759
			0.0	65			4760
4.0			0.0	40	large charcoal fleck ~ 1/4" long		4788
			0.0	60			4823
5.0			0.0	75	Clay: same as above	CL	4755
			0.0	75	5' 6" silt with clay: yellowish brown (10YR 5/6) clay same as above (10) moist, medium stiff, no odor, 10% clay, 90% silt, low plasticity, low toughness		4965
6.0			0.0	85		CL	5031
						CL	5334

Radiological Background 46 / 2432		Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 1				
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	Inches	Borehole Gamma Readings (CPM)
6.0		0.0	85		Clay - Same as above (CK)	ML		5337
		0.0	81		6'6" Silt with clay: yellowish brown (10YR 5/6), moist, medium stiff, no odor, 10% clay, 90% silt, low plasticity, low toughness. (CK)	ML CK		5009
7.0		0.0	81		medium stiff, no odor, 10% clay, 90% silt, low plasticity, low toughness. (CK)	ML CK		4842
		0.0	73		Silty clay: yellowish brown (10YR 5/6), moist, stiff, no odor, 30% silt, 70% clay, low plasticity, medium toughness, some CaCO ₃ stringers and nodules	CL		4659
8.0		0.0	62					4758
		0.0	50					4817
9.0		0.0	51					4690
		0.0	49					4616
10.0		0.0	60		Same as above: Silty clay	CL		4719
<p>Total Depth: 10.0' bgs</p> <p>No GW encountered</p> <p>Anomaly detected at 6.0' bgs above 3Σ</p>								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN ^{group 1} group 2	Location ID 2			
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 5-25-11/0858	Date/Time Total Depth Reached 5-25-11/0905			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50003) (0905)					
Geologist C. Carmichael		Checked by/Date John R. Robbins/Mullman 7/13/11					
Radiological Background 10		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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	10	Sand with gravel and silt, (10 YR, 4/4), brown, 65% fine to medium grained sand, 20% gravel fill rock, 15% silt, dry, dense, no plasticity or hardness, no odor.	AF/SW	
No groundwater reached.							



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 1	Location ID 2
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-16-11 1435	Date/Time Total Depth Reached 5-16-11 1540
Type of Sampling Device 1 3/4" Macrotube	Samples Collected 50004 (1440) 1 1/2 gallon bags + 4 oz jar	Geologist C. Knight	
Radiological Background UR/2351		Radiological Equipment Used Pancake / downhole	
PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)		Checked by/Date J. Robbins/Goldman 7/13/11	

Depth	Interval	Recovery	PID	Radiological	Description <i>AF: Artificial Fill</i> (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)
			0.0	50	Surface: gravel		2124
0.5			0.0	55	Fill: Clay with sand and gravel; dark brown (10YR 3/3), moist medium stiff, no odor, 10% angular coarse gravel (fill/rails), 10% medium sand, 80% clay, trace mottling, low plasticity	AF	2847
1.0			0.0	50	Silty clay: Brown (10YR 4/3), moist, medium stiff, no odor, 5% fine sand, 15% silt, 80% clay, cohesive, low plasticity	CL	4394
			0.0	48	cohesive		4618
2.0			0.0	53			4922
			0.0	56			5149
3.0			0.0	48			5166
			0.0	35	3'2" Dark Silty clay: Yellowish Brown (10YR 4/6), moist, stiff, no odor, 30% silt, 60% clay, 10% CaCO ₃ nodules	CL	4853
4.0			0.0	50			5005
			0.0	69			4964
5.0			0.0	70			5030
			0.0	49			4981
			0.0	56	Same as above		4854
6.0			0.0	56			4983

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 1	Location ID 3
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-16-11 0930	Date/Time Total Depth Reached 5-16-11 1100
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 5005 (0940) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins/Meldrum 7/13/11		

Radiological Background 43 / 2322	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <i>Artificial Fill</i> (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	43	Surface: Asphalt		+05' 2356
0.5			0.0	74	3" Asphalt		2972
			0.0	65	Fill: Clay; Black (10YR 2/1) moist, medium stiff, ^{ck} no odor, slight odor, medium plasticity, medium toughness, cohesive	AF / CL	4639
1.0			0.0	50	12"		5347
			0.0	63	lean clay, very clay, grayish brown (10YR 3/2), moist, medium stiff, no odor, medium plasticity, ^{ck} cohesive, low toughness	CL	5342
2.0			0.0	60			4988
			0.0	67			4923
3.0			0.0	65			4981
			0.0	67			5077
4.0			0.0	75			5075
			0.0	65			5005
5.0			0.0	75			5047
			0.0	70			4973
6.0			0.0	55	Same as above: CL		5080

Radiological Background				Project Name	Project Number	Location	
43 / 2322				SSFL Area IV Radiological Study	EP9038.01.22.04.03	3	
Depth	Interval	Recovery	PID	Radiological	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		5880
			0.0	55	6' 6"		4898
7.0			0.0	50	Clay with sand; dark yellowish brown (10YR 4/6), moist, stiff, no odor, 10% fine sand, 90% clay, cohesive, medium plasticity	CL	8010
			0.0	65			5103
8.0			0.0	60			5861
			0.0	50			4833
9.0			0.0	60	8' 11" weathered sandstone; yellowish brown (10YR 5/4), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone	Sp	5031
10.0					Refusal on sandstone at 9' 6" s		
					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 5DN ^{group 1} 472	Location ID 4				
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5' 0.75'				
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a	Date/Time Drilling Started 5-25-11/1037	Date/Time Total Depth Reached 5-25-11/1050				
Type of Sampling Device Stainless steel shovel		Samples Collected ^{1 4-oz jar} 1 1/2 gall bag (#50006) (1050)						
Geologist C. Carmichael		Checked by/Date Robbie Feldman 7/13/11						
Radiological Background 10		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	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0	4" of asphalt on surface. Sand with gravel and clay, (10YR, 3/4), dark reddish-brown, 70% fine to coarse grained sand, 15% gravel fill and asphalt pieces, 15% clay, moist, dense, no plasticity and hardness, no odor.	AF/SW		
No groundwater reached.								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 1	Location ID 4
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-16-11 1123	Date/Time Total Depth Reached 5-16-11 1240
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50007 (1130) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date Julian Robin Feldman 7/14/11		

Radiological Background 51 / 2185	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	50	AF: Artificial fill		
0.5			0.20	55	Fill: Silty sand with gravel: Yellowish brown (10YR 5/5), moist, medium dense, no odor, 10% angular coarse gravel (fill rock), 5% coarse, 15% silt, 20% medium sand, 50% fine sand	AF / SM	2897 4394 4618
1.0			0.0	50	13" —————		
			0.0	48	Silt: dark brown (10YR 3/3), very moist, soft, no odor, 10% clay, 90% silt, cohesive, low plasticity	ML	4822
2.0			0.0	55			5145
			0.0	56	2'6" —————		5165
3.0			0.0	48	Clay: Dark brown (7.5YR 3/3), moist, stiff, no odor, 100% clay, medium plasticity, cohesive	CL	4853
			0.0	35			5009
4.0			0.0	50			4964
			0.0	69			5030
5.0			0.0	70	No recovery		4981
			0.0	45	Same as above	CL	4859
6.0			0.0	50			4983

Radiological Background 51/2185				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 4		
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	50		Clay: Same as above 6" 4"	CL		4983
		0.0	65		Clay with silt: Brown (7.5 YR 4/4), moist, stiff, no odor, 10% silt, low plasticity, cohesive, abundant CaCO ₃ nodules, trace CaCO ₃ stringer, medium toughness, 90% clay			4876
7.0		0.0	60					4808
		0.0	48					4783
8.0		0.0	51					4667
		0.0	66					4667 4699 (CIR)
9.0		0.0	57				4699 4745 (CIR)	
		0.0	75				4814	
10.0		0.0	70		Same as above			4976
<p>Total Depth 10.0' bgs No GW encountered</p>								

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN ^{group 1} group 2	Location ID 5
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 5-25-11/1005	Date/Time Total Depth Reached 5-25-11/1012
Type of Sampling Device Stainless steel shovel	Samples Collected 1 4-oz jar 1 1/2 gall bag (#50008) (1012)		
Geologist C. Carmichael	Checked by/Date Robbino, J. Edman 7/13/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5				0.012	Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 35% fine to medium grained sand, common rootlets, dry, medium stiff, low plasticity and hardness, no odor. No groundwater reached	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 1	Location ID VGA 5
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-17-11 0855	Date/Time Total Depth Reached 5-17-11 1000
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50009 (0900) (1) 1/2 gallon bags + 402 Jar		
Geologist C. Knight	Checked by/Date J. Rebbin Alderman 7/13/11		

Radiological Background 46 / 2440	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches <small>(CPM)</small>
					Surface: soil and grass		+0.5 2621
			0.0	60			3262
0.5			0.0	55	Clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 100% clay, cohesive, low plasticity, medium toughness, trace rootlets near surface	CL	4419
1.0		0.0	59	4702			
		0.0	60	4912			
2.0		0.0	45	4907			
			0.0	60			5039
3.0			0.0	65			4947
			0.0	64			4762
4.0			0.0	56	Same as above		4529
			0.0	70	Silt with clay: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 10% clay, 90% silt, low toughness, low plasticity, cohesive	ML	4407
5.0			0.0	53			4250
			0.0	55	Clay with silt: strong brown (7.5YR 5/8), moist, medium stiff, no odor, 10% silt, 5% fine sand, 85% clay, CaCO ₃ stringers and nodules	CL	4454
6.0			0.0	85			4738

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN ^{group 1} group 2	Location ID 6				
Drilling Company HGL		Driller J. Morse	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A	Date/Time Drilling Started 5-25-11/0823	Date/Time Total Depth Reached 5-25-11/0840				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4oz jar 1 1/2 gall bag (#50010) (0840)						
Geologist C. Carmichael		Checked by/Date J. Robbins/Geldman 7/13/11						
Radiological Background 12		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	12	2" of asphalt on surface. Clay with sand, (10 YR, 2/2), dark brown, 80% clay, 20% medium grained sand, trace asphalt gravel and sandstone fragments, moist, medium stiff, medium plasticity and hardness, no odor.	CL		
No groundwater reached.								

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DN	Group: 1	Location ID: 6
Drilling Company: HGL	Driller: T. Morse	Ground Elevation: NA	Total Depth Drilled: 9'9"	
Drilling Equipment: 2 3/4" hand auger	Borehole Diameter: 4.76 inches - 2 3/4"	Date/Time Drilling Started: 8-11-11 / 0746	Date/Time Total Depth Reached: 8-11-11 / 0919	
Type of Sampling Device: 2 3/4" hand auger	Samples Collected: 4 oz jar (#50011) (0835) One 1/2 Gallon Bag (Approx 8 lbs.)		Checked By / Date: J Robbins Alderman 8/16/11	
Geologist: Chelsea Carmichael				

Radiological Background: 71, 3026 cpm	Radiological Equipment Used: Micro R (Downhole) Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft. bgs.)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					2" of asphalt on top.			0 - 4203
0.5			0.0	64	Clay with sand, (10YR, 3/2), dark brown, 85% clay, 15% fine sand, moist, medium stiff, medium plasticity, hardness, no odor.	CL		0.5 - 3085
			0.0	75				4520
1.0			0.0	100				4727
			0.0	115				4722
2.0			0.0	92	2' Clay with sand, same as above, except dark orange-ish brown, (10YR, 3/4) and trace calcium carbonate (mm-sized) nodules.	CL		2 - 4868
			0.0	75				5003
3.0			0.0	66	3' Gradational Contact Clay with sand, (10YR, 4/6), reddish brown with red and off-white speckles, 80% clay, 20% fine to medium grained sand, moist, low-medium plasticity, hardness, no odor.	CL		3 - 5056
			0.0	67				5299
4.0			0.1	72	Same as above, except light brown (10YR, 5/4) plus common stringers and nodules.			4 - 5236
			0.1	90				5194
5.0			0.0	53	Gradational Contact Clayey sand, (10YR, 6/3 and 5/8), light brown mottled with orange, 55% fine to medium grained sand, 45% clay, semi-moist, low plasticity, hardness, no odor, some speckles, CaCO ₃ nodules and stringers.	SC		5 - 5047
			0.0	86				4847
6.0			0.0	94				6 - 5027

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: SDN	Group: 1	Location ID: 6		
Radiological Background: 71, 3026 cpm		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs. Borehole Gamma Readings (CPM)
6.0					Clayey sand (same as above)	SC	6 5227
7.0			0.0	65			7 5041
			0.0	82			5100
			0.0	77			8 5315
8.0			0.0	91	8' Gradational Contact Clayey sand, (10YR, 5/4), light brown, 55% fine sand, 45% clay, moist, medium dense, common CaCO ₃ mm to cm-sized nodules, some mottling with iron-oxide staining, no odor.	SC	8 5490
			0.0	67			9 5329
9.0			0.0	80			5055
			0.0	54			
10.0					9.75' refusal (C)		10
					10' goal depth reached (C) (Refusal at sandstone bedrock) No GW reached.		
11.0							11
12.0							12
13.0							13

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID SDN, group 2	Location ID 7
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 8-22-11/0747	Date/Time Total Depth Reached 8-22-11/0808
Type of Sampling Device Stainless steel shovel / trowel	Samples Collected ^{8-oz jar} 1-1/2 gall bag (#50012) (0805)		
Geologist C. Carmichael	Checked by/Date Liz Jean Robinson Mollman 10/25/11		

Radiological Background 14 uR/hr	Radiological Equipment Used uR meter	PID Used Mini Rac 2000 (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'					3" of asphalt on top. Sandy clay, (10 YR, 3/3), dark brown, 60% clay, 40% sand and sand-sized asphalt, medium stiff, dry, low plasticity, hardness, no odor.	SC		
No GW reached.								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 7
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 6'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-10-11/0845	Date/Time Total Depth Reached 8-10-11/0933
Type of Sampling Device 2 3/4" hand auger	Samples Collected 4-oz jar Field DUP: 50430 1 1/2 gall bag (#50432) (0930)		
Geologist C. Carmichael	Checked by/Date J. Robbins-Medman 50013 8/16/11		

Radiological Background 61, 2802 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	ID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
			0.0	70			0.5	3284
1'			0.051		Clay with sand, (10 YR, 3/3), dark brown, 85% clay, 15% fine sand, moist, medium stiff, low-medium plasticity, hardness, no odor.	CL		4095
			0.070			4807		
			0.070			5077		
2'			0.075			5252		
			0.102			5052		
3'			0.065		4911			
			0.055	3.5'	Clay with sand, (10 YR, 3/4 - 5/8), dark brown with speckles of orange, 75% clay, 25% fine grained sand, moist, medium stiff, low-medium plasticity, hardness, no odor, calcium carbonate mm-sized nodules, trace siltstone/sandstone fragments.	CL		5060
			0.100			5232		5157
4'			0.060			5105		5232
			0.080			5315		5105
5'			0.085	5.5'	Sand with clay, (10 YR, 5/6), orangeish-brown, 85% fine to medium grained sand, 15% clay, semi-moist, medium dense, no plasticity, hardness, no odor.	SC		5192
			0.090			5192		5315
6'								5228

Refusal at 6' - sandstone bedrock

No GW reached.

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 8			
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment Stainless steel shovel		Borehole Diameter 1 1/8	Date/Time Drilling Started 5-23-11/1653	Date/Time Total Depth Reached 5-23-11/1700			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50014) (1700)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Malden 7/13/11					
Radiological Background 11		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)
05				2.0	Silt, (10YR, 5/4), light brown, 95% silt, 5% fine sand, dry, soft, common rootlets, very low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 8
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-31-11 1445	Date/Time Total Depth Reached 5-31-11 1600
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz jar		
Geologist C. Knight	Checked by/Date Shawn Robbins Hedman 9/8/11		

Radiological Background S8 / 2352	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface soil and gravel		70.5' 2442 (CPM)
0.5			0.0	55	Fill: silty clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% fine sand, 20% silt, 75% clay. (low plasticity, medium toughness, cohesive)	AF/CL	2980
			6.0	47			3915
1.0			0.0	57	Sandy silt with clay: yellowish brown (10YR 5/6), moist, medium stiff, no odor, 20% fine sand, 15% clay, 65% silt, low plasticity, cohesive, low toughness	ML	4398
			0.0	58			4529
2.0			0.0	50			4554
			0.0	47	2'6" silty sand: yellowish brown (10YR 5/8), moist, medium dense, no odor, 20% silt, 5% med fine sand, 75% fine sand, trace iron oxide staining	SM	4655
3.0			0.0	50			4791
			0.0	52	3'6" silty clay with sand: yellowish brown (10YR 5/4), moist, stiff, no odor, 20% silt, 15% fine sand, 65% clay, low plasticity, cohesive, trace CaCO ₃ stringers, some CaCO ₃ nodules	CL	4826
4.0			0.0	45			4774
			0.0	48			4538
5.0			0.0	43			4460
			0.0	54			4576
6.0			0.0	65			4776

Radiological Background 58/2352				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 8		
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	CL		4778
		0.0	64		6" Clayey silt with sand: brownish yellow (10YR 6/8), moist, medium stiff, no odor, 25% fine sand, 30% clay, 45% silt, cohesive, low plasticity, CaCO ₃ stringers and nodules	ML		4980
7.0		0.0	75					5001
		0.0	55					4710
8.0		0.0	55					4746
		0.0	77					4742
9.0		0.0	66		8' 10" Poorly graded sand with silt; light olive brown (2.5Y 5/6), moist, medium dense, nodular, 10% silt, 90% fine sand	SP		4627
		0.0	62					4939
10.0		0.0	36					4762
<p>Total Depth: 10.0' bgs</p> <p>No GW encountered</p>								

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 9			
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 5-23-11/1710	Date/Time Total Depth Reached 5-23-11/1716			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50016) (1715)					
Geologist C. Carmichael		Checked by/Date J. Robbins Waldman 7/13/11					
Radiological Background 11		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	11	Silt, (10 YR, 4/3), brown, 90% silt, 5% clay, 5% fine sand, moist, medium stiff, some rootlets, low-medium plasticity and hardness, no odor. No groundwater reached.	ML	



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 9
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-9-11/1440	Date/Time Total Depth Reached 8-9-11/1615
Type of Sampling Device 2 3/4" hand auger	Samples Collected 4-82 jar 1 1/2 gall bag (#50017) (1545)		
Geologist C. Carmichael	Checked by/Date Robert Feldman 9/8/11		

Radiological Background 63,3058 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
			0.0	77			3922	0.5
							4678	0
			0.0	71	Sand with clay, (10YR, 4/4), brown, 85% fine to medium grained sand, 15% clay, semi-moist, medium dense, no plasticity, hardness or odor.	SC	4903	
1'			0.0	76	1' Gradational Contact		4947	
			0.0	85	Sandy clay, (10YR, 3/3), dark brown, 70% clay, 30% fine to medium grained sand, semi-moist, medium stiff, low-medium plasticity and hardness, no odor, trace mm-sized calcium carbonate nodules.	CL	4868	
2'			0.0	69	2' Same as above, except reddish-brown (10YR, 4/6).		5019	
							5189	
			0.0	67			5570	
3'			0.0	73	3' Gradational Contact	SC	5680	
					Same as 0'-1', except reddish-brown (10YR, 4/6), trace red speckles (iron-oxide)		5382	
			0.0	71	Sand with clay		5403	
4'			0.0	79			5251	
							5514	
			0.0	77			5502	
5'			0.0	77				
			0.0	92				
6'			0.0	78				

Radiological Background 63,3058 cpm					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 9
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)
					(Same as above)	SC	5393
7'			0.065				5464
			0.063				5424
			0.056				5367
8'			0.070		Sandy clay (Same as 1'-2'), except 7.5YR, 4/4 plus more significant amounts of calcium carbonate precipitate.	CL	5347
			0.086				5328
9'			0.077				5235
			0.051				5364
			0.075				
10'					10' goal depth reached. No GW reached.		

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 10				
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 5-23-11/1634	Date/Time Total Depth Reached 5-23-11/1642				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50018) (1640)						
Geologist C. Carmichael		Checked by/Date J. Rottino Feldman 7/13/11						
Radiological Background 11		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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	11	Gravelly sand, (10YR, 2.5Y, 5/2), greyish brown, 60% fine to medium grained sand, 40% gravel fill, dry, dense, no plasticity or hardness, no odor. No groundwater reached.	SW/AF		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN Group 2	Location ID 10			
Drilling Company Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs			
Drilling Equipment Geo probe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-31-11 1315	Date/Time Total Depth Reached 5-31-11 1435			
Type of Sampling Device 1 3/4" Macrocore		Samples Collected 50019 (1320) (1) 1/2 gallon bags 30431 (NT) Field VWP + 4oz Jar					
Geologist C. Knight		Checked by/Date Julian Robbins/Medman 9/8/11					
Radiological Background 46 / 2495		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface: soil and grass		40.5' 2561
0.5			0.0	48	Fill: well graded sand with gravel: gray (10YR 6/1), dry, medium dense, no odor, 25% fine to coarse angular gravel (fill rock), 10% coarse sand, 25% medium sand, 40% fine sand	AR Sio	3118 3919
1.0			0.0	60	Silty clay: darkly yellowish brown (10YR 3/4), moist, medium stiff, no odor, 25% silt, 75% clay, medium plasticity, low low toughness, cohesive, trace roots	CL	4475
			0.0	59			4565
2.0			0.0	83			4727
			0.0	61			4789
3.0			0.0	51			4759
			0.0	58	3'6" ———— Silty clay with sand: yellowish brown (10YR 5/6), moist, medium stiff, no odor, 30% silt, 5% medium sand, 20% fine sand, 45% clay, low plasticity, medium toughness, cohesive	CL	4779
4.0			0.0	63	4698		
			0.0	52	4722		
5.0			0.0	64			474
			0.0	57	5'6" abundant CaCO ₃ stringers and nodules within clay		4532
6.0			0.0	58			4584

Radiological Background 46/2495				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 10			
Depth	Interval	Recovery	PID	Radiological	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	58		Same as above			4584	
		0.0	67		6'9"	CL		4633	
7.0		0.0	70		Sandy silt; Brown (7.5YR 5/4), moist, medium stiff, no odor, 25% fine sand, 75% silt, cohesive,	ML		4644	
		0.0	74		low plasticity, slow dilatancy, Iron oxide staining, some CaCO ₃ stringers, trace carbon speckles			4637	
8.0		0.0	62					4852	
		0.0	65					4779	
9.0		0.0	63		8'10" Silt, clay with sand; Brown (7.5YR 5/3), moist, medium stiff, no odor, 30% silt, 5% coarse sand, 10% medium sand, 15% fine sand, 40% clay, low plasticity,	CL		4694	
		0.0	51		non cohesive			4830	
10.0		0.0	55					4911	
Total Depth 10.0' bgs No GW encountered									

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 11	
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 5-23-11/1614		Date/Time Total Depth Reached 5-23-11/1622	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (#50020) (1622)			
Geologist C. Carmichael				Checked by/Date J. Robinson/Geldman 7/13/11			
Radiological Background 11		Radiological Equipment Used w/ R meter			PID Used Mini Rae 2000 (Background: 0.0 ppm)		
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5				0.0 11	<p>Sandy silt, (10 YR, 4/6), brown, 70% silt, 30% fine sand, common rootlets, dry, loose, no plasticity or hardness, no odor.</p> <p style="font-size: 1.5em; text-align: center;">No groundwater reached</p>	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 11
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 7'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-9-11/1039	Date/Time Total Depth Reached 8-9-11/1210
Type of Sampling Device 2 3/4" hand auger	Samples Collected 4-oz jar 1 1/2 gall bag (#50021) (1200)	Checked by/Date J Rollins Hedman 8/16/11	
Geologist C. Carmichael		Background: Mini Rac 2000 (0.0 ppm)	

Radiological Background 59, 3009 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 2000 (0.0 ppm)
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Depth	Interval	Recovery	Radiological CPM	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)
			72	(1.5' of soil on top of asphalt in drainage)		0.5	3932
			77	Clayey sand, (10YR, 3/3), dark brown, 70% fine to medium grained sand, 30% clay, dense, medium dense, semi-moist, very low hardness, no plasticity, no odor.	SC		4830
			75	Gradational Contact			4923
			61	Same as above, except orangeish-brown, (10YR, 4/6), plus calcium carbonate nodules (mm-sized)			4904
			80				5030
			75				5009
			65	Gradational Contact			5057
			65	Sandy clay (10YR, 5/4), light brown, 55% clay, 45% fine to medium grained sand, semi-moist, medium stiff, low plasticity, low-medium hardness, no odor, trace iron-oxide tinting.	CL		5162
			63				5230
			56				5173
			78				5302
			84	Same as above, except mottled with orange and light brown.			5160
			83				5418

Radiological Background					Project Name	Project Number	Location
59,3009 cpm					SSFE Area IV Radiological Study	EP9038.01.22.04.03	11
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)		Inches
				0.074	Sand with clay and rock fragments, (10YR, 4/6), light reddish-brown; 65% fine to medium grained sand, 20% siltstone and sandstone rock fragments, 15% clay, no plasticity, hardness, no odor.	SC	5348
				0.087			5169
7'					Refusal hit at 7' - siltstone/sandstone bedrock		
					No GW reached.		

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 12				
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 5-23-11/1540	Date/Time Total Depth Reached 5-23-11/1550				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gallon bag (#50022) (1550)						
Geologist C. Carmichael		Checked by/Date J. Rabin/Meldman 7/13/11						
Radiological Background 11		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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5					<p>~1.5" of gravel on top.</p> <p>Clay with sand and gravel, (10 YR, 4/2), greyish-brown, 70% clay, 15% fine to medium grained sand, 15% gravel fill rock, semi-moist, trace rootlets, medium plasticity and hardness, no odor.</p> <p>No groundwater reached.</p>	CL		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 12		
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'		
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-9-11/0818	Date/Time Total Depth Reached 8-9-11/0941		
Type of Sampling Device 2 3/4" hand auger		Samples Collected 4-oz jar 1 1/2 gall bag (#50023) (0930)				
Geologist C. Carmichael		Checked by Date J. Robbins Feldman 8/16/11				
Radiological Background 90, 2913 cpm		Radiological Equipment Used Downhole Scanner, Pancake meter		Background: PID Used Mini Rac 2000 (0.0 ppm)		
Depth	Interval	Recovery	Radiological PID 105	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)
1'			0.077	Clay with sand and gravel (10YR, 3/4), dark reddish-brown, 60% clay, 20% fine to coarse grained sand, 20% gravel fill rock, semi-moist, stiff, low plasticity, low-medium hardness, no odor, trace iron-oxide staining in sand.	CL	4555
			0.060			4702
2'			0.076	1.5' Gradational Contact	CL	4804
			0.081	Clay with sand, (10YR, 3/4), dark reddish-brown, 80% clay, 20% fine to medium grained sand, moist, medium stiff, medium hardness, plasticity, no odor.		4800
			0.071			4709
3'			0.043			4538
			0.086			4213
			0.087	3.75'	SW	3365
4'		0.086	Sand, (2.5Y, 5/2), greenish-brown, 95% fine to coarse grained sand, 5% silt, medium dense, moist, no hardness, plasticity, no odor.	2983		
	5'		0.071	5'	CL	3972
			0.074	Clay, (10YR, 3/2), dark brown, 95% clay, 5% fine sand, moist, medium-high plasticity, hardness, no odor, medium stiff.		4634
6'			0.053	5.75'	SC	4934
				Clayey sand, (10YR, 4/6), reddish-brown, 55% fine to medium grained sand, 45% clay, low plasticity, hardness, no odor.		

Radiological Background				Project Name	Project Number	Location	
90, 2913 cpm				SSFE Area IV Radiological Study	EP9038.01.22.04.03	12	
Depth	Interval	Recovery	PID	Radiological	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)
7'			0.050		Same as above, except sandier: 65% sand, 35% clay + trace off-white calcium carbonate stringers		4955
			0.080		Same as above, except addition of black, red and off-white speckles.		5130
8'			0.073				4944
			0.103		Gradational Contact	CL	4941
			0.095		Sandy clay, (10YR, 5/4 + 5/8) brown mottled with orange, 60% clay, 40% fine to medium grained sand, semi-moist, some calcium carbonate pockets of precipitation, medium stiff, low plasticity, hardness, no odor.		5079
9'			0.081				5013
			0.082				5151
10'			0.055				5148
10' goal depth reached. No GW encountered.							

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 13			
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 5-23-11/1517	Date/Time Total Depth Reached 5-23-11/1525			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50024) (1525)					
Geologist C. Carmichael		Checked by/Date J. Robbins-Meldman 7/13/11					
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Ra2 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	11	Gravelly sand with silt, (10 YR, 4/3), light greyish-brown, 50% fine to medium grained sand, 35% gravel fill rock, 15% silt, dry, dense, no plasticity or hardness, no odor. No groundwater reached.	SW	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 2	Location ID 13
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-31-11 0900	Date/Time Total Depth Reached 5-31-11 1015
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50025 (0905) (1) 1/2 gallon bags + 102 Jar		
Geologist C. Knight	Checked by/Date J. Robbins-Moldman 7/13/11		

Radiological Background 42 / 2281	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 gravel		+0.5 2496
0.5			49		Fill: Well graded sand with gravel: light gray (10YR 7/1), dry, medium dense, no odor, 20% coarse to fine angular gravel (fill rock), 30% fine sand, 20% medium sand, 30% coarse sand	AF	3253
1.0			48			Sw	4156
			46				4521
			80		1'5" w/silt		4746
2.0			54		Clay: Brown (7.5YR 4/3), moist, medium stiff, no odor, 5% fine sand, 15% silt, 80% clay, cohesive, medium plasticity, medium toughness	CL	4701
			56				4841
3.0			72				4824 4890
			81				4718 4724 4890
4.0			73		4' bgs. same as above, trace CaCO ₃ nodules	CL	4700 4718 4924
			76				4687 4700 4718
5.0			83		Clay: Brown (7.5YR 4/4), moist, stiff, no odor, 5% silt, 5% fine sand, 90% clay, low plasticity, cohesive, abundant CaCO ₃ nodules		4588 4700
			62			CL	4438 4687
6.0			78				4588

Radiological Background 42/22-81				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 13		
Depth	Interval	Recovery	FTD	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				78	Same as above			4588
				62		CL		4438
7.0				41				4505
				44	Sandy silt with clay: Yellowish brown (10YR 5/8), moist, medium stiff, no odor, 20% fine sand, 5% medium sand, 10% clay, 65% silt, non-cohesive, low plasticity, Iron oxide staining abundant, abundant CaCO ₃ nodules	ML CL CL		4811
8.0				60				4860
				61	8" - Sandy clay: Yellowish brown (10YR 5/4), moist, stiff, no odor, 5% coarse sand, 10% medium sand, 15% fine sand, 5% silt, 65% clay, cohesive, medium plasticity, abundant well developed CaCO ₃ nodules, trace CaCO ₃ stringers	CL		4582
9.0				58				4496
				55				4573
10.0				56				4562
					Total Depth 10.0' bgs No GW encountered			

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 14			
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 5-23-11/1455	Date/Time Total Depth Reached 5-23-11/1505			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50026) (1505)					
Geologist C. Carmichael		Checked by/Date J. Rottin Aldman 7/13/11					
Radiological Background 11		Radiological Equipment Used 4" 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	11	Clayey sand, (10 VR, 4/3), brown, 55% fine to coarse grained sand, 45% clay, trace gravel fill, common rootlets, dry, medium dense, low plasticity, no odor. No groundwater reached.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 14
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-31-11 1025	Date/Time Total Depth Reached 5-31-11 1150
Type of Sampling Device 1 3/4" Macrocore	Samples Collected S0027 (1030) (1) 1/2 gallon bags + 4oz jar		
Geologist C. Knight	Checked by/Date J. Robbins/Medman 7/13/11		

Radiological Background 55 / 2296	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Description <u>AF: Artificial Fill</u> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface: green and soil		+0.5' 2494 (CPM)
0.5			63		Fill: clayey silt with sand; dirty yellowish brown (10YR 4/4), dry, medium stiff, no odor, 10% fine sand, 5% medium sand, 20% clay, 5% angular volcanic gravel (fill rock), 60% silt, cohesive, low plasticity, low toughness, trace rootlets	AF	2963
			44			ML	3894
1.0			43				4254
			46				4428
2.0			41				4498
			61			2'3" silty clay; strong brown (2.5YR 4/6), dry, medium stiff, no odor, 30% silt, 70% clay, medium plasticity, low toughness, cohesive, some CaCO ₃ nodules	CL
3.0			55				4931
			67				4813
4.0			75				4448
			80				4580
5.0			54				4349
			64		Same as above, abundant CaCO ₃ nodules and stringers,	CL	4495
6.0			67				4418

Radiological Background 55/2296				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 14	
Depth	Interval	Recovery	PTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
6.0		0.0	67		Same as above; Abundant inundation of CaCO ₃ as nodules and a fine grained material	CL	4418
		0.0	58			CL	4354
7.0		0.0	56			CL	4390
		0.0	68			CL	4318
8.0		0.0	69		8'3" - Sandy silt with clay; Brown (7.5YR 5/4), moist, stiff, no odor, 5% medium sand, 25% fine sand, 10% clay, 60% silt, low plasticity, slow dilatancy, non cohesive, iron oxide staining, some CaCO ₃ stringers	ML	4459
		0.0	71			ML	4512
9.0		0.0	70		9'4" - Sandy silt; Yellowish brown (10YR 5/6), moist, stiff stiff, no odor, 25% fine sand, 75% silt, low plasticity, low toughness, trace coarse gravel, trace CaCO ₃ stringers	ML	4699
		0.0	76			ML	4541
10.0		0.0	69				4811
Total Depth 10.0' bgs							
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 5DN group 2	Location ID 15				
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 5-23-11/1159	Date/Time Total Depth Reached 5-23-11/1210				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50028) (1210)						
Geologist C. Carmichael		Checked by/Date J. Robbins-Heldman 7/13/11						
Radiological Background 11		Radiological Equipment Used up Rater		PID Used Mini Rax 2000 (Background: 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			0.011		Sandy clay, (10 YR, 4/4), brown, 55% clay, 35% fine to coarse grained sand, 10% gravel fill, trace CaCO ₃ nodules (mm-sized), common rootlets, semi-moist, medium stiff, low plasticity and hardness, no odor. No groundwater reached.	CL		



Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SDN group 2	Location ID: 15
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 125 13'ft. bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 6-1-11 1412	Date/Time Total Depth Reached: 6-1-11-1420
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (1) 1/2 gallon bags + (1) 4oz. jar		50029 (1425)
Geologist: C. Knight L. Goldman	Checked by/Date: J. Robbins Yeldman 7/13/11		

Radiological Background: 46 / 2403	Radiological Equipment Used: Pancake / downhole	PID Used: Mini Rae 2000 (Bkgd: 0.0 ppm)
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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
					Surface: grass & soil		+0.5 = 2592 (CPM)
					AF = artificial fill		
			0.0	47	Artificial fill: silty clay: dark yellowish brown (10yr 4/4), dry to moist, med. stiff, no odor, 65% clay, 25% silt, 10% fine sand, low plasticity, low toughness, cohesive, ^{UPG} trace rootlets, trace angular gravel	AF	3141
0.5			0.0	52			3952
1.0			0.0	65			4201
			0.0	65			4396
2.0			0.0	55			4345
			0.0	60			4339
3.0			0.0	57			4452
			0.0	55			4407
4.0			0.0	59			4460
			0.0	55			4631
5.0			0.0	55	4312		
			0.0	56	unit same as above - color change: dark yellowish brown (10yr 4/6).	AF	4497
6.0			0.0	85			4502

sample not taken 11-5' bgs - LR6

Radiological Background 46/2403cpm				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 50N - Group 2, #15	
Depth	Interval	Recovery	PID	Radiological	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	85		Unit same as above: silty clay; dark yellowish brown (10yr 4/6)		4502
		0.0	68			4257	
7.0		0.0	80			4412	
		0.0	62			4535	
8.0		0.0	72			AF 4552	
		0.0	65	- 815 ^u trace charcoal pieces ~10mm		4527	
9.0		0.0	59			4619	
		0.0	65			4496	
10.0		0.0	63	- trace angular gravel present in Macrocore shoe		4521	
		0.0	51	10'2" silty clay: dark yellowish brown (10yr 4/4), moist, med. dense, low plasticity, cohesive, med. toughness, pin hole pores, trace Fe-oxidation nodules, 75% clay, 20% silt, 5% fine sand, no odor		CL 4461	
11.0		0.0	58		4637		
		0.0	57	10'9" weathered bed rock sandstone: light olive brown (2.5 yr 5/6), dry, dense, no odor, mechanically weathered to SP (fine grained sandstone)	BR 4578		
12.0		0.0	56		4550		
		0.0	55		4754		
13.0		0.0	60		BED ROCK 5142		

refusal @ 13' bgs
no GW encountered

Anomaly encountered @ 13' bgs
Sample interval = 12' - 13' bgs

Project Name: SSEL Area JV Radiological Study		Project Number EP2038.01.22.04.03		Subarea ID 5DN group 2		Location ID 16	
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 5-23-11/1133		Date/Time Total Depth Reached 5-23-11/1140	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (#50030) (1140)			
Geologist C. Carmichael				Checked by/Date J. Robbins Medman 7/14/11			
Radiological Background 11		Radiological Equipment Used 4" R meter		PID Used Mini Rae 2000		(Background: 0.0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	11	Clayey sand, (10 YR, 4/4), brown, 55% fine to coarse grained sand, 35% clay, 10% gravel fill, dry, medium dense, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	SC	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 16
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 13.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-2-11 0845	Date/Time Total Depth Reached 6-2-11 1030
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 500 31 (0850) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins/Meldmen 7/14/11		

Radiological Background 35 / 2316	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: grass and soil		+0.5' 2364
0.5			0.0	44	Fill: Silty clay with silt and gravel;	AF	2632
			0.0	62	Clay with silt, gravel and sand; dark yellowish brown (10YR 4/4), slightly moist, stiff, no odor, 10% silt, 15% angular gravel (fill rock or asphalt), 5% coarse sand, 10% medium sand, 10% fine sand, 50% clay, cohesive, low plasticity, medium toughness, trace CaCO ₃ nodules, some mottling	CL	3655
1.0			0.0	55			4193
			0.0	64			4290
2.0			0.0	55			4370
			0.0	50			4472
3.0			0.0	45	2' 10" Asphalt pieces (~3/4" diameter)		4307
			0.0	60			4349
4.0			0.0	60	3' 10" packet of coarse and medium angular sand (~1" thick)		4429
			0.10	68	4' 6" Charcoal flake		4408
5.0			0.10	64			4453
			0.0	55	Fill; Silty clay with sand; Brown (7.5YR 4/4), moist, stiff, no odor, 15% silt, 5% medium sand, 5% fine sand, 5% medium to coarse angular gravel (fill rock)	AF/CL	4539
6.0			0.0	64	70% clay (cont'd)		4456

Radiological Background 35 / 2316				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 16				
Depth	Interval	Recovery	PID	Radiological	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		medium plasticity, medium toughness, cohesive, mottled	AF/CL		4456		
		0.0	65						4579	
7.0		0.0	55						4577	
		0.0	50						4580	
8.0		0.0	58				7'9" Clear plastic sheeting	AF/CL		4524
		0.0	72				Same as above			4595
9.0		0.0	80							4638
		0.0	90							4589
10.0		0.0	65				10'0" trace roots and rootlets	AF/CL		4456
		0.0	55				Same as above			4768
11.0		0.0	54				4786			
		0.0	58		Silty Sand: Yellowish brown (10YR 5/6), moist, dense, no odor, 20% silt, 80% finesand, low toughness, rapid dilatancy, Iron oxide staining.	SM		4800		
12.0		0.0	70					4896		
		0.0	85		12'3" Weathered Sandstone: Yellowish brown (10YR 5/4), slightly moist, dense, no odor, mechanically weathered to SP, 95% fine sand, 5% silt, some iron oxide staining, trace CaCl ₂ stringers			5109		
13.0		0.0	65		Refusal at 13.0' bgs on sandstone No GW encountered			4916		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 17				
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 5-23-11/1229	Date/Time Total Depth Reached 5-23-11/1236				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50032) (1235)						
Geologist C. Carmichael		Checked by/Date J. Robbins Muleman 7/4/11						
Radiological Background 11		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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy clay with gravel, (10 YR, 3/4), dark brown, 50% clay, 35% fine to coarse grained sand, 15% gravel fill and concrete fragments, trace CaCO ₃ nodules (mm-sized), dry, common rootlets, very low hardness, low plasticity, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDM group 2	Location ID 17
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-1-11 1140	Date/Time Total Depth Reached 6-1-11 1250
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50033 (1145) (L) 1/2 gallon bags + 402 Jar		
Geologist C. Knight	Checked by/Date J. Robbin Aldman 7/14/11		

Radiological Background 42/2607	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: grass and soil		2435
0.5			0.0	40	Fill: Silty Clay: Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 5% fine sand, 25% silt, 70% clay, low plasticity, medium toughness, cohesive, trace angular medium gravel	AF/CL	2437
			0.0	41			3079
1.0			0.0	49	1'0"		4073
			0.0	48	Clay with silt: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 10% silt, 5% fine sand, 85% clay, medium plasticity, medium toughness, abundant CaCO ₃ stringers and nodules	CL	4366
2.0			0.0	42	2'3"		4441
			0.0	45	Clayey silt: Brown (7.5YR 4/4), ^{moist} stiff, no odor, 40% clay, 5% fine sand, 55% silt, low plasticity, low to medium toughness, abundant CaCO ₃ stringers vertically and horizontally, CaCO ₃ speckles	ML	4394
3.0			0.0	57			4325
			0.0	62			4435
4.0			0.0	51	4'3" heavily inundated with CaCO ₃ , trace coarse sand		4440
			0.0	50			4424
5.0			0.0	51			4516
			0.0	57	Sandy silt: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 5% clay, 5% medium sand, 25% fine sand, 65% silt, low plasticity, low toughness, cohesive, slow dilatancy	ML	4487
6.0			0.0	55			4766

Radiological Background 42/2607				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 17	
Depth	Interval	Recovery	FTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings
							Inches (CFM)
6.0		0.1	55		Same as above	ML	4766
		0.1	59		Weathered siltstone; Pale yellow (2.5Y 7/4), dry, dense, no odor, interbedded siltstone beds w 1-2m thick, mechanically weathered to ML, some CaCO ₃ stringers	B S L O C K	4655
7.0		0.1	70				4848
		0.1	68				5568
8.0		0.1	51				5439
					Refusal on siltstone at 8.0' 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 5DN group 2	Location ID 18			
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 5-23-11/1428	Date/Time Total Depth Reached 5-23-11/1435			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50034) (1435)					
Geologist C. Carmichael		Checked by/Date J. Robbins Waldman 7/14/11					
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 11	Sandy clay, (10YR, 3/4), 60% clay, 40% fine to medium grained sand, common rootlets, dry, medium stiff, trace gravel fill, low plasticity & hardness, no odor. No groundwater reached.	CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 18
Drilling Company Boat Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-1-11 0820	Date/Time Total Depth Reached 6-1-11 1100
Type of Sampling Device 1 3/4" Macrotube	Samples Collected 50035 (0825) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins-Maldman 7/14/11		

Radiological Background 58 / 2468	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)
			8.0	41			+0.5 2348
0.5			0.0	50	Fill; Silt; Clay with Sand; Yellowish brown (10YR 5/4) dry, medium stiff, no odor, 20% silt, 10% fine sand, 70% clay, low plasticity, low toughness, cohesive, trace asphalt pieces	AP/CL	2627
1.0			0.0	56			3545
			0.0	68	Clayey Silt; Yellowish brown (10YR 5/4) dry, medium stiff, no odor, 20% clay, 10% fine sand, 70% silt, low plasticity, low toughness, cohesive, abundant	ML	4255
2.0			0.0	71	CaCO ₃ stringers and nodules		4757
			0.0	63	2-8" large pocket of CaCO ₃ nodules ~1" thick		4580
3.0			0.0	77			4565
			0.0	72			4686
4.0			0.0	65	4'2"		4701
			0.0	51	Clay with Silt; dark yellowish brown (10YR 4/4) dry, stiff, no odor, 10% silt, 5% fine sand, 85% clay, medium plasticity, medium toughness, cohesive, some CaCO ₃ stringers that are vertical and horizontal	CL	4695
5.0			0.0	53			4809
			0.0	51			4724
6.0			0.0	52	6' contact		4809
							4763

No sample from 1.5' bgs

Radiological Background 58/2468				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 18		
Depth	Interval	Recovery	FD	Radiological	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	52		Sandy silt; olive yellow (2.5Y 6/6), dry, medium stiff, no odor, 5% coarse sand, 10% medium sand, 15% fine sand, 70% silt, low plasticity; slow dilatancy, low toughness, CaCO ₃ speckles (some)		4763	
		0.0	55				4848	
7.0		0.0	41				5042	
		0.0	31			- increase sand content to 40% with more fine sand and less silt		5200
		0.0	33		7'10"		5193	
		0.0	55		Weathered bedrock sandstone and siltstone; very pale brown (10YR 7/3), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone w/ trace silt	SP bedrock	5046	
		0.0	52		8'11"			5374
		0.0	63		9'2"			6359
		0.0	63		weathered siltstone: pale yellow (2.5Y 7/3), dry, dense, no odor, thinly bedded siltstone laminae ~ 1-2 mm thick, weathers to ML			
					weathered sandstone: same as above			
10.0					<ul style="list-style-type: none"> Refusal on sandstone at 9.5' bgs No GW encountered Sample collected from 8.5 to 9.5' bgs due to 3 sigma gamma anomaly detected with downhole detector 			
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 19			
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 5-23-11/1027	Date/Time Total Depth Reached 5-23-11/1035			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gallon bag (#50036) (1035)					
Geologist C. Carmichael		Checked by/Date J. Robby Aldman 7/14/11					
Radiological Background 		Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0		Sandy clay, (10 YR, 3/3), dark brown, 60% clay, 40% fine to coarse grained sand, common rootlets, semi-moist, medium stiff, low plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDM group 2	Location ID #19
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-3-11 - 1025	Date/Time Total Depth Reached 6-3-11 - 1035
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags (1) 4oz. jar 50037 (1030)		
Geologist L. Robbins Goldman	Checked by/Date L. Robbins Goldman 7/14/11		

Radiological Background 49 / 2752	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					Surface: grass + soil		40.5' = 2465
0.5			0.0	49	Silty clay: dark yellowish brn (10yr 4/6), dry, no odor, 65% clay, 30% silt, 5% fine sand, low plasticity, cohesive, low toughness, med. dense, no dilatancy, trace rootlets, mottled w/ CaCO ₃ nodules + stringers, pin hole pores, Fe-oxidation + char charcoal nodules present in trace amounts.		2906
			0.0	65		3893	
1.0			0.0	80		4114	
			0.0	75		4370	
2.0			0.0	55		4139	
			0.0	65		4224	
3.0			0.0	63		4413	
			0.0	80		4362	
4.0			0.0	70		4255	
			0.0	62		4179	
5.0			0.0	65	4242		
			0.0	70	--- abundant CaCO ₃ nodules present ---	4483	
6.0			0.0	74	Same as above	CL 4480	

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Radiological Background					Project Name	Project Number	Location
49/2752.com					SSFL Area IV Radiological Study	EP9034.01.22.04.03	SDN group 2-#19
Depth	Interval	Recovery	PID	Radiological	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	74		Same as above: silty clay		4486
		0.0	80			CL	4804
7.0		0.0	82		6'8" Sandy silt: yellowish brown (10 yr 5/6), moist, no odor, 75% silt, 15% med sand, 10% fine sand, low plasticity, med-dense, cohesive, low med-toughness, low dilatancy, CaCO ₃ nodules, Fe-oxidation nodules present in trace amounts, pin-hole pores.		4559
		0.0	80			ML	4916
8.0		0.0	59				4778
		0.0	54				4564
9.0		0.0	60				4711
		0.0	70				4745
10.0		0.0	65				4679
					total depth 10' bgs no GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 20	
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 5-20-11/1509		Date/Time Total Depth Reached 5-20-11/1519	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (#50038) (1518)			
Geologist C. Carmichael				Checked by/Date J. Robbins/Feldman 7/14/11			
Radiological Background 11		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'			0.0	11	Sand with 2 silt and gravel, (2.54, 4/3) greenish brown, 65% fine to coarse grained sand, 20% silt, 15% gravel. fill rock, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 20
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 1035 6-15-11 08:35 AM	Date/Time Total Depth Reached 6-15-11 1100
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz for	50039 (0840) CL (1040)	
Geologist C. Knight	Checked by/Date J. Robbins, Waldman 7/14/11		

Radiological Background 12/2742/11MR	Radiological Equipment Used Pancake / downhole / MR	PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface soil and grass		195' 2742
0.5			0.1	61	Fill: silty clay w/ sand, dark yellowish brown (10YR 5/6), moist, medium stiff, no odor, medium plasticity, medium toughness, 30% silt, 5% fine sand, 5% medium sand, 60% clay	AF/CL	2973
1.0			0.1	63	Sandy silt: yellowish brown (10YR 5/6), moist, medium stiff, no odor, 35% silt, 65% fine sand, 65% silt, low plasticity, low toughness, cohesive, trace CaCO ₃ stringers	CL/ML	3818
2.0			0.1	64			4361
			0.1	69			4288
			0.1	64			4280
			0.1	56			4511
3.0			0.1	73	3' CaCO ₃ layer 1/4" thick - horizontal		4486
			0.1	63	Silty sand: yellowish brown (10YR 5/6), moist, medium dense, no odor, 30% silt, 70% fine sand, abundant CaCO ₃ stringers	ML	4780
4.0			0.1	57			4512
			0.1	58	fine grained sandstone in macro core shoe	SM	4532
5.0					Refusal on sandstone at 4.5' bgs no GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 21			
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 5-23-11/1059	Date/Time Total Depth Reached 5-23-11/1110			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50040) (1110)					
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/14/11					
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy clay with gravel, (10 YR, 3/4), dark brown, 50% clay, 35% fine to coarse grained sand, 15% gravel fill, semi-moist, medium stiff, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 2)
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 20.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-2-11 1055	Date/Time Total Depth Reached 6-2-11 1500
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50041 (1100), 50042 (1110) (1) 1/2 gallon bags + 4 oz jar for both samples		
Geologist C. Knight	Checked by/Date Julian Polinski & Edman 9/8/11		

Radiological Background 69 / 2557	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
					Description <i>Artificial Fill</i> (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: <i>grass and soil</i>		+0.5' 2414 (CPM)
0.5			0.0	53	Fill: Sandy clay with silt and gravel: Brown (10YR4/3), moist, medium stiff, no odor, 5% coarse sand, 5% medium sand, 10% fine sand, 15% silt, 10% angular fine to coarse gravel (fill rock), 55% clay, low plasticity, cohesive, low toughness, trace asphalt debris, mottled, trace roots etc. 3' 8" trace asphalt gravel 3/8" diameter	AF	2649
			0.10	54		CL	3977
1.0			0.0	88		4354	
			0.0	61		4318	
2.0			0.0	74		4465	
			0.0	73		4479	
3.0			0.0	80		4454	
			0.0	67		4524	
4.0			0.0	51		4524	
			0.0	71		4447	
5.0			0.0	80	4281		
			0.0	54	Fill: Silty Clay with Sand: Strong brown (7.5YR 5/8), slightly moist, stiff, no odor, 20% silt, 5% medium sand, 10% fine sand, 65% clay, low plasticity, medium toughness, cohesive, trace CaCO ₃ nodules, some CaCO ₃ stringers, (cont)	AF	4484
6.0			0.0	60		CL	4457

Radiological Background 69/2557				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 21	
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	60		mottled, trace fine gravel, iron oxide staining	AF	4457
		6.0	56		Same as above	CL	4387
7.0		0.0	48				4288
		0.0	54				4424
8.0		0.0	61				4373
		0.6	57				4601
9.0		0.0	49		increase in medium sand	AF	4572
		0.0	57		Same as above	CL	4605
10.0		0.0	66				4688
		0.0	43		Fill * Sandy Silt; dark yellowish brown (10YR 4/6), moist, stiff, no odor, 30% fine sand, 70% silt, low plasticity, low toughness, slow dilatancy, mottled	AF ML	4665
11.0		0.0	47				4668
		0.0	73				4593
12.0		0.0	72				4610
		0.0	62			AF	4552
13.0		0.0	65		Same as above	ML	4705

cont

Radiological Background 69/2557				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 21		
Depth	Interval	Recovery	FD	Radiological	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		0.0	65		Same as above	AF/ML	4705	
		0.6	66		13' 9" Fill: Poorly graded sand: Yellow (10YR 7/6), dry, loose, no odor, fine grained sand	AF/ML	4865	
14		0.0	79		13' 11" Same as 13' 9" Sandy silt; Fill	AF/SP	5056	
		6.0	74		14' 2" Same as 13' 11" Sandy silt; Fill	AF/ML	4788	
		0.0	62		14' 4" Fill: Poorly graded sand: Yellow (10YR 7/6), dry, loose, no odor, fine grained sand	AF/ML	4590	
15		0.0	57		Same as above; Fill: Sandy silt w/ trace CaCO ₃ stringers	AF/ML	4520	
16		0.0	57		15' 9" Fill: Poorly graded sand: Yellow (10YR 7/6), dry, loose, no odor, fine grained sand	AF/SP	4609	
		0.0	84		16' 4" Fill: Sandy silt; dark yellowish brown (10YR 4/6), slightly moist, med stiff, 30% fine sand, 70% silt, low plasticity, low toughness, no odor	AF/ML	4708	
		0.0	71		16' 5" Fill: Sandy silt; dark yellowish brown (10YR 4/6), slightly moist, med stiff, 30% fine sand, 70% silt, low plasticity, low toughness, no odor	AF/SP	4780	
17		0.0	80		16' 9" Fill: Poorly graded sand: Yellow (10YR 7/6), dry, medium dense, no odor, fine grained sand	AF/ML	4600	
18		0.0	67		Fill: Sandy silt with clay: Yellowish brown (10YR 5/4) dry, medium stiff, no odor, 10% clay, 20% fine sand, 70% silt, low plasticity, low toughness, cohesive, some CaCO ₃ stringers	AF/ML	4764	
		0.0	84		17' 8" A 3-inch thick bed of poorly graded sand	AF/ML	4900	
19		0.0	72		18' 0" Same as above: Pale yellow (2.5Y 7/3) Sandy silt; Fill	AF/ML	4582	
		6.0	52		18' 11" Same as above: Fill: Sandy silt; CaCO ₃ stringers (trace), some iron oxide staining	AF/ML	5083	
20		0.0	70		20' approx 1/2 to 1" pink quartzite gravel layer		4853	

* note: pink quartzite gravel viewed in all 5 advancements

Radiological Background 69/2557				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 21	
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
20			0.0	70	Pearly graded sand; light yellowish-brown (to top 2.54 6/4), dry, dense, no odor, fine grained sand loose (CL)	AF	4853
			0.0	65		SP	4849
21					Refusal at 20.5' No GW encountered		
22							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 22				
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 5-23-11/0920	Date/Time Total Depth Reached 5-23-11/0930				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50043) (0930)						
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/14/11						
Radiological Background 11		Radiological Equipment Used up Rater		PID Used Mini Rac 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0 11	Sandy clay, (10 YR, 3/4), dark brown, 55% clay, 35% fine to coarse grained sand, + 5% gravel fill and asphalt, 5% silt, common rootlets, semi-moist, low plasticity and hardness, no odor, medium stiff. No groundwater reached.	CL		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50M Group 2	Location ID 22
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 16.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6.6.11 1030	Date/Time Total Depth Reached 6.6.11 1230
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 4oz Jars 50044 (1050) (2) 1/2 gallon bags 50045 (1040)		
Geologist C. Knight	Checked by/Date Julian R. Feldman 9/8/11		

Radiological Background 47 / 10mR	Radiological Equipment Used Pancake / downhole μ R	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)
			8.0	50	Surface: grass and soil		405 2449
0.5			0.0	65	Fill: Silty clay: Brown (10YR 5/3), moist, medium stiff, no odor, 20% silt, 80% clay, cohesive, medium plasticity, medium toughness, pinhole pores, trace rootlets	AF CL	2830
1.0		0.0	43	4127			
		0.0	60	4427			
			0.0	60			4473
2.0			0.0	68	Fill: Clay with silt and sand: grayish brown (10YR 5/2), moist, stiff, no odor, 10% fine sand, 10% silt, 80% clay, medium plasticity, medium toughness, cohesive, trace mottling	AF CL	4481
		0.0	60	4520			
3.0		0.0	70	4503			
		0.0	80	4535			
4.0			0.0	65	3'4" appearance of CaCO ₃ nodules, trace pinhole pores		4584
		0.0	50	4501			
5.0		0.0	55	4564			
			0.0	55	Fill: Sandy silt with clay: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, low plasticity, low toughness, cohesive, 20% fine sand, 10% clay, 20% silt, mottled, Iron oxide staining	AF ML	4664
6.0		0.0	54	4773			

Radiological Background 47/10/R				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 22	
Depth	Interval	Recovery	PID	Radiological	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	59		Same as above	AR ML	4733
		0.0	47				4845
7.0		0.0	55		6'10" Fill; Silty clay with sand: Brown (10YR 5/3), moist, stiff, no odor, 25% silt, 15% fine sand, 60% clay, cohesive, medium plasticity, medium toughness, some CaCO ₃ stringers and nodules 7.5" fine angular gravel within clay	AR CL	5010
		0.0	60				4775
8.0		0.0	58				4518
		0.0	50				4378
9.0		0.0	53				4425
		0.0	60				4588
10.0		0.0	55		Fill; Sandy silt: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 5% medium sand, 35% fine sand, 60% silt;	AR ML	4358
		0.0	47				4795
11.0		0.0	48				4835
		0.0	53				4892
12.0		0.0	61				4870
		0.0	73				4810
13.0		0.0	68				4720

Radiological Background 47/104R				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 22	
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)
13.0		0.0		68	Same as above	AF ML	4720
		0.0		93	13'3" ^{FM} Poorly graded sand with silt: Brownish yellow (10YR 6/6), moist, loose, no odor, 10% silt, 90% fine sand, 13'8"	AF SP	4980
14.0		0.0		73	Same as 10.0' bgs: Fill: Sandy silt	AF ML	5035
		0.0		80	14'10" pink quartzitic gravel (medium to coarse sand)		4890
15.0		0.0		65	Fill: Poorly graded sand: Olive yellow (2.5Y 6/8), moist, loose, no odor, 5% coarse sand, 95% fine sand	AF SP	4902
		0.0		60			5298
16.0		0.0		70	Sandstone encountered at boring terminus		4936
17.0					Refusal at Sandstone at 16.0' bgs		
					No GW encountered		
18.0							
19.0							
20.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 23				
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 5-23-11/0953	Date/Time Total Depth Reached 5-23-11/1000				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50046) (0959)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11						
Radiological Background 11		Radiological Equipment Used AP R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0 11	Clayey sand, (10 YR, 4/4), brown, 55% fine to coarse grained sand, 35% clay, 10% gravel fill, semi-moist, medium dense, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 23
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 21.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-8-11 1030	Date/Time Total Depth Reached 6-8-11 1150
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags + 2-4oz jars 50047 (1040) 50048 (1050)		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 48 / 125R/10MR	Radiological Equipment Used Pancake / downhole / MR 10	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	48			10.5 2599
0.5			0.0	50	Fill: Clay with silt; dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 10% silt, 90% clay, cohesive, medium plasticity, medium toughness, mottled, trace CaCO ₃ nodules.	AF	2683
			0.0	62		CL	3793
1.0			0.0	60			4318
			0.0	50			4476
2.0			0.0	65			4556
			0.0	60	Same as above: clay with sand; 57% medium sand, 32% fine sand, 57% silt, 85% clay	AF / CL	4513
3.0			0.0	62			4515
			0.0	55	3' 7" concrete gravel 3/4" diameter		4368
4.0			0.0	63			4584
			0.0	55			4514
5.0			0.0	57			4623
			0.0	75			4564
6.0			0.0				4625

Radiological Background 48/2599 10yr				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 23		
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)	
6.0		0.0	75		Same as above: clay with silt and sand:	AF	4629	
		0.0	65			CL	4650	
7.0		0.0	95				4702	
		0.0	65				4624	
8.0		0.0	60				4779	
		0.0	54				4740	
9.0		0.0	75				4666	
		0.0	65				4731	
10.0		0.0	60			5' 10" angular granitic medium gravel		4657
		0.0	55					4558
11.0		0.0	63				4614	
		0.0	70			AF/CL	4486	
12.0		0.0	60		12' Poorly sorted sand; Brownish yellow (10YR 6/6), moist, loose, no odor, fine sand	AF/SP	4464	
		0.0	58		12' 4" trace charcoal	AF	4914	
13.0		0.0	65		Fill; Sandy silt; Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 30% fine sand, 70% silt, cohesive, low plasticity, low toughness, iron oxide staining	ML	4674	

Radiological Background				Project Name	Project Number	Location	
48/2599 10 _μ R				SSFL Area IV Radiological Study	EP9038.01.22.04.03	23	
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 (CPM)
13				65	Same as above: Sandy silt	AF ML	4674
				64	13'5" Fill: Silty Sand: dark yellowish brown (10YR 4/6), moist, medium dense, no odor, 35% silt, 65% fine sand	AF SM	4779
14				65			4644
				95	14'2" Fill: Silty Clay: dark yellowish brown (10YR 4/6) moist, medium stiff, no odor, 35% silt, 65% clay, cohesive, medium plasticity, low toughness	AF CL	4696
15				67		AF ML	4707
				73	Fill: Sandy silt with clay: yellowish brown (10YR 5/4) moist, stiff, no odor, 10% clay, 30% sand, 60% silt, low toughness, low plasticity, cohesive		4426
16				75			4713
				70			4668
17				76			4693
				78			4638
18				76	18'0" pocket of SP ~1" thick		4711
				70	18'3" pocket of SP ~1" thick		4878
19				65		AF ML	4821
				68			4747
20				65	19'9" See next page	Bedrock	4786

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 24	
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 5-20-11/1338		Date/Time Total Depth Reached 5-20-11/1346	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (# 50049) (1345)			
Geologist C. Carmichael				Checked by/Date [Signature] 7/15/11			
Radiological Background 11		Radiological Equipment Used MP R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.010	Sandy clay, (10YR, 3/3), dark brown, 65% clay, 35% fine to coarse grained sand, trace asphalt pieces, dry, medium stiff, common rootlets, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDM group 2	Location ID 24
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 20.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-7-11 0815	Date/Time Total Depth Reached 6-7-11 1840
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags + 2 4oz jars		50050 (0820) 50051 (0825)
Geologist C. Knight	Checked by [Signature] 7/15/11		

Radiological Background S1 / 11, 12, 14, 24	Radiological Equipment Used Pancake / downhole MR / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					surface: grass and soil		2746
0.5			0.0	49	Fill: Silty clay: Very dark grayish brown (10YR3/2), moist, medium stiff, no odor, 25% silt, 75% clay, low plasticity, medium toughness, cohesive	AF	3015
			0.0	53		CL	4285
1.0			0.0	50		CL	4518
					1'3"		
			0.0	51	Fill: Clay: dark brown (7.5YR 3/4), moist, stiff, no odor, 5% silt, 95% clay, medium plasticity, medium toughness, cohesive	AF	4535
2.0			0.0	53		CL	4566
			0.0	61			4632
			0.0	60	3'6"		
			0.0	55		AF	4789
4.0			0.0	57		ML	4765
			0.0	53	Fill: Clayey silt with sand: dark yellowish brown (10YR 4/4), moist, stiff, no odor, 25% clay, 50% silt, 5% coarse sand, 10% medium sand, 10% fine sand, low plasticity, non-cohesive, heavily mottled		4888
			0.0	50			4917
5.0			0.0	52	Fill: Silt with sand: light yellowish brown (10YR 6/4), dry, stiff, no odor, 10% fine sand, 90% silt, low plasticity, low toughness, some CaCO ₃ stringers and trace CaCO ₃ nodules		4694
6.0			0.0	57			4751

Radiological Background 51/11, R/2746					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 24
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		57	Same as above: Silt with sand	AF	4751
		0.0		58		ML	4625
7.0		0.0		55			4773
		0.0		58	7'6" Fill: S. Hy. Clay: Brown (7.5YR 4/4), moist, stiff, no odor, 30% silt, 70% clay, medium plasticity, medium toughness, abundant CaCO ₃ nodule beds and packets with some CaCO ₃ stringers	AF	5050
8.0		0.0		60		CL	4868
		0.0		65			4714
9.0		0.0		67			4572
		0.0		66			4200
10.0		0.0		70	Fill: Sandy Silt; Strong brown (7.5YR 4/6), moist, stiff, no odor, ^{CR} 25% fine sand, 75% silt, low plasticity, low toughness; s low dilatancy	AF	4109
		0.0		45		ML	4122
11.0		0.0		52			4323
		0.0		54			4541
12.0		0.0		58			4599
		0.0		58		4581	
13.0		0.0		50		4497	

Radiological Background				Project Name	Project Number	Location	
SI/UMR/2746				SSFL Area IV Radiological Study	EP9038.01.22.04.03	24	
Depth	Interval	Recovery	PID	Radiological	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			0.0	50	Same as above: Silty silt	AF	4497
			0.2	51		ML	4696
14			0.0	48			4671
			0.2	50	14' 4" Fill: Fairly graded sand: light olive brown (2.5Y 5/6), moist, loose, no odor, fine sand	AF SP	4554
15			0.0	50			4627
			0.2	52	Silty sand: Olive yellow (2.5Y 6/6), moist, medium dense, no odor, 35% silt, 65% fine sand, some CaCO ₃ stringers, trace Iron oxide staining	SM	4606
16			0.0	50			4547
			0.2	47			4665
17			0.2	49			4817
			0.0	57	17' 2" to 17' 4" Poorly graded sand (SP): brownish yellow (10YR 6/6), moist, loose, no odor, fine grained sand	SP	4864
					Silty sand: same as 15' above	SM	
18			0.2	55	17' 10" to 18' 0" (SP) Same as 17' 2"	SP	4682
					Silty sand: same as 15' above	SM	
			0.2	53			4604
					18' 8" to 18' 10" (SP) Same as 17' 2"	SP	
					Silty sand: same as 15' above	SM	
19			0.0	54			4602
			0.0	54	Weathered siltstone bedrock: Olive yellow (2.5Y 6/6), moist, hard, no odor, inter bedded siltstone with some fine grained sandstone beds	SP Rock	4658
20			0.0	57	Refusal on siltstone at 20.0' by		5097

no GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 25				
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 5-20-11/1317	Date/Time Total Depth Reached 5-20-11/1325				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50052) (1325)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11						
Radiological Background LO		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 60% clay, 35% fine to medium grained sand, 5% asphalt, brick and concrete fragments, semi-moist, medium stiff, low-medium plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 25
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 24.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-8-11 0835	Date/Time Total Depth Reached 6-8-11 1010
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags 72-402hrs 50053 (0840) 50054 (0850)		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 52 / 2698 / 10MR	Radiological Equipment Used Pancake / downhole / MR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface: grass and soil		40.5 2698
0.5			0.0	48	CK AF Fill: clay: Dark brown (10YR 3/3), moist, stiff, no odor, lean clay 90%, 5% fine sand, 5% silt, medium plasticity, medium toughness, cohesive, trace rootlets 3'7" Same as above: with trace CaCO ₃ stringers 4' Same as above: with CaCO ₃ nodules 5' Abundant CaCO ₃ nodules	AF	3581
			0.0	50		CL	4470
1.0			0.0	50			4559
			0.0	55			4677
2.0			0.0	65			4658
			0.0	55			4563
3.0			0.0	65			4311
			0.0	60			4351
4.0			0.0	75			4314
			0.0	65			4332
5.0			0.0	55		AF/CL	4253
			0.0	65			4450
6.0			0.0	57			4813

Radiological Background				Project Name	Project Number	Location	
52/2698 / 10mR				SSFL Area IV Radiological Study	EP9038.01.22.04.03	25	
Depth	Interval	Recovery	PID	Radiological	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	57	Same as above	AF	4813
			0.2	53		CL	4905
7.0			0.0	60	Fill: Sandy silt: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 5% clay, 15% fine sand, 80% silt, cohesive, low plasticity, low toughness, pin hole pores, some CaCO ₃ nodules and stringers	AF EE ML	4681
			0.2	61			4467
8.0			0.2	70			4301
			0.2	75	6'3" —————	AF	4476
9.0			0.0	70	Fill: Silty Clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 20% silt, 80% clay, cohesive, medium plasticity, medium toughness, abundant CaCO ₃ stringers and nodules	CL	4517
			0.2	60			4480
10.0			0.0	55			4460
			0.0	60			4709
11.0			0.0	62			4685
			0.2	55	11'1" —————	AF ML	4482
12.0			0.0	53	Fill: Sandy silt: Strong brown (7.5YR 5/6), moist, medium stiff, no odor, 10% medium sand, 25% fine sand, 65% silt, cohesive, low plasticity, low toughness, slow dilatancy		4547
			0.2	60			4419
13.0			0.0	65			4448

Radiological Background 542698 / 10AR				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 25	
Depth	Interval	Recovery	PID	Radiological	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		0.0	65		Same as above; Sandy Silt; Fill	AF	4440
		0.0	73			ML	4310
14		6.0	60				4367
		0.0	62				4445
15		0.0	62				4338
		0.0	80				4302
16		0.0	60		16'		4462
		0.0	60		Fill: Silty Sand; Yellowish brown (10YR 5/4), moist, medium dense, no odor, 20% silt, 80% fine sand, rapid dilatancy	AF	4339
		0.0	85			SM	4410
17		0.0	65				4647
18		0.0	60				4630
		0.0	55				4449
19		0.0	60				4386
		0.0	65				4448
20		0.0	65		19' 11" see next page	AS/SP	4455

Radiological Background				Project Name	Project Number	Location	
52/2698/10AR				SSFL Area IV Radiological Study	EP9038.01.22.04.03	25	
Depth	Interval	Recovery	PTD	Radiological	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)	Inches	
20			0.0	65	Fill: Partly graded sand; Strong brown (2.5YR 5/6), moist, loose, no odor, fine sand	AF/SP	4453
			0.0	65			4669
21			0.0	65	20' 8" Silty sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 25% silt, 75% fine sand,	SM	4583
			0.0	70	21' 2" Partly graded sand: Brown (10YR 5/6), moist, medium dense, no odor, fine grained sand 100%.	SP	
			0.0	68	21' 4" Same as above: SM	SM	4738
			0.0	68	21' 7" Same as above: SP	SP	
22			0.0	60	22' Same as above: SM	SM	4576
			0.0	65	22' Same as above: SP	SP	
			0.0	65	22' Same as above: SM	SM	4776
			0.0	65	22' Same as above: SP	SP	
23			0.0	63	23' 6" Same as above: SP	SM	4735
			0.0	65	Weathered sandstone: Pale yellow (5Y 7/3), moist, dense, no odor, fine grained sandstone, mechanically weathered to SP,	SP	4764
24			0.0	70	Refusal on sandstone at 24.0' bgs	Refusal	4690
25					No GW encountered		
26							
27							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 26
Drilling Company HGL	Driller J. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter n/a	Date/Time Drilling Started 5-20-11/1133	Date/Time Total Depth Reached 5-20-11/1141
Type of Sampling Device Stainless steel shovel	Samples Collected 1 4-oz jar 1 1/2 gall bag (#50055) (1140)		
Geologist C. Carmichael	Checked by/Date [Signature] 7/15/11		

Radiological Background II	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0ppm)
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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	II	Sandy clay, (10 YR, 3/2), dark brown, 65% clay, 30% fine to medium grained sand, 5% gravel fill, some iron-oxide tinting and some charcoal found, common rootlets, semi-moist, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Radiological Background					Project Name	Project Number	Location	
SS/2660/100R					SSFL Area IV Radiological Study	EP9038.01.22.04.03	26	
Depth	Interval	Recovery	PID	Radiological	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	58		Same as above: silty clay	AC		4516
		0.0	63		6' 5" Fill: silty clay with sand; dark brown (7.5YR 3/4), moist, stiff, no odor, 35% silt, 5% coarse sand, 5% medium sand, 10% fine sand, 45% clay, cohesive, med. plasticity, medium hardness, some CaCO ₃ nodules, mottled	CL		4519
7.0		0.0	65			AC		4588
		0.0	58					4606
8.0		0.0	60					4497
		0.0	59					4404
9.0		1.0	50					4509
		0.0	50					4612
10.0		0.0	49					4591
		0.0	45					4381
11.0		0.0	42					4557
		0.0	50		11' 4" Fill: Silty Sand: strong brown (7.5YR 5/8), moist, medium dense, no odor, 25% silt, 75% fine sand, mottled	AC		4537
12.0		0.0	50			SM		4520
		0.0	58					4542
13.0		0.0	65				4637	

Radiological Background 55cpm/2666/10μR				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 26	
Depth	Interval	Recovery	PID	Radiological	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)
13	0-10	0.00	65		Same as above: Silty Sand	AF/SM	4637
	10-20	0.00	60			AF/SM	4563
14	20-30	0.00	55				4619
	30-40	0.00	53		14'6" Fill: Silty silt: Brown (10YR 5/3), moist, stiff, no odor, 20% fine sand, 5% clay, 75% silt, cohesive, low plasticity, low toughness	AF/ML	4408
15	40-50	0.00	52		150" black plastic sheeting found in other sample pushes	AF/ML	4488
	50-60	0.00	51		Fill: Silty Sand: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 20% silt, 80% fine sand, mottled	AF/SM	4625
16	60-70	0.00	56				4713
	70-80	0.00	53				4790
17	80-90	0.00	53				4718
	90-100	0.00	58		17'5" ⁽¹⁷⁾ Weathered Sand: Poorly graded sand; Olive yellow (2.5Y 6/6), moist, loose, no odor, fine sand (fill sand)	SP	4864
18	100-110	0.00	60		Bottom of borehole: Weathered Sandstone: Light yellowish brown (2.5Y 6/3) fine grained	Ps/csk	5011
	110-120				Refusal on sandstone at 18.0' bgs		
	120-130				No GW encountered		
19	130-140						
20	140-150						

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 27			
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 5-20-11/1357	Date/Time Total Depth Reached 5-20-11/1406			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50058) (1405)					
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11					
Radiological Background II		Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.011		Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 35% fine to coarse grained sand, CaCO ₃ nodules (mm-sized), dry, trace asphalt fragments, medium stiff, common rootlets, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID #27
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-3-11 1155	Date/Time Total Depth Reached 6-3-11 - 1200
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (2) 1/2 gallon bags (1) 4oz jars	50059 (1200) 50060 (1210)	
Geologist L Robbins Goldman	Checked by/Date <i>[Signature]</i> 7/20/11		

Radiological Background 47 / 2532	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
				Surface = grass + soil (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) AF = artificial fill		+0.5' = 2448
0.5		0.0	55	clay w/ sand: dark yellowish brown (10 yr 4/6), moist, no odor, med. dense, 70% clay, 10% silt, 10% fine sand, 5% med sand, 5% coarse sand, med. plasticity, cohesive, med to high dry strength, med. toughness, no dilatancy, rootlets present in upper 2 feet of unit (trace amount), mottled w/ Fe-oxidization, pin hole pores, trace angular gravel present, LRG	AF	2992
		0.0	66		CL	3977
1.0		0.0	67		CL	4292
		0.0	70		CL	4281
2.0		0.0	75		CL	4425
		0.0	63		CL	4433
3.0		0.0	52	CL	4407	
		0.0	62	CL	4551	
4.0		0.0	72	CL	4434	
		0.0	100	4441	AF	4519
5.0		0.0	90	clay w/ sand: brown (10 yr 4/3), moist, no odor, med. dense, 80% clay, 10% fine sand, 10% med sand, med. plasticity, cohesive, med to high dry strength, high toughness, no dilatancy, less mottled than previous unit, trace Fe-oxidation nodules pinhole pores, trace angular gravel, trace CaCO3 nodules, gravel sizes vary 5mm to 1/4"	AF	4521
		0.0	60		CL	4428
6.0		0.0	75		CL	4504

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Radiological Background				Project Name	Project Number	Location	
47/2532				SSFL Area IV Radiological Study	EP9038.01.22.04.03	5DN, Grp 2, #27	
Depth	Interval	Recovery	PID	Radiological	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: clay w/ sand (cont): 10mm to 20mm gravel sizes, mica flecks		4504
		0.0	60			4600	
7.0		8.0	67			4608	
		0.0	55			4660	
8.0		0.0	56			4753	
		0.0	65			4703	
9.0		0.0	60			4662	
		0.0	69			4538	
10.0		0.0	70			4512	
		0.0	70			4564	
11.0		0.0	65			4511	
		0.0	70			4637	
12.0		2.0	65		4539		
		0.0	75		4623		
13.0		0.0	65		4769		

11'6" clean ^{sand} ~~fine~~ _{leg} olive yellow (2.5YR 4/6), moist, low density, no odor, 45% ^{fine} _{leg} fine grain sand, 45% med sand, 10% coarse sand, no plasticity, no cohesiveness, low dry strength, rapid dilatancy, 20mm gravel present at bottom of unit

12'2" Silty sand: yellowish brown (10YR 5/6) moist, no odor, low dense (continue next page)

Radiological Background		Project Name		Project Number		Location	
47/2532		SSPL Area IV Radiological Study		EP9038.01.22.04.03		SDN, Grp 2, #27	
Depth	Interval	Recovery	FID	Radiological	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)
13.0	5' 0" LBG		0.0	65	<p>Silty sand (continued): no odor; 50% fine sand, 30% med sand, 15% silt, 5% coarse sand, low plasticity, low cohesiveness, low dry strength, med to rapid dilatancy, ~10mm round gravel slightly mottled, Fe-oxidation nodules present</p> <p>13.7" med to coarse grained sandstone olive yellow (2.5Y.6/6); weathered, moist, dense, 65% coarse sand, 25% med sand, 10% fine sand, sand grains are angular to sub angular, mechanically weathered to SP. (poorly graded sand)</p>	LOG	5028 4769
			0.0	74		ML	5028 49.29
14.0	20' LBG		0.0	68		SM	4761 5028
			0.0	70			4761
15.0	8' 0" LBG		0.0	60			4735
16.0	5' 0" LBG				refusal @ 15' logs no GW encountered		
17.0	1' 0" LBG						
18.0	1' 0" LBG						
19.0	2' 0" LBG						
20.0	1' 3" LBG						

BEDROCK

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 28
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 5-20-11/1417	Date/Time Total Depth Reached 5-20-11/1426
Type of Sampling Device Stainless steel shovel	Samples Collected 1 4-oz jar 1 1/2 gall bag (#50061) (1425)		
Geologist C. Carmichael	Checked by/Date Stephen J. Ma 7/15/11		

Radiological Background 10	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.011	Sandy clay, (10 YR, 3/3), dark brown, 60% clay, 35% fine to coarse grained sand, 5% asphalt fragments, trace gravel fill and CaCO ₃ nodules (mm-sized), dry, medium stiff, common rootlets, low-medium plasticity and hardness, no odor. No groundwater reached	CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 28
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth CL 12'6" ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-8-11 1330	Date/Time Total Depth Reached 6-8-11 1425
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags + 2-4oz jars		50062 (1340) 50063 (1350)
Geologist C. Knight	Checked by/Date Julian Robbins Muldner 9/8/11		

Radiological Background #1 12589 / 10µR	Radiological Equipment Used Pancake / downhole / µR	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	Surface: grass, and soil		+0.5' 2589
0.5			0.0	63	Fill: ^(OK) Silty Clay with sand: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 20% silt, 5% coarse sand, 5% medium sand, 10% fine sand, non-cohesive ^(OK)	AF / CL	2725 3734
1.0			0.0	55	60% clay, non cohesive, low plasticity, medium toughness, trace rootlets near surface, trace CaCO ₃ nodules		4320
			0.0	58			4400
2.0			0.0	60			4378
			0.0	52			4406
3.0			0.0	60			4450
			0.0	55	3'6" Angular sandstone grave ~3/4" diameter		4476
			0.0	50	3'8" - - - - -		4499
4.0			0.0	50	Fill: Clay: Brown (10YR 5/2), moist, stiff, no odor, 5% medium sand, 5% fine sand, 90% clay, cohesive, medium plasticity, medium toughness, trace CaCO ₃ nodules	AF / CL	4417
			0.0	58			4560
5.0			0.0	68			4585
			0.0	57			4506
6.0			0.0	51			

Radiological Background 41/2589 / 10 _{MR}				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 28	
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		51	Same as above; 10% silt, 5% fine sand, 85% clay	AF CL	4506
		0.0		45			4687
7.0		0.0		51	7'1" to 7'3" concrete debris ~ 2" thick.		4654
		0.0		52			4742
8.0		0.0		48	8'4" angular fine concrete debris	AF CL	4661
		0.0		45			4676
9.0		0.0		60	4' angular fine granitic gravel (fill rock)		4591
		0.0		55			4552
10.0		0.0		62	Same as above, except: fill @ 10' bgs: Clay w/ trace CaCO ₃ nodules, 100% clay	AF CL	4436
		0.0		75			4592
11.0		0.0		45	11' 6" ^{5% silt} Poorly graded sand: Olive yellow (2.5Y 6/6), moist, 100% no odor, fine grained sand	AF SP	4605
		0.0		85			4454
12.0		0.0		68	Fill: clay with gravel and sand: dark yellowish brown (10YR 4/6), moist, stiff, no odor, 10% rounded medium volcanic gravel (fill rock), 5% silt, 5% fine sand, 80% clay, medium plasticity, medium to very hard sandstone at end of boring	AF CL	4620
		0.0		70			4645
13.0					Refusal on sandstone at 12.5' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 29			
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 5-20-11/1453	Date/Time Total Depth Reached 5-20-11/1501			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50064) (1500.)					
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11					
Radiological Background 10		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'					Sandy clay, (10 YR, 3/3), dark brown, 70% clay, 30% fine to medium grained sand, trace asphalt fragments, dry, medium-stiff, common rootlets, some charcoal found, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 29
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5' ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-15-11 0835	Date/Time Total Depth Reached 6-15-11 0918
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags + (2) 1/2 jars (0840) 50065 (0850) 50066	Geologist C. Knight	
Radiological Background 47 / 2689 / 10mR		Radiological Equipment Used Pancake / downhole / mR	
Radiological Background		PID Used Mini Rae 2000 (Bkgd: 2.0 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	32	surface: soil and grass		2689
0.5			0.0	48	Fill: Silty clay with sand: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor,	AF / CL	4051
1.0			0.0	52	6% silt, 5% coarse sand, 5% medium sand, 15% fine sand, 50% clay, low plasticity, medium toughness, non cohesive, trace angular granitic gravel, very mottled, some caliche nodules and stringers	CL	4521
			0.0	49			4597
2.0			0.0	43			4576
			0.0	40			4511
3.0			0.0	53	Fill: Sandy silt with clay: Brown (10YR 5/3), moist, medium stiff, no odor, 5% medium sand, 20% fine sand, 15% clay, 60% silt, low plasticity, low toughness, cohesive, mottled	AF / ML	4436
			0.0	49			4334
4.0			0.0	49			4421
			0.0	62	Same as above		4505
5.0			0.0	41	Fill: Sandy silt: Brown (7.5YR 4/4), moist, medium stiff, no odor, 5% coarse, 10% medium sand, 20% fine sand, 65% silt, low plasticity, low toughness, slow dilatancy, non-cohesive, mottled	AF / ML	4446
			0.0	46			4642
6.0			0.0	42	contact 6.0'		4870

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 30				
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 5-19-11/1501	Date/Time Total Depth Reached 5-19-11/1510				
Type of Sampling Device Stainless steel shovel		Samples Collected ^{1 4oz jar} 1 1/2 gall bag (#50067) (1510.)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11						
Radiological Background 11		Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)					
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	11	Sandy clay, (10 VR, 3/4), dark brown, 60% clay, 40% fine to medium grained sand, CaCO ₃ nodules (mm-sized), common rootlets, dry, low plasticity and hardness, no odor, medium stiff. No groundwater reached.	CL		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 2	Location ID 30
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0' Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-15-11 0930	Date/Time Total Depth Reached 6-15-11 1020
Type of Sampling Device 1 3/4" Macrotore	Samples Collected (1) 1/2 gallon bags + 4oz Jar		50068 (0940)
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 39 / 2661 / 11μR	Radiological Equipment Used Pancake / downhole / μR	PID Used Mini Rae 2000 (Bkgd): 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil and gravel		±0.5' 2661
0.5			0.0	34	AF Fill: Silty clay with sand; Brown (10YR 5/3), dry, medium stiff, no odor, 25% silt, 5% coarse, 10% medium, 5% fine sand, 55% clay, low plasticity, medium toughness, non cohesive, trace fill rock	AF	3072
			0.0	30		CL	4006
1.0			0.0	65			4351
			0.0	81	1" fill rock and concrete debris		4372
2.0			0.0	81	1" Silty clay: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 35% silt, 65% clay, cohesive, medium plasticity, medium toughness, some CaCO ₃ stringers	CL	4353
			0.0	56			4283
3.0			0.0	65			4199
			0.0	46			4536
4.0			0.0	43			4594
			0.0	52	Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 70% fine sand	SM	4868
5.0			0.0	50			4757
6.0					Refusal on sandstone at 5.0' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 31	
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 5-19-11/1436		Date/Time Total Depth Reached 5-19-11/1445	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50069) (1445)			
Geologist C. Carmichael				Checked by/Date Jm 7/15/11			
Radiological Background		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>		USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5			0.0 11	Sand with clay, (10 YR, 4/4), brown, 80% fine to medium grained sand, 20% clay, CaCO ₃ nodules (mm-sized), trace charcoal, some rootlets, dry, medium dense, no plasticity or hardness, no odor. No groundwater reached.		SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 31
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-15-11 1105	Date/Time Total Depth Reached 6-15-11 1140
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50020 (1110) (1) 1/2 gallon bags + 4oz jar		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 52 / 2631 / μ R	Radiological Equipment Used Pancake / downhole / μ R	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 (CPM)
			0.0	42	surface: soil and grass		3223
0.5			0.0	49	Fill: Clayey silt with sand. Reddish yellow (7.5YR 6/6), drg, medium stiff, no odor, 20% clay, 15% fine sand, 65% silt, low plasticity, low toughness, cohesive	AF / ML	3856
1.0			0.0	67			4013
			0.0	56			4084
2.0			0.0	72	Sandy silt: Strong brown (7.5YR 5/6), moist, medium stiff, no odor, 30% fine sand, 70% silt, low plasticity, low toughness, cohesive, abundant CaCO ₃ stringers, trace CaCO ₃ nodules	ML	4066
			0.0	58			4199
3.0			0.0	94			4331
			0.0	82			4255
4.0			0.0	63	4'6" Silty sand with clay: Strong brown (7.5YR 5/6), moist, medium dense, no odor, 35% silt, 20% clay, 5% coarse sand, 10% medium sand, 30% fine sand, Abundant CaCO ₃ stringers	SM	4065
			0.0	70			4214
5.0			0.0	56			4259
			0.0	70			4222
6.0			0.0	88			4327

Radiological Background				Project Name	Project Number	Location	
52/2631/11/HR				SSPL Area IV Radiological Study	EP9034.01.22.04.03	31	
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	88	Same as above; 7.2' <u>Weathered Sandstone Bedrock: Brownish Yellow (10YR 6/6), moist dense, no color, mechanically weathered to SP, finegrained sandstone</u>	SM	4327
			0.0	91			4290
7.0			0.0	85		Borehole	4301
			0.0	92			4474
8.0					Refusal on sandstone at 7.5' hrs 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 5DN group 2	Location ID 32			
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 5-19-11/1246	Date/Time Total Depth Reached 5-19-11/1255			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4oz jar 1 1/2 gall bag (#50071) (1255)					
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11					
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	11	Sandy clay, (10 YR, 3/4), dark reddish-brown, 55% clay, 40% fine to medium grained sand, 5% gravel fill and sandstone rock fragments, common rootlets, low-medium plasticity and hardness, no odor, semi-moist, medium stiff. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 32
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 11.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-14-11 1145	Date/Time Total Depth Reached 6-14-11 1245
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags + 4 oz Jar	50072 (1150) 1150 50073 (1200)	
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 60 / 2794 / 11613	Radiological Equipment Used Pancake / downhole / uR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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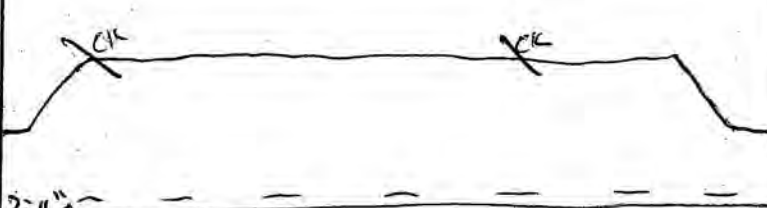
Depth	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			00	60			2869
0.5			00	85	Fill: Clayey silt with sand; yellowish brown (10YR 5/4), moist, medium stiff, no odor, 5% coarse sand, 5% medium sand, 10% fine sand, 25% clay, 55% silt, low plasticity, low toughness, non cohesive, trace fine gravel, mottled	AF / ML	3872
1.0		00	72	4201			
		00	75	4485			
2.0		1.0	88	4445			
			00	85			4423
3.0			00	75			4580
			00	85	3'4" <hr/> Fill: silty clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 25% silt, 75% clay, medium plasticity, medium toughness, cohesive, some CaCO ₃ stringers	AF / CL	4662
4.0		00	65	4653			
		00	65	4415			
5.0		00	66	4324			
			00	63			4443
6.0			00	49			4352

Radiological Background 60/2794 / UMR				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 32	
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	49				4352
		0.0	60		6'9" Abundant CaCO ₃ nodules and stringers	AF CL	4321
7.0		0.0	53				4450
		0.0	55				4377
8.0		0.0	65				4553
		0.0	85		8'1" Same as above; strong brown (10YR 4/6)	AF CL	4416
9.0		0.0	73				4474
		0.0	67				4602
10.0		0.0	64		10' Fill: Poorly graded sand; Brownish yellow (10YR 6/6) moist, loose, no odor, fine grained sand, trace silt	AF SP	4716
		0.0	69		10'6" weathered sandstone bedrock; light yellowish brown (2.5Y 6/3) moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, some Iron oxide staining, trace CaCO ₃ stringers, horizontal CaCO ₃ 10mm thick	SP bedrock	4594
11.0		0.0	65				4729
					Refusal on sandstone at 11' hgs		
12.0					No GW encountered		
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 33				
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 5-19-11/1310	Date/Time Total Depth Reached 5-19-11/1319				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50074) (1318)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11						
Radiological Background 11		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)
05			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 60% clay, 40% fine to medium grained sand, trace rock fragments - asphalt, semi-moist, medium stiff, common rootlets, low-medium plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID #, Group SPN group 2	Location ID 33
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 12 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-14-11 0955	Date/Time Total Depth Reached 6-14-11 1130
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags + 2-4oz jars	50075 (1000) 50076 (1010)	
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 50 / 2835 / 11.6R	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	50	surface: soil and grass		2984
0.5			0.0	55	Fill: Silty clay with sand; Yellowish brown (10YR 5/4), slightly moist, medium stiff, no odor, 5% coarse sand, 5% medium sand, 15% fine sand, 30% silt, 45% clay, low plasticity, low toughness, trace angular volcanic medium gravel, mottled	AF/CL	4098
1.0			0.0	80			4208
			0.6	68			4465
2.0			0.0	58			4527
			0.0	48	2" 11" 	AF/CL	4427
3.0			0.0	55			4397
			0.0	65	Fill: Clay; dark yellowish brown (10YR 3/6), moist, stiff, no odor, 100% clay, medium plasticity, medium toughness, cohesive, mottled	AF/CL	4273
4.0			0.0	58			4508
			0.0	65	4' trace charcoal fragments		4494
5.0			0.0	53	5' trace asphalt	AF/CL	4608
			0.0	65			4545
6.0			0.0	60			4468

Radiological Background 50/2835/11NR				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 33	
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
6.0			0.0	60		AF	4468
			0.0	55	6'4" medium angular granitic gravel ~ 3/4" diameter	CL	4402
7.0			0.0	57	6'10" Fill: Clayey silt; dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 20% clay, 80% silt, low plasticity, low toughness, cohesive	AF	4554
			0.0	63		ML	4581
			0.0	85			
8.0			0.0	95			4540
			0.0	60	9'4" concrete debris ~ 1/2" angular diameter		4461
			0.0	58			4791
10.0			0.0	63	10' Fill: Poorly graded sand; yellow (10YR 7/6), dry, loose, no odor, 5% coarse sand, 5% medium sand, 90% fine sand	AF	5040
			0.0	90	10'9" Fill: Clayey silt with sand; yellowish brown (10YR 5/4), moist, medium dense, no odor, 20% clay, 15% fine sand, 65% silt low plasticity, low toughness, non cohesive, mottled, trace charcoal	SP	5202
			0.0	95		ML	5104
11.0			0.0	85	Weathered sandstone bedrock; Pale yellow (2.5Y 7/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	ML	5086
12.0			0.0	75		CL	5017
13.0					Refusal on sandstone at 12' bgs No GW encountered		

Not sampled

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 34	
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 5-19-11/1406		Date/Time Total Depth Reached 5-19-11/1415	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (#50077) (1415)			
Geologist C. Carmichael				Checked by/Date <i>[Signature]</i> 7/15/11			
Radiological Background 11		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 12	Silty sand with gravel, (10 YR, 4/4), brown, 50% fine to coarse grained sand, 35% silt, 15% gravel fill and asphalt fragments, common rootlets, dry, medium dense, very low hardness, no plasticity, no odor. No groundwater reached.	SM	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 34
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-15-11 1200	Date/Time Total Depth Reached 6-15-11 1300
Type of Sampling Device 1 3/4" Macrotore	Samples Collected (2) 1/2 gallon bags + (2) 102 Jars 50078 (1209) 50079 (1210)		
Geologist C. Knight	Checked by/Date Julian Rollins & Aldman 9/8/11		

Radiological Background 39 / 2711 / 114R	Radiological Equipment Used Pancake / downhole / 11R	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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	61	surface: soil and grass		40.5 = 2741
0.5			0.0	72	Fill: Clay with silt and sand; dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 10% fine sand, 10% silt, 80% clay, medium plasticity, medium toughness, cohesive	AF	3069
1.0			0.0	59		CL	3944
			0.0	56			4139
			0.0	56			4241
2.0			0.0	48	2'6" angular medium gravel (fill/rock)		3962
			0.0	42	2'6" _____		3991
3.0			0.0	82	Clayey silt with sand: ^(CL) dark strong brown (7.5YR 4/6) moist, medium dense, no odor, 25% clay, 10% fine sand, 5% medium sand, 60% silt, low plasticity, low toughness, cohesive, abundant CaCO ₃ stringers	ML	3893
			0.0	83	3'6" CaCO ₃ stringer - horizontal 1/4" thick		3963
4.0			0.0	72			4095
			0.0	47			4303
5.0			0.0	57			4255
			0.0	82	Same as above	ML	4221
6.0			0.0	51	contact 6.0'		4240

Radiological Background				Project Name	Project Number	Location	
39 / 27M / 11MB				SSPL Area IV Radiological Study	EP9034.01.22.04.03	34	
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
							(CFM)
6.0			0.0	51	Reddish sand: Strong brown (7.5YR 5/6), moist, medium dense, no odor, 35% silt, 66% fine sand, some CaCO ₃ stringers and nodules	SM	4240
			0.2	42	Weathered sandstone bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone some CaCO ₃ stringers	S.S.	4249
7.0			0.0	47			4195
8.0					Refusalon sandstone at 7.0' hys 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 5DN group 2	Location ID 35			
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 5-19-11/1340	Date/Time Total Depth Reached 5-19-11/1349			
Type of Sampling Device Stainless steel shovel		Samples Collected ^{1 4oz jar} 1 1/2 gall bag (#50080) (1348)					
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11					
Radiological Background II		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 II	Clay with sand, (10YR, 3/3), dark brown, 80% clay, 20% fine to medium grained sand, trace amounts of carbon/charcoal, dry, medium stiff, low-medium plasticity and hardness, no odor. No groundwater reached	CL	

Radiological Background 48/2735 /LWR				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 35	
Depth	Interval	Recovery	PID	Radiological	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	66	Same as above	ML	4560
			0.0	65			4402
7.0			0.0	73	Same as above; yellowish red (5Y 4/6)	ML	4535
			0.2	80			4569
8.0			0.2	67	weathered sandstone Bedrock light olive brown (2.5Y 5/6), moist, dense, no odor, mechanically weathered to: SP, fine grained sandstone		4704
			0.0	75			4805
9.0			0.0	73			4814
			0.0	70			4930
10.0			0.0	68	Refusal on sandstone at 10.5' hys No GW encountered		5009
			0.0	77			4834
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 36				
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 5-20-11/0938	Date/Time Total Depth Reached 5-20-11/0951				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50083) (0950) Field DUP (Sew)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11						
Radiological Background 11		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5				0.0 11	Sandy clay with gravel, (10 YR, 3/3), brown, 55% clay, 30% fine to coarse grained sand, 15% gravel fill, trace asphalt fragments, some rootlets, dry, medium stiff. low plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 36
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-7-11 1410	Date/Time Total Depth Reached 6-7-11 1510
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz Jar 50084 (1420)		
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 44 / 2349 / 10uR	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 and gravel		3290
0.5			0.0	53	Fill: Silty clay with sand; dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 20% silt, 5% medium sand, 10% fine sand, 65% clay, cohesive, low plasticity, medium toughness	AF CL	4350
1.0			0.0	50			4448
			0.0	65			4515
2.0			0.0	50			4408
			0.0	59			4371
3.0			0.0	58	2' 9" Clay with silt: yellowish brown (10YR 5/4), moist, stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive, trace CaCO ₃ speckled nodules	CL	4375
			0.0	60			4512
4.0			0.0	52			4311
			0.0	60			4278
5.0			0.0	58			4356
			0.0	50	Clayey silt: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 25% silt, 75% clay, 25% silt, cohesive, low plasticity, low toughness, abundant CaCO ₃ stringers and nodules	ML	4311
6.0			0.0	55			4147

Radiological Background 64/2344 / 10μR				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 36		
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	55		Same as above; clayey silt	ML	4147	
		0.0	59				4266	
7.0		0.0	60				4414	
		0.0	55				4455	
8.0		0.0	65			Same as above except; Strong brown (7.5YR 4/6)	ML	4290
		0.0	60					4413
9.0		0.0	63					4215
		0.0	65					4160
10.0		0.0	57					4361
						End boring: Total Depth 10.0' by 5 No GW encountered		
11.0								
12.0								
13.0								

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 37				
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 5-20-11/112	Date/Time Total Depth Reached 5-20-11/1120				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50085) (1120)						
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11						
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 30% fine to medium grained sand, 5% rock fragments (asphalt, fill rock), some charcoal found, common rootlets, semi-moist, low-medium plasticity and hardness, no odor. No groundwater reached.	CU		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 37
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 12.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-9-11 1455	Date/Time Total Depth Reached 6-9-11 1605 1015
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 1-402 Jar	50086 (0900) (1500) CK	
Geologist C. Knight	Checked by/Date <i>[Signature]</i> 7/15/11		

Radiological Background 42 / 2671 / 10µR	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 grass and soil		2671
0.5			0.0	50	Fill: Artificial Fill Sandy clay with silt: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% medium sand, 15% fine sand, 15% silt, 65% clay, medium plasticity, medium toughness, cohesive, mottled, trace rootlets near surface	AR CL	3153
			0.0	47			4132
1.0			0.0	47			4375
			0.0	47			4497
			0.0	44			4516
2.0			0.0	43			4585
			0.0	50			4524
			0.0	57	3'11" trace asphalt fine gravel		4421
4.0			0.0	57	4'2" Angular medium granitic gravel		4403
			0.0	58			4371
5.0			0.0	62			4488
			0.0	55	Fill: Clayey silt: strong brown (7.5YR 5/6), moist, medium stiff, no odor, 5% fine sand, 20% clay, 75% silt, cohesive, low plasticity, low toughness, mottled, trace CaCO ₃ nodules	AF ML	4562
			0.0	56			4522

Radiological Background 42/267 / 10MR					Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 37	
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)
6.0			0.0	56	Same as above!	AF / ML		4522
			0.6	52				4497
7.0			0.6	53				4503
			0.0	55	7'7" ————— Clayey silt with sand. Brown (7.5 YR 5/4), moist, medium stiff, no odor, 10% finesand, 20% clay, 20% silt, low plasticity, low toughness, cohesive, abundant CaCO ₃ stringers and nodules	ML		4442
8.0			0.0	52				4433
			0.0	45				4645
9.0			0.0	43				4574
			0.0	43				4638
			0.0	47	11'0" ————— Silty sand: light yellowish brown (2.5 Y 6/4), moist, medium dense, no odor, 30% silt, 70% fine sand, slow dilatancy	SM		4696
10.0			0.0	52				4717
			0.0	49				4686
			0.0	52	Weathered siltstone! olive yellow (2.5 Y 6/6), moist, hard, no odor, interbedded siltstone layers	SM		4715
11.0			0.0	49				4649
			0.0	58	Refusal on siltstone at 12.5' bgs No G.W. encountered 3 sigma is 5129 3 sigma anomaly at 5295	SM		5295
12.0			0.0	58				
13.0			0.0	58				

not sampled

sampled

SM

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 38			
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 5-20-11/1054	Date/Time Total Depth Reached 5-20-11/1102			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gallon bag (#50087) (1100)					
Geologist C. Carmichael		Checked by/Date <i>[Signature]</i> 7/15/11					
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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 30% fine to medium grained sand, 5% gravel fill, semi-moist, medium stiff, common rootlets, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 38
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 125 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6.9.11 1350	Date/Time Total Depth Reached 6.9.11 1440
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 50088 (1400) (4) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins Madman 7/19/11		

Radiological Background 33 / 2634 / 104R	Radiological Equipment Used Pancake / downhole / MR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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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	51	Surface grass and soil		5149
0.5			6.0	52	Fill: Silty Clay with Sand: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% fine sand, 5% medium sand, 25% silt, 65% clay, medium plasticity, medium toughness, cohesive, mottled	AF/CL	4166
1.0		0.0	55	4377			
		0.0	58	4514			
2.0		0.0	60	4390			
		0.0	58				4502
3.0		0.0	59		3" 6" Angular volcanic granite medium gravel		4627
		0.0	60		3" 6" - - - - -		4581
4.0		0.0	63		Fill: Clay with sand: dark brown (10YR 3/3), moist, stiff, no odor, 5% fine sand, 5% medium sand, 90% clay, cohesive, medium plasticity, medium toughness, trace angular fine volcanic gravel, mottled	AF/CL	4547
		0.0	67				4556
5.0		0.0	66				4547
		0.0	46				4478
6.0		0.0	46				4461

Radiological Background 33/2634/10NR				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 38		
Depth	Interval	Recovery	PID	Radiological	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	46	Same as above	AF		4461
			0.0	55	67"	CL		4518
7.0			0.0	54	Fill: Clayey silt with sand; strong brown (7.5YR 5/6), moist, medium stiff, no odor, 20% clay, 5% medium sand, 5% fine sand, 70% silt, cohesive, low plasticity, low toughness, some CaCO ₃ stringers, mottled	AF/ML		4379
			0.0	54				4513
8.0			0.0	52				4412
			0.0	66				4745
9.0			0.0	52			4864	
			0.6	52			4640	
10.0			0.6	48	10' fine quartzite gravel			4764
			0.0	52	Poorly graded sand ^{w/ silt} ; Brownish yellow (10YR 6/6), moist, med. dense, no odor, 10% silt, 90% fine sand, trace CaCO ₃ stringers	SP		4684
11.0			0.10	56	Weathered sandstone bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace CaCO ₃ stringers			4790
			0.0	55				4777
12.0					Refusal on sandstone at 11.5' bgs			
13.0					No GW encountered			

Project Name: SSFL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 39			
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 5-20-11/1004	Date/Time Total Depth Reached 5-20-11/1013			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gal bag (#50089) (1012.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Alderman 7/19/11					
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 30% fine to medium grained sand, 5% gravel fill, common rootlets, semi-moist, medium stiff, low-medium plasticity and hardness, no odor. No groundwater reached	CL	

Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SDN group 2	Location ID: 39
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 1205 ft. bgs.
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 6-9-11 1110	Date/Time Total Depth Reached: 6-9-11 1210
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (2) 1/2 gallon bags + 2-4oz jar	50090 (1120) 50432 (1130)	
Geologist: C. Knight	Checked by/Date: J. Robbins/Geldman 7/19/11		

Radiological Background: 56 / 2552 / 104R	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)	
					AF: Artificial Fill surface: grass and soil Former VST location		10.5' 2552	
0.5			0.1	57			2947	
			0.1	54			4146	
1.0			0.1	56	Fill: Sandy clay with silt: dark brown (10YR 3/3), moist, stiff, no odor, 5% coarse sand, 10% medium sand, 15% fine sand, 15% silt, 55% clay, cohesive, medium plasticity, medium toughness, mottled	AF/CL	4447	
			0.1	58			4555	
2.0			0.1	66			2' 2" Asphalt debris ~ 1/4" diameter	4519
			0.1	78				4607
3.0			0.1	73	3' 4" Asphalt debris ~ 1/8" diameter		4485	
			0.1	72	3' 10" medium subangular granitic gravel		4535	
4.0			0.1	74	4' 3" to 4' 7" Concrete debris ~ 1.5" diameter		4575	
			0.1	78			4569	
5.0			0.1	72	Same as above:	AF/CL	4493	
			0.1	56			4553	
6.0			0.1	56			4410	

(16)

Radiological Background				Project Name	Project Number	Location	
56 cpm / 2552 / 104R				SSFL Area IV Radiological Study	EP9038.01.22.04.03	39	
Depth	Interval	Recovery	PID	Radiological	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	56		same as above: sandy clay w/ silt		4410
		0.1	62		6'6" subangular medium granitic gravel	Af / Cl	4594
7.0		0.1	60				4376
		0.1	52				4438
8.0		0.1	55				4487
		0.1	56				4562
9.0		0.1	53		9'0" trace CaCO ₃ nodules		4525
		0.1	52		9'2" Asphalt debris - 1/4" diameter		4493
10.0		0.1	57		10'0" black plastic sheeting at 10' bgs		4386
		0.1	47		Fill: Poorly graded sand: Br yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% fine sand, 90% medium sand, trace pockets of silt or clay	Af / SP	4349
11.0		0.1	56				4097
		0.1	66				4358
12.0		0.1	74		Weathered Sandstone bedrock: Pale yellow (2.5Y 7/4), moist, very dense, no odor mechanically weathered to SP, fine grained sandstone		4155
		0.1	77				4511
13.0					Refusal on sandstone at 12.5' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 40				
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 5-20-11/1034	Date/Time Total Depth Reached 5-20-11/1042				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50091) (1040)						
Geologist C. Carmichael		Checked by/Date Robbin Feldman 7/19/11						
Radiological Background		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Background: 0.6 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	11	Sandy clay, (10 YR, 3/2), dark brown, 65% clay, 30% fine to medium grained, 5% gravel fill, dry, medium stiff, common rootlets, low-medium plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 40
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 11.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-4-11 0950	Date/Time Total Depth Reached 6-4-11 1040
Type of Sampling Device 1 3/4" Macrocure	Samples Collected (2) 1/2 gallon bags + 2-4oz jars		50092 (1000) 50433 (1010)
Geologist C. Knight	Checked by/Date Subramanian/Robins/Holman 9/8/11		

Radiological Background 51 / 2703 / 10µR	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	44	Surface: Grass and Soil		2703
0.5			0.0	42	Fill: Sandy clay with silt; dark brown (10YR 3/3), moist, stiff, no odor, 5% coarse sand, 10% medium sand, 15% fine sand, 15% silt, 55% clay, cohesive, medium plasticity, medium toughness, trace (all rock) gravel, mottled, trace clear plastic sheeting	AF / CL	3217
1.0		0.0	38	4106			
		0.0	41	4362			
2.0		0.0	47	4524			
			0.0	45	2" Asphalt piece		4440
			0.0	48	3' 3" Subrounded medium gravel (granite fill rock) ~ 3/4" diameter		4597
3.0		0.0	49	4443			
		0.0	49	4432			
4.0			0.2	40	Same as above	AF / CL	4488
			0.0	41			4429
5.0		0.0	40	4334			
		0.0	44	4489			
6.0			0.0	42			4358

Radiological Background				Project Name	Project Number	Location		
51/2703/10/HR				SSPL Area IV Radiological Study	EP9034.01.22.04.03	40		
Depth	Interval	Recovery	FTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)	
6.0		0.1		42	Same as above; 7' 10" sub rounded 1" granite gravel		4358	
		0.1		51		M	4537	
7.0		0.1		56		C	4461	
		0.1		57			4441	
8.0		0.1		61			4386	
		0.1		58			4473	
9.0		0.1		59			4327	
		0.1		59			4044	
10.0		0.1		55		9' 10" Fill; poorly graded sand: yellowish brown (10YR 5/6), moist, medium dense, no odor, 10% fine sand, 90% medium sand, trace pockets of clay or silt, trace medium rounded gravel (fill rock)	M	4062
		0.1		42			SP	4174
11.0		0.1		51	11' 3" Weathered sandstone bedrock: Pale yellow (2.5Y 7/4), moist, very dense, no odor, mechanically weathered to SP, fine grained sandstone		4490	
		0.1		50		SP	4416	
12.0					Refusal on sandstone at 11.5' bgs			
					No GW encountered			
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 41	
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 5-19-11/1022		Date/Time Total Depth Reached 5-19-11/1030	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50093) (1028)			
Geologist C. Carmichael				Checked by/Date John Paul Collins M. H. Man 9/8/11			
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000		(Background: 0.0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy clay, (10 YR, 3/2), dark brown, 55% clay, 35% fine to coarse grained sand, 10% gravel fill rock, semi-moist, soft, common rootlets, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 41
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-10-11 1030	Date/Time Total Depth Reached 6-10-11 1135
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 500 gm (1040) (1) 1/2 gallon bags + 4 oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins, J. Edman 7/19/11		

Radiological Background 37 / 2720 / 134R	Radiological Equipment Used Pancake / downhole / AR	PID Used Mini Rae 2000 (Bkgd: 0.1 0.1 ppm)
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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)
			0.1	38	Surface: grass and soil		3738
0.5			0.1	48	Fill: Sandy clay with silt; dark yellowish brown (104R 4/4), moist, medium stiff, no odor, 5% medium sand, 15% fine sand, 15% silt, 65% clay, medium plasticity, medium toughness, cohesive, mottled, trace subrounded gravel	AF/CL	4214
1.0		0.1	44	4406			
		0.1	40	4500			
2.0		0.1	43	4539			
			0.1	52	2' 8" - - - - -		4518
3.0			0.1	52	Fill: Silty clay: Dark yellowish brown (104R 3/4), moist, medium stiff, no odor, 20% silt, 80% clay, cohesive, medium plasticity, medium toughness, trace gravel and CaCO ₃ nodules	AF/CL	4501
		0.1	56	4551			
4.0			0.1	55			4512
			0.1	56	4' 8" Angular medium quartzite gravel		4623
5.0			0.1	59			4569
			0.1	57			4644
6.0			0.1	52			4449

Radiological Background				Project Name	Project Number	Location	
37/2720/13MR				SSPL Area IV Radiological Study	EP9038.01.22.04.03	41	
Depth	Interval	Recovery	PTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings (CPM)
6.0		0.1		52	Same as above: Fill: Silty Clay	AF/CL	4449
		0.1		44		AF/CL	4416
7.0		0.1		51	6'10" Fill: Silty Clay with Sand: dark yellowish brown (10YR 5/6), moist, medium stiff, no odor, 30% clay, 52% medium sand, 10% fine sand, 55% clay, cohesive, medium plasticity, medium toughness	AF/CL	4541
		0.1		52			4492
8.0		0.1		54	8'3" Asphalt debris (fine asphalt gravel)		4513
		0.1		58			4611
9.0		0.1		60	4'1" granite medium gravel		4463
		0.1		58	4'4" Fill: Partly graded Sand: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 5% coarse sand, 95% medium sand, trace granite medium gravel, trace pockets of silt	AF/SP	4365
10.0		0.1		66			4224
<p>Total Depth: 10.0'</p> <p>No GW encountered</p>							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 42	
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 5-19-11/0959		Date/Time Total Depth Reached 5-19-11/1009	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50095) (1008)			
Geologist C. Carmichael				Checked by/Date J. Robbins Feldman 7/19/11			
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy clay, (10 YR, 3/4), reddish-brown, 60% clay, 35% fine to medium grained sand, 5% fill gravel, common rootlets, semi-moist, medium stiff, low-medium hardness and plasticity, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 42
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-13-11 1050	Date/Time Total Depth Reached 6-13-11 1140
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz jar (1100) 50096		
Geologist C. Knight	Checked by/Date J. Robbins/J. Johnson 7/19/11		

Radiological Background 47 / 2410 / 102R	Radiological Equipment Used Pancake / downhole / MR	PID Used Mini Rae 2000 (Bkgd): 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)	
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: gravel + soil		2654	
0.5			0.0	49	Fill: Silty Clay with sand: dark brown (10YR 3/3), moist, medium stiff, no odor, 5% angular granitic medium gravel, 5% coarse sand, 5% medium sand, 10% fine sand, 30% silt, 45% clay, non-cohesive, low plasticity, low toughness, very mottled		2737	
			0.0	53		AF/CL	3706	
1.0			0.0	33		4154		
			0.0	32		4457		
2.0			0.0	41		4359		
			0.0	47		4430		
3.0			0.0	53		4428		
			0.0	40		3' 5" Sandy Silt:	AF/ML	4441
4.0			0.0	38		Fill: Brown (7.5 YR 5/4), moist, medium stiff, no odor, 20% fine sand, 80% silt, low plasticity, low toughness cohesive	4400	
			0.0	35		4' 9" subangular greiss medium gravel		4394
5.0			0.0	44			4312	
			0.0	55			4470	
6.0			0.0	78			4476	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 43	
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 5-19-11/0926		Date/Time Total Depth Reached 5-19-11/0935	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (#50097) (0935)			
Geologist C. Carmichael				Checked by/Date J. Robbins/Goldman 7/19/11			
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'			0.0	11	Clayey sand, (10 YR, 4/3), brown, 60% fine to medium grained, 40% clay, trace gravel fill, semi-moist, soft, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDA group 2	Location ID 43
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-13-11 1140	Date/Time Total Depth Reached 6-13-11 1215
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 5009B (1150)		
Geologist C. Knight		Checked by/Date Sue Dean Robbins Mldman 9/8/11	

Radiological Background 47 / 2354 / 10 AR	Radiological Equipment Used Pancake / downhole / MR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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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 and grass		+0.5' - 2354 (CPM) 0 - 2638
0.5			0.0	51			
			0.0	55	Fill: silty clay with sand: yellowish brown (10YR 5/4), moist, medium stiff, no odor, 25% silt, 5% gravel (fill rock), 5% coarse sand, 10% medium sand, 10% fine sand, 45% clay, medium to low plasticity, medium toughness, non cohesive	AR CL	3724
1.0			0.0	42			4354
			0.0	35			4337
2.0			0.0	45			4426
			0.0	41	2' 5" angular granitic medium gravel		4353
3.0			0.0	59			4359
			0.0	69	3' 5" large asphalt gravel		4469
4.0			0.0	86			4377
			0.0	72			4342
5.0			0.0	83			4412
			0.0	66	same as above	AS CL	4507
6.0			0.0	71			4341

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 44				
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 5-20-11/1438	Date/Time Total Depth Reached 5-20-11/1446				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50099) (1445)						
Geologist C. Carmichael		Checked by/Date J. Robin Feldman 7/20/11						
Radiological Background 10		Radiological Equipment Used w/ Rater		PID Used Mini Ra2 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				0.0 11	Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 35% fine to coarse grained sand, trace gravel, dry, medium stiff, common rootlets, low to medium plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDM group 2	Location ID 44
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 13.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-14-11 1415	Date/Time Total Depth Reached 6-14-11 1530
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (2) 1/2 gallon bags 74 and 815		50100 (1420) 50101 (1430)
Geologist C. Knight	Checked by/Date J. Robbin Feldman 7/20/11		

Radiological Background Ug / 2499/10AR	Radiological Equipment Used Pancake / downhole / AR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	52	Surface: gravel and soil		2952
0.5			0.0	55	Fill: Silty Clay with sand: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% coarse sand, 5% medium sand, 10% fine sand, 25% silt, 55% clay, low plasticity, medium toughness, non cohesive, mottled	Af / CL	3869
1.0			0.0	53			4229
			0.0	50			4335
2.0			0.0	48			4440
			0.0	53			4416
3.0			0.0	65	2' 2" large granitic angular gravel ~ 3/4" diameter		4408
			0.0	60	3' 5" large granitic angular gravel ~ 1/2" diameter 3' 5" fine granitic angular gravel ~ 1/8" diameter		4375
4.0			0.0	58	4' 1" —————		4441
			0.0	60	Fill: Clay with silt: dark brown (10YR 3/3), moist, stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive		4369
5.0			0.0	63			4536
			0.0	62			4443
6.0			0.0	70	5' 8" sheathed electrical wire ~ 1/4" long		4511

Radiological Background				Project Name	Project Number	Location	
VA/245A / 10 _{MR}				SSPL Area IV Radiological Study	EP9034.01.22.04.03	44	
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			6.0	70		AF CL	4511
			6.0	57	6'6" coarse granitic medium gravel 1/2" diameter		4485
7.0			6.0	71	7'3" concrete debris ~ 1" diameter		4694
			6.0	75			4622
			6.0	85	7'11" granitic medium gravel		4481
8.0			6.0	75	Fill: Silty clay: dark brown (7.5YR 3/4), moist, medium stiff, no odor, 35% clay, 65% silt, trace fine sand, mottled, low plasticity, low toughness	AF CL	4663
9.0			6.0	55			4551
			6.0	52	9'7" asphalt debris ~ 1" diameter		4645
10.0			6.0	70			4668
			6.0	56			4560
11.0			6.0	57	11'4" trace charcoal ~ 5mm diameter		4574
			6.0	60	Fill: Poorly graded sand; Olive yellow (2.5Y 6/6), moist, loose, no odor, fine sand 95% and 5% coarse sand		4490
12.0			6.0	90	Fill: Sandy silt: Brown (10YR 4/3), moist, medium stiff, no odor, 5% coarse sand, 5% medium sand, 15% fine sand, 75% silt, low plasticity, low toughness, trace concrete, trace tar pitch, mottled, trace angular gravel (fill rock)	AF SP	4294
			6.0	85	Weathered sandstone bedrock: Pale yellow (2.5Y 7/4), moist, dense, no odor, mechanically weathered to fine grained sandstone	AF ML	4651
13.0			6.0	70		Bedrock	4709

Refusal on sandstone at 13' bgs
No GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 45	
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 5-19-11/1044		Date/Time Total Depth Reached 5-19-11/1051	
Type of Sampling Device Stainless steel shovel				Samples Collected 4-oz jar 1 1/2 gall bag (#50102) (1050)			
Geologist C. Carmichael				Checked by/Date J. Robbins Aldman 7/20/11			
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 60% clay, 35% fine to coarse grained sand, 5% gravel fill, common rootlets, semi-moist, medium stiff, low-medium plasticity and hardness, no odor. No groundwater reached	CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 45
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-10-11 1020	Date/Time Total Depth Reached 6-10-11 1215
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz jar		50103 (1030)
Geologist C. Knight	Checked by/Date J. Robins Aldman 7/20/11		

Radiological Background 43 / 2683 / 2AR	Radiological Equipment Used Pancake / downhole / nR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					surface grass and soil		+0.5' 2683 (CPM)
0.5			0.0	35			3620
			0.0	32	Clay: Brown (10YR 4/3), moist, ^{medium} stiff, no odor, 5% silt, 95% clay, medium plasticity, medium toughness, cohesive, trace rootlets and pinhole pores	CL	4286
1.0			0.0	32			4403
			0.0	38			4517
2.0			0.0	47			4435
			0.0	56			4543
3.0			0.0	61			4532
			0.0	59	3' 5" Clayey silt: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 35% clay, 65% silt, low toughness, medium to low plasticity, cohesive, trace CaCO ₃ stringers	ML	4463
4.0			0.0	59			4511
			0.1	57	4' 3" Silty clay: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 15% silt, 85% clay, medium plasticity, medium toughness, cohesive, some CaCO ₃ stringers and nodules	CL	4352
5.0			0.1	57			4261
			0.1	56			4341
6.0			0.1	56			4350

Radiological Background 43/2683 / 12µR				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 45	
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		0.1	56		Same as above : Silty Clay	CL	4350
		0.1	58				4385
7.0		0.1	60				4295
		0.1	60				4464
8.0		0.1	58		7'10" - - - - - Same as above : strong brown (7.5Y 5/8)	CL	4283
		0.1	52				4377
9.0		0.1	57				4277
		0.1	58				4347
10.0		0.1	55				4277
<p>Total depth : 10.0' by 5</p> <p>No GW encountered</p>							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 46	
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 5-19-11/0904		Date/Time Total Depth Reached 5-19-11/0912	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (#50104) (0910)			
Geologist C. Carmichael				Checked by/Date J. Robin Feldman 7/20/11			
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'				11	Clayey sand, (10 YR, 3/3), dark brown, 60% fine to medium grained sand, 30% clay, 10% fill gravel and asphalt fragments, some rootlets, semi-moist, medium dense, low plasticity and hardness, no odor. No groundwater reached.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 46
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-13-11 0930	Date/Time Total Depth Reached 6-13-11 1100
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (0.40) S0105 (2) 1/2 gallon bags + 4oz Jar (2) 56428(LNT)		
Geologist C. Kurdt	Checked by/Date J. Robbins-Johnson 7/20/11		

Radiological Background 47 / 236 / 11 nR	Radiological Equipment Used Pancake / downhole / nR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	60			2833 3123
0.5			0.0	53	Clay with silt; Dark Brown (10YR 3/3), moist, medium stiff, no odor, 10% silt, 5% fine sand, 85% clay, cohesive, medium plasticity, medium toughness,	CL	4123 4168
1.0		0.0	35	4168 4427			
		0.0	52	4427 4563			
2.0		0.0	57	4563 4686			
			0.0	57			4686 4628
3.0			0.0	75	3'2" - - - - - Same as above: yellowish brown (10YR 5/6)	CL	4628 4670
		0.0	63	4670 4746			
4.0			0.0	62			4746 5048
			0.0	54	4'3" - - - - - Silty with sand; dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 10% fine sand, 90% silt, low plasticity, low toughness, slow dilatancy	ML	5048 5139
5.0		0.0	66	5139 4929			
			0.0	69	Silty clay; dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 15% silt, 85% clay, medium plasticity, medium toughness, cohesive, abundant CaCO ₃ nodules	CL	4929 4526
6.0		0.0	59	4463			

Radiological Background 47/2396/11/PR					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location L16
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	59		Same as above: S. Hy Clay		4483
		0.0	42				4456
7.0		0.0	38				4717
		0.0	46				4603
8.0		0.0	53				4449
		0.0	65				4438
9.0		0.0	61		Same as above: S. Hy Clay		4393
		0.0	71				4435
10.0		0.0	81		End Boring / Total Depth 10.0' bgs No GW encountered	CL	4418
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 47
Drilling Company HGL	Driller J. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter N/A	Date/Time Drilling Started 5-19-11/0822	Date/Time Total Depth Reached 5-19-11/0829
Type of Sampling Device Stainless steel shovel	Samples Collected 1 4-oz jar 1 1/2 gall bag (#50106) (0828)		
Geologist C. Carmichael	Checked by/Date J. Roblin Feldman 7/20/11		

Radiological Background 10	Radiological Equipment Used up R meter	PID Used Mini Rae 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	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0011	Clayey sand, (10 YR, 4/3), brown, 60% fine to coarse grained sand, 30% clay, 10% rock fragments/gravel (asphalt, gravel fill, sandstone fragments), some rootlets, dry, dense, very low plasticity and hardness, no odor, a nail was found. No groundwater reached	SC		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 47
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 11.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-13-11 0830	Date/Time Total Depth Reached 6-13-11 0925
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50107 (0840) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight		Checked by/Date J. Robbins/Jedman 7/20/11	

Radiological Background 47 / 2519	Radiological Equipment Used Pancake / downhole	PID Used Mini Rge 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					Surface: soil, dirt road		405' 2611
0.5			0.0	65	Fill: Clay: Brown (10YR 4/3), moist, medium stiff, no odor, 5% fine sand, 5% angular fine gravel (cl. rock), 5% silt, 65% clay, cohesive, medium plasticity, medium toughness.	AF	3285
			0.0	50		CL	4255
1.0			0.0	53	Silty Clay: dark yellowish brown (10Y 3/4), moist, medium stiff, no odor, 20% silt, 80% clay, medium plasticity, medium toughness, cohesive		4450
			0.0	57		CL	4692
2.0			0.0	73			4540
			0.0	58			4510
3.0			0.0	48			4612
			0.0	51	3'4" Silty Clay with Sand: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 10% fine sand, 25% silt, 65% clay, trace CaCO ₃ stringers, medium plasticity, medium toughness, cohesive	CL	4690
4.0			0.0	47			4801
			0.0	37			4674
5.0			0.0	52			4838
			0.0	63	Silty Clay with Sand: Yellowish brown (10YR 5/6), moist, stiff, no odor, 15% fine sand, 35% silt, 50% clay, medium plasticity, medium toughness, cohesive, abundant CaCO ₃ stringers and nodules	CL	4489
6.0			0.0	59			4278

Radiological Background				Project Name	Project Number	Location
47 / 2519				SSFL Area IV Radiological Study	EP9038.01.22.04.03	47
Depth	Interval	Recovery	Rad. Background	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			PID	(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)	Inches	
6.0			59 0.0	Same as above	Q	4278
			44 0.0			4304
7.0			39 0.0			4375
			53 0.0			4493
			47 0.0			4478
			60 0.0	4717		
8.0			75 0.0	Silty Sand: Brown (7.5 YR 5/4), moist, medium dense, no odor, 30% silt, 70% fine sand, trace mottling, trace CaCO ₃ stringers	SM	4813
			78 0.0			4724
			70 0.0			4465
9.0			24 0.0	Weathered Sandstone bedrock: light olive brown (2.5 Y 5/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	Bey	4420
			56 0.0			4618
10.0				Refusal on sandstone at 11.0' bgs No GW encountered		
11.0						
12.0						
13.0						

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 48				
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 5-19-11/0844	Date/Time Total Depth Reached 5-19-11/0852				
Type of Sampling Device Stainless steel shovel		Samples Collected / 4-oz jar 1 1/2 gall bag (#50108) (0850)						
Geologist C. Carmichael		Checked by/Date J. Robbins/Geldman 7/20/11						
Radiological Background II		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	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	II	Sandy silt with gravel, (10 YR, 4/3), brown, 55% silt, 30% fine to coarse grained sand, 15% gravel fill, common rootlets, semi-moist, soft, piece of iron found, no plasticity or hardness, no odor. No groundwater reached.	ML		



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 48
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 12.5' ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-10-11 1450	Date/Time Total Depth Reached 6-10-11 1550
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 50109 (1500) (1) 1/2 gallon bags + 402 jar		
Geologist C. Knight	Checked by/Date J. Robin Waldman 7/20/11		

Radiological Background 48 / 2215 / 13mR	Radiological Equipment Used Pancake / downhole / mR	PID Used Mini Rae 2000 (Bkgd: 0.10 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	46			4327
0.5			0.0	72	Clay: Brown (10YR 4/3), moist, med. dense, no odor, 5% silt, 5% clay, cohesive, med. plasticity, medium toughness, trace pinhole pores and rootlets	CL	4534
1.0			0.0	76			41467
			0.0	65			4566
2.0			0.0	86			4534
			0.0	71			4529
3.0			0.0	58			4610
			0.0	35			4591
4.0			0.0	54			4603
			0.0	64			4733
5.0			0.0	53			4779
			0.0	44	Same as above	CL	4529
6.0			0.0	42	5' siltty clay with sand; dark yellowish brown (10YR 4/4) cont next page	CL	4265

Radiological Background				Project Name	Project Number	Location		
48/2715/13MR				SSPL Area IV Radiological Study	EP9034.01.22.04.03	48		
Depth	Interval	Recovery	PID	Radiological	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	42		moist, medium stiff, no odor, 20% silt, 15% fine sand, 65% clay, cohesive, medium plasticity, medium toughness, abundant CaCO ₃ stringers and nodules	CL		4265
		0.0	47				4263	
7.0		0.1	72				4181	
		0.0	61				4300	
		0.0	65				4214	
8.0		0.0	71					4348
9.0		0.0	62					4468
		0.0	33		Same as above: silty clay with sand	CL		4444
10.0		0.0	55		Silty Sand: yellowish brown (10YR 5/8), moist, dense, no odor, 15% silt, 85% fine sand, iron oxide staining		SM	
		0.1	58					
11.0		0.1	55					4595
		0.1	89					4689
12.0		0.1	55		118" weathered Sandstone Bedrock: light yellowish brown (2.5Y 6/4), moist, dense, no odor, mechanically weathered to SP, fine-grained sandstone	Refusal		4655
		0.1	59					
13.0					Refusal on Sandstone at 12.5' bgs No GW encountered			

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 49			
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 5-19-11/1101	Date/Time Total Depth Reached 5-19-11/1110			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50110) (1110)					
Geologist C. Carmichael		Checked by/Date Julian Rollins Waldman 9/8/11					
Radiological Background 11		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 Inches (CPM)
0.5			0.0	11	Sand with clay and gravel, (10 YR, 3/3), dark brown, 65% fine to medium grained sand, 20% clay, 15% gravel fill and asphalt pieces, common rootlets, dry, medium dense, no hardness or plasticity, no odor. No groundwater reached.	SC	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 49
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 16.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-10-11 1343	Date/Time Total Depth Reached 6-10-11 1445
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 5011 (1350) C(1) 1/2 gallon bags + 402 Jar		
Geologist C. Knight	Checked by/Date J. Robbins/Hudson 7/26/11		

Radiological Background 44 / 2707 / 11uR	Radiological Equipment Used Pancake / downhole / uR	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		2707
0.5		0.0	52	Silty Clay: Brown (10YR 7/3), moist, medium stiff, no odor, 15% silt, 85% clay, medium plasticity, medium toughness, cohesive, trace rootlets and pinhole pores	CL	2962
		0.0	48			4093
1.0		0.0	42			4407
		0.0	48			4517
2.0		0.0	47			4526
		0.0	46			4458
3.0		0.0	52			4567
		0.0	59			4647
4.0		0.0	49			4594
		0.0	42	Same as above	CL	4360
5.0		0.0	45			4241
		0.0	58	Silty Clay: Dark yellowish brown (10YR 4/6), moist, med stiff, no odor, 25% silt, 5% fine sand, 70% clay, cohesive, medium plasticity, medium toughness	CL	4337
6.0		0.0	68			4202

Radiological Background 44/2707/11μR				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 49	
Depth	Interval	Recovery	PID	Radiological	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		0.0	68		Same as above: Silty Clay with trace CaCO ₃ nodules	CL	4202
		0.0	53				4237
7.0		0.0	44				4315
		0.0	47		7'8" ————— Same as above: Brown (7.5YR 5/4) with abundant CaCO ₃ nodules and stringers	CL	4442
8.0		0.0	54				4506
		0.0	67		10'5" ————— Clayey Silt with sand: Strong brown (7.5YR 5/6), moist, medium stiff, no odor, 15% clay, 10% fine sand, 75% silt, low plasticity, low toughness, cohesive, abundant CaCO ₃ nodules and stringers	ML	4278
9.0		0.0	64				4449
		0.0	52				4340
10.0		0.0	45				4420
		0.0	51				4456
		0.0	45		at 13'0" some CaCO ₃ speckles (no nodules or stringers)	ML	4622
11.0		0.0	62				4562
		0.0	56				4691
12.0		0.0	55				4602
13.0		0.0	75				4441

Radiological Background 44/2707/112A					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 49	
Depth	Interval	Recovery	PID	Radiological	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	(CFM)
13	6.0 CK		0.0	75	Same as above: Clayey silt w/ sand	CL ML		4441
			0.0	82				4467
14	7.0 CK		0.0	64	Weathered siltstone bedrock: Yellow (2.5Y 7/6) 15" dense, dry, no odor, interbedded layers of siltstone, mechanically weathered to ML	BL ML		4533
			0.0	76				4628
15	8.0 CK		0.0	65				4878
			0.0	67			4739	
16	9.0 CL		0.0	57			4940	
			0.0	53			5106	
17	10.5 CK				Refusal on siltstone at 16.5' bgs No CW encountered			
18	11.0 CK							
19	12.0 CK							
20	13.0 CK							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 50			
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 5-20-11/0843	Date/Time Total Depth Reached 5-20-11/0852			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50112) (0850)					
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/20/11					
Radiological Background 11		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 55% clay, 35% fine sand, 10% gravel (fill and asphalt fragments), some rootlets, dry, soft, low plasticity and hardness, no odor. No groundwater reached.	CL	



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 50
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 12.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-9-11 0846	Date/Time Total Depth Reached 6-9-11 0950
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar		50113 (0850)
Geologist C. Knight	Checked by/Date J. Robbins + J. Aldman 7/20/11		

Radiological Background 42 / 2733 / 11ppm	Radiological Equipment Used Pancake / downhole / MR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches <small>(CPM)</small>
					Surface: Soil and grass		+0.5' 2733
0.5			0.0	59	Clay: dark brown (10YR 3/3), moist, medium stiff no odor, silt, silt, fine sand, 90% clay, cohesive, medium toughness, medium plasticity		3266
			0.0	61		CL	4184
1.0			0.0	69			4427
			0.0	56			4341
2.0			0.0	57			4548
			0.0	72			4612
3.0			6.0	58	Same as above: some CaCO ₃ nodules		4523
			0.0	67			4604
4.0			0.0	66		CL	4801
			0.0	65			4844
5.0			0.0	61			4674
			0.0	41		4715	
6.0			0.0	47		CL	4571

Radiological Background 42/2733/11AR				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 50		
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	47		6'3" Same as above	CL		4571
		0.0	56		Clayey Silt with sand; light yellowish brown (10YR 6/4) moist, medium stiff, no odor; 15% clay, 10% fine sand, 75% silt, cohesive, low plasticity, low toughness, Some CaCO ₃ stringers and nodules			4577
7.0		0.0	55			ML		4772
		0.0	56					4748
8.0		0.0	64			7'10" gradual contact color change		
		0.0	54		Same as above; Strong brown (10YR 5/6)	ML		4594
9.0		0.0	62					4590
		0.0	64					4493
10.0		0.0	63					4438
		0.0	50					4623
11.0		0.0	55					4508
		0.0	55					4724
12.0		0.0	62		11'7" Weathered Sandstone Bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP 2.5Y		4781
		0.0	54					4831
13.0					Refusal on Sandstone at 12.5' bgs No Gw encountered			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 51				
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 5-20-11/0905	Date/Time Total Depth Reached 5-20-11/0919				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50114) (0915)						
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/20/11						
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
05			0.0	11	Clayey Sa Sandy clay with gravel, (10 YR, 4/3), brown, 50% clay, 35% fine sand, 15% gravel fill and asphalt, some rootlets, dry, stiff, low plasticity and hardness, no odor. No groundwater reached	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 51
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 15 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/8/11 1450	Date/Time Total Depth Reached 6/8/11 1630
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 5015 (1500) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins Aldman 7/20/11		

Radiological Background 64 / 2516 / 11mR	Radiological Equipment Used Pancake / downhole / μ R	PID Used Mini Rae 2000 (Bkgs: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: soil		+0.5' 2516 (CPM)
0.5			0.0	67	Clay: dark yellowish brown (10YR 3/4), moist, stiff, no odor, 5% silt, 5% fine sand, 90% clay, cohesive, medium plasticity, medium toughness, pin hole pores, trace rootlets near surface	a	3744
			0.0	73			4374
1.0			0.0	55			4503
			0.0	75			4614
2.0			0.0	67			4651
			0.0	75			4721
3.0			0.0	80	3' 10" Appearance of trace CaCO ₃ stringers and some CaCO ₃ nodules	cL	4769
			0.0	72			4564
4.0			0.0	70			4503
			0.0	67			4458
5.0			0.0	55	Sandy silt: strong brown (7.5YR 5/6), moist, medium stiff, no odor, 5% clay, 30% fine sand, 65% silt, cohesive, low plasticity, low toughness, abundant CaCO ₃ stringers and nodules	ML	4325
			0.0	68			4288
6.0			0.0	85			40177

Radiological Background 64/2516 / HWR				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 51		
Depth	Interval	Recovery	FD	Radiological	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	85					4477
		0.0	81		Same as above : Sandy silt	ML		4596
7.0		0.0	88					4756
		0.0	90					4732
8.0		0.0	85		7'9" ————— Clayey silt with sand ; strong brown (7.5 YR 4/6), moist, medium stiff, no odor, 20% clay, 15% fine sand, 65% silt, cohesive, low plasticity, low toughness, abundant CaCO ₃ stringers	ML		4707
		0.0	90					4851
9.0		0.0	95					4672
		0.0	95					4763
10.0		0.0	70					4834
		0.0	75					4560
11.0		0.0	65					4288
		0.0	62					4526
12.0		0.0	65					4438
		0.0	60					4566
13.0		0.0	63		Same as above : Clayey silt w/ sand	ML		4512

cont next pag

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 52			
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 5-23-11/0855	Date/Time Total Depth Reached 5-23-11/0905			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50116) (0905)					
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/30/11					
Radiological Background 10		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05				0.0 11	<p>Clayey sand, (10YR, 3/3), dark brown, 60% fine to coarse grained sand, 35% clay, 5% gravel fill, trace pieces of metal found, some rootlets, semi-moist, medium dense, low plasticity and hardness, no odor.</p> <p style="font-size: 1.5em; text-align: center;">No groundwater reached.</p>	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 52
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-3-11 - 1520	Date/Time Total Depth Reached 6-3-11 - 1530
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags, (1) 4oz jar 50117 (1525)		
Geologist L Robbins Goldman	Checked by/Date L Robbins Goldman 7/20/11		

Radiological Background 36 / 2443	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings +0.5' = 2448 (CPM)
					Surface: grass + soil		
0.5			0.0 35 40		Silty clay - brown (10yr 4/3), moist, med-stiff, med to high plasticity, cohesive, no odor, 80% clay, 15% silt, 5% fine sand, high toughness, dense, med to high dry strength, no dilatancy, trace rootlets in upper 3 feet of unit, ^{LRG} some mottling, slightly mottled		2972 3001 LRG
			0.0 40 54			3977 4138 LRG	
1.0			0.0 54 61			4292 4561 LRG	
			0.0 61 70			4284 4546 LRG	
2.0			0.0 70 75			4425 4675 LRG	
			0.0 75 83			4433 4785 LRG	
3.0			0.0 83 85			4407 4799 LRG	
			0.0 85 90			4551 4838 LRG	
4.0			0.0 90 90			4857	
			0.0 90 100			4945	
5.0			0.0 100 65		4935		
			0.0 65 58		4834		
6.0			0.0 58 65		4933		

-- 4'0" -- slight color change: yellowish brown (10yr 5/4), otherwise unit same as above --

5'8" Clag w/ sand: yellowish brn (10yr 5/6), moist, med dense, no odor, 85% clay, 10% med sand, 5% fine sand, low plasticity (continued on next page).

36/65

Radiological Background 36 / 2443				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 5DN, Grp 2, 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 (CPM)
6.0		00	76		65' continued from previous page: cohesive, low toughness, low dry strength, low dilatancy, pin hole pores, abundant CaCO ₃ nodules, trace charcoal flecks, trace Fe-oxide from	CL	4933
		00	60				5257
		00	58				5578
7.0		00	60				4921
		00	85				4727
		00	85				4564
		00	70				4505
8.0		00	58				4683
		00	65				4567
		00	60				
9.0		00	60				
		00	55				
		00	60				
		00	62				
10.0		00	70				
					total depth is 10' bgs no GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 53				
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 5-23-11/0827	Date/Time Total Depth Reached 5-23-11/0835				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50118) (0835)						
Geologist C. Carmichael		Checked by/Date J. Robby Feldman 7/20/11						
Radiological Background 10		Radiological Equipment Used up Rater		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			0.0	11	Silty sand with clay, (10 YR, 3/3), dark brown, 55% fine to medium grained sand, 30% silt, 15% clay, trace gravel fill, common rootlets, semi-moist, medium dense, very low plasticity, no hardness, no odor. No groundwater reached.	SM		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 2	Location ID 53
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 125' Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-6-11 1445	Date/Time Total Depth Reached 6-6-11 1600
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 10 50119 (1450) (1) 1/2 gallon bags + 402 gal		
Geologist C. Knight	Checked by/Date Julian Robbins/J. Johnson 9/8/11		

Radiological Background 18 / 2647	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, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5			0.0	64	Silty clay; dark yellowish brown (10YR 3/6), dry, medium stiff, no odor, 25% silt, 5% fine sand, 70% silt, cohesive, low plasticity, trace pinhole pores, trace rootlets near surface	CL	2750
			0.0	75			3850
1.0			0.0	65			4369
			0.0	60			4361
2.0			0.0	63	Clay: dark yellowish brown (10YR 4/4), moist, stiff, no odor, 5% silt, 5% fine sand, 90% clay, medium plasticity, high dry strength, cohesive, medium toughness, trace CaCO ₃ nodules	CL	4450
			0.0	55			4570
3.0			0.0	63			4436
			0.0	65			4466
4.0			0.0	60	4' abundant CaCO ₃ nodules within clay		4431
			0.0	75			4558
5.0			0.0	80			4362
			0.0	60	Clayey silt: brownish yellow (10YR 6/6), moist, medium stiff, no odor, 30% clay, 65% silt, 5% fine sand, cohesive, low plasticity, some CaCO ₃ stringers and nodules	ML	4475
6.0			0.0	55			4464

Radiological Background 48 / 2697				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 53		
Depth	Interval	Recovery	PID	Radiological	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	55	Same as above 7'2" silty clay: ^(CK) yellow strong brown (7.5 YR 4/6), moist, stiff, no odor, 40% silt, 60% clay, low plasticity, medium toughness, abundant CaCO ₃ stringers and nodules.	ML	4164	
			0.0	70			4871	
7.0			0.0	65			4960	
			0.0	58			4723	
8.0			0.0	64			4508	
			0.0	76			4602	
9.0			0.0	73			4624	
			0.0	60			4649	
10.0			0.0	60			4746	
			0.0	55			Sandy silt: brownish yellow (10 YR 6/6), moist, dense, no odor, 45% fine sand, ^{CK} 65% 55% silt, non cohesive, low to no plasticity, slow dilatancy.	ML
			0.0	53	4944			
11.0			0.0	55	5159			
			0.0	70	5028			
			0.0	65	Weathered sandstone: light olive brown (2.5 Y 5/6), moist, very dense, no odor, 10% coarse sand, 20% medium sand, 70% fine sand. 12'4" weathered siltstone: Pale yellow (2.5 Y 7/4)	OK 100%	5127	
12.0					Refusal on siltstone at 12.5' by s.			
13.0					No GW encountered			

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 54
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 5-18-11/1341	Date/Time Total Depth Reached 5-18-11/1349
Type of Sampling Device Stainless steel shovel	Samples Collected 1 4oz jar 1 1/2 gall bag (#50120) (1348)		
Geologist C. Carmichael	Checked by/Date J Robbins Goldman 7/20/11		

Radiological Background 11	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	11	Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 35% fine to medium grained sand, semi-moist, medium stiff, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	CL		



Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: 5DN group 2	Location ID: 5DN-54
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10 ft, bgs
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 6-13-11-1455	Date/Time Total Depth Reached: 6-13-11-1500
Type of Sampling Device: 1 3/4" Macrocoring	Samples Collected: (1) 1/2 gallon bags 7/11/11 + 4oz Jar	50121 (1505)	
Geologist: L. Robbins Goldman	Checked by/Date: L. Robbins Goldman 7/20/11		

Radiological Background ID: 96 / 2217 / NR	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 = grass + soil		10.5 = 2619
0.5		0.0	72	100% silty clay: olive brown (2.5 yr 4/3), dry, low density, no odor, 65% clay, 10% silt, 10% coarse sand, 10% gravel (fill), 5% fine sand, med. plasticity, cohesive, med toughness, low dilatancy, trace rootlets, asphalt chunks <10mm	AF	3117
		0.0	81		CL	3986
1.0		0.0	70			4281
		0.0	55	silty clay: brown (10 yr 4/3), moist, med-dense, no odor, 75% clay, 20% silt, 5% fine sand, med. plasticity, cohesive, med. toughness, low to no dilatancy, trace CaCO ₃ nodules <1mm		4475
2.0		0.0	51			4488
		0.0	55			4642
3.0		0.0	44			4556
		0.0	60			4528
4.0		0.0	41	sandy clay: brown (10 yr 4/3), moist, med. dense, no odor 60% clay, 20% 10% silt, 20% sand (15% fine grain, 15% med sand), med. plasticity, low dilatancy, cohesive, low toughness, CaCO ₃ nodules + stringers, Fe-oxidation nodules <1mm	UGS	4727
		0.0	64		CL	4736
5.0		0.0	60			4859
		0.0	61			4691
6.0		0.0	64			4722

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 55	
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 5-18-11/1424		Date/Time Total Depth Reached 5-18-11/1431	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4oz jar 1 1/2 gall bag (#50122) (1430.)			
Geologist C. Carmichael				Checked by/Date J. Robinson 7/20/11			
Radiological Background 11		Radiological Equipment Used up R meter			PID Used Mini Rae 2000 (0.0 ppm)		
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5				0.0 11	Clay with sand and gravel, (10 VR, 3/3), 65% clay, 20% sand, 15% gravel (sandstone fragments, asphalt, gravel fill), semi-moist, some rootlets, medium stiff, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SDN group 2		Location ID 55	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 10.0 Ft. bgs	
Drilling Equipment Geo probe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6-15-11 1415		Date/Time Total Depth Reached 6-15-11 1500	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected (2) 1/2 gallon bags 4oz jar 50123 (1420) 50429 (AVT) field DUP			
Geologist C. Knight				Checked by/Date J. Robbins Aldman 7/20/11			
Radiological Background 78 / 2675 / 13mR		Radiological Equipment Used Pancake / downhole / mR		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					<p>AF: Artificial Fill</p> <p>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</p> <p>Surface: soil and grass</p>		<p>2859</p> <p>3724</p> <p>4252</p> <p>4228</p> <p>4290</p> <p>4071</p> <p>3883</p> <p>3808</p> <p>4062</p> <p>4180</p> <p>4344</p> <p>4407</p> <p>4592</p>
0.5			00	61	<p>Fill: clayey silt with sand: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 25% clay, 5% coarse sand, 5% medium sand, 10% fine sand, 55% silt, non cohesive, low plasticity, low toughness, mottled, trace asphalt, trace medium granitic gravel</p>	AF/m	
			00	68			
1.0			00	60			
			00	52			
2.0			00	47			
			00	93			
3.0			00	72			
			00	62			
4.0			00	70			
			00	58			
5.0			00	48			
			00	69	abundant CaCO ₃ stringers		
6.0			00	65			
					<p>3'0" mottled until 3'6" bgs</p> <hr/> <p>Silty clay with sand: Brown (7.5YR 5/4), moist, medium stiff, no odor, 35% silt, 10% fine sand, 55% clay, medium plasticity, medium toughness, cohesive, some CaCO₃ stringers</p>	CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 56
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter 1/3	Date/Time Drilling Started 5-18-11/1445	Date/Time Total Depth Reached 5-18-11/1453
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50124) (1452)		
Geologist C. Carmichael	Checked by/Date J. Robbins Aldman 7/20/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Ra2 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	Borehole Gamma Readings	
							Inches	(CPM)
0.5				0.012	Clayey sand, (10 YR, 3/3), dark reddish-brown, 65% fine to coarse grained sand, 30% clay, 5% rock fragments (sandstone, gravel, asphalt), semi-moist, medium dense, common rootlets, ^{very} low plasticity and hardness, no odor. No groundwater reached.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 56
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-15-11 1505	Date/Time Total Depth Reached 6-15-11 1540
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags + 4oz Jar		50125 (1510)
Geologist C. Knight	Checked by/Date J. Reblus Goldman 7/20/11		

Radiological Background 48 / 2563 / 11 uR	Radiological Equipment Used Pancake / downhole / uR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5' 2563 (CPM)
					Surface: soil and grass		
0.5			0.0	70	Silty clay with sand: yellowish brown (10YR 5/4), moist, medium stiff, no odor, 25% silt, 15% fine sand, 60% clay, medium plasticity, low toughness, cohesive, some CaCO ₃ stringers	CL	3049
			0.0	31		4107	
1.0			0.0	71		41204	
			0.0	75		4079	
2.0			0.0	90		3889	
			0.0	76		3781	
3.0			0.0	74		3898	
			0.0	70		3986	
4.0			0.0	76		41159	
			0.0	75		4105	
5.0			0.0	65	41301		
			0.0	78	Same as above: Silty clay with sand	CL	41338
6.0			0.0	89			4430

Radiological Background 48/2563/11, n/a				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 56		
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	89	6' 2" Same as above	CL	4430	
			0.0	76	Clayey silt with sand; Brownish yellow (10YR 6/6) moist, medium stiff, no ^{cl} no odor, 20% clay, 15% fine sand, 65% silt, low toughness, low plasticity, some CaCO ₃ nodules and stringers	ML	4417	
7.0			0.0	65			4247	
			0.0	75		6' 3" abundant CaCO ₃ nodules		41091
			0.0	65			OK 3995 3963	
			0.0	66			OK 4170 3995	
8.0			0.0	62			OK 4295 4170	
9.0			0.0	72	9' 8" Silty sand; light yellowish brown (10YR 6/4) moist, dense, no odor, 35% silt, 65% fine sand, slow ^{rapid} dilatancy ^{cl}	SM	4295	
			0.0	58				4258
10.0	End boring / Total depth 10.0' bgs.							
	No GW encountered							
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 57	
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 5-24-11/1546		Date/Time Total Depth Reached 5-24-11/1555	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4oz jar 1 1/2 gall bag (#50126) (1555)		Checked by/Date J Robbins/Gedman 7/20/11			
Geologist C. Carmichael		Radiological Background 11		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5				0.0 12	Sandy clay, (10YR, 3/4 f 4/6), mottled texture with colors - reddish-brown and dark brown, dry, medium stiff, 60% clay, 40% fine to medium grained sand, some rootlets, very low plasticity, low hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN - 2	Location ID LEG 57
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/16/11 - 912	Date/Time Total Depth Reached 6/16/11 - 0930
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags, (1) 4oz. jar		50127 (915) 50127
Geologist L. Robbins Goldman	Checked by/Date J. Robbins Goldman 7/20/11		

Radiological Background 41 / 2814 / 11UR	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	48			705 = 2814 (CPM)
0.5			0.0	54	Silty clay: dark brown (10yr 3/3), dry, dense, no odor, 70% clay, 20% silt, 10% fine sand, med. plasticity, cohesive, med. toughness, med. dry strength, no dilatancy, pin hole pores, rootlets	CL	3454
1.0			0.0	52	0.9"		4186
			0.0	45	Silty clay: strong brown (7.5yr 4/6), moist, dense, no odor, 60% clay, 20% silt, 10% med sand, 10% fine sand, med. plasticity, cohesive, med toughness, med. dry strength, slow dilatancy, pin hole pores.		4387
2.0			0.0	52			4467
			0.0	45			4554
3.0			0.0	27			4463
			0.0	63			4581
			0.0	63			4523
4.0			0.0	68			4502
			0.0	63	- calcO ₃ nodules present ^{LRG} 20 <10 mm		4428
5.0			0.0	81			4385
			0.0	54	Silty clay: dark yellowish brown (10yr 4/4), moist, dense, no odor, 65% clay, 20% clay, 10% med. sand, 5% fine sand, med. plasticity, cohesive, med. toughness, med. dry strength, no dilatancy, med. toughness, med. dry	CL	4344
6.0			0.0	55			4284

Radiological Background				Project Name	Project Number	Location		
0.0/41/2914/11uR				SSFL Area IV Radiological Study	EP9038.01.22.04.03	SDN, Grp 2, 57 57		
Depth	Interval	Recovery	PTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							inches	(CPM)
6.0			0.055		strength, pinhole pores, CaCO ₃ nodules, Fe-oxidation nodules		4284	
			0.057				4307	
7.0			0.061			CL	4373	
			0.065				4320	
8.0			0.069	7194	Silty clay: dark yellowish brn (10 yr 4/6), moist, dense, 60% clay, 25% silt, 15% med sand, med. plasticity, cohesive, low toughness, low dry strength, slow dilatancy, no odor		4391	
			0.071				4227	
9.0			0.070			CL	4157	
			0.065				4248	
10.0			0.068				4574	
					Borehole depth = 10' bgs no GW encountered			
11.0								
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 58
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment trowel/shovel	Borehole Diameter NA	Date/Time Drilling Started 5-18-11/1510	Date/Time Total Depth Reached 5-18-11/1517
Type of Sampling Device trowel/shovel	Samples Collected 1 1/2 gall bag, 14oz jar (#50128) (1515)		
Geologist C. Carmichael	Checked by/Date J. Robby Moldovan 7/20/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'			0.0	11	Sandy clay, (10 YR, 3/2), dark brown, 65% clay, 35% fine to medium grained sand, common rootlets, semi-moist, soft, low plasticity and hardness, no odor. No groundwater reached	CL		



Project Name: SSFL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SDN- Grp 2	Location ID: 58
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10 Ft. bgs
Drilling Equipment: Geo probe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 6/16/11 - 1020	Date/Time Total Depth Reached: 6/16/11 - 1030
Type of Sampling Device: 1 3/4" Macrocore	Samples Collected: (1) 1/2 gallon bags, (1) -4oz jar 50129(1025)		
Geologist: L. Robbins Goldman	Checked by/Date: J. Robbins Goldman 7/20/11		

Radiological Background: 49 / 2698 / 114R	Radiological Equipment Used: Pancake / downhole	PID Used: Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	44	Silty clay: dark yellowish bm (10 yr 1/4), dense, dry; no odor, 70% clay, 20% silt, 10% fine sand; med. plasticity, cohesive, med. toughness, med. dry strength, no dilatancy, pinhole pores, trace rootlets.	CL	3716
0.5			0.0	38			4303
1.0			0.0	35			4718
			0.0	41	- 14"		4767
			0.0	42	Silty clay: yellowish bm (10 yr 5/4), dense, dry, 65% clay, 15% silt, 15% fine sand, 5% med. sand, low to med. plasticity, cohesive, med. toughness, med. dry strength, no dilatancy, pinhole pores; no odor	CL	4882
2.0			0.0	40			4898
			0.0	43			4833
			0.0	41			4718
			0.0	48			4741
			0.0	55			4756
			0.0	60	Silty clay: dark yellowish bm (10 yr 4/6), moist, dense, 60% clay, 20% silt, 10% fine sand, 5% med sand, 5% coarse sand, low to med. plasticity, cohesive, med. toughness, med. dry strength, no odor. <i>(continue on next page)</i>	CL	4650
5.0			0.0	45			4666
6.0			0.0	48			4715

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 59				
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 5-18-11/1403	Date/Time Total Depth Reached 5-18-11/1411				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4oz jar 1 1/2 gall bag (#50130) (1410.)						
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/20/11						
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	11	Sandy clay, (10 YR, 4/3), brown, 60% clay, 35% fine to coarse grained sand, 5% sandstone rock fragments and fill rock, common rootlets, some CaCO ₃ (mm-sized) nodules, semi-moist, medium stiff, low plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN 2	Location ID #59
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/16/11 - 0825	Date/Time Total Depth Reached 6/16/11 - 0850
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags, (1) 4oz jar 50131 (830)		
Geologist L. Robbins Goldman	Checked by/Date J. Robbins Goldman 7/20/11		

Radiological Background 38 / 2786 / 81R	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	65	Silty clay: dark brown (10yr 3/3), dry, dense, no odor, 65% clay, 20% silt, 10% fine sand, 5% med. sand, med. plasticity, cohesive, med tough, high dry strength, no dilatancy, rootlets, pinhole pores.	CL	40.5 = 2786
0.5			0.0	74			3256
1.0			0.0	70			3865
			0.0	65			4498
			0.0	64			4766
2.0			0.0	70			4664
			0.0	73			4718
3.0			0.0	78			4696
			0.0	79			4589
4.0			0.0	71			4690
			0.0	72	414" Silty clay: dark yellowish brn (10yr 3/6), dry, dense, no odor, 60% clay, 30% silt, 10% fine sand, med plasticity, cohesive, med tough, med. dry strength, no dilatancy, pinhole pores.	CL	4617
5.0			0.0	36			4619
			0.0	42			4727
6.0			0.0				4786

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 60			
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 5-25-11/1524	Date/Time Total Depth Reached 5-25-11/1533			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50132) (1532)					
Geologist C. Carmichael		Checked by/Date J. Robbins Melman 7/20/11					
Radiological Background 2		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 11	Silty sand, (10 YR, 3/3), dark brown, @ 55% fine to medium grained sand, 40% silt, 5% gravel fill rock, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID / Group Subarea SDN group 2	Location ID 60			
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 9' 2"			
Drilling Equipment hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 8/5/11 / 1103	Date/Time Total Depth Reached 8/5/11 / 1220			
Type of Sampling Device 2 3/4" hand auger		Samples Collected Sample ID: 50133 / time: 1240 (1) 1/2 gallon bag / (1) 4 oz. jar					
Geologist S. Lapeyre-Montrose		Checked by/Date J. Robbins-Heldman 8/16/11					
Radiological Background 81 / 3010		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)			
Depth ft	Interval	Recovery	PID	Radiological	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: top soil, (weeds) vegetation, and asphalt debris		3452
			0.0	52	0-1' SM silty sand with clay brown (10YR 4/3)	SM	4140
			0.0	67	5% gravel 25% silt, 15% clay, 55% fine-coarse grained sand dry, rootlets, low plasticity, soft, asphalt debris, no MC odor		4546
1.0			0.0	52	1'-4' SC clayey sand with silt dark yellowish brown pieces of concrete, asphalt debris (10YR 4/4)	SC	4715
			0.0	69	30% clay, 20% silt, 50% fine-coarse grained sand, low-medium plasticity, soft, no MC odor, dry		4659
2.0			0.0	57			4230
			0.0	71	Same as above		4027
			0.0	59			4531
4.0			0.0	63	4'-6' SC clayey sand with yellowish brown silt (10YR 5/4)	SC	4486
			0.0	86	25% clay, 20% silt, 55% fine-coarse grained sand, low-medium plasticity, soft, no MC odor, dry		4469
5.0			0.0	66			4698
			0.0	57	Same as above		4810
			0.0	79			

Radiological Background 81/3010				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 60		
Depth	Interval	Recovery	RFD	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	79		Same as above			4728
		0.0	76					
7.0		0.0	72	7'-8'	SM silty sand with clay dark yellowish brown (10YR 4/4) 15% clay, 20% silt, 65% fine-coarse grained sand, low plasticity, very soft, no HC odor, dry	SM		4855
		0.0	84					4585
8.0		0.0	73	8'-9'	SM silty sand olive yellow (2.5Y 6/4) 20% silt, 80% fine-coarse grained sand, dense, no HC odor, non plastic, dry	SM		4244
		0.0	65					4848
9.0		0.0	68	9'-9'2"	SP sand yellowish brown (10YR 5/6) 90% fine-coarse grained sand, 10% silt, loose, no HC odor, non plastic, dry (little coarse grained sand)	SP		5436
					TD = 9'2" (refusal)			
					No Gw encountered			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 61
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-16-11 1400	Date/Time Total Depth Reached 6-16-11 1510
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50134 (1410) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J Robbins Feldman 7/21/11		

Radiological Background UM / 2358	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	41	Surface: Asphalt		2566
			0.0	41	4" asphalt		3910
0.5			0.0	41	Clay with silt: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive	CL	4519
1.0			0.0	42			4932
			0.0	45			4737
2.0			0.0	46			CK 4783 4741
			0.0	47			CK 4722 4783
3.0			0.0	53			CK 4677 4722
			0.0	55			4671
4.0			0.0	54			4661
			0.0	53			4730
5.0			0.0	51			4647
			0.0	40	Same as above: Clay with silt	CL	4668
6.0			0.0	39	5'9" See next page for description	ML	4505

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 02
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth CL 40 75 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/16-11 1515	Date/Time Total Depth Reached 6/16-11 1620
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50135 (1520) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins Alderman 7/21/11		

Radiological Background 28 / 2301	Radiological Equipment Used Pancake / downhole 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: asphalt		70.5 = 2372 (CPM)
0.5		0.0	63		Clay with silt: dark brown (10YR 3/3), moist, medium stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive	CL	2611
		0.0	66			3678	
1.0		0.0	67			4441	
		0.0	64			4852	
2.0		0.0	62			4708	
		0.0	67			4705	
3.0		0.0	65			4765	
		0.0	63			4591	
4.0		0.0	64			4672	
		0.0	65			CL 4461	
5.0		0.0	65		4' 10" Clayey silt: light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 20% clay, 5% fine sand, 75% silt, cohesive, low plasticity, low toughness	ML 4244 4339 URG	
		0.0	45			4241	
6.0		0.0	63			4216	

886

Radiological Background 20 / 2301				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 62	
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	63	<p>Same as above: Clayey silt</p> <p>7.0' : weathered sandstone bedrock: light yellowish brown (2.5Y 6/4) moist, dense, no odor, mechanically weathered to SP, fine grained sandstone</p>	ML	4216
			0.0	70			4328
7.0			0.0	64			4370
			0.0	66			4238
8.0					<p>Total Depth to ^{OK} 7.5' bgs No GW encountered</p>		
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 5DN Group 2	Location ID 63
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -1'8" ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-27-11 1135	Date/Time Total Depth Reached 6-22-11 1220
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50136 (1140)
Geologist C. L. Knight	Checked by/Date J. Robbins-Meldman 8/16/11		

Radiological Background 54 / 2553 / 11mR	Radiological Equipment Used Pancake / downhole / mR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					Surface: asphalt		10.5' 2553
0.5					5" Asphalt	AF	3177
					3" Road Base		4369
1.0					Weathered Sandstone Bedrock: light olive brown (2.5Y 5/4) moist, very dense, no odor, fine grained sandstone	B. Bedrock	4808
2.0					1'8"		5025
3.0					Refusal on sandstone 1'8"		
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 5DN group 2	Location ID 64				
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 5-18-11/1020	Date/Time Total Depth Reached 5-18-11/1032				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50137) (1030.)						
Geologist C. Carmichael		Checked by/Date J. Robbins, M. Feldman 7/21/11						
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5				0.0 12	Sandy clay, (10 YR, 3/3), dark brown, 60% clay, 40% fine to medium grained sand, common rootlets, an iron nail, a tile and a fill rock found, low plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 64
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5' 2" Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-20-11 1100	Date/Time Total Depth Reached 5-20-11 1150
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50138 (1110) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins Feldman 7/21/11		

Radiological Background 53 / 2647	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	62	Surface; grass and soil		405 2671
0.5			0.0	61	Clayey silt: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 30% clay, 5% fine sand, 65% silt, low plasticity, cohesive, low toughness, trace rootlets near surface	ML	3275
			0.0	56			4445
1.0			0.0	57			4848
			0.0	57	1' 4" Clay with silt: Brown (10YR 4/3), moist, medium stiff, no odor, 10% silt, 90% clay, low plasticity, medium toughness, cohesive,	CL	4791
2.0			0.0	60	4690		
			0.0	61	4900		
3.0			0.0	51	4826		
			0.0	60	Sandy silt with clay: Strong brown (7.5YR 5/6), moist, medium stiff, no odor, 5% medium sand, 15% fine sand, 10% clay, 70% silt, low plasticity, low toughness, trace mottling, trace CaCO ₃ nodules	ML	4846
4.0			0.0	56			4860
			0.0	55			4761
			0.0	62	5' 0" weathered sandstone: Pale yellow (2.5Y 7/4), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone	ML	4542
5.0					Refusal on sandstone at 5' 2"		
6.0					NO GW encountered		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 65			
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 5-18-11/1044	Date/Time Total Depth Reached 5-18-11/1055			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50139) (1055.)					
Geologist C. Carmichael		Checked by/Date J. Robinson Yeldman 7/21/11					
Radiological Background 11		Radiological Equipment Used MP R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05'				0.0 11	Clayey sand, (10 YR, 3/3), dark brown, 60% fine to medium grained sand, 40% clay, common rootlets, semi-moist, very low plasticity and hardness, no odor, medium dense. No groundwater reached.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN Group 2	Location ID 65
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8'0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-20-11 0840	Date/Time Total Depth Reached 5-20-11 1030
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50140 (0850) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date L. Robbins Gelman 7/21/11		

Radiological Background 41 / 2734	Radiological Equipment Used Panace / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					Surface - soil and gravel		40.5' 2523
0.5			0.0	60	1'9" Clayey silt: Dark brown (10YR 3/3), moist, medium stiff, no odor, 35% clay, 60% silt, 5% fine sand, low plasticity, low toughness, cohesive, trace rootlets near surface	ML	2829
			0.0	50		41083	
1.0			0.0	45		4781	
			0.0	60		4789	
2.0			0.0	50	1'9" Silty clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 20% silt, 80% clay, medium plasticity, medium toughness, trace rootlets and pin hole pores, cohesive	CL	4887
			0.0	58		4841	
3.0			0.0	65		4873	
			0.0	60		4927	
4.0			0.0	70			4951
			0.0	60			4996
5.0			0.0	45	5'2" Clayey silt with sand: dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 20% clay, 10% fine sand, 70% silt, low toughness, low plasticity, cohesive, some CaCO ₃ stringers	ML	4942
			0.0	55		4841	
6.0			0.0	55		4676	

No sample 1.5' CR

Radiological Background 44 / 2734				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 65	
Depth	Interval	Recovery	PID	Radiological	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	55	Same as above	ML	4676
			0.0	70			4928
7.0			0.0	63			5009
			0.0	85	<p>→ 8" <u>Weathered Sandstone: Yellow (2.5Y 7/6), moist, hard, no odor, mechanically weathered to SP, fine grained sandstone</u></p>		5276
8.0			0.0	75			5932
9.0					Refusal on sandstone at 8.0 bgs		
					No GW encountered		
					Sample collected 7-8' bgs due to anomaly at 8' bgs		
10.0							
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 66			
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 5-17-11/1515	Date/Time Total Depth Reached 5-17-11/1525			
Type of Sampling Device Stainless steel shovel			Samples Collected 1 1/2 gallon bag (#50141) (1525)				
Geologist C. Carmichael			Checked by/Date J Robbins Medman 7/2/11				
Radiological Background II		Radiological Equipment Used MP R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 II	<p>Clayey sand, (10 YR, 4/2), brown, 60% fine sand, 35% clay, 5% gravel (fill rock and cement), common rootlets, semi-moist, medium dense, low plasticity and hardness, no odor.</p> <p style="font-size: 2em; text-align: center;">No groundwater.</p>	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN - group 2	Location ID 66
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5/19/11 1420	Date/Time Total Depth Reached 5/19/11 1455
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50142 (1430) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins/Jedman 7/21/11		

Radiological Background 48 / 2660	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5 2696 (CPM)
					Surface grass and soil		
0.5			0.0	50	Clayey silt / sand: dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 20% clay, 10% fine sand, 70% silt, low plasticity, cohesive, low toughness, trace rootlets near surface	ML	3559
			0.0	63			4264
1.0			0.0	56			4754
					14"		
			0.0	60	Silty clay: Very dark grayish brown (10YR 3/2), dry, medium stiff, no odor, 35% silt, 65% clay, medium plasticity, medium toughness, cohesive	CL	4857
2.0			0.0	60			4886
			0.0	62			4904
3.0			0.0	55			4702
			0.0	58	3 1/4" Clayey silt: Brownish yellow (10YR 6/6), slightly moist, medium stiff, no odor, 30% clay, 5% fine sand, 65% silt, low plasticity, low toughness, trace CaCO3 stringers	ML	4841
4.0			0.0	55			4955
			0.0	50			5202
5.0			0.0	55			4913
			0.0	50	50 52	CL	5080
6.0			0.0	48			4986

Radiological Background 48/2660				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 66		
Depth	Interval	Recovery	PID	Radiological	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	48		Same as above: Clayey silt	ML	4986	
		0.0	52				5008	
7.0		0.0	50				5050	
		0.0	73		7'4" Sandy silt with clay: Brown (7.5YR 5/4), moist, medium stiff, no odor, 10% medium sand, 25% fine sand, 10% clay, 55% silt, non cohesive, low plasticity	ML	5132	
8.0		0.0	70		Silt with sand and clay: Brown (7.5YR 5/4), moist, medium stiff, no odor, 10% fine sand, 10% clay, 80% silt, low plasticity, low toughness	ML	5052	
		0.0	68				4740	
9.0		0.0	70				4728	
		0.0	75		9'3" Abundant CaCO ₃ nodules: Clayey silt w/ sand: 40% clay, 10% fine sand, 50% silt	ML	4829	
10.0		0.0	60				4874	
<p>Total Depth 10.0' bgs No GW encountered</p>								

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 67	
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 5-17-11/1009		Date/Time Total Depth Reached 5-17-11/1016	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50143) (1015)			
Geologist C. Carmichael				Checked by/Date J. Roblin Melman 7/21/11			
Radiological Background 11		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 11	Clayey sand, (10 YR, 4/2), brown, 70% fine sand, 30% clay, common rootlets, semi-cemented, semi-moist, medium dense, low hardness, no plasticity, no odor. No groundwater.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 67
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-18-11 1550	Date/Time Total Depth Reached 5-18-11 1650
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50144 (1600) (1) 1/2 gallon bags		
Geologist C. Lough	Checked by/Date J. Robbins, M. J. Johnson 7/21/11		

Radiological Background 38 / 2713	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 8.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	73	Surface: gravel soil		2566
0.5			0.0	70	Clayey silt: Very dark grayish brown (10YR 3/2) dry, moist, medium stiff, no odor, 40% clay, 60% silt, low plasticity, low toughness, cohesive		3038
1.0			0.0	56	12" clayey silt becomes moist	ML	4428
			0.0	52			4725
2.0			0.0	67			4901
			0.0	66			4784
3.0			0.0	54	2 1/4" silty clay: Very dark grayish brown (10YR 3/2), moist, medium stiff, no odor, 15% silt, 85% clay, low plasticity, medium toughness, cohesive	CL	5035
			0.0	55			5053
4.0			0.0	65	4 1/2" silt: Brownish yellow (10YR 6/6), dry, medium stiff, no odor, 52% fine sand, 46% silt, low plasticity, low toughness	ML	5035
			0.0	60			5098
5.0			0.0	72	4 1/4" silty clay: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 25% silt, 75% clay, low plasticity, non cohesive, medium toughness, some Ca CO ₃ nodules	CL	5166
			0.0	40			4882
6.0			0.0	54			4601
			0.0	54			4514

Radiological Background 3812713				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 67		
Depth	Interval	Recovery	PID	Radiological	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	54		<p>Some are above</p> <hr/> <p>7'4" silty clay: strong brown (5.5Y 5/6), moist, medium dense, no odor, 30% silt, 70% clay, low plasticity, medium toughness, non cohesive</p>	a	4516	
		0.0	41				4514	
7.0		0.0	53				4666	
		0.0	54				4749	
8.0		0.0	57				4862	
		0.0	66				4864	
9.0		0.0	71				5019	
		0.0	58				4910	
10.0		0.0	76				4862	
							CL	
<p>Total Depth: 10.0' bgs</p> <p>No GW encountered</p>								

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 68
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-17-11 1540	Date/Time Total Depth Reached 5-17-11 1700
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50145 (1550) (1) 1/2 gallon bags		
Geologist C Knight	Checked by/Date J. Robbins Yeldman 7/21/11		

Radiological Background 41 / 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 <i>Af: Artificial Fill</i> (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	5" Asphalt		5571
0.5			0.0	57	Fill: Clayey silt: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, low plasticity, low toughness, 30% clay, 70% silt, cohesive	AF/ML	4706
1.0			0.0	70	12"		5337
			0.0	76	Clay: Brown (10YR 4/4), moist, stiff, no odor, 100% clay, medium plasticity, medium toughness, cohesive		5052
2.0			0.0	70		CL	5087
			0.0	65			5106
3.0			0.0	68			5108
			0.0	50	3' 2"		5252
4.0			0.0	50	Sandy silt: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 35% fine sand, 66% silt, low cohesion, low plasticity, slow dilatancy, abundant CaCO ₃ stringers and nodules	ML	5178
			0.0	58			5313 5463 CK
5.0			0.0	59			5090 5313 CK
			0.0	75			4833 5090 CK
6.0			0.0	71			4833



Radiological Background 41/2624				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 68	
Depth	Interval	Recovery	PID	Radiological	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	71		Same as above abundant CaCO ₃ nodules 6" by 5	ML	4833
		0.0	62				4869
7.0		0.0	45				4951
		0.0	55		7'8" Clayey Sand: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 10% medium sand, 10% silt, 20% clay, 60% fine sand, non cohesive.	SC	5036
8.0		0.0	68				5054
		0.0	75		8'8" Clay with silt: Brownish yellow (10YR 6/6), moist, stiff, no odor, 10% silt, 90% clay, trace fine sand, low plasticity, cohesive, trace CaCO ₃ stringers	CL	4951
9.0		0.0	90				4746
		0.0	80				4811
10.0		0.0	70				4919
11.0					Total Depth: 10.0' by 5		
					No GW encountered		
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 69
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-18-11 0820	Date/Time Total Depth Reached 5-18-11 0930
Type of Sampling Device 1 3/4" Macrocore	Samples Collected SO16 (0530) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robb, Gelman 7/21/11		

Radiological Background Si / 2648	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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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)
					AF: Artificial F.11		
					Surface asphalt		
			0.0	55	5" Asphalt	AF	3351
0.5			0.0	67	Fill: Clay: Brown (10YR 7/3), moist, med. stiff, no odor, 100% clay, low plasticity, cohesive, med. toughness	CL	4588
1.0			0.0	61	Clayey silt: dark brown (10YR 3/3), moist, medium stiff, no odor, 40% clay, 60% silt, low plasticity, cohesive, low toughness	ML	5088
			6.0	60			5498
2.0			0.0	57	1 1/2" Clay with silt: Brown (10YR 4/3), moist, stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive	CL	5320
			0.0	58			5151
3.0			0.0	52			4984
			0.0	54			5021
4.0			0.0	48			4970
			0.0	53			5064
			0.0	52	4 1/4" Silty clay: Yellowish brown (10YR 5/8), moist, medium stiff, no odor, 30% silt, 65% clay, 5% fine sand, low plasticity, low toughness, cohesive,	CL	5102
5.0			0.0	40			5039
			0.0	50			4628
6.0			0.0	60			

Radiological Background 51/2648				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 69		
Depth	Interval	Recovery	PID	Radiological	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	60		Silty clay. Same as above at 6.0' bgs abundant CaCO ₃ nodules with trace stringers	CL		4628
		0.0	61				4527	
7.0		0.0	70				4623	
		0.0	70				4525	
8.0		0.0	60				4573	
		0.0	65				4584	
9.0		0.0	55				4696	
		0.0	60				4835	
10.0		0.0	75				4822	
							Same as above	CL
Total Depth: 10.0' bgs NO GW encountered								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN Group 2	Location ID 70
Drilling Company Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-18-11 0940	Date/Time Total Depth Reached 5-18-11 1115
Type of Sampling Device 1 3/4" Macrocore		Samples Collected 50147 (1000) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date Ludlan Robbins Sedman 9/21/11		
Radiological Background 62/2643		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: Asphalt			+0.5 2702
0.5		0.0	45	5" Asphalt			4049
		0.0	45	Clay; Very dark grayish brown (10YR 3/2), moist, stiff, no odor, low plasticity, cohesive, medium toughness, 5% silt, 5% fine sand, 90% clay	CL		5014
1.0		0.0	63	Clayey silt; Dark brown (10YR 3/3), moist, medium stiff , no odor, 35% clay, 65% silt, low plasticity, stiff	ML		5483
		0.0	41	low toughness, cohesive			5285
2.0		0.0	60	1.5" Clay with silt; Brown (10YR 4/3), moist, stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive	CL		5076
		0.0	62				4898
3.0		0.0	48				4969
		0.0	64				4445
4.0		0.0	51				4206
		0.0	63	4.4" Silty clay with sand; Yellowish brown (10YR 5/6), medium dense, no odor, 10% fine sand, 25% silt, 65% clay, low plasticity, low cohesion, trace iron oxide staining, trace Iron oxide staining	CL		5184
5.0		0.0	64				5225
		0.0	55				5125
6.0		0.0	65				4886

Radiological Background 62/2643				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 70		
Depth	Interval	Recovery	PID	Radiological	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: Silty Clay with Sand trace CaCO ₃ stringers and nodules	CL		4886
			0.0	60			4534	
7.0			0.0	55			4656	
			0.0	55			4844	
8.0			0.0	60			4832	
			0.0	70			4644	
9.0			0.0	65			4683	
			0.0	60			4683	
10.0			0.0	50			4698	
11.0					No GW encountered Total depth: 10.0'			
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 71				
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 5-27-11/0823	Date/Time Total Depth Reached 5-27-11/0830				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50148) (0830)						
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/21/11						
Radiological Background 14		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	13	Silt with sand, (10 YR, 4/4), brown, 85% silt, 15% medium grained sand, trace sandstone fragments, 1 piece of iron found, dry, soft, trace rootlets, very low plasticity, hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 71
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-10-11/1057	Date/Time Total Depth Reached 8-10-11/1159
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50149) (1200)	Checked by/Date J. Robbins, J. Feldman 8/16/11	
Geologist C. Carmichael			

Radiological Background 50, 2850 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: Borehole Gamma Readings (0.0 ppm)
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Depth	Interval	Recovery	CPD	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micromerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			74					0.5-2992
			100		Sand with silt and clay, (10YR, 4/4), brown with speckles of off-white sand, 70% fine to coarse grained subrounded sand, 20% clay, 10% silt, dry, no plasticity, hardness or odor.	SC	4629	0-3071
1'			92		Gradational Contact Clayey sand, (10YR, 3/3 and 5/4) dark brown with light brown sand, 60% fine to coarse grained sand, 40% clay, some calcium carbonate (mm-sized) nodules, semi-moist, medium dense, low plasticity, hardness; no odor.	SC	4753	
			68				4957	
2'			110		← 2' fragments of asphalt ~ 1 inch thick		5096	
			85		2.5' Sand, (10YR, 5/3), light brown, 95% fine to coarse grained sand, 5% fine gravel fill, semi-moist, loose, no plasticity, hardness or odor.	SW	4852	
3'			80				4763	
			55		3.5' Sandy clay, (10YR, 4/6), reddish-brown, 60% clay, 40% fine to coarse grained sand, dry, medium stiff, low plasticity and hardness, no odor.	CL	5032	
4'			70				5068	
			55		4.5' Same as above, except with trace gravel fill rock and sandier: 55% clay, 45% sand.		5058	
5'			75		5' Sandy clay, (10YR, 4/4 and 4/6), brown mottled with reddish-brown, 70% clay, 30% fine to medium grained sand, some calcium carbonate (mm-sized) nodules, semi-moist, low-medium plasticity, hardness,		5130	
			75				5067	
6'			60		no odor.		4806	

Radiological Background 50,2850 cpm					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 71
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 (CPM)
					Same as above	CL	4874
7'			0.065		7' Sandy clay, same as above, except with significant calcium carbonate stringers and pockets of precipitation.		4814
			0.065				4850
8'			0.055				4862
			0.075				4953
9'			0.0110				5235
			0.076				5296
10'			0.082				5280
					10' goal depth reached No GW reached		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 72			
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 5-17-11/0832	Date/Time Total Depth Reached 5-17-11/0841			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50150) (0840)					
Geologist C. Carmichael		Checked by/Date J. Robbins, Y. Goldman					
Radiological Background 10		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.1 11	Silty sand with clay, (10YR, 4/3), brown, 50% fine to medium grained sand, 35% silt, 15% clay, semi-moist, loose, common rootlets, no odor, very low plasticity, no hardness.	SM	
No groundwater reached							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 72
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 6'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-10-11/1411	Date/Time Total Depth Reached 8-10-11/1449
Type of Sampling Device 2 3/4" hand auger	Samples Collected 4 1/2 jar (#50151) (1455)		Checked by/Date Shelley Robbins Hedman 9/8/11
Geologist C. Carmichael			

Radiological Background 62,284 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000 (D.C ppm)	Background: (D.C 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)
			0.077				0.5	2867
1'			0.073		Clayey sand, (10 YR, 3/3), dark brown, 65% fine to coarse grained sand, 30% clay, 5% fine fill gravel and asphalt fragments, semi-moist, medium dense, very low plasticity, hardness, no odor.	SC		
			0.086			4345		
			0.071			4475		
			0.084			4572		
2'			0.068			Same as above, except sandier: 75% fine to (sand with clay) coarse grained sand, 20% clay, 5% fine gravel and other fill fragments.		
			0.065		4709			
3'			0.051		Gradational Contact Sandy clay, (10 YR, 4/4 and 4/6), brown mottled with orange-ish brown, 60% clay, 40% fine to medium grained sand, semi-moist, medium stiff, low-medium plasticity and hardness, no odor.	CL		
			0.079			4741		
			0.086			4929		
4'			0.081		Same as above, except more clay 65% clay, 35% sand, plus calcium carbonate (mm-sized) nodules and stringers of precipitate.			
			0.063		5039			
			0.086		4957			
5'					4794			
					4746			
6'					4769			
					4638			

Refusal hit at 6' - bedrock
No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group CL SDN group 2	Location ID 73
Drilling Company Boat Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-17-11 1910	Date/Time Total Depth Reached 5-17-11 1530
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50162 (1920) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins/Gedman 7/21/11		

Radiological Background 49 / 2430	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	40	4" Asphalt	AC	3665
0.5			0.0	35	Fill: Clay with silt: Darkly ellawish brown (10YR 4/4), moist, medium stiff, no odor, low plasticity, medium toughness, 10% silt, 90% clay	CL	4199
1.0			0.0	50	Clay: Brown (10YR 5/3), moist, medium stiff, no odor, 5% silt, 95% clay, medium plasticity, medium toughness.	CL	5198
			0.0	55			4995
2.0			0.0	52			5158
			0.0	57			5074
3.0			0.0	49			5138
			0.0	54			5122
4.0			0.0	67	3' 10" silty clay w/ sand: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 20% silt, 15% sand, 65% clay, low plasticity, low toughness	CL	5255
			0.0	66			5180
5.0			0.0	65			4976
			0.0	56			4778
6.0			0.0	48			4732

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 74				
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 5-17-11/0952	Date/Time Total Depth Reached 5-17-11/1000				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50153) (1000)						
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/21/11						
Radiological Background 		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0		Clayey sand with gravel gravel, (10YR, 4/2) brown, 55% fine to medium grained sand, 30% clay, 15% gravel - concrete, semi-moist, medium dense, very low hardness, no plasticity, no odor, common rootlets. No groundwater.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 74
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-18-11 1145	Date/Time Total Depth Reached 5-18-11 1235
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50154 (1200) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J Robbins Melawan 7/21/11		

Radiological Background UR/ 2394	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)
					AF: Artificial Fill Surface & gravel soil		705 2521
0.5			0.0	41	Fill: Clayey silt; Brown (10YR 5/3), dry, medium stiff, no odor, 25% clay, 75% silt, low plasticity, low toughness, trace angular medium gravel (fill rock)	AF	3334
			0.0	44		ML	4689
1.0			0.0	50	Silty Clay: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, low plasticity, medium toughness, cohesive, abundant speckles of fine to medium grained CaCO ₃ , 30% silt, 5% fine sand, 65% clay	CL	5012
			0.0	67		5072	
2.0			0.0	65		5093	
			0.0	56		5083	
3.0			0.0	72		4968	
			0.0	59	4943		
4.0			0.0	58	4754		
			0.0	44	4735		
5.0			0.0	57	light yellowish brown (10YR 6/4) Silty Clay with sand; strong brown (7.5YR 5/8) (CR)	CL	4547
			0.0	63	moist, medium stiff, no odor, 30% silt, 10% fine sand, low plasticity, medium toughness, low cohesive, abundant CaCO ₃ stringers and nodules		4506
6.0			0.0	62			4488

Radiological Background 412 / 2398				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 74	
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	62	Same as above! Silty clay with sand. 6.3" 2 inch thick pocket of CaCO ₃ nodules 6.6" trace charcoal flakes	CL	4488
			0.0	41			4359
7.0			0.0	66	Same as above! strong brown (7.5YR 5/8)		4155
			0.0	56			4163
8.0			0.0	44	8'-9' bgs, a abundant CaCO ₃ stringers and nodules (~20%) Same as above! Silty Clay with sand	CL	3548
			0.0	43			3722
9.0			0.0	35	Total depth: 10.0 bgs No GW encountered		41084
			0.0	48			4288
10.0			0.0	67			4329
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 75				
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 5-17-11/0859	Date/Time Total Depth Reached 5-17-11/0906				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50155) (0985)						
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/21/11						
Radiological Background 11		Radiological Equipment Used w/ 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
05				0.0 11	<p>3" of asphalt on top</p> <p>Clay with sand, (10YR, 4/2), brown, 85% clay, 15% fine sand, trace asphalt pieces, moist, medium stiff, medium plasticity and hardness, no odor.</p> <p>No groundwater.</p>	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5D N Group 2	Location ID 75
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-23-11 1735	Date/Time Total Depth Reached 5-23-11 1610
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50156 (1450) (1) 1/2 gallon bags + 402 jar		
Geologist C. Knight	Checked by/Date J. Robbins/Geldman 7/21/11		

46 Radiological Background 2598	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: Asphalt v-ditch		+0.5' 2431
0.5			51		3" Asphalt	AF	2937
			65		Fill: Silty Clay: dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 25% silt, 75% clay, cohesive, medium plasticity, trace asphalt chunks, slight mottling	CL	4077
1.0			77				4377
			73				4531
2.0			76				4734
			72		2.5" Clayey silt: yellowish brown (10YR 5/6), moist, medium stiff, no odor, low plasticity, low toughness, cohesive, 30% clay, 5% fine sand, 65% silt	ML	4613
3.0			71				4693
			66		3.6" Clayey silt with sand: yellowish brown (10YR 5/4), moist, medium stiff, no odor, abundant CaCO ₃ nodules, low plasticity, low toughness, 30% clay, 5% coarse sand, 5% medium sand, 10% fine sand, 50% silt, cohesive, low plasticity	ML	4485
4.0			65				4247
			66				4458
5.0			71		No Recovery		4408
			46		Same as above: clayey silt with sand	ML	4460
6.0			45				4221

Radiological Background 46/2598				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 75		
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	45		Same as above			4221
		0.0	43			ML		4009
7.0		0.0	46					3823
		0.0	54					3866
8.0		0.0	50		8'3"			4174
		0.0	52		clayey silt with sand: Brown (7.5 YR 5/4), moist, medium stiff, ^{cl} no odor, 20% clay, 15% fine sand, 65% silt, abundant CaCO ₃ nodules and fine grained CaCO ₃	ML		4613
9.0		0.0	47		9'4"			4627
		0.0	51		Sandy silt: Brown (2.5 YR 5/4), moist, medium stiff, no odor, 35% fine sand, 65% silt, low plasticity, low toughness, rapid dilatancy, some pockets of CaCO ₃ fine material			4726
10.0		0.0	52					NM
					Total Depth 10.0' by s			
					No GW encountered			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 76				
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 5-17-11/0930	Date/Time Total Depth Reached 5-17-11/0936				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50157) (0935)						
Geologist C. Carmichael		Checked by/Date Dan Robbins/Meldman 9/8/11						
Radiological Background 11		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				11	Clayey sand with gravel, (10 YR, 3/3), dark brown, 55% fine to medium grained sand, 30% clay, 15% gravel fill, semi-moist, common rootlets, very low hardness, no plasticity, no odor.	SC		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 76
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-18-11 1430	Date/Time Total Depth Reached 5-18-11 1530
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50158 (1440) CL 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Joe Paul Robbins Hedman 9/8/11		

Radiological Background Se / 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 <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches</small>
					Surface: grass and soil		405' 2586 (CPM)
0.5			0.0	35	Clay with silt: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 10% silt, 90% clay, low plasticity, medium toughness, trace rootlets to 17', trace pinhole pores	CL	3359
			0.0	52		4528	
1.0			0.0	53		4842	
			0.0	73		4864	
2.0			0.0	99	1'11" Silty clay: brown (7.5YR 4/4), dry, medium stiff, no odor, 20% silt, 80% clay, low plasticity, medium toughness, some CaCO ₃ speckles	CL	4912
			0.0	92			5052
3.0			0.0	74			5168
			0.0	54	3'4" Silt: very pale brown (10YR 7/3), dry, medium dense, no odor, 100% silt, low plasticity, low toughness, slow dilatancy	ML	5072
4.0			0.0	66	3'11" Silty clay with sand: light yellowish brown (10YR 6/4), moist, medium dense, no odor, 10% fine sand, 25% silt, 65% clay, low plasticity, medium toughness, some CaCO ₃ nodules	CL	4916
			0.0	56			4388
5.0			0.0	38			4477
			0.0	54			4322
6.0			0.0	58			4451

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 2	Location ID 77
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth - 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-27-11 1010	Date/Time Total Depth Reached 6-27-11 1050
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags + 4oz Jar		50155 (1020)
Geologist C. Knight	Checked by/Date J. Robbins Medman 8/16/11		

Radiological Background 49 / 2006 / 11/1R	Radiological Equipment Used Pancake / downhole / MR 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings Inches (CPM)
					surface: soil and grass		+05' 2628
0.5			60		Silty Clay: Brown (10YR 4/3), moist, medium stiff, no odor, 40% silt, 60% clay, medium plasticity, medium toughness, cohesive, trace pinhole pores	CL	3086
			62				4239
1.0			49				4256
			58				4312
2.0			56				4329
			57				4428
3.0			85		3'2" _____		4439
			74		Clayey Silt: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 25% clay, 5% ^{fine} sand, 70% silt, low plasticity, low toughness, cohesive, trace pinhole pores, trace CaCO ₃ stringers	ML	4659
4.0			68				4767
			73				4694
5.0			73				4589
			75				4709
6.0			78				4667

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 78
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-27-11 0930	Date/Time Total Depth Reached 6-27-11 1000
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50/60 (0940) (1) 1/2 gallon bags + 402		
Geologist C. Knight	Checked by/Date J. Robbins Meldman 8/16/11		

Radiological Background 45 / 2675 / 104R	Radiological Equipment Used Pancake / downhole / uR 1	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>inches</small>
					Surface: soil and grass		70.5' 2675 (CPM)
0.5			0.0	52	Silty Clay: Brown (10YR 5/3) moist, medium stiff, no odor, 35% silt, 65% clay, medium plasticity, medium toughness, cohesive	CL	3434
			0.2	62		4281	
1.0			0.2	75		4398	
			0.2	67		4519	
2.0			0.2	65		4579	
			0.0	53	Same as above 3'2"	CL	4574
3.0			0.2	77		4580	
			0.2	82		4621	
4.0			0.2	75	Clayey silt: Yellowish brown (10YR 5/6) moist, medium stiff, no odor, 20% clay, 80% silt, low plasticity, low toughness, cohesive, trace carbon speckles, trace pin hole pores, naturally mottled, trace Fe staining (Iron oxide staining)	ML	4790
			0.2	90		4530	
5.0			0.0	78		4669	
			0.2	71		4524	
6.0			0.2	55			4490



Radiological Background 45/2765/10UR					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 78	
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)
6.0		0.0	55		Same as above.			4490
		0.2	68				MR	4367
7.0		0.0	63					4306
		0.2	58		7'2" silty sand: dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 35% silt, 65% fine sand, slow dilatancy, some iron oxide staining, some CaCO ₃ nodules and stringers		SM	4279
8.0		0.0	56					4394
		0.2	48					4374
9.0		0.0	77					4477
		0.2	77					4606
10.0		0.0	83				SM	4610
Total Depth / End boring 10.0' bgs								
NO G.W. encountered								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 79			
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 5-17-11/10:39	Date/Time Total Depth Reached 5-17-11/1048			
Type of Sampling Device Stainless steel shovel		Samples Collected 14-oz jar 1 1/2 gall bag (#50161) (1048)					
Geologist C. Carmichael		Checked by/Date Jonathan Alderman 7/21/11					
Radiological Background 10		Radiological Equipment Used MP Rater		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 11	Sand with clay and gravel, (10 YR, 3/3) dark brown, 60% fine to medium grained sand, 20% clay, 20% gravel fill, common rootlets, semi-moist, medium dense, no plasticity or hardness, no odor.	SC	
					No groundwater.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN - group 2	Location ID 79
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-19-11 0910	Date/Time Total Depth Reached 5-19-11 1010
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50162 (0915) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins/Medman 7/21/11		

Radiological Background N1 / 2600cpm	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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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 gravel and soil		+0.5' 2757
0.5		0.0	40			3320
		0.0	48	Fill: clayey silt; Brown (10YR 5/3), dry, medium stiff, no odor, 25% clay, 5% fine sand, 70% silt, low plasticity, low toughness, cohesive, some asphalt chunks/debris, trace angular gravel (medium, fill rock), another 1-5' attempt recovered a U-bracket (metal) on outside of macro core, trace rootlets near surface	AF/ML	4406
1.0		0.0	49			4670
		0.0	56			4910
2.0		0.0	70	1' 9" Clay: dark brown (10YR 3/3), moist, stiff, no odor, 5% silt, 5% fine sand, 90% clay, low plasticity, cohesive, medium toughness,	CL	4856
		0.0	61			4966
3.0		0.0	59			4963
		0.0	57			4853
4.0		0.0	54	3' 9" Clayey silt: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 30% clay, 5% fine sand, 65% silt, low plasticity, low toughness, trace CaCO ₃ stringers	ML	5061
		0.0	56			5040
5.0		0.0	56			5037
		0.0	35	5' 3" Clayey silt with sand; Brown (7.5YR 4/4), moist, medium stiff, no odor, 25% clay, 15% fine sand, 60% silt, ^{MS} dilatancy, low plasticity, low toughness, trace Fe oxide stains	ML	5077
6.0		0.0	43			5289

Radiological Background 41/2600 cpm				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 79		
Depth	Interval	Recovery	PID	Radiological	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: Clayey silt with sand	ML	5289	
		0.0	40				5390	
7.0		0.0	39				5434	
		0.0	40				5376	
8.0		0.0	43				4949	
		0.0	39				4901	
9.0		0.0	36				ML	4869
		0.0	42	Sandy silt with clay: Strong brown (7.5 YR 4/6), moist, medium stiff, no odor, 5% medium sand, 25% fine sand, 15% clay, 55% silt, slow dilatancy, low plasticity, low toughness, Iron oxide staining (trace)				4848
10.0		0.0	24					4793
11.0					Total Depth: 10.0' bgs No GW encountered			
12.0								
13.0								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 80				
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 5-17-11/1101	Date/Time Total Depth Reached 5-17-11/1106				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50163) (1105)						
Geologist C. Carmichael		Checked by/Date J Robbins Meldman 7/21/11						
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (0.0ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
05'			0.0	11	Sand with clay and gravel, (10YR, 3/3), dark brown, 60% fine to medium grained sand, 20% clay, 20% gravel gravel fill and cement, semicemented, dry, medium dense, common rootlets, no plasticity or hardness, no odor.	SC		
					No groundwater.			

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN - Group 2	Location ID 80
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-19-11 1020	Date/Time Total Depth Reached 5-19-11 1100
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50164 (1030) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins & Johnson 7/21/11		

Radiological Background 90 12CK / 12MR	Radiological Equipment Used Micro R Pancake / downhole etc	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable) Surface: grass and soil, 4373 footprint of Bldg		+0.5' 2804
0.5			0.0	59	Fill: Silty clay: dark brown (7.5YR 3/2), moist, medium stiff to stiff, no odor, 30% silt, 70% clay, low plasticity, medium toughness, cohesive, trace rootlets, some mottled texture, appears to be compacted fill	AF/ CL	3087
			0.0	58			4492
1.0			0.0	61			4866
			0.0	53			4837
2.0			0.0	50	Clayey silt with sand: Brown (7.5YR 4/2) moist, medium stiff, no odor, 25% clay, 10% finesand, 65% silt, low plasticity, low toughness, cohesive	ML	4896
			0.0	64			4800
3.0			0.0	60			4971
			0.0	58			4978
4.0			0.0	62	Same as above: Brown (7.5YR 4/4) clayey silt with sand	ML	5038
			0.0	62			5151
5.0			0.0	64	Appearance of CaCO ₃ stringers and trace nodules (CaCO ₃)		5386
			0.0	45			5222
6.0			0.0	45			5436

Radiological Background 40cpm / 12µR				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 80	
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	45		Same as above	ML	5436
		0.0	50				5305
7.0		0.0	49				5262
		0.0	46				5364
8.0		0.0	48		8'3" Sandy silt with clay: reddish yellow (7.5YR6/6) dry, medium dense, no odor, 25% fine sand, 57% medium sand, 15% clay, 55% silt, low plasticity, slow dilatancy, non-cohesive.		5369
		0.0	47		Weathered sandstone: Pale yellow (2.5Y 7/3), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	ML	5288
9.0		0.0	59		Refusal on sandstone at 9.0' bgs	SP 64	5262
					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 5DN group 2	Location ID 81				
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment Stainless steel shovel		Borehole Diameter 1 1/2"	Date/Time Drilling Started 5-17-11/1326	Date/Time Total Depth Reached 5-17-11/1336				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 oz jar 1 1/2 gall bag (#50165) (1335)						
Geologist C. Carmichael		Checked by/Date J. Robbins Meldman 7/21/11						
Radiological Background 11		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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sand with gravel and clay, (10 YR, 3/3), dark brown, 65% fine to medium grained sand, 20% gravel-fill and concrete, 15% clay, semi-moist, medium dense, common rootlets, no plasticity or hardness, no odor. No groundwater.	SW		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 2	Location ID 81
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-23-11 11:50	Date/Time Total Depth Reached 5-23-11 12:50
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50166 (1200) (1) 1/2 gallon bags + 4.02 Jar		
Geologist C. Knight	Checked by/Date J. Ruffin Medman 7/21/11		

Radiological Background 49 / 2315	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: sand & gravel		2311
					Artificial Fill		2688
0.5			0.0	65	Fill: silt: olive yellow (2-57 (46), dark yellowish brown (104R 4/4), dry, medium stiff, no odor, 5% angular medium gravel (fill rock), 5% fine sand, 80% silt, 10% clay, trace rootlets near surface, trace pine hole pores, low plasticity, low toughness	AF/ML	4022
1.0			0.0	78			4499
			0.0	83			4751
2.0			0.0	87			4640
			0.0	86	2' 10"		4731
3.0			0.0	82	Sandy silt: yellowish brown (104R 5/8) dry, medium stiff, no odor, 5% medium sand, 20% fine sand, 10% clay, 65% silt, low plasticity, cohesive, low toughness	ML	4790
			0.0	82			4876
4.0			0.0	75			4794
			0.0	67			4627 4794
5.0			0.0	70			4627 4627
			0.0	53			4493 4641
6.0			0.0	54	Sandy silt with clay: dark yellowish brown (104R 4/6), dry, medium stiff, no odor, 10% clay, 30% fine sand, 60% silt (cont)	ML	4493

Radiological Background 44/2315				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 81	
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	54		low plasticity, low toughness, some CaCO ₃ stringers and nodules	ML	4493
		0.0	52				4398
7.0		0.0	61		7" Abundant CaCO ₃ pocket 2" thick, fine grained CaCO ₃		4688
		0.0	61				4711
8.0		0.0	67		Same as above	ML	4752
		0.0	71				4666
9.0		0.0	66		4'2" weathered bedrock sandstone: olive yellow (2.5Y 6/6), slightly moist, hard, no odor, mechanically weathered to SP, fine grained sandstone, trace Iron oxide staining	A R S S S	4765
		0.0	67				4783
10.0		0.0	67		Total Depth: 10.0' hrs No GW encountered		NM
11.0							
12.0							
13.0							

Project Name: SSEL Area JV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 82	
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 5-17-11/1502		Date/Time Total Depth Reached 5-17-11/1511	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 4-oz jar 1 1/2 gall bag (# 50167) (1310)			
Geologist C. Carmichael				Checked by/Date J. Robbins Feldman 7/2/11			
Radiological Background 11		Radiological Equipment Used MP R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05			0.0	11	Sand with clay and gravel, (10YR, 3/3), dark brown, 60% fine to medium grained sand, 20% clay, 20% gravel fill- concrete, fill rock, semi-moist, medium dense, common rootlets, no plasticity or hardness, no odor. No groundwater.	SC	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN - group 2	Location ID 82
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-19-11 1110	Date/Time Total Depth Reached 5-19-11 1200
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50168 (1120) (1) 1/2 gallon bags + 4oz jar		
Geologist C. Knight	Checked by/Date J. Robbins Goldman 7/21/11		

Radiological Background 44 / 12 uR	Radiological Equipment Used ^{OK} Pancake / downhole uR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches <small>(CPM)</small>
			0.0	46	Fill: Artificial Fill Aldy 4373 footprint		+0.5' 2755
0.5			0.0	44	Fill: Silty clay: Brown (10YR 4/3), dry, medium stiff, no odor, 35% silt, 5% angular medium gravel (fill rock), 60% clay, low plasticity, medium toughness, cohesive, trace rootlets near surface	AF / CL	2692 3754
1.0			0.0	43			4426
			0.0	45			4801
2.0			0.0	50	2'3" Clay with silt: Brown (10YR 4/3), moist, medium stiff, no odor, 10% silt, 5% fine sand, 85% clay, ^{OK} low plasticity, medium toughness	CL	4967
			0.0	40		CL	4990
3.0			0.0	47	3' Sandy clay with silt: strong brown (7.5YR 5/6), slightly moist, medium stiff, no odor, 5% medium sand, 20% fine sand, 20% silt, 55% clay	CL	4818
			0.0	43		CL	4934
4.0			0.0	47			5014
			0.0	54			5088
5.0			0.0	58			5281
			0.0	61	Weathered Sandstone: Yellow (2.5Y 7/6), dry, hard, no odor, mechanically weathered to SP, fine grained sandstone	SP	5279
6.0			0.0	54			4836

Refusal on Sandstone at 6.0' bgs
No GW encountered

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 83			
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 5-17-11/1419	Date/Time Total Depth Reached 5-17-11/1426			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50169) (1425)					
Geologist C. Carmichael		Checked by/Date J Robbins Muldman 7/21/11					
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sand with clay & gravel, (10YR, 4/2), brown, 60% fine to medium grained sand, 20% clay, 20% gravel, 25% 15% semi-moist, some rootlets, medium dense, + very low plasticity, no hardness, no odor. No groundwater.	SC	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 83				
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 5'8"					
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-8-11/1105	Date/Time Total Depth Reached 8-8-11/1157					
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1 4-pz jar 1 1/2 gall bag (#50170) (1210)						
Geologist C. Carmichael		Checked by/Date L. Land/P. Robbins/J. Helman 9/8/11						
Radiological Background 61, 3113 cpm		Radiological Equipment Used Downhole scanner, Pancake 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	Inches	Borehole Gamma Readings (CPM)
			0.067	67				05-3058
			0.074	74				0-3356
1'			0.096	96	Silt with gravel, (10YR, 4/2), pale brown, 80% silt, 15% gravel fill rock and sandstone fragments, 5% fine sand, dry, semi-cemented, medium stiff, no plasticity, very low hardness, no odor.	ML	4472	
			0.062	62	Gradational contact			
2'			0.074	74	Clay with sand, (10YR, 3/3), dark brown, 85% clay, 15% fine sand, dry, stiff, medium plasticity and hardness, no odor.	CL	4788	
			0.064	64			4933	4850
			0.054	54			4933	
3'			0.071	71	Gradational Contact			
			0.088	88	Clayey sand, (10YR, 5/4), light brown, 65% fine to medium grained sand, 35% clay, semi-moist, medium stiff, trace calcium carbonate nodules (mm-sized) and stringers, very low plasticity and hardness, no odor.	SC	4818	
			0.082	82			4996	
4'			0.068	68	Gradational Contact			
			0.069	69	Sand with clay, (10YR, 5/4), light brown, Same as above, except 75% fine to medium grained sand, 25% clay.	SC	5007	
					Weathered sandstone at 5.50		4971	
							4921	
5'							4856	
							4877	
6'					Refusal hit at 5'8"			

No. BW reached.

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 84			
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 5-17-11/1351	Date/Time Total Depth Reached 5-17-11/1400 (ea)			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50171) (1358)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Geldman 7/12/11					
Radiological Background II		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (D.D 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	II	Sand with gravel and clay, (10 YR, 3/2) dark brown, 60% sand (fine to medium grained), 20% gravel (fill rock and cement), 20% clay, semi-moist, medium dense, some rootlets, no plasticity or hardness, no odor.	SW	
No groundwater.							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group ²	Location ID 84
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-23-11 0820	Date/Time Total Depth Reached 5-23-11 0930
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 50172 (0825) (1) 1/2 gallon bags + 1 4oz Jar		
Geologist C. Knight	Checked by/Date J. Robbins, J. Goldman 7/22/11		

Radiological Background 30 / 2696	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd): 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: Soil and rock		+0.5' 1247
0.5			0.0	49	Silt with sand: Brown (10YR 5/3), dry, medium stiff, no odor, 10% fine sand, 90% silt, low plasticity, low toughness, cohesive, trace rootlets	ML	1271
			0.0	46			1778
1.0			0.0	48	1'3"		2234
			0.0	59	Sandy silt: Strong brown (7.5YR 4/6), dry, medium stiff, no odor, 35% fine sand, 5% clay	ML	2365
2.0			0.0	57	60% silt, slow dilatancy, low plasticity, non-cohesive, low toughness		2535
			0.0	55			2586
3.0			0.0	54			2583
			0.0	51			2538
4.0			0.0	56			2372
			0.0	60			2299
5.0			0.0	57	CL Poorly graded sand & brownish yellow (10YR 6/6), dry, medium dense, no odor, fine sand (100%)	SP	2149
			0.0	47	Weathered sandstone: brownish yellow (10YR 6/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	2347
6.0			0.1	47		SP	NM

Refusal on sandstone at 6.0' bgs
No LWD encountered

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 85
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-27-11 0855	Date/Time Total Depth Reached 6-27-11 0920
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50173 (0900) (1) 1/2 gallon bags + 4oz Jar		
Geologist C. Knight	Checked by/Date J Robbins Feldman 8/16/11		

Radiological Background 40 / 2765 / UMR	Radiological Equipment Used Pancake / downhole / MR 1;	PID Used Mini Rae 2000 (Bkgd: 0.6 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: soil and grass		10.5' 2765 (CPM)
0.5			0.0	62		ML	2940
			0.0	75	Clayey silt: Brown (10YR 5/3), dry, medium stiff, no odor, 25% clay, 57% fine sand, 20% silt, low plasticity, low toughness, cohesive		4000
1.0			0.0	64			4466
			0.0	50	15"		4585
2.0			0.0	76	Clayey silt with sand: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% medium sand, 10% fine sand, 35% clay, 50% silt, low plasticity, low toughness, cohesive, trace CaCO ₃ nodules	ML	4629
			0.0	64			4430
3.0			0.0	68			4289
			0.0	62	Weathered Sandstone Bedrock: pale yellow (2.5Y 7/4), moist, medium stiff, dense, no odor, fine grained Sandstone		4364
4.0							
5.0					Refusal on Sandstone 3.5' bgs		
6.0					No GW encountered		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 86	
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 5-18-11/0942		Date/Time Total Depth Reached 5-18-11/0951	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 4-oz jar 1 1/2 gall bag (#50174) (0950)		Checked by/Date J Robbins/Heldman 7/22/11			
Geologist C. Carmichael							
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	11	Clay with sand, (10 YR, 3/3), dark brown, 80% clay, 20% fine sand, trace gravel, common rootlets, semi-moist, medium stiff, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 86
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-20-11 / 1445	Date/Time Total Depth Reached 5-20-11 / 1455
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50175 (1445) (1) 1/2 gallon bags + 4 oz. jar		
Geologist L. Robbins Goldman	Checked by/Date L. Robbins Goldman 7/22/11		

Radiological Background 34 / 2764	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches</small> +0.5' = 2537 (CPM)
					Surface: soil and grass		
0.5			0.0	65	clayey silt: dark brown (10YR 4/3), moist, med. stiff, no odor, 35% clay, 60% silt, 5% fine sand, low plasticity, low toughness, cohesive, trace rootlets		2871
			0.0	65			4094
1.0			0.0	70		ML	4760
			0.0	85			4863
2.0			0.0	90			4818
			0.0	70	2' 2" silty clay w/ sand: brown (7.5YR 4/3), dry, med. stiff, no odor, 5% med. sand, 5% fine sand, 30% silt, 60% clay, med. plasticity, med. toughness, cohesive, mica flecks.		4915
3.0			0.0	57		CL	4927
			0.0	75			4845
4.0			0.0	80	4' 1" silty sand: ^{LE} dark gr light yellowish brown: (10YR 6/4), moist, 20% silt, 5% med. sand, 75% fine sand, non-cohesive, no odor, med. dense		4625
			0.0	90		SM	4444
5.0			0.0	85			4604
			0.0	65	5' 5" sandy silt: yellowish brown (10YR 5/6), moist, med. stiff, no odor, 35% fine sand, 65% silt, cohesive, low plasticity, slow dilatency, (with)		4338
6.0			0.0	75		ML	4330

cont next page

Radiological Background				Project Name	Project Number	Location	
34/2764				SSFL Area IV Radiological Study	EP9038.01.22.04.03	5DN-Group 2-#86	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings
							(CPM)
6.0			0.0	75	low toughness.		4330
			0.0	55		ML	4780
7.0			0.0	80	7'0" weathered sandstone: yellowish brown (10yr 5/4), moist, mechanically weathered to S.P., hard, no odor, coarse grained sandstone	BEDROCK	4937
			0.0	75	7'6"		4947
8.0					Refusal on sandstone @ 7.5' bgs no GW encountered Sample collected 1-5' 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 5DN group 2	Location ID 87			
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 5-18-11/0920	Date/Time Total Depth Reached 5-18-11/0928			
Type of Sampling Device Stainless steel shovel		Samples Collected (4-oz jar) 1 1/2 gall bag (#50176) (0928)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Meldman 7/22/11					
Radiological Background 10		Radiological Equipment Used w/ 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				0.0 11	Sandy clay, (10 VR, 3/3), dark brown, 60% clay, 35% fine to medium grained sand, 5% gravel, semi-moist, medium stiff, common rootlets, cobbles on top of location, low plasticity and hardness, no odor. No groundwater reached	CL	



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SDN Group 2		Location ID 87	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 2.5 ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 5-23-11 1045		Date/Time Total Depth Reached 5-23-11 1140	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected 50177 (1050) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date J. Robbins, M. Aldman 7/22/11			
Radiological Background NI 1.1018		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		
					Surface is gravel sand and large gravel		105 963
0.5			0.0	40	Silt with gravel: dark yellowish brown (10YR 4/4)	AF	1218
			0.0	46	dry, medium stiff, no odor, 30% fine sand, 5% medium sand, 10% angular medium gravel (fill rock), 55% silt, low plasticity, non cohesive, low toughness, mottled, trace rocklets	ML	2106
1.0			0.0	58	Silty silt: light yellowish brown (10YR 8/4), dry, medium dense, no odor, 5% angular fine gravel, 30% silt, 10% medium sand, 55% fine sand, mottled	AF/SM	2434
			0.0	62			2575
2.0			0.0	63	Weathered sandstone: Very pale brown (10YR 7/4), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	2513
			0.0	58			2521
3.0					Refusal on sandstone at 2.5' bgs		
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 5DN group 2	Location ID 88				
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 5-18-11/1005	Date/Time Total Depth Reached 5-18-11/1013				
Type of Sampling Device Stainless steel shovel		Samples Collected ^{1 4-oz jar} 1 1/2 gall bag (#50178) (1012)						
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/22/11						
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.011		Clay with sand, (10 VR, 3/2), dark brown, 85% clay, 15% fine sand, common rootlets, semi-moist, medium stiff, medium plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 88
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-20-11 1315	Date/Time Total Depth Reached 5-20-11 1410
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 56179 (1322) 50424 (NT)-field dup (1) 1/2 gallon bags + (1) 4oz jar		
Geologist T. Knight L. Robbins Goldman	Checked by/Date J. Robbins Goldman 7/22/11		

Radiological Background 50 / 2746	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches</small>
					Surface: grass + soil		40.5': 2664 (CPM)
0.5			0.0	45	clayey silt: brown (10 yr 4/3), dry, medium stiff, no odor, 30% clay, 5% sand, 65% silt, low plasticity, low toughness, cohesive, trace rootlets,		3265
			0.0	50			4606
1.0			0.0	51			4885
			0.0	82		ML	4949
2.0			0.0	90			4842
			0.0	80	2141 silty clay w/ sand: brown (7.5 yr 4/3), dry, medium stiff, no odor, 5% ^{medium} coarse sand, 5% fine sand,	CL	4915
3.0			0.0	65	30% silt, 60% clay, medium plasticity, medium toughness, cohesive, mica flecks.		5057
			0.0	45	silty sand: dark gray (10 yr 4/1), dry, 25% ^{med} coarse sand, 40% fine grained sand, 30% silt, 5% coarse	SM	5096
4.0			0.0	60	grained sand, no odor.		5305
			0.0	63	weathered sandstone: light brownish gray (10 yr 6/2), dry, mechanically weathered by downhole drill rig to Sp., moist, hard, no odor,		5304
5.0			0.0	55	fine grained sandstone		5243
					Refused on sandstone @ 5' bgs No GW encountered Sample collected 1-5' bgs		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 89				
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 5-18-11/0853	Date/Time Total Depth Reached 5-18-11/0901				
Type of Sampling Device Stainless steel shovel		Samples Collected ^{1 4-oz jar} 1 1/2 gall bag (#50180) (0900)						
Geologist C. Carmichael		Checked by/Date J. Robling Maldman 7/22/11						
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Clay with sand, (10 YR, 3/3), dark brown, 80% clay, 20% fine sand, some rootlets, semi-moist, medium stiff, medium plasticity and hardness, no odor. No groundwater reached	CL		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDM Group 2	Location ID 89
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-23-11 0945	Date/Time Total Depth Reached 5-23-11 1030
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 5x18" (0950) (1) 1/2 gallon bags + 1-4oz jar		
Geologist C. Lutz, Jr	Checked by/Date J. Robbins Malzman 7/22/11		

Radiological Background 38 / 1477	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches <small>(CPM)</small>
0.5			0.0	45	Silt with Sand: Dark yellowish brown (10YR 4/6), dry, medium stiff, no odor, 10% fine sand, 5% clay, 85% silt, low plasticity, cohesive, low toughness	ML	1657
			0.0	43			2150
1.0			0.0	44			2312
			0.0	45			2365
2.0			0.0	45			2380
			0.0	45	2'3" ←		
			0.0	45	Sandy silt: Yellowish brown (10YR 5/4), dry, medium dense, no odor, 35% fine sand, 5% clay, 60% silt, slow dilatancy, low plasticity	ML	2459
3.0			0.0	46			2506
			0.0	46			2600
			0.0	47	3'7" ←		
4.0			0.0	48		Poorly graded sand: Yellowish brown (10YR 5/8), moist, medium dense, no odor, 5% silt, 95% fine sand, some Iron oxide staining	SP
			0.0	46	7" ← weathered sandstone: Brownish yellow (10YR 6/8), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	2636
5.0			0.0	52			2986
6.0					Refusal on sandstone at 5.0' bgs No GW encountered		

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 90
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 5-18-11/0823	Date/Time Total Depth Reached 5-18-11/0838
Type of Sampling Device Stainless steel shovel	Samples Collected 1 4-oz jar 1 1/2 gall bag (#50182) (0838)		
Geologist C. Carmichael	Checked by/Date J. Robbins Feldman 7/22/11		

Radiological Background 11	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5			0.0	11	Clay with sand, (10 VR, 4/3), brown, 75% clay, 20% fine to medium grained sand, 5% gravel fill and asphalt pieces, moist, medium stiff, medium plasticity and hardness, no odor. (3" of asphalt on top) No groundwater reached.	CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 90
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 8-8-11/1417	Date/Time Total Depth Reached 8-8-11/1434
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50183) (NO SAMPLE)		
Geologist C. Carmichael	Checked by/Date Sub. Dan Robbins/Helman 9/8/11		

Radiological Background 66, 3125 cpm	Radiological Equipment Used Downhole scanner, pancake meter	PID Used Mini Raz 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID CPM	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.0	0.0		108	74	Sandy clay, (10YR, 4/4), brown with some iron-oxide staining, 60% clay, 40% fine to medium grained sand, semi-moist, medium stiff, trace asphalt, sandstone fragments and gravel fill rock, low plasticity, hardness and no odor.	CL	
1'					Refusal on sandstone at 8".		
2'					No GW reached.		
3'					No sample collected.		
4'							
5'							
6'							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN_group 3	Location ID 91
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 5-27-11/0902	Date/Time Total Depth Reached 5-27-11/0910
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50184) (0910)		
Geologist C. Carmichael	Checked by/Date J. Robbins/Goldman 7/20/11		

Radiological Background 14	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.014	Silt with clay and sand, (10YR, 3/3), dark brown, 70% silt, 15% clay, 15% fine to medium grained sand, dry, medium stiff, some rootlets, low plasticity and hardness, no gas odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 3	Location ID 91
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 12:20	Date/Time Total Depth Reached 6-23-11 13:05
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags SO185 (1230)		
Geologist C. Knight	Checked by/Date Julian Rollins & Madman 19/10/11		

Radiological Background 50 / 2702	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface soil analysis		2667
0.5			0.0	54	Fill: Silty clay with sand: dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 25% silt, 52% medium sand, 75% fine sand, 55% clay, non cohesive, low plasticity, medium toughness, very mottled, trace gravel (fill rock)	AF/CL	2779
1.0			0.0	70			3643
1.0			0.0	63			4351
1.5			0.0	55			4684
2.0			0.0	54			4569
2.5			0.0	65			4615
3.0			0.0	75	3' Asphalt debris in 2" thick ----- dashed -----		4401
3.0			0.0	65	Fill: Clay: dark grayish brown (10YR 4/2), moist, stiff, no odor, medium plasticity, medium toughness, cohesive	AF/CL	3955
4.0			0.0	65	3' 5" - Concrete debris in 3" thick		4121
4.0			0.0	65	Fill: Clay Silty Clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 35% silt, 65% clay, cohesive, medium plasticity, medium toughness	AF/CL	4111
5.0			0.0	60	Sandy Silt: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, low plasticity, low toughness, cohesive, abundant CaCO ₃ stringers and nodules, 20% fine sand, 80% silt	ML	3891
5.0			0.0	56			4106
5.5			0.2	62	Weathered Sandstone Bedrock: Olive yellow (2.5Y 6/8), moist, dense, no odor, mechanically weathered to SP, fine-grained sandstone		4163
6.0			0.0	58			

Refusal on sandstone at 6.0' bgs
No Cnw encountered

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 3	Location ID 92
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 5-27-11/0941	Date/Time Total Depth Reached 5-27-11/0950
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50186) (0950)		
Geologist C. Carmichael	Checked by/Date L. Robbins/Goldman 7/22/11		

Radiological Background 14	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000	(Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	14	Clayey silt with sand, (10YR, 3/4), dark brown, 50% silt, 30% clay, 20% fine to medium grained sand, dry, medium stiff, some rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 3	Location ID 92
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8' 4" ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 0955	Date/Time Total Depth Reached 6-23-11 1110
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50187 (1000)
Geologist C. Knight	Checked by/Date J. Robbins Goldman		

Radiological Background 54 / 2527	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	65	surface: grass and soil		10.5' 2643
0.5			0.0	80	Clay: Dark yellowish brown (10YR 3/4) moist, medium stiff, no odor, 5% silt, 5% fine sand, 90% clay, medium plasticity, cohesive, medium toughness	CL	2843
1.0			0.0	61			3943
			0.0	60			4479
			0.0	48			4557
2.0			0.0	48			4652
			0.0	57			4686
3.0			0.0	48			4694
			0.0	65			4603
4.0			0.0	54			4579
			0.0	58			4451
5.0			0.0	60	Clayey silt: Brown (10YR 4/3), moist, medium stiff, no odor, 15% clay, 85% silt, low plasticity, low toughness	ML	4522
			0.0	61			4568
6.0			0.0	70			4320

Radiological Background					Project Name	Project Number	Location
94 / 2527					SSPL Area IV Radiological Study	EP9034.01.22.04.03	92
Depth	Interval	Recovery	PTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings (CPM)
6.0		0.0		70	Same as above 7'9" trace CaCO ₃ stringers 8'2" weathered sandstone Bedrock: Pale yellow (2.5Y 7/3) 8'4" moist, dense, no odor, mechanically weathered to SP, fine grained sandstone Refusal on sandstone at 8'4" hgs NO GW encountered	ML	4320
		0.0		80			4180
7.0		0.0		72			3990
		0.0		54			3958
8.0		0.0		65			4066
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 5DN group 3	Location ID 93
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 5-27-11/0958	Date/Time Total Depth Reached 5-27-11/1006
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (# 50188) (1005.)		
Geologist C. Carmichael	Checked by/Date J. Robbins Aldman 7/22/11		

Radiological Background 4	Radiological Equipment Used M R meter	PID Used Mini Rac 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5'				0.014	<p>Clayey silt with sand, (10YR, 3/3), dark brown, 50% silt, 30% clay, 20% fine to medium grained sand, dry, common rootlets, low plasticity and hardness, no odor.</p> <p>No groundwater reached</p>	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 93
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-20-11 1200	Date/Time Total Depth Reached 6-20-11 1240
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50189 (1210) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins/J. Goldman 7/22/11		

Radiological Background 60 / 2714	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 7.05' 27.69 (CPM)
0.5			0.0	67	Clay (dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% silt, 5% fine sand, 90% clay, cohesive, medium density, medium plasticity, trace rootlets	CL	3432
			0.0	66			4243
1.0			0.0	70			4533
			0.0	63			4662
2.0			0.0	62			4680
			0.0	59			4655 4562
3.0			0.0	62			4622 4655
			0.0	61			4571 4622
4.0			0.0	64			4570 4571
			0.0	63			4569 4570
5.0			0.0	63	4510 4569		
			0.0	64	4510 4510		
6.0			0.0	64	CL 4437		
					Same as above		

Radiological Background 60/2714					Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 93
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	64		Same as above	CL	4437
		0.0	65		Silty Sand: Brown (7.5 YR 5/4), moist, medium dense, no odor, 40% silt, 60% fine sand, rapid dilatancy	SM	4517
7.0		0.0	73			4547	
		0.0	75			4644	
8.0		0.0	64			4658	
		0.0	62			4480	
9.0		0.0	59			4581	
		0.0	66		Weathered Sandstone bedrock: Brownish yellow (10 YR 6/6), moist, dense, no odor, mechanically weathered to SP, 5% coarse sand, 5% medium sand, 90% fine sand.	B 3 C 5	4690
10.0		0.0	03				4576
11.0					Total Depth 10.0' bgs		
					No GW encountered		
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 94
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 5-31-11/0835	Date/Time Total Depth Reached 5-31-11/0845
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50190) (0845)		
Geologist C. Carmichael	Checked by/Date J. Robbins/Goldman 7/20/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	12	Silt with clay, (10YR, 3/3), dark brown, 65% silt, 25% clay, 10% fine sand, common rootlets, dry, medium stiff, low hardness and plasticity, no odor. No groundwater reached.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number: EP9038.01.22.04.03	Subarea ID & Group: SDN group 3	Location ID: 94
Drilling Company: Boart Longyear	Driller: D. Hansen	Ground Elevation: NA	Total Drilled Depth: 10 Ft. bgs
Drilling Equipment: Geo probe 6600	Borehole Diameter: 1 3/4"	Date/Time Drilling Started: 6-22-11/0914	Date/Time Total Depth Reached: 6-22-11/0926
Type of Sampling Device: 1 3/4" Macrotore	Samples Collected: (1) 1/2 gallon bags #50191 (0940)		
Geologist: C. Carmichael	Checked by/Date: J Robbins Feldman 7/22/11		

Radiological Background: 44/2755	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	(CPM)	
0.5		0.0	67	AF: Artificial Fill (10YR, 3/3), dark brown, 75% clay, 15% fine grained sand, 10% silt, trace rootlets, medium stiff, low-medium plasticity and hardness, no odor. 2.75' Same as above, except speckled texture Same as above, except reddish-brown (10YR, 3/4)	CL	0.5	3007	
1.0			72		AF	4344	0	3877
			54			4570		
2.0			72			4585		
			65			4733		
3.0			53			4703		
			54			4565		
4.0			51			4574		
			35			4503		
5.0			43			4639		
			58		4650			
6.0			64		4573			
					4668			

Radiological Background					Project Name	Project Number	Location
44 / 2755					SSFL Area IV Radiological Study	EP9038.01.22.04.03	5DN - 94
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
							Inches
				0.073			4615
7'				71	Sandy clay, (10 YR, 3/6), reddish-brown, 60% clay, 40% fine to medium grained sand, some speckling, semi-moist, medium stiff, very low plasticity and hardness, no odor.	CL	4617
			65	4703			
8'			55	4788			
			70	4749			
9'				61	Gradational Contact Clayey sand, (10 YR, 4/6), light reddish-brown, 70% fine to medium grained sand, 30% clay, trace gravel fill rock, no plasticity or hardness, no odor.	SC	4621
				73		AF	4736
10'				61	10' goal depth reached No GW encountered.		4305

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN _{group3}		Location ID 95	
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 5-31-11/0853		Date/Time Total Depth Reached 5-31-11/0905	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50192) (0905)			
Geologist C. Carmichael				Checked by/Date J. Robbins Aldman 7/22/11			
Radiological Background 12		Radiological Equipment Used M/R meter		PID Used Mini Rac 2000 (Background: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.012	Silt with clay and sand, (10YR 3/4) dark brown, 65% silt, 15% clay, 15% fine sand, 5% gravel fill rock, dry, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 95
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-22-11/0957	Date/Time Total Depth Reached 6-22-11/1010
Type of Sampling Device 1 3/4" Macrotore	Samples Collected (1) 1/2 gallon bags #50193 (1020)		
Geologist C. Carmichael	Checked by/Date J. Robbins Haldman 7/25/11		

Radiological Background 42/2484	Radiological Equipment Used Pancake/downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings		
							Inches	(CPM)	
0.5			0.0	54	Clayey silt with sand, (10YR, 3/3), dark brown, 55% silt, 30% clay, 15% fine grained sand, dry, medium stiff, trace rootlets in top 2-3", low plasticity and hardness, no odor.	ML	0.5	3015	
1.0				65			4645		
				53				4828	
2.0				45				4896	
				65		Gradational Contact Clay, (10YR, 3/6), reddish-brown, 85% clay, 10% silt, 5% fine sand, speckled texture, dry, medium stiff, medium plasticity, no odor.	CL	4882	
3.0				64				4668	
				56				4710	
4.0				53				4760	
				63				4626	
5.0				68			4755		
				56		4730			
6.0				61	(Cont. on pg 2)		4668		

Radiological Background 42/2484					Project Name SSF: Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 5DN-95
Depth	Interval	Recovery	PID	Radiological	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)
					Same as above	CL	
			63				4721
7'			78				4676
			55				4667
8'			43	8'			4462
			83		Clayey sand, (10 YR, 4/4, 4/6), brown mottled with reddish-brown and white CaCO ₃ stringers, 70% fine to medium grained sand, 30% clay, semi-moist, medium dense-dense, no plasticity, very low hardness, no odor.	SC	4368
9'			77				4260
			68		Sand with clay and silt, (10 YR, 5/4), light brown, 70% fine to medium grained sand, 20% clay, 10% silt, semi-moist, no plasticity, hardness or odor.	SP	4615
10'			84				4711
					10' goal depth reached.		
					No GW reached.		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 96			
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 5-31-11/0911	Date/Time Total Depth Reached 5-31-11/0916			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50194) (0915)					
Geologist C. Carmichael		Checked by/Date Judson Robbins Midway 9/8/11					
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5				0.0 12	Clayey silt, (10 YR, 3/3), dark brown, 70% silt, 30% clay, trace gravel fill, dry, medium stiff, some rootlets, low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 96
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-22-11/0830	Date/Time Total Depth Reached 6-22-11/0840
Type of Sampling Device 1 3/4" Macrocore	Samples Collected Field DUP: 50417 (No Time) (1) 1/2 gallon bags (#50195) (0850)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Melman 9/8/11		

Radiological Background 51/2695	Radiological Equipment Used Pancake/downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
			0.0	72			0.5	2748
0.5			0.063		Silt, (10YR, 4/3), brown, 90% silt, 5% fine grained sand, 5% gravel fill rock, dry, stiff, trace rootlets, low plasticity and hardness, no odor.	MLK AF	4409	
1.0				66			4607	4627
				69	1.5'		4703	
2.0				72	Same as above, except 80% silt, 15% clay, 5% gravel fill rock, so silt with clay, also speckled texture appears.		4758	
				82			4729	
3.0				71			4692	
				65			4692	
4.0				61			4604	
				56			4631	
5.0				54	5'		4553	
				60	Clay with sand, (10YR, 4/6), reddish-brown, 85% clay, 15% fine grained sand, semi-moist, medium stiff, medium plasticity and hardness, no odor.	CL AF	4524	
6.0				61			4694	

Radiological Background					Project Name	Project Number	Location		
51/2695					SSFL Area IV Radiological Study	EP9034.01.22.04.03	5DN 96		
Depth	Interval	Recovery	PID	Radiological	Description		USCS Symbol	Borehole Gamma Readings	
					(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)			Inches	(CPM)
6.0							SC		
			0.0	73	Clayey sand, (10 YR, 4/6), reddish-brown with white stringers, 65% fine to medium grained sand, 35% clay, semi-moist, medium dense, no plasticity or hardness, no odor.				4624
7.0				52					4583
				61					4455
8.0			V 48		Sand (10YR 8/2) greyish-beige, 100% fine to coarse grained sand, dry, dense, no plasticity, hardness or odor.		SW		4064
					Refusal hit at 8' - bedrock				
					No GW reached.				
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 5DN _{group3}	Location ID 97			
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 5-31-11/0922	Date/Time Total Depth Reached 5-31-11/0929			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50196) (0928.)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Moldman 7/25/11					
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0.0, 13	Clayey sand, (10 YR, 3/3), dark brown, 60% fine sand, 30% clay, 10% silt, dry, medium dense, common rootlets, t_{20} very low plasticity and hardness, no odor. No groundwater reached.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 47
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-21-11 1145	Date/Time Total Depth Reached 6-21-11 1220
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50197 (1150)
Geologist C. Knight	Checked by/Date J Robbins Goldman 7/21/11		

Radiological Background 50/2596	Radiological Equipment Used Pancake/downhole	PID Used Mini Rae 2000 (Bkgd: 0-0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: grass and soil		2764
0.5			0.0	62	Clay with silt: dark brown (10YR 3/4), moist, medium stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive	CL	3248
			0.0	65			4205
1.0			0.0	71			4634
			0.0	70			4606
2.0			0.0	76			4569
			0.0	68			4812
3.0			0.0	57			4679
			0.0	55	Same as above	CL	4585
4.0			0.0	68	Silty Clay: strong brown (7.5YR 4/6), moist, medium stiff, no odor, 30% silt, 70% clay, cohesive, medium stiff, medium plasticity, medium toughness	CL	4860
			0.0	55			4711
5.0			0.0	58			4722
			0.0	55			4660
6.0			0.0	94	contact 6.0'		4954

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DNgroup3		Location ID 98	
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 5-31-11/0939		Date/Time Total Depth Reached 5-31-11/0946	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall. bag (#50198) (0945)			
Geologist C. Carmichael				Checked by/Date J. Robbins Goldman 7/25/11			
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'				0.0 11	Clayey sand, (10 YR, 3/4), dark brown, 65% fine sand, 30% clay, 5% sandstone fragments and gravel fill, dry, medium dense, some rootlets, very low hardness and plasticity, no odor. No groundwater reached.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 3	Location ID 98
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-21-11 10 50	Date/Time Total Depth Reached 6-24-11 11 30
Type of Sampling Device 1 3/4" Macrocore	Samples Collected C (1) 1/2 gallon bags		50199 (1100)
Geologist C. Lught	Checked by/Date J Robbins/Jedman 7/25/11		

Radiological Background 61 / 2645	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)	
					Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil and grass		105 2516	
0.5			62		Fill: Silty Clay: dark yellowish brown (10YR 3/6), dry, medium stiff, no odor, 20% silt, 5% fine sand, 75% clay, cohesive, medium plasticity, medium plasticity, true rootlets near surface	AF	2819	
			101			CL	4018	
1.0			89				4617	
			82				4739	
2.0			74				4873	
			63				4723	
3.0			72			3" 2" trace concrete 1/4" diameter		4726
			71			Fill: Clay same as above	AF/CL	4684
4.0			75			4" trace asphalt - 1/8" diameter Concrete debris for 4' to 4'6"		4591
			74					4254
5.0		NR	76		NO Recovery		4347	
			58		Silty Sand: Strong brown (7.5YR 4/6), 25% silt CL 65% fine sand, moist, medium dense, no odor, 35% silt, 65% fine sand, non cohesive, slow dilatancy	SM	4667	
6.0			62				4686	

Radiological Background 61/2645				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 93	
Depth	Interval	Recovery	FTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, zirconology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
6.0		0.0		62	Some as above! SM 7'10" weathered Sandstone Bedrock & very pale brown (10YR 7/3) moist, dense, nodular; mechanically weathered to S.P. fine grained sandstone, trace silt	SM	4686
		0.0		66		4771	
7.0		0.0		57		4765	
		0.0		87		4732	
8.0		0.0		71		4548	
					Refusal on sandstone at 8.0' bgs 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 5DNgroup3		Location ID 99	
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 5-31-11/1401		Date/Time Total Depth Reached 5-31-11/1410	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50200) (1410)		Geologist C. Carmichael			
Radiological Background 12		Radiological Equipment Used w/ Rater		Checked by/Date J. Robbins Feldman 7/22/11			
PID Used Mini Rae 2000		(Background: 0.0 ppm)					

Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.5				0012	Sandy silt with clay (10.4R, 3/4), dark brown, 55% silt, 30% fine to medium grained sand, 15% clay, some rootlets, dry, medium stiff, very low plasticity and hardness, no odor.	ML		
No groundwater reached.								

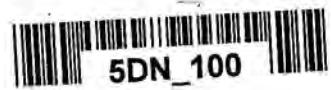
Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 99
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-21-11 1415	Date/Time Total Depth Reached 6-21-11 1430
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected S0201 (1420) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Rablins / J. Adams 7/25/11		

Radiological Background 65 / 2682	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
					Surface: soil and grass		705 2775
0.5			0.0	45	Clay: dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 5% silt, 5% fine sand, 90% clay, cohesive, medium plasticity, medium toughness.	CL	3126
			0.0	53			4322
1.0			0.0	64			4702
			0.0	85			4812
2.0			0.0	84			4935
			0.0	71			4903
3.0			0.0	76			4944
			0.0	73			4843
4.0			0.0	92			4859
			0.0	70			4906
5.0			0.0	75	Same as above	CL	5010
			0.0	59	Silty Sand: yellowish brown (10YR 5/4), moist, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand	SM	5043
6.0			0.0	85			4846

Radiological Background 65/2682					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 99
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	85		Same as above: Silty Sand	SM	4846
		0.0	64		Weathered Sandstone Bedrock: Very pale brown (10YR 7/4), moist, dense, no cels, interbedded layers of siltstone and sandstone		4990
7.0		0.0	55				4990
					Refusal on sandstone at 7.0' bgs		
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 5DN _{group3}	Location ID 100			
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 6-1-11/1518	Date/Time Total Depth Reached 6-1-11/1525			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50202) (1525)					
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/25/11					
Radiological Background 11		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05				00-13	Silt with sand, and (ca) (10YR, 3/4), dark brown, 65% silt, 30% fine to medium grained sand, 5% clay, trace gravel fill, dry, medium stiff, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 100
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 0820	Date/Time Total Depth Reached 6-23-11 0845
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50203 (0830)
Geologist C. Knight	Checked by/Date J. Robbins/Goldman 7/25/11		

Radiological Background 341 1/21/11 AR	Radiological Equipment Used Pancake / downhole / AR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	56			4052817
0.5			0.0	55	Silty Clay: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 30% silt, 5% fine sand, 65% clay, cohesive, medium plasticity, medium toughness	CL	3575
			0.0	55			4404
1.0			0.0	55			46246
			0.0	65			4674
2.0			0.0	50			4637
			0.0	41	2'6" Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 35% silt, 5% medium sand, 60% fine sand	SM	4581
3.0			0.0	50			4563
			0.0	45	3'3" weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	4347
4.0			0.0	75			4465
					Refusal on Sandstone @ 4.0 bgs		
					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN, group 3		Location ID 101	
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 5-31-11/1525		Date/Time Total Depth Reached 5-31-11/1535	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50204) (1535)			
Geologist C. Carmichael				Checked by/Date J. Robbins-Meldman 7/25/11			
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05				0.0 11	Sandy silt with clay, (1.0 YR, 3/3), dark brown, ^(ca) 55% silt, 30% fine to medium grained sand, 15% clay, trace asphalt; pieces of burnt wood, bungee cord, some charcoal, no plasticity or hardness, dry, medium stiff, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 101
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 0850	Date/Time Total Depth Reached 6-23-11 0920
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50205 (0900)
Geologist C. Knight		Checked by/Date J. Robbins Feldman 7/25/11	

Radiological Background 39 / 2789 / nR	Radiological Equipment Used Pancake / downhole / nR 1	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 (CPM)
			0.0	42	surface: soil analysis		3295
0.5			0.0	65	Fill Clay: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 5% fine sand, 5% silt, 5% fine angular fine gravel, 85% clay, cohesive, low plasticity, medium toughness, trace asphalt	AF CL	4228 4691
1.0			0.0	60	1' 8"		4814
2.0			0.0	64	Partly graded sand: Pale yellow (2.5Y 7/6), moist, medium dense, no odor, fine grained sand	SP	4705
			0.0	60	2' 5"		4781
3.0			0.0	56	weathered sandstone bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, fine grained sandstone, mechanically weathered to SP	SP	4684
			0.0	62			4814
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 5DN_group3		Location ID 102	
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 5-31-11/1318		Date/Time Total Depth Reached 5-31-11/1325	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50206) (1325)			
Geologist C. Carmichael				Checked by/Date J. Robbins/Goldman 7/25/11			
Radiological Background 13		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	12	Sand with clay, (10YR, 4/4), brown, 75% fine to medium grained sand, 25% clay, dry, medium dense, some rootlets, very low plasticity; hardness; no odor. No groundwater reached.	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 3	Location ID 102
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 1445	Date/Time Total Depth Reached 6-23-11 1525
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 50207 (1450) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J Robbins/Geldman 7/25/11		

Radiological Background 50 / 2953 / 11µR	Radiological Equipment Used Pancake / downhole / µR 1	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	55	Fill: silty clay; dark yellowish brown (10YR 4/4) moist, medium stiff, no odor, 20% silt, 80% clay, trace fine to medium gravel, medium plasticity, medium toughness, cohesive	AF	3396
1.0			0.0	60	1/4" Angular medium gravel (fill rock)	CL	4221
			0.0	70	1/4"		4604
2.0			0.0	55	Silty clay; dark yellowish brown (10YR 4/6) moist, medium stiff, no odor, 20% silt, 80% clay, medium plasticity, medium toughness, cohesive	CL	4067
			0.0	65			4104
			0.0	70			3985
3.0			0.0	55	Silty sand; yellowish brown (10YR 5/4) moist, dense, no odor, 35% silt, 65% fine sand	SM	4585
			0.0	50	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4) moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	4860
4.0			0.0	72			4821
					Refusal at 4' bgs on sandstone		
					No GW encountered		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 103			
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 5-31-11/1102	Date/Time Total Depth Reached 5-31-11/1110			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50208) (1110)					
Geologist C. Carmichael		Checked by/Date J. Robbins Yeldman 7/25/11					
Radiological Background 12		Radiological Equipment Used M Rater	PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.012	Sandy silt with clay, (10YR, 3/4), dark brown, 55% silt, 30% fine sand, 15% clay, trace sandstone/siltstone rock fragments, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50N - group 3	Location ID 103
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-24-11 0840	Date/Time Total Depth Reached 6-24-11 0930
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50209 (0850) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date J. Robbins/Goldman 7/25/11	

Radiological Background HD / 2534	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <i>AF: Artificial Fill</i> <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	63	Surface: grass and soil		2659
0.5			0.0	53	Fill: Clayey Silt: Brown (10YR 4/3), moist, medium stiff, no odor, 40% clay, 5% fine sand, 65% silt, low plasticity, low toughness, cohesive	AF / AL	3621
1.0			0.0	55			4511
			0.0	65	Fill: Silty Sand with clay: Pale brown (10YR 6/3), moist, medium dense, no odor, 30% silt, 20% clay, 5% gravel, 20% fine sand, 25% medium sand, mottled	AF / SM	4627
2.0			0.0	70			4602
			0.0	71			4808
3.0			0.0	55	3'0" Angular volcanic medium gravel	AF / SM	4945
			0.0	73	Same as above		5000
4.0			0.0	74	4'2" Sub-rounded medium gravel (fill rock)	AF / SM	4895
			0.0	71	Same as above		4825
					No Recovery		
5.0			0.0	65		AF / ML	4906
			0.0	65	Silt with clay: dark brown (10YR 3/3), moist, medium stiff, no odor, 10% clay, 5% fine sand, 85% silt, low plasticity, low toughness, cohesive		4854
6.0			0.0	80			4791

Radiological Background 40/2534				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 103	
Depth	Interval	Recovery	SPD	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	80		Same as above	ML	4791
		0.0	75		1/2" diameter red brick debris		4757
7.0		0.0	73		6" 11"		4729
		0.0	64		Weathered Sandstone bedrock: Olive brown (2.5 Y/3), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone.	SP	4778
8.0		0.0	66		Refusal on sandstone at 8.0' No GW encountered.		4663
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 5DNgroup3		Location ID 104	
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 5-31-11/1121		Date/Time Total Depth Reached 5-31-11/1130	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50210) (1130)		Geologist C. Carmichael			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0013	Sandy silt, (10 YR, 3/4), dark brown, 55% silt, 35% fine to medium grained sand, 10% gravel fill rock and asphalt, dry, medium stiff, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SDN group 3		Location ID 104	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0 Ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6-23-11 1415		Date/Time Total Depth Reached 6-23-11 1445	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected 50211 (1420)			
Geologist C. Knight				Checked by/Date J Robbins Goldman 7/25/11			
Radiological Background SI / 2857 / 11AR		Radiological Equipment Used Pancake / downhole / 1AR		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 is grass and soil		3315
0.5			0.0	70	Fill: Sandy silt: yellowish brown (10YR 5/4), dry, soft, no odor, 25% fine sand, 5% medium sand, 5% fine gravel, 65% silt, non cohesive, low plasticity, low toughness	AF / ML	4202
1.0			0.0	60			4557
			0.0	68	2'0" concrete debris, 1/4" thick		4408
2.0			0.0	58	2'0"		4444
			0.0	60	Fill: Clayey silt with sand: dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 20% clay, 10% fine sand, 70% silt, cohesive, low plasticity, low toughness, trace asphalt debris	AF / ML	4679
3.0			0.0	55	3'1" trace schist gravel		4755
			0.0	64	Silty clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 35% silt, 65% clay, cohesive, medium plasticity, medium toughness	CL	4818
4.0			0.0	65			4803
			0.0	65	Weathered Sandstone Bedrock: light olive brown (2.5Y 5/6), moist, dense, no odor, fine grained sandstone		4759
5.0			0.0	58	Refusal on sandstone at 5.0' bgs No GW encountered	BS	4854
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 105			
Drilling Company HGL		Driller J. Morse	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A	Date/Time Drilling Started 6-1-11/1325	Date/Time Total Depth Reached 6-1-11/1332			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50212) (1332)					
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/2/11					
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5				0.0/12	Silt with sand and clay, (10YR, 3/4), dark brown, 60% silt, 25% fine to medium grained sand, 15% clay, trace gravel fill, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDA group 3	Location ID 105
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 1515	Date/Time Total Depth Reached 6-23-11 1550
Type of Sampling Device 1 3/4" Macrocore	Samples Collected () 1/2 gallon bags	50213 (1520)	
Geologist C-Knight	Checked by/Date J. Robbins/Goldman 7/25/11		

Radiological Background 56 / 2787 MAR	Radiological Equipment Used Pancake / downhole / microR	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 (CPM)
			0.0	36	Surface: Soil and grass		3484
0.5			0.0	53	Fill: Sandy silt with clay; dark yellowish brown (10YR 4/4), dry, medium dense, no odor, 15% clay, 25% fine sand, 5% medium sand, 55% silt, cohesive, low plasticity, low toughness, trace angular fine gravel	AF / ML	4425
1.0			50	4783			
			0.9	63			4647
2.0			0.2	80			4559
			0.0	69			4672
3.0			0.0	50	Fill: Clay with silt; Brown (10YR 4/3), moist, medium stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness	AF / CL	4665
			0.0	46			4519
4.0			0.0	54			4559
			0.0	43			4460
5.0			0.0	57	Well graded gravel with sand: Greenish gray (Gley) 5/10Y, dry, dense, no odor, ^{CU} 15% fine sand, 5% medium sand, 30% subrounded gravel coarse, 30% medium subrounded gravel, 20% fine subrounded gravel, granitic gravel	AF / GW	4574
			0.0	60			4422
6.0			0.0	62			4630

Refusal at 6' bgs on gravel
no GW encountered

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 106			
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 6-1-11/1340	Date/Time Total Depth Reached 6-1-11/1348			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50214) (1348.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Medman 7/25/11					
Radiological Background 11		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0-12	Silt with sand and clay, (10YR, 3/3), dark brown, 65% silt, 20% fine to medium grained sand, 15% clay, trace gravel fill, dry, medium stiff, common rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 3	Location ID 106
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 1130	Date/Time Total Depth Reached 6-23-11 1215
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50215 (1140)
Geologist C. Knight	Checked by/Date J. Robbins Medman 7/22/11		

Radiological Background 47 / 2807 / (uR)	Radiological Equipment Used Pancake / downhole / uR	PID Used Mini Rae 2000 (Bkgd: 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)
			0.0	53	Surface: grass and soil		3573
0.5			0.0	62	Fill: Sandy silt with clay: Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 5% medium sand, 20% fine sand, 15% clay, 60% silt, trace angular medium gravel (fill rock), cohesive, low plasticity, low toughness, mottled	AF / ML	4410
1.0		0.0	45	4659			
		0.0	40	4842			
2.0		0.0	53	4832			
			0.0	83			4736
3.0			0.0	75			4743
			0.0	95	4'0" subrounded volcanic medium gravel		4561
4.0			0.0	70	4'0" Fill: Silty clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 20% silt, 5% fine sand, 75% clay, cohesive, low plasticity, medium toughness	AF / CL	4715
			0.0	60	4696		
5.0			0.0	60	Angular medium and fine gravel layer 3" thick	CIC	444695
			0.0	75	Silty Sand: light olive brown (2.5Y 5/4), moist, medium dense, no odor, 20% silt, 80% fine sand, some CaCO ₃ stringers, Iron oxide staining	AF / SM	4639
6.0			0.0	90			4364

Radiological Background 47/2807/11/18				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 106	
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	9.0		Same as above 5M	5M	4364
		0.0	7.2				4356
7.0		0.0	8.5				4364
		0.0	7.5				4371
8.0		0.0	5.8				4519
		0.0	5.5			4708	
9.0		0.0	8.5		4'3" Poorly graded sand; light to live brown (2.54 5/16) moist, medium dense, no odor, 5% coarse sand, 10% medium sand, 85% fine	SP	4825
		0.0	8.2			4'6"	SM
10.0		0.0	8.5		Same as above 5' section with abundant CaCO ₃ stringers		4529
Total Depth 10.0' bgs No G.W. encountered							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 107			
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 6-1-11/1402	Date/Time Total Depth Reached 6-1-11/1410			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50216) (1410)					
Geologist C. Carmichael		Checked by/Date J. Robbins, Goldman 7/25/11					
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0.012	Silty sand with clay, (10YR, 4/4), brown, 55% fine to medium grained sand, 30% silt, 15% clay, some rootlets, dry, medium dense, trace gravel fill; no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 107
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.5 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 1100	Date/Time Total Depth Reached 6-23-11 1125
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50217 (1110)
Geologist C. Knight	Checked by/Date J. Robbins Goldman 7/25/11		

Radiological Background 45 / 2994 / 114R	Radiological Equipment Used Pancake / downhole / 4R	PID Used Mini Rae 2000 (Bkgd: 20 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	Surface: grassland soil		3120
0.5			0.0	67	Fill: Clayey silt: yellowish brown (10YR 5/6), clay, medium stiff, no odor, 30% clay, 5% fine sand, 5% angular medium volcanic (fill rock) gravel, 60% silt, cohesive, low plasticity, low toughness	AF/ML	4409
1.0			0.0	50			5007
			0.0	63			5008
2.0			0.0	75	2'3" volcanic gravel medium size		4994
			0.0	65	2'3" silty clay: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 25% silt, 5% fine sand, 70% clay, cohesive, medium dense, etc	CL	4985
3.0			0.0	58			4720
			0.0	53	3'6" Sandy silt: light yellowish brown (2.5Y 6/3), moist, medium stiff, no odor, 40% fine sand, 60% silt, slow dilatancy		4713
4.0			0.0	66	4'4" Weathered Sandstone Bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	ML	4746
			0.0	68			4910
5.0					Refusal on sandstone at 4.5 No GW encountered		
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 108			
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 6-1-11/1423	Date/Time Total Depth Reached 6-1-11/1435			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50218) (1435)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/25/11					
Radiological Background II		Radiological Equipment Used M 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	12	Sandy silt, (10 YR, 4/4), brown, 60% silt, 35% fine to medium grained sand, dry, some rootlets, medium stiff, trace gravel fill, no plasticity or hardness, no odor. No groundwater reached.	ML	



5DN_108

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 3	Location ID 108
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 1030	Date/Time Total Depth Reached 6-23-11 1050
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50219 (1040) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins Yaldema 7/25/11		

Radiological Background 55 / 2832 / NR	Radiological Equipment Used Pancake / downhole / NR	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 grass + soil		105' 2832
0.5			0.0	62	Fill: Silty clay sand: dark yellowish brown (10YR 4/4) moist, med. stiff, no odor, 35% silt, 5% fine sand, 60% clay, cohesive, low plasticity, medium toughness, trace fine quartzite gravel, mottled	AF / CL	3371
1.0			0.0	59			4485
			0.0	55			4894
2.0			0.0	60	2' weathered Sandstone Bedrock: olive yellow (2.5Y 6/6) moist, dense, no odor, mechanically weathered to SP, fine grained sandstone		4927
			0.0	56			4858
3.0					Refusal on Sandstone at 2.5' bgs No GW encountered		4919
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DNgroup3		Location ID 109	
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 6-1-11/1457		Date/Time Total Depth Reached 6-1-11/1505	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50220) (1505)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/25/11					
Radiological Background 12		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'				0.0 12	Silt with sand and clay, (10YR, 3/3), dark brown, 70% silt, 15% fine to medium grained sand, 15% clay, some rootlets, dry, medium stiff, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SDN Group 3		Location ID 109	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 4.5 Ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6-23-11 0955		Date/Time Total Depth Reached 6-23-11 1020	
Type of Sampling Device 1 3/4" Macrocore		Samples Collected 50221 (1000) (1) 1/2 gallon bags					
Geologist C. Knight		Checked by/Date J. Robbins Goldman 7/25/11					
Radiological Background 40 / 2850 / 111R		Radiological Equipment Used Pancake / downhole / 11R		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					Surface: soil and grass		10.5' 2850
0.5			0.0	55	Fill: Silty clay; dark yellowish brown (10YR 3/6) moist, medium stiff, no odor, 30% silt, 5% fine sand, 65% clay, cohesive, low plasticity, medium toughness, mottled.	AF/CL	3184
			0.0	70			4412
1.0			0.0	74	1'3" Clay: dark yellowish brown (10YR 3/6); moist, medium stiff, no odor, 5% fine sand, 5% silt, 90% clay, cohesive, medium plasticity, medium toughness.	CL	4786
			0.0	80			4905
2.0			0.0	58	2'6" weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4) moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	B Siltstone	4934
			0.0	90			4770
3.0			0.0	70	Weathered Sandstone Siltstone Bedrock: Pale yellow (2.5Y 7/4) dry, dense, no odor, mechanically weathered to ML, inter bedded siltstone beds	B Siltstone	4674
			0.0	85			4795
4.0			0.0	75	Refusal on Siltstone at 4.5'		5109
			0.0	80			5281
5.0					No GW encountered		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 110			
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 5-31-11/1544	Date/Time Total Depth Reached 5-31-11/1555			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50222) (1555)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/25/11					
Radiological Background II		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'					Sandy silt, (10YR, 3/3), dark brown, 60% silt, 30% fine to medium grained sand, 10% clay, trace sandstone rock fragments and asphalt pieces, dry, medium stiff, common rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SPN group 3		Location ID 110	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 5.0 ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6-23-11 0920		Date/Time Total Depth Reached 6-23-11 0945	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected 50223 (0930)			
Geologist C. Knight				Checked by/Date J. Robbins Goldman 7/25/11			
Radiological Background SD 12801 / 14MB		Radiological Equipment Used Pancake / downhole / MR 1		PID Used Mini Rae 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)		2801 (CPM)
					Surface grass and soil		
0.5			0.0	55	<p>Fill: Silty clay: Yellowish brown (10YR 5/4) moist, medium stiff, no odor, 5% angular medium gravel, 35% silt, 60% clay, cohesive, medium plasticity, medium toughness, gravel is quartzite (fill rock), mottled</p>	AF, CL	3292
			0.0	72			4336
1.0			0.0	90			4762
			0.0	86			4638
2.0			0.0	100			4740
			0.0	92			4602
3.0			0.0	90			4693
			0.0	85			4928
4.0			0.0	93			4891
			0.0	85			4909
5.0			0.0	75	4815	SM	
					<p>4'2" Silty sand: Yellowish brown (10YR 5/8), moist, dense, no odor, 10% coarse sand, 10% medium sand, 55% fine sand, 25% silt,</p> <p>4'10" Weathered Sandstone Bedrock: Olive yellow (2.5Y 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone</p>		
					<p>Refusal on sandstone at 5.0' bgs</p> <p>No GW encountered</p>		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 111			
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 5-31-11/1341	Date/Time Total Depth Reached 5-31-11/1350			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50224) (1350)					
Geologist C. Carmichael		Checked by/Date J. Robbins, J. Feldman 7/25/11					
Radiological Background 12		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				QA13	Sand with clay, (10 YR, 3/4), dark brown, 80% fine to medium grained, 20% clay, dry, medium dense, common rootlets, very low plasticity and hardness, no odor. No groundwater reached	SC	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDM group 3	Location ID 111
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-22 11/1454	Date/Time Total Depth Reached 6-22 11/1505
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags #50225 (1525)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Feldman 9/8/11		

Radiological Background 531-599	Radiological Equipment Used Pancake/downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	RND	Radiological	Description	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			2594		Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)			0.5 - 2751
0.5			0.0	62	Silt with clay and sand, (10 YR, 3/4), dark reddish brown, 70% silt, 15% clay, 15% fine sand, dry, soft, some rootlets in top 1", very low plasticity and hardness, no odor, some speckles.	ML/A	4104	0 - 3032
1.0				75			4748	
				78	1.75' Gradational Contact		4730	
2.0				74	Clay with silt and sand, (10 YR, 3/3), dark brown with some speckles, 70% clay, 20% fine to medium grained sand, 10% silt, dry, medium stiff, low-medium plasticity and hardness, no odor.	CL/A	4812	
				76			4539	
3.0				84			4520	
				83			4684	
4.0				74			4623	
				65			4768	
5.0				83			4775	
				46	5.5' Gradational Contact		4725	
6.0				84	Sand with clay, (10 YR, 5/4), orangeish-brown, 80% fine to medium grained sand, 20% clay, dry, medium dense, some speckles, no plasticity and hardness, no odor.	SC	5085	

Radiological Background 53/1599				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 5DN-111	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
					(Same as above)	SC	
7'			0.083	6.5'	Weathered sandstone (10 YR, 6/4), beige, 100% fine to medium grained sand, dry, dense, no plasticity or hardness, no odor.	SP	5083
				76			5304
				85			5527
8'					Refusal hit at 7.5' - bedrock No GW reached.		

Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group} ³	Location ID 112
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 5-31-11/1439	Date/Time Total Depth Reached 5-31-11/1450
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50226) (1450)		
Geologist C. Carmichael	Checked by/Date J. Robbins Yeldman 7/25/11		

Radiological Background 3	Radiological Equipment Used M R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.012	Sandy silt with clay, (10YR, 3/3), dark brown, 70% silt, 15% fine to medium grained sand, 15% clay, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 112
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-22-11/1126	Date/Time Total Depth Reached 6-22-11/1132
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags #50227 (1200)		
Geologist C. Carmichael	Checked by/Date J. Robbins-Maldman 7/25/11		

Radiological Background 56 / 2659	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgsd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
			0.0	62			0.5	2795
0.5			0.0	46	Clay with silt and sand, (10YR, 3/2), dark greyish brown, 75% clay, 15% fine sand, 10% silt, trace gravel fill rock, dry, medium stiff, trace vegetation and rootlets, low plasticity and hardness, no odor.	CL / AF	4210	
1.0				75			4562	
				7.8	1.5' Gradational Contact		4623	
2.0				74	Clay with sand, (10 YR, 3/3), dark brown, speckles, 85% clay, 15% fine sand, dry, medium stiff, low-medium plasticity and hardness, no odor.	CL / AF	4692	
				76			4709	
3.0				84			4663	
				83			4718	
4.0				74			4723	
				65			4623	
5.0				83			4909	
				46	Gradational Contact		5052	
6.0			N	84	Sandy clay, (10 YR, 3/6), dark reddish-brown with speckles, semi-moist, very low hardness and plasticity, 60% clay, 40% fine to medium grained sand, no odor.	CL	4944	

Radiological Background				Project Name	Project Number	Location	
56/2659				SSFL Area IV Radiological Study	EP9038.01.22.04.03	SDN-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
							Inches
7'			0.0	83	Sand with clay (10 YR, 7/6), light orangish brown, 80% fine to medium grained sand, 20% clay, some CaCO ₃ stringers, dry, dense, no plasticity or odor or hardness.	SC	4897
				76			4923
8'				7.25'	Weathered bedrock - (10 YR, 6/6), beige, 100% fine to medium grained sand, dry, dense, no odor. Refusal hit at 7.5' - bedrock No GW reached.	SP	4813
				85			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 113			
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 5-31-11/1422	Date/Time Total Depth Reached 5-31-11/1430			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50228) (1430)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Goldman 7/25/11					
Radiological Background 13		Radiological Equipment Used M/R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	11	Silt with sand and clay, (10 YR, 3/3), dark brown, 60% silt, 25% fine to medium grained sand, 15% clay, dry, medium stiff, common rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 3	Location ID 113
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-21-11 1500	Date/Time Total Depth Reached 6-21-11 1525
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50229 (1510) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins Melman 7/25/11		

Radiological Background 55 / 2801	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	56	AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) Surface: soil and grass		2745
0.5			0.0	65	Fill: Silty Clay: Yellowish brown (10YR 5/4) slightly moist, medium dense, no odor, 30% silt, 5% fine sand, 5% angular medium gravel, 60% clay, trace roots and rootlets, mottled	AF / CL	4017
1.0		0.0	68	4272			
		0.0	72	1' 10" Concrete debris ~ 1/4" diameter			4499
2.0		0.0	55	Silty clay: Brown (7.5YR 4/4) moist, medium stiff, no odor, 25% silt 5% fine sand, 70% clay, cohesive, medium plasticity			4471
			0.0	56			4658
3.0			0.0	62			4631
			0.0	60			4550
4.0			0.0	54			4744
			0.0	45			4653
5.0			0.0	45	Same as above	CL	4549
			0.0	61	5' 3" Silty Sand: Yellowish brown (10YR 5/6) moist, medium stiff, no odor, 35% silt, 65% fine sand, some CaCO ₃ stringers	SM	4580
6.0			0.0	55			4526

Radiological Background 55 / 2801				Project Name SSFL 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)
6.0		0.0	55		Silty sand: same as above	SM	4526
		0.0	76				4634
7.0		0.0	73		6'10" weathered sandstone: light olive brown (2.5Y 5/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace siltstone, trace CaCO ₃ stringers.		4898
		0.0	63				5244
8.0					Refusal on sandstone at 2.5' bgs		
					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 5DN, group 3		Location ID 114	
Drilling Company HGL		Driller J. Morse		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 5-31-11/1502		Date/Time Total Depth Reached 5-31-11/1510	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50230) (1510)					
Geologist C. Carmichael		Checked by/Date J. Robbins-Meldman 7/25/11					
Radiological Background 11		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0.012	Sandy silt, (10 YR, 4/3), brown, 60% silt, 30% fine to medium grained sand, 10% clay, trace gravel fill, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 114
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-22-11/1410	Date/Time Total Depth Reached 6-22-11/1420
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags #50231 (1435)		
Geologist C. Carmichael	Checked by/Date J Robbins, Goldman 7/25/11		

Radiological Background 49 / 2567	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgr: 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	AF: Artificial Fill		0.5	2873	
0.5			0.0	46	Silt with clay and sand, (10 YR, 4/4), brown, 70% silt, 15% clay, 15% fine sand, trace rootlets in top 1', soft, dry, very low plasticity and hardness, no odor, trace gravel fill rock.	ML / AF			
1.0				75	Same as above, except w/spreckles			0	3061
				78					
2.0				74					
				76					
3.0				84	Gradational Contact				
				83	Clay, to (10 YR, 3/3), dark brown with speckles of white and red, 95% clay, 5% fine sand, dry, medium stiff, medium plasticity and hardness, no odor.	CL / AF			
4.0				74					
				65					
5.0				83					
				46					
6.0				84					

Radiological Background 49/2567				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 5DN-114	
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)
7'			0.0	83	Clayey sand, (10YR, 5/6) light orangeish brown, 70% fine to medium grained sand, 30% clay, dry, medium dense, no plasticity or odor, gradually getting sandier...	SC	4811
				76			5011
				85	Weathered bedrock - 95% fine to medium sand, 5% clay, dense, no odor.	SP	5022
8'					Refusal hit at 7.5' - bedrock		
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 115
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-22-11/1039	Date/Time Total Depth Reached 6-22-11/1055
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags #50232 (1105)		
Geologist C. Carmichael	Checked by/Date J. Robbins Hedman 7/25/11		

Radiological Background 51 / 2555	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	(CPM)
					AF: Artificial Fill		0.5	2859
0.5			0.0	63	Clay with silt, (10YR, 4/3), brown, 80% clay, 15% silt, 5% gravel fill rock, dry, medium stiff, trace rootlets in top 2-3", low-medium plasticity & hardness, no odor.	CL / AF		
1.0				55	Gradational Contact			
				63	Clay with sand, (10YR, 3/4), dark reddish-brown with speckles, 80% clay, 20% fine grained sand, dry, medium stiff-stiff,	CL / AF		
2.0				59				
				54				
3.0				66				
				71				
4.0				72	4' Same as above, except 75% clay, 25% fine sand.			
				97				
5.0				74	5' Gradational Contact			
				65	Sand with clay, (10YR, 5/6) light reddish-brown with CaCO ₃ stringers, 75% fine to medium grained sand, 25% clay, dry, medium dense, no plasticity or hardness, no odor.	SC		
6.0				77				

Radiological Background 51/2555				Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location SDN-115	
Depth	Interval	Recovery	PID	Radiological	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)
					Sand, C10YR, 8/2, light beige, 95% fine to medium grained sand, 5% silt, dry, dense, no plasticity, hardness or odor.	SP	4841
				76			
				71	Weathered bedrock		4715
7'					Refusal at 7' - bedrock		
					No GW encountered.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 116
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 0930	Date/Time Total Depth Reached 6-28-11 0955
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50233 (0940)
Geologist C. Knight	Checked by/Date Julian Robbins/Geldman 9/8/11		

Radiological Background Si / 2740	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface: soil and grass		+0.5' 2979
0.5			0.0	53	Fill: Silty Sand: Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 35% silt, 52% coarse sand, 15% medium sand, 5% angular medium gravel (fill rock), 40% fine sand, mottled	AF / SM	3492
			0.0	54			4583
1.0			0.0	59	10" Fill: Silty Sand with clay: Brownish yellow (10YR 6/6), moist, medium dense, no odor, 10% clay, 25% silt, 10% medium sand, 55% fine sand, mottled	AF / SM	5031
			0.0	60			5265
2.0			0.0	59			5254
			0.0	65			5242
3.0			0.0	67	2' 10" Fill: Silty Clay with Sand: Brown (10YR 5/3), moist, medium stiff to stiff, no odor, 30% silt, 52% medium sand, 20% fine sand, 45% clay, low plasticity, medium toughness, cohesive, mottled	AF / CL	5277
4.0					Refusal silty clay at 3' bgs No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 3	Location ID 117
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 5-27-11/1037	Date/Time Total Depth Reached 5-27-11/1050
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (# 50234) (1050.)	Checked by/Date Ludlow Robbins/Goldman 9/8/11	
Geologist C. Carmichael		PID Used Mini Rac 2000 (Background: 0.0 ppm)	

Radiological Background 13	Radiological Equipment Used w/ R meter
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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	13	Clayey silt, (10YR, 3/4), reddish-brown, 65% silt, 30% clay, 5% fine to medium grained sand, dry, medium stiff, common rootlets; low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 117
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-20-11 1405	Date/Time Total Depth Reached 6-20-11 1435
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50235 (1410) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins Goldman 7/25/11		

Radiological Background 45 / 2624	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 00 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			0.0	57	Surface: soil and grass			2780
0.5			0.0	61	Clay: dark yellowish brown (10YR 3/6) moist, medium stiff, no odor, 5% silt, 5% fine sand, 90% clay, medium plasticity, medium toughness, cohesive	CL		3689
1.0			0.0	62				4307
			0.0	60				4527
2.0			0.0	65				4612
			0.0	66				4606
3.0			0.0	62				4594
			0.0	65		4711		
4.0			0.0	71	3'10" Silty Sand: strong brown (7.5YR 4/6) moist, medium dense, no odor, 30% silt, 70% fine sand	SM		4714
			0.0	71			4649	
5.0			0.0	73			4578	
			0.0	63			4395	
6.0			0.0	74	contact 6'0"			4196

Radiological Background 45/2629				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 117		
Depth	Interval	Recovery	PID	Radiological	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			7.0	71	Poorly graded sand: yellowish brown (10YR 5/6), moist, medium dense, no odor, fine sand	SP		4196
			8.0	95				4475
7.0			9.0	73	6'10" weathered sandstone bedrock: light olive brown (2.5Y 5/4), moist, very dense, no odor, mechanically weathered to SP, fine grained sandstone	SP		4533
8.0								
9.0								
10.0								
11.0								
12.0								
13.0								

Refused on sandstone at 7.0' bgs
no GW encountered

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 118			
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 5-27-11/1104	Date/Time Total Depth Reached 5-27-11/1111			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50236) (1110.)					
Geologist C. Carmichael		Checked by/Date Julian Robbins/Goldman 9/8/11					
Radiological Background 14		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 14	Silt with sand and clay, (10YR, 4/3), brown, 70% silt, 15% fine sand, 15% clay, dry, medium stiff, common rootlets, low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 118
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-20-11 1440	Date/Time Total Depth Reached 6-20-11 1515
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50237 (1450)
Geologist C. Knight		Checked by/Date J. Rehm/Alldman 7/25/11	

Radiological Background 43 / 2400	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 00 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					Surface: soil and grass		405 2694 (CPM)
0.5			0.0	56	Clay: dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 5% silt, 5% fine sand, 90% clay, cohesive, medium plasticity, medium toughness	CL	2851
			0.0	60		4332	
1.0			0.0	65		4677	
			0.0	65		4766	
2.0			0.0	64		4640	
			0.0	64		4622	
3.0			0.0	63		4791	
			0.0	65		4661	
4.0			0.0	56		4708	
			0.0	54	Same as above	CL	4826
5.0			0.0	54	4' 10" Silty sand & light brown (7.5YR 6/4), moist, medium dense, no odor, 35% silt, 65% fine sand, unconsolidated with CaCO ₃ stringers	SM	4730
			0.0	47		4444	
6.0			0.0	55		4481	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 3	Location ID 119			
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 5-27-11/1139	Date/Time Total Depth Reached 5-27-11/1150			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50238) (1150)					
Geologist C. Carmichael		Checked by/Date J. Robbins Meldman 7/25/11					
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	14	Silt with clay and sand, (10YR, 3/3), dark brown, 70% silt, 15% clay, 15% fine to medium grained sand, trace sandstone fragments and asphalt, dry, medium stiff, low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SDN Group 3		Location ID 119	
Drilling Company: Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 7.5 Ft. bgs	
Drilling Equipment Geo probe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6-20-11 1525		Date/Time Total Depth Reached 6-20-11 1555	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected 50239 (1530) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date J. Robbins, J. Aldman 7/25/11			
Radiological Background 51 / 2805		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					surface (soil and grass)		205' 2627
			0.2	45			2842
0.5			0.0	53			4132
1.0			0.0	56	Clay: dark to bluish brown (10YR 3/6), moist, medium stiff, no odor, 5% fine sand, 5% silt, 90% clay, cohesive, medium plasticity, medium toughness, ^{trace} fine hole pores and rootlets	CL	4644
			0.0	60		4793	
2.0			0.0	58		4681	
			0.0	58		4768	
3.0			0.0	57		4658	
			0.0	57		4660	
4.0			0.0	50		4633	
			0.0	57		4922	
5.0			0.2	59		4744	
			0.0	48		5' 6"	SM
6.0			0.0	44	Silty Sand: strong brown (7.5 YR 4/6), moist, medium dense, no odor, 30% silt, 70% fine sand	SM	500

Radiological Background				Project Name	Project Number	Location	
SM/2505				SSPL Area IV Radiological Study	EP9034.01.22.04.03	119	
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)
6.0			60	44	Same as above	SM	5009
			60	44	6'5" Weathered Sandstone and siltstone: light olive brown (2.5Y 5/6) moist, dense, no odor, interbedded	SP-1000	4857
7.0			60	48	Siltstone and sandstone beds.		5106
			60	71			5255
8.0					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 5DN group 3	Location ID 120
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 5-27-11/ 1121	Date/Time Total Depth Reached 5-27-11/ 1130
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50240) (1130)		
Geologist C. Carmichael	Checked by/Date J. Robbins Maldman 7/26/11		

Radiological Background 14	Radiological Equipment Used w/ R meter	PID Used Mini Rac 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	Borehole Gamma Readings (CPM)
0.5'			0.0	14	Silt with clay, (10YR, 3/3), dark brown, 75% silt, 20% clay, 5% fine to medium grained sand, dry, common rootlets, medium stiff, low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SPN group 3		Location ID 120		
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 7.5' Ft. bgs		
Drilling Equipment Geo probe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6-21-11 0830		Date/Time Total Depth Reached 6-21-11 0910		
Type of Sampling Device 1 3/4" Macrocore				Samples Collected (1) 1/2 gallon bags		50291 (0840)		
Geologist C. Knight				Checked by/Date J. Robbins-Meldman 7/26/11				
Radiological Background 45 / 2791		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)	
					Surface: grass and soil		10.5' 2810	
0.5			0.0	40	Clay: dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 5% fine sand, 5% silt, 90% clay, cohesive, medium plasticity, medium toughness	CL	2904	
			0.0	47			4138	
1.0			0.0	58			4632	
			0.0	53			4823	
2.0			0.0	59			4688	
			0.0	46			4601	
3.0			0.0	48			4600	
			0.0	47			4758	
4.0			0.0	49			Same as above	4704
			0.0	47			4929	
5.0			0.0	58	Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand	SM	5039	
			0.0	49			5180	
6.0			0.0	46			5207	

Radiological Background 45/2791					Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 120
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
							(CFM)
6.0		0.0	46		Same as above: 15% silt, 85% fine sand	SM	5207
		0.0	50		Weathered sandstone and siltstone bedrock; olive yellow (2.5Y 6/6), dry, no odor, dense, mechanically weathered to SP and ML, interbedded sandstone and siltstone beds etc	SM	5065
7.0		0.0	52				5003
		0.0	55				4790
8.0					Refusal on sandstone at 7.5 lbs 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 5DNgroup3		Location ID 121	
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 5-31-11/1033		Date/Time Total Depth Reached 5-31-11/1040	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50242) (1040)			
Geologist C. Carmichael				Checked by/Date J. Robbins/Meldman 7/26/11			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	13	Silty sand, (10YR, 3/4), dark brown, 60% fine to medium grained sand, 30% silt, 5% clay, 5% sandstone fragments and gravel fill rock, dry, medium dense, some rootlets, no odor. No groundwater reached.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 121
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 9.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-21-11 0910	Date/Time Total Depth Reached 6-21-11 0940
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		S0243 (0920)
Geologist C. Knight		Checked by/Date J Robbins Melder 7/26/11	

Radiological Background 59 / 2792	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	45	Surface: Soil and gravel		2996
0.5			0.0	58	Clay: dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 5% finesand, 5% silt, 90% clay, cohesive, medium stiff, medium toughness	CL	418.6
1.0			0.0	60			4528
			0.0	62			4596
2.0			0.0	50			4681
			0.0	71			4736
3.0			0.0	68			4689
			0.0	65			4653
4.0			0.0	55			4622
			0.0	52	Same as above: CL	CL	4836
5.0			0.0	66	5'6" silty sand yellowish brown (10YR 5/4), moist, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand	SM	4991
			0.0	58			4984
6.0			0.0	57			5023

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN	Location ID 122				
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 5-27-11/0921	Date/Time Total Depth Reached 5-27-11/0930				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50244) (0930)						
Geologist C. Carmichael		Checked by/Date J. Robbins Maldman 7/26/11						
Radiological Background 14		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5				0.014	Clayey silt with sand, (10 YR, 3/3), brown, 55% silt, 30% clay, 15% fine grained sand, dry, medium stiff, some rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 122
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-23-11 1115	Date/Time Total Depth Reached 6-23-11 1210
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50245 (1120)		
Geologist C. Knight	Checked by/Date J. Robbins Yeldman 7/26/11		

Radiological Background 53/2527	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	60	Surface soil and gravel		2588
0.5			0.0	65	clay: Dark brown (10YR 3/3), moist, medium stiff, no odor, 5% silt, 95% clay, cohesive, medium plasticity, medium toughness	CL	4198
1.0			0.0	54			4588
			0.0	58			4611
			0.0	54			4552
2.0			0.0	55			4677
			0.0	45			4562
			0.2	44			4663
4.0			0.0	45			4605
			0.0	60			4475
			0.2	55			4542
5.0			0.0	70	Same as above	CL	
			0.0	70	Clayey silt with sand; light olive brown (2.5Y 5/3), moist, medium stiff, no odor, 20% clay, 15% fine sand, 65% silt, cohesive, low plasticity, low toughness, abundant CaCO ₃ stringers and nodules	ML	4268
6.0			0.0	51			3958

Radiological Background 53/2527				Project Name SSPL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 122	
Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
						feet	(CPM)
6.0			0.6	57	Same as above	ML	3958
			0.0	55			3912
7.0			0.2	95			3964
			0.0	60	7'4" weathered Sandstone Bedrock: light yellowish brown (2.5Y 6/4), moist, dense, no color, mechanically weathered to SP, fine grained Sandstone	Bedrock	4414
8.0							
9.0					Refusal at 7.5' hys on sandstone 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 5DNgroup3		Location ID 123	
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 6-1-11/1013		Date/Time Total Depth Reached 6-1-11/1022	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall. bag (#50246) (1020)					
Geologist C. Carmichael		Checked by/Date J. Robbins-Maldman 7/27/11					
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.012	Sandy silt, (10YR, 3/3), dark brown, 70% silt, 30% fine sand, dry, soft, some rootlets, no plasticity or hardness, no odor. No groundwater reached	ML	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SPN group 3	Location ID 23
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-27-11 1420	Date/Time Total Depth Reached 6-27-11 1455
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 10 1/2 gallon bags	50247 (1430)	
Geologist C. Knight	Checked by/Date L. Robbins-Maldman 8/18/11		

Radiological Background 45 / 2812 / 12mR	Radiological Equipment Used Pancake / downhole / mR	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		10.5' 2812 (CPM)
0.5			0.0	58			3101
			0.0	67	Clayey silt; dark yellowish brown (4/4), dry, medium stiff, no odor, 5% fine sand, 15% clay, 80% silt, low plasticity, low toughness, cohesive	ML	4207
1.0			0.0	54			4739
			0.0	68			4814
2.0			0.0	54			4817
			0.0	52			4937
3.0			0.0	78	2' 7" weathered sandstone bedrock: light yellowish brown (2.5/6/4), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone	BRK	5058
			0.0	85			5096
4.0					Refusal on sandstone at 3.5'		
					No GW encountered		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DNgroup3		Location ID 124	
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 6-1-11/1036		Date/Time Total Depth Reached 6-1-11/1045	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50248) (1045.)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Goldman 7/26/11					
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	12	Sandy silt, (10YR, 3/3), dark brown, 70% silt, 30% fine to medium grained sand; dry, stiff, some rootlets, trace charcoal, no plasticity and hardness, no odor. No groundwater reached.	ML	



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 125			
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 5-31-11/1012	Date/Time Total Depth Reached 5-31-11/1020			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50250) (1020)					
Geologist C. Carmichael		Checked by/Date J. Robbins Yulman 7/26/11					
Radiological Background 12		Radiological Equipment Used M/R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'				0.0 12	Clayey sand, (10YR, 3/4), dark brown, 70% fine sand, 30% clay, some rootlets, dry, medium dense, Very low plasticity and hardness, no odor. No groundwater reached.	SC	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 125
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-21-11 1000	Date/Time Total Depth Reached 6-21-11 1035
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 5025J (1010)		
Geologist C. Knight	Checked by/Date J Robbins Goldman 7/26/11		

Radiological Background 53 / 2677	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
			0.0	45	Surface: soil and grass		2976
0.5			0.0	67	Clay: dark yellowish brown (10YR 3/6), moist medium stiff, no odor, 5% silt, 5% fine sand, 90% clay, cohesive, medium plasticity, medium toughness, trace fine angular gravel (sandstone), trace rootlets near surface	CL	4015
1.0			0.0	53			4566
			0.0	68			4722
2.0			0.0	54			4600
			0.0	66			4727
3.0			0.0	72	3'6" Silty Clay: strong brown (7.5YR 4/6), moist, medium stiff, no odor, 35% silt, 5% fine sand, 60% clay, medium plasticity, low toughness, cohesive	CL	4543
			0.0	86			CK 4643 4654
4.0			0.0	75			CK 4808 4693
			0.0	82			CK 4896 4808
5.0			0.0	55			CK 4944 4896
			0.0	65			4944
6.0			0.0	89	5'10" cont next page	SM	4842

Radiological Background 53/2677				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 125		
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	0.0	89	Silty Sand: Reddish brown (5YR 5/4), moist, medium dense, no odor, 30% silt, 5% medium sand, 65% fine sand, some CaCO ₃ stringers, trace pinhole pores lined with CaCO ₃	SM		4842
		0.0	0.0	73				4919
7.0		0.0	0.0	51				4882
		0.0	0.0	75				4830
		0.0	0.0	82				4787
8.0		0.0	0.0	55	8'8" lens 7'9" CaCO ₃ lense ^{lens} 1/4" thick			5046
9.0		0.0	0.0	66	Weathered Sandstone Bedrock: Brownish yellow (10YR 6/6), moist, dense, no odor, mechanically weathered to SP, fine grained sandstone.	SP/SL		5052
		0.0	0.0	86				5183
10.0		0.0	0.0	75				5472
Total Depth 10.0' by 5'								
NO GW encountered								

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 126				
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 6-1-11/1108	Date/Time Total Depth Reached 6-1-11/1116				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50252) (1115)						
Geologist C. Carmichael		Checked by/Date J. Robbins, J. Waldman 7/26/11						
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.6 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
05				0013	Sandy silt, (10 YR, 3/4), dark brown, 65% silt, 35% fine to medium grained sand, common rootlets, dry, medium stiff, no plasticity or hardness, no odor. No groundwater reached.	ML		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Group 3	Location ID 126
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -1'9" Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-27-11 15 30	Date/Time Total Depth Reached 6-27-11 1605
Type of Sampling Device 1 3/4" MacroCore	Samples Collected (1) 1/2 gallon bags 50253 (1540)		
Geologist C. L. Knight	Checked by/Date Julian Robbins Mallman 8/29/11		

Radiological Background 60 / 2881 / 2mR	Radiological Equipment Used Pancake / downhole / mR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches</small>
					Surface soil analysis		70.5' 2804 (CPM)
0.5			0.0	63	Clayey silt: dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 15% clay, 5% fine sand, 80% silt, cohesive, low plasticity, low toughness, trace rootlets near surface	ML	3328
1.0			0.0	73	11" weathered sandstone bedrock: light olive brown (3.5YR 2-5 5/4), moist, dk dense, no odor, mechanically weathered to sandstone	Sp	4563
1.0			0.0	56			4203
2.0					Refusal on sandstone 1'9"		4675
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 5DN_group3		Location ID 127	
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 6-1-11/1124		Date/Time Total Depth Reached 6-1-11/1133	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50254) (1132)					
Geologist C. Carmichael		Checked by/Date J. Robbins, Meldman 7/26/11					
Radiological Background B3		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05				2013	Sand with silt and gravel, (10YR, 4/4) 60% fine to coarse grained sand, 25% gravel fill rock and asphalt pieces, 15% silt, dry, dense, no plasticity or hardness, no odor. No groundwater reached	SW	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 127
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 0815	Date/Time Total Depth Reached 6-28-11 0830
Type of Sampling Device 1 3/4" Macrocure	Samples Collected 50255 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date Julian Perkins/Gedman 9/8/11		

Radiological Background 47 / 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 <i>AF: Artificial Fill</i> (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	62	Surface; soil v.d. etc		
0.5			0.0	64	Fill: Silty sand! Yellowish brown (10YR 5/4), dry, loose, no odor, 5% fine gravel (fill rock), 30% silt, 10% medium sand, 55% fine sand, concrete and asphalt in shoe, unable to advance past 1.0' bgs	AF / SM	
1.0			0.0	65			
2.0					Refusal on concrete at 1.0' bgs		
3.0					No GW encountered		
4.0					No Sample collected subsurface		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DNgroup3		Location ID 128	
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 6-1-11/0904		Date/Time Total Depth Reached 6-1-11/0915	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50256) (0915)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/26/11					
Radiological Background 12		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (Background: 0.2 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	12	<p>4" of asphalt on surface.</p> <p>Clayey sand with gravel, (10 YR, 4/3), brown, 55% fine to coarse grained sand, 30% clay, 15% gravel fill and asphalt pieces, moist, medium dense, low plasticity and hardness, no odor.</p> <p>No groundwater reached.</p>	SC	

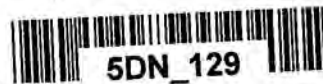
Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDW 3	Location ID 128
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 7 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/29/11 1139	Date/Time Total Depth Reached 6/29/11 1209
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50257 - 1210 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date LuDeen Robbins Melman 8/29/11		

Radiological Background 61 / 2604	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches</small> 0.5 = 2541 (CPM)
			0.0	48	ASPHALT (3")		3474
0.5				56	Silty Sand, Dark grayish brown (4/2 10YR), 70% fine sand, 30% silt, 5% clay, dry, loose, no odor or staining, trace gravel (granitic)	SM	4301
1.0				59	(Fill)		4603
				58			4816
2.0				54	Sand (Fill) Light Yellowish Brown (6/4 2.5Y), 95% fine sand, 5% silt, trace gravel, dry, low-med dense, no odor or staining	SP	4938
				45	Concrete (1.5")		5001
3.0				48	Silty Sand, Light Olive Brown (5/4 2.5Y) 55% fine sand, 40% silt, 5% clay, dry, med dense, no odor or staining	SM	4964
				36			5072
4.0				51			5112
				48			5133
5.0				26			5343
				59			5695
6.0				76			5562

Radiological Background				Project Name	Project Number	Location	
01 / 2604				SSPL Area IV Radiological Study	EP9034.01.22.04.03	5DN ³ +28 3,128	
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings
							(CPM)
6.0			0.0	76	Siltstone Light Yellowish Brown (6/4 2.54)		5562
				73			5793
7.0				78			5650
					TD = 7 ft bgs Refusal on siltstone no gas encountered		
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 5DN _{group3}		Location ID 129	
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 6-1-11/0842		Date/Time Total Depth Reached 6-1-11/0850	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50258) (0850)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/26/11					
Radiological Background 12			Radiological Equipment Used w/ R meter			PID Used Mini Rae 2000 (Background: 0.0 ppm)	
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	12	Silty sand, (10 YR, 3/3), dark brown, 60% fine to medium grained sand, 40% silt, trace gravel fill and sandstone fragments, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached	SM	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN 3	Location ID 129
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/29/11 1039	Date/Time Total Depth Reached 6/29/11 1054
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50259-015 (3) 1055 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Julian Robbins Madman 8/29/11		

Radiological Background 50 / 2818	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches 10.5 = 2718 (CPM)</small>
0.0			0.0	45	Silty Sand, Brown (4/3 10YR) (Artificial fill)	Sm	3334
0.5				68	65% fine sand, 30% silt, 5% clay, dry, loose, trace rootlets, trace coarse gravel, no odor or skin		4579
1.0				63	Sandy silt, Brown (5/3 10YR)		4872
				78	60% silt, 30% fine sand, 10% clay, dry, low toughness, low strength, low plasticity, no odor or skinning	ML	5225
2.0				65			5199
				64			5072
3.0				73	Sand (sandstone), Yellowish brown (5/6 10YR)	Sp (Red tab)	5182
				57	95% fine sand, 5% silt, dry, med-high dense, no odor or staining		5177
4.0					TD = 3.5ft bgs refusal @ sandstone no gw encountered no anomalies		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 130			
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 6-1-11/0823	Date/Time Total Depth Reached 6-1-11/0831			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50260) (0830)					
Geologist C. Carmichael		Checked by/Date J. Robbins, Goldmen 7/26/11					
Radiological Background 13		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'				0.0 13	Sandy silt, (10YR, 4/3), brown, 65% silt, 35% fine to medium grained sand, dry, medium stiff, some rootlets, trace gravel and sandstone fragments, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 131			
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 6-2-11/1124	Date/Time Total Depth Reached 6-2-11/1132			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50262) (1132)					
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/27/11					
Radiological Background 13		Radiological Equipment Used M/R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.012	Silty sand ^(SM) (10 YR, 4/4), brown, 70% fine to medium grained sand, 30% silt, dry, medium dense, some rootlets, trace gravel, piece of metal found, no plasticity or hardness, no odor. No groundwater reached	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 131
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 4.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 1205	Date/Time Total Depth Reached 6-28-11 1235
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags	50263 (1210) 50418 (NT) DOP Field	
Geologist C. Knight	Checked by/Date Julian Robbins/Heldman	8/29/11	

Radiological Background 50 / 275	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5' 3135 (CPM)
					Surface: soil & grass		
0.5			0.0	52	Silt with sand; Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 10% fine sand, 90% silt, low plasticity, low toughness, cohesive	ML	3838
			0.0	55			4722
1.0			0.0	54			5077
			0.0	62	12' Poorly graded sand with silt; Dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 10% silt, 90% fine sand, rapid dilatancy	SP	5189
2.0			0.0	50			5264
			0.0	72			5148
3.0			0.0	76			4973
			0.0	60	3' 5" Sandy silt; dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 30% fine sand, 70% silt, low plasticity, low toughness, cohesive, slow dilatancy	ML	4923
4.0			0.0	61	Weathered sandstone bedrock: light olive brown (2.5 Y 5/3), moist, dense, no odor, fine grained sandstone		4967
			0.0	62			4742
5.0					Refusal on sandstone at 4.5' bgs		
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 132				
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 6-2-11/1103	Date/Time Total Depth Reached 6-2-11/1110				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50264) (1110)						
Geologist C. Carmichael		Checked by/Date J. Robbins Moldman 7/26/11						
Radiological Background 11		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	12	Sandy silt, (10 YR, 4/4), brown, ⁶⁵ 60% silt, 35% fine to medium grained sand, dry, medium stiff, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 132
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 1355	Date/Time Total Depth Reached 6-28-11 1420
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50265 (1400) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Laurie Robbins Goldman 8/29/11		

Radiological Background 40 / 3074 / 124R	Radiological Equipment Used Pancake / downhole / Micro Rf	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches
					Surface: Soil and grass		3074 (CPM)
0.5			0.0	47	Fill	AF	3685
			0.0	59	Silt with sand: yellowish brown (10YR 5/4) dry, medium stiff, no odor, 5% subrounded gravel (fill rock), 10% fine sand, 85% silt	ML	4669
1.0			0.0	55	12"		5151
			0.0	52	Fill: Silty Sand: dark yellowish brown (10YR 4/4), moist, medium dense, no odor, 35% silt, 65% fine sand	AF / SM	5242
2.0			0.0	62			5284
			0.0	53			5084
3.0			0.0	57			5107
			0.0	67	Fill: well graded gravel with sand: Pale brown (10YR 6/3), moist, medium dense to dense, no odor, 10% fine angular gravel, 15% medium gravel, 40% coarse subangular gravel, 30% fine sand, 5% medium sand. Gravel is granitic.	AF / GW	5707 4929
4.0			0.0	66			4910
			0.0	73	Poorly graded sand with silt: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 10% silt, 90% fine sand	SP	4666
5.0			0.0	75	4' 11" weathered sand stone bedrock: light olive brown (2.5Y 5/6), moist, dense, no odor, fine grained sandstone	Bk / rock	4618
					Refusal on sandstone at 5' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup ³	Location ID 133			
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 6-2-11/1044	Date/Time Total Depth Reached 6-2-11/1052			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50266) (1052)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Yeldman 7/26/11					
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Ra2 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5			0.0	13	Sandy silt, (10YR, 4/4), brown, 65% silt, 30% fine to medium grained sand, 5% gravel and sandstone fragments, dry, medium stiff, no plasticity or hardness, no odor. No groundwater reached.	ML	

Radiological Background				Project Name	Project Number	Location	
72/2782				SSFL Area IV Radiological Study	EP9038.01.22.04.03	133	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings
							Inches
6.0			0.0	67	Sand w/ silt (Same as above)	SM	5006
			0.0	69	6'4" Siltstone: light yellowish brown (2.5YR 6/4), moist, dense, mechanically weathered to ML w/ sandstone fragments, interbedded siltstone.	BEDROCK	5257
7.0			0.0	70	7'0" Refusal on siltstone @ 7.0' bgs no groundwater encountered		5389
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 5DNgroup3	Location ID 134			
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 6-2-11/0840	Date/Time Total Depth Reached 6-2-11/0850			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50268) (0850)					
Geologist C. Carmichael		Checked by/Date J. Robbins Gildman 7/26/11					
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0/12		Sandy silt, (10YR, 5/4), light brown, 60% silt, 30% fine sand, 10% rock fragments and gravel fill, dry, medium stiff, no plasticity, no hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 134
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-25-11 1805	Date/Time Total Depth Reached 5-25-11 1530
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50269 (1510) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins Goldman 7/27/11		

Radiological Background 52 / 2551	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
					Surface: soil + grass		405 2662
0.5			0.0	70	Fill; Sandy silt: Brown (10YR 5/3), dry, medium stiff, no odor, 10% medium sand, 5% coarse sand, 20% fine sand, 65% silt, low plasticity, cohesive, trace medium concrete debris, trace rubble	AF / ML	2825 4137
1.0			0.0	78	Silty sand: Brownish yellow (10YR 6/8) and light yellowish brown (10YR 6/4), dry, medium dense, no odor, 30% silt, 70% fine sand, mottled pockets of sand and silt, iron oxide staining	AF / SM	4669 4855
2.0			0.0	75	Weathered sandstone: Olive yellow (2.5Y 6/8), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone, iron oxide staining.	SP / SL	5204
			0.0	75	2" of SP mudstone light brownish gray (2.5Y 6/2) at ends of boring		5407
3.0					Refusal on Mudstone 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 5DNgroup3	Location ID 135				
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 6-2-11/0855	Date/Time Total Depth Reached 6-2-11/0905				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50270) (0905)						
Geologist C. Carmichael		Checked by/Date J. Robbins Yeldman 7/26/11						
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	12	Silty sand, (10 YR, 4/4), brown, 60%. fine to medium grained sand, 30%. silt, 10%. gravel fill and siltstone/sandstone, dry, dense, no plasticity or hardness, no odor. No groundwater reached	SM		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 135
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-25-11 1422	Date/Time Total Depth Reached 5-25-11 1455
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50271 (NO SAMPLE) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Julian Robbins / Edman 9/8/11		

Radiological Background Si / 2594	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings (CPM)
			0.0	70	AF: Artificial Fill		+0.5 2662
0.5			0.0	75	Fill: Sandy silt: Brown (10YR 5/3), dry, medium dense, no odor, 5% coarse sand, 5% medium sand, 15% fine sand, 75% silt, low plasticity, cohesive, trace angular (fill rock) gravel	AF	3123
1.0			0.0	55	Weathered sandstone: Yellowish brown (10YR 5/6), dry, dense, no odor, mechanically weathered to SP, fine grained sand stone	ML	4340
			0.0	60	1" of mudstone at bottom of boring	MS	5218
2.0					Refusal on mudstone at 1.5' bgs		6080
3.0					No GW encountered		
4.0					No sample collected in situ face due to refusal		
5.0							
6.0							

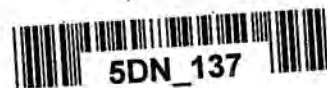
Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 136			
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A	Date/Time Drilling Started 6-2-11/0821	Date/Time Total Depth Reached 6-2-11/0828			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (# 50272) (0828.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/26/11					
Radiological Background 13		Radiological Equipment Used w/ Ruler		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0013	Silty sand with gravel, (10YR, 5/3), light brown, 55% fine sand, 30% silt, 15% gravel fill rock, dry, dense, no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 3	Location ID 136
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5' ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-25-11 1615	Date/Time Total Depth Reached 5-25-11 1640
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 50273 (NO SAMPLE)		
Geologist C. Knight	Checked by/Date J. Robbins/Sldman 7/26/11		

Radiological Background 48 / 2680	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgsd: 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		70.5' 2716
0.5			0.0	65	Fill: Sandy silt: yellowish brown (10YR 5/4), dry, medium	AF	3140
			0.0	72	silt, no odor, SP, medium sand, 20% fine sand, 75% silt, low plasticity, cohesive, trace granular medium gravel (fill rock)	ML	4540
1.0			0.0	70	Weathered bedrock sandstone: Brownish yellow (10YR 6/8), dry, dense, no odor, mechanically weathered to SP,	BR	5120
			0.0	65	fine grained sand stone	BR	5344
2.0					Refusal on sandstone at 1.5' bgs		
3.0					No GW encountered		
4.0					No Sample collected due to shallow refusal at 1.5' bgs		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 137				
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 6-2-11/0911	Date/Time Total Depth Reached 6-2-11/0920				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50274) (0920)						
Geologist C. Carmichael		Checked by/Date J. Robbins-Holdman 7/26/11						
Radiological Background 12		Radiological Equipment Used M Probe		PID Used Mini Rac 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5				0.013	Sandy silt, (10YR, 4/4), brown, 55% silt, 40% fine to medium grained sand, 5% gravel fill and sandstone fragments, dry, medium stiff, no plasticity or hardness, no odor. No groundwater reached.	ML		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 137
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-25-11 1355	Date/Time Total Depth Reached 5-25-11 1420
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 50275 (1900) AL (NO SAMPLE) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date L. Paul Robbins/Jedman 9/8/11		

Radiological Background 02 / 2610	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 and grass		70.5' 2629
0.5			0.0	65	Fill: Sandy silti Brown (10YR 5/3), dry, medium dense, no odor, 5% coarse sand, 5% medium sand, 15% fine sand, 75% silt, low plasticity, cohesive, trace concrete debris	AF, ML	3104 4404
1.0			0.0	58	1'3" weathered sandstone: yellowish brown (10YR 5/6), dry, dense, no odor, mechanically weathered to SP, 10% silt, 90% fine grained sandstone.	SP	5031
			0.0	47			5013
2.0					Refusal on sandstone at 1.5' bgs		
3.0					No GW encountered		
4.0					No sample collected due to shallow refusal		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 138			
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 6-2-11/0926	Date/Time Total Depth Reached 6-2-11/0940			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50276) (0940)					
Geologist C. Carmichael		Checked by/Date J Robbins/Meldman 7/25/11					
Radiological Background 13		Radiological Equipment Used M R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	13	Sand with silt and gravel, (10 YR, 5/4), light brown, 70% fine to medium grained sand, 15% silt, 15% gravel fill and sandstone fragments, dry, dense, no plasticity or hardness, no odor. Bedrock encountered. No groundwater reached.	Sm	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 138
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2.5 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-24-11 1105	Date/Time Total Depth Reached 5-24-11 1140
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50277 (110) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins/Goldman 7/26/11		

Radiological Background 59 / 2714	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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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 and grass		+0.5' 2651
0.5		63		Fill: Silty Sand: Brown (7.5 YR 5/4), dry, medium stiff, no odor, 30% silt, 10% medium sand, 60% fine sand, trace asphalt	AF	2998
		60		3" asphalt	SM	4208
1.0		65		Silty Sand: Brown (7.5 YR 5/4), dry, medium stiff, no odor, 35% silt, 8% medium sand, 60% fine sand	SM	4412
		75		Poorly graded sand: light yellowish brown (10 YR 6/4), dry, fine grained, no odor, fine grained sand	SP	4694
2.0		70		Weathered Sandstone: olive yellow (2.5 Y 6/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	4958
		65		Weathered siltstone: Pale yellow (2.5 Y 7/4), dry, dense, no odor, interbedded siltstone beds, mechanically weathered to ML, trace mudstone & sandstone beds	SL	4914
3.0				Siltstone Refusal on Sandstone 2.5' bgs (CB)		
				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 5DN _{group3}		Location ID 139	
Drilling Company HGL		Driller T. Morse		Ground Elevation NA		Total Drilled Depth 0.5' 2"	
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 6-2-11/1001		Date/Time Total Depth Reached 6-2-11/1010	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50278) (1010)			
Geologist C. Carmichael				Checked by/Date Lillian Robbins Hartman 9/8/11			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.2'				0.0/2	Sandy silt, (10 YR, 5/4), light brown, 65% silt, 35% fine to medium grained sand, dry, stiff, no plasticity or hardness, no odor. (weathered bedrock)	ML	
					Bedrock reached at 2"		
					No groundwater reached.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 139
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-24-11 1015	Date/Time Total Depth Reached 5-24-11 1050
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50279 (1020) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins-Maldman 7/26/11		

Radiological Background 52 / 2938	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
					AF: Artificial Fill (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable) surface & soil and grass		405' 2798
0.5			0.0	57	Fill:		3007
			0.0	47	Sandy Silt: Strong brown (7.5Y 4/6) dry, medium stiff, no odor, 5% angular coarse sand, 10% medium sand, 30% fine sand, 55% silt, low plasticity, non cohesive, low toughness, rapid dilatancy, trace mottling.	AF / ML	4472
1.0			0.0	65			5135
			0.0	59	1'6" some mottling		5066
2.0			0.0	63			4981
			0.0	70	Weathered Sandstone: light yellowish brown (10YR 6/6) dry, hard, no odor, mechanically weathered to SP, fine grained sandstone		4850
3.0			0.0	60	End boring 3.0' bgs		4740
4.0					Refusal on sandstone at 3.0' bgs		
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 140			
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 6-2-11/1025	Date/Time Total Depth Reached 6-2-11/1035			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall. bag (#50280) (1035)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Goldman 7/26/11					
Radiological Background 13		Radiological Equipment Used w/ Rmeter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	13	Silty sand, (10YR, 4/4), brown, 65% fine to medium grained sand, 35% silt, dry, dense, no plasticity or hardness, some sandstone rock fragments, no odor. No groundwater reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN-3	Location ID 140
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 6.5 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5/25/11 - 10:00	Date/Time Total Depth Reached 5/25/11 1021
Type of Sampling Device 1 3/4" Macrotore	Samples Collected (1) 1/2 gallon bags 50281 (1006)		
Geologist LR Goldman	Checked by/Date J. Robbins Goldman 7/26/11		

Radiological Background 44 / 2828	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	75	Sandy silt: dark brown (10YR 3/3), 65% silt, 35% sand, med. plasticity, no odor, med. stiff, dry, low toughness, cohesive, rootlets, mica flecks.		2883
0.5		0.0	80		4167	
1.0		0.0	85		4932	
		0.0	55		5346	
2.0		0.0	70		5356	
		0.0	75		5404	
3.0		0.0	68		5376	
		0.0	70	Silt w/ sand: dark yellowish brown (10YR 4/6), 65% silt , 85% silt, 5% ^{med.} coarse sand, 10% ^{LG} fine sand, dry, med stiff, med. plasticity, no odor, cohesive, low toughness, mica flecks, trace fine gravel (angular)		5428
4.0		0.0	68		5148	
		0.0	55		5224	
5.0		0.0	58		5231	
		0.0	58	5'6" Sandstone: brownish yellow (10YR 6/8), moist, dense, no odor, mechanically weathered to SP, trace nodules of siltstone		5299
6.0		0.0	51		5062	

Radiological Background 44/2828				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 140	
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				50	Same as above		
7.0					<p>Refusal on sandstone 6.5' by 5'</p> <p>No GW encountered</p>		4793
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 5DN _{group3}	Location ID 141				
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 6-2-11/1308	Date/Time Total Depth Reached 6-2-11/1316				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50282) (1315)						
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/26/11						
Radiological Background 12		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0 13	Sandy silt, (10 YR, 4/3) brown, 65% silt, 35% fine to medium grained sand; dry, medium stiff, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 741
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 1435	Date/Time Total Depth Reached 6-28-11 1455
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 50283 (1440)		
Geologist C. Knight	Checked by/Date Lillian Robbins, Moldman 8/29/11		

Radiological Background 56 / 3166 / 12AR	Radiological Equipment Used Pancake / downhole / Micro R1	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	59	surface: soil and grass		3166
0.5			0.0	66	Silty Sand: Yellowish brown (10YR 5/4), moist, medium dense, no odor, 35% silt, 65% f. ne sand	SM	3786
1.0			0.0	55			4788
			0.0	65			5159
2.0			0.10	63	1 1/2" w/silt Poorly sorted Sand & Very pale brown (10YR 7/4), moist, medium dense, no odor, 10% silt, 90% fine sand	SP	4972
			0.0	57			4706
3.0			0.0	50			4529
			0.0	58			4332
4.0			0.0	55	Silty Sand: Yellow (10YR 7/6), moist, dense, no odor, 20% fine sand, 30% silt, silt beds are in between fine sand beds and 2mm thick (silt), weathered siltstone at end of boring	SM	41676
			0.0	64			5036
5.0			0.0	75			5171
					Refusal on silty sand siltstone No Gw encountered		5220
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 142			
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 6-2-11/1410	Date/Time Total Depth Reached 6-2-11/1420			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50284) (1420)					
Geologist C. Carmichael		Checked by/Date L. Robbins Feldman 7/27/11					
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	13	Silt with sand, (10YR, 4/4), brown, 80% silt, 20% fine to medium grained sand, dry, medium stiff, common rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN-3	Location ID 142
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-25-11 0917	Date/Time Total Depth Reached 5-25-11 0923 0917
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 5 50285 (0923)		
Geologist L.R. Goldman	Checked by/Date J. Robbins Maldman 7/27/11		

Radiological Background 41 / 2694	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.0			0.0	43	Surface: soil + grass		+0.5 = 2709
0.5			0.0	55	Sandy silt: brown (10yr 4/3), 60% silt, 40% sand, med. plasticity, no odor, dry, med. stiff, low toughness, cohesive		2918
1.0			0.0	65		ML	4494
			0.0	55			4897
2.0			0.0	80			5101
			0.0	60	Sandstone: yellowish brown (10yr 5/6), 60% med sand, 20% fine sand, 10% coarse sand, mechanically weathered to SP, rapid dilatancy, no odor, 10% med. sand.		5039
3.0			0.0	64		2'8" - 30"	4967
					Refusal @ 3.0' bgs NO GW encountered	BEDROCK	4922
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 143				
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 6-2-11/1324	Date/Time Total Depth Reached 6-2-11/1332				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50286) (1332)						
Geologist C. Carmichael		Checked by/Date J. Robbins Mellem 7/27/11						
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.014	Silt with sand, (10 YR, 4/3), brown, 80% silt, 20% fine to medium grained sand, dry, medium stiff, trace rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 143
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 1505	Date/Time Total Depth Reached 6-28-11 1540
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50287 (1510) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Lu Dean Robbins Feldman 8/29/11		

Radiological Background 56 / 3030 / 124R	Radiological Equipment Used Pancake / downhole / Micro R	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	58	surface: soil and gravel		405' 3030
0.5			0.0	67	Sandy silt; dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 20% fine sand, 80% silt, low plasticity, low toughness, cohesive, pin hole pores	ML	3413
1.0			0.0	75			4634
			0.0	80	1' 8"		5240
2.0			0.0	75	Clayey silt with sand and gravel; Dark yellowish brown (10YR 3/6), moist, medium stiff, no odor, 10% subangular fine gravel, 20% clay, 15% fine sand, 55% silt, mottled texture, pin hole pores, appears to be in situ, silts tone and muds fine beds at end of boring, low plasticity, low toughness	ML	5486
			0.0	83			5550
3.0			0.0	75			5547
			0.0	85			5905
4.0			0.0	63			5773
			0.0	65			5866
5.0			0.0	72	siltstone at end of boring		5816
					Refusal on siltstone at 5.0'		6026

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 144				
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 6-2-11/1424	Date/Time Total Depth Reached 6-2-11/1432				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50288) (1432)						
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/27/11						
Radiological Background 13		Radiological Equipment Used w/ Rater	PID Used Mini Rac 2000 (Background: 0.0 ppm)					
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.13	Silt with sand, (10 YR, 4/4), brown, 75% silt, 25% fine to medium grained sand, dry, some rootlets, medium stiff, no plasticity or hardness, no odor. No groundwater reached	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN Grp 3	Location ID 144
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5/24/11 1600	Date/Time Total Depth Reached 5/24/11 1614
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50289 (1605) (1) 1/2 gallon bags		
Geologist L.R. Goldman	Checked by/Date J. Robbins-Jedman 7/27/11		

Radiological Background 54 / 2639	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches 0.5 = 2756 (CPM)
0.0			0.0	40	sandy silt.		3098
0.5			0.0	60	silty sand: brown (10yr 4/3), 50% silt, 40% fine grained sand, 10% coarse gr sand, dry, med. stiff, no odor, rootlets, mica flecks.	ML	4531
1.0			0.0	58			4942
			0.0	62	1'5" siltstone: dark yellowish brown (10yr 4/6), moist, med. stiff, no odor, trace mudstone beds; interbedded siltstone, top portion mechanically weathered to ML rapid dilatancy; non-cohesive.		5107
2.0			0.0	75			5005
			0.0	80			4998
3.0			0.0	69	3'0" Refusal at 3.0' bgs no GW encountered	BEDROCK	5401
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN, group 3		Location ID 145	
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 6-2-11/1439		Date/Time Total Depth Reached 6-2-11/1448	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50290) (1448.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/27/11					
Radiological Background 13		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM) Inches
0.5'				13	Sandy silt, (10 YR, 4/4), brown, 65% silt, 30% fine to medium grained sand, 5% gravel fill and sandstone fragments, dry, medium stiff, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDM group 3	Location ID 145
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 3.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-24-11 1145	Date/Time Total Depth Reached 5-24-11 1220
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50291 (1150) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J Robbins Goldman 7/27/11		

Radiological Background 52 / 2753	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' 2856
0.5			0.0	100	Sandy silt; yellowish brown (10YR 5/4), dry, medium stiff, no odor, 52% medium sand, 15% fine sand, 80% silt, low plasticity, cohesive, low toughness	ML	2896
			0.0	55			4178
1.0			0.0	59	1'3" Silty Sand: strong brown (7.5YR 5/8), dry, medium dense, no odor, 40% silt, 10% medium sand, 50% fine sand	SM	5108
			0.0	66			5288
2.0			0.0	60	2'1" weathered Bedrock Sandstone: strong brown (7.5YR 4/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone, trace silt	SP	5343
			0.0	65			5121
3.0			0.0	80			5013
					Refusal on sandstone at 3.0' bgs No GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN - Group 3	Location ID 146
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-24-11 1359	Date/Time Total Depth Reached 5-24-11 5.0 ft 1450
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 5029a (1359)		
Geologist Ludean Robbins Goldman		Checked by/Date J. Robbins Goldman 7/27/11	

Radiological Background 45 / 2719	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd): 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5 = 2699 (CPM)
0.0			0.0	60	Surface: soil + grass		
0.5			0.0	58	Silty sand: dark yellowish brown (10YR 4/6), 40% silt, 10% coarse grained sand, 50% fine grained sand, dry, medium stiff, no odor, rootlets, mica flecks.	SM	3215
1.0			59	4460			
							4839
2.0			0.0	50	Sandy silt: light olive brown (2.5YR 5/6), dry, medium stiff, no odor, 5% coarse sand, 5% med. sand, 20% fine grained sand, 70% silt, low plasticity, cohesive, slow dilatancy.	ML	4942
			52	4902			
			62	4624			
3.0			0.0	55	Sandy silt: yellowish brown (10YR 5/6), moist, med. stiff, no odor, 5% coarse sand, 10% med. sand, 25% fine grained sand, 60% silt, low plasticity, cohesive, slow dilatancy.	ML	4757
			60	4638			
			80	4605			
4.0			0.0	65	Weathered sandstone: dark yellowish brown (10YR 4/6), moist, med. dense, no odor, mechanically weathered to sp.	BEDROCK	4689
5.0			0.0	55			4667
6.0					Refusal on sandstone @ 5.0' bgs no GW encountered		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 147
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth - 2.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 1045	Date/Time Total Depth Reached 6-28-11 1120
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 50293 (1050)		
Geologist C. Knight		Checked by/Date LuAnn Robbins Goldman 8/29/11	

Radiological Background 49 / 2566 / 12413	Radiological Equipment Used Pancake / downhole / micro R1	PID Used Mini Rae 2000 (Bkgs: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	49	Surface: grassland soil		105 2966
0.5			0.0	65	Clayey silt - Brown (10YR 5/3), dry, medium stiff, no odor; 20% clay, 5% fine sand, 75% silt, low plasticity, low toughness, cohesive, trace rootlets near surface	ML	3267
1.0			0.0	55	Weathered Sandstone Bedrock: light olive brown (2.5Y 5/4), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	SP	4620
			0.0	62			5158
2.0			0.0	65			5425
					Refusal on sandstone at 2' bgs		5448
					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 5DNgroup3	Location ID 148			
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 6-1-11/1541	Date/Time Total Depth Reached 6-1-11/1550			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50294) (1550)					
Geologist C. Carmichael		Checked by/Date L. Alan Robbins, Edman 2/8/11					
Radiological Background 11		Radiological Equipment Used up Reiter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5				0.0 12	Clayey silt with sand, (10YR, 4/4), brown, 55% silt, 30% clay, 15% fine sand, trace sandstone/siltstone fragments, dry, medium stiff, some rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 3	Location ID 148
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 2-0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-28-11 1010	Date/Time Total Depth Reached 6-28-11 1040
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 50245 (1020)		
Geologist C. Knight	Checked by/Date Sallan Robbins-Holdman 8/29/11		

Radiological Background 46 / 3185 / 12mR	Radiological Equipment Used Pancake / downhole / micro R	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
					Surface: soil and grass		795' 3185
0.5			0.0	56	Clayey silt: yellowish brown (10YR 5/4) dry, soft, no odor, 25% clay, 75% silt, cohesive, low plasticity, low toughness	ML	3443
			0.0	59			458.2
1.0			0.0	52	Weathered siltstone: light yellowish brown (2.5Y 6/4), dry, hard, no odor, mechanically weathered to ML, interbedded siltstone w/ some claystone present	SL	5393
			0.4	62			5402
2.0			0.0	58			5635
					Refusal siltstone @ 2' bgs No GW encountered		
3.0							
4.0							
5.0							
6.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 149
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 6-2-11/1522	Date/Time Total Depth Reached 6-2-11/1530
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50296) (1530)		
Geologist C. Carmichael	Checked by/Date J. Robbins/Meldman 7/27/11		

Radiological Background 12	Radiological Equipment Used w/ R meter	PID Used Mini Rac 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	13	Silt with sand, (10 YR, 3/3), dark brown, 80% silt, 20% fine sand, dry, medium stiff, few rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN 5043	Location ID 149
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-11-11 0610	Date/Time Total Depth Reached 7-11-11 0900
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected (1) 1/2 gallon bags 50297 (0810)		
Geologist C. Knight	Checked by/Date J. Dan Robbins/Goldman 11/1/11		

Radiological Background 45 / 2667	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	52	Surface: Gravel and soil		705 3013
0.5			0.0	42	Clayey silt: dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 20% clay, 5% fine sand, 75% silt, low plasticity, low toughness, cohesive	ML	4538
			0.0	44			4905
1.0			0.0	48			4902
			0.0	51			4909
2.0			0.0	47	Silty clay with sand: Brown (7.5YR 4/4), moist, medium stiff, no odor, 10% fine sand, 5% medium sand, 25% silt, 60% clay, cohesive, medium plasticity, medium toughness	CL	4818
			0.0	54			4652
3.0			0.0	95			4874
			0.0	75			4684
4.0			0.0	60	Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), dry, dense, no odor, fine grained sandstone		4788
			0.0	65			4706
5.0			0.0		Refusal on sandstone @ 5' bgs		4978
6.0					No GW encountered		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 150			
Drilling Company HGL		Driller J. Morse	Ground Elevation NA	Total Drilled Depth 0.5'			
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A	Date/Time Drilling Started 6-2-11/1457	Date/Time Total Depth Reached 6-2-11/1505			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50298) (1505)					
Geologist C. Carmichael		Checked by/Date J. Robbins Moldman 7/27/11					
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5'			0.0	12	Silt, (10 YR, 3/3), dark brown, 90% silt, 10% fine sand, dry, medium stiff, some rootlets, ⁽²⁾ a very low plasticity and hardness, no odor. No groundwater reached.	ML	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN & Group 3	Location ID 150
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-24-11/1500	Date/Time Total Depth Reached 5-24-11/1505
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50299 (1505) 1) 1/2 gallon bags	Geologist L.R. Goldman	
Checked by/Date J. Robbins Goldman 7/27/11			

Radiological Background 48 / 2500	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5 = 2608 (CPM)
0.0			0.0	50	Surface: soil + grass		2997
0.5			0.0	55	Silt w/ sand: dark yellowish brown (10yr 4/4), 60% silt, 40% silt, 5% ^{PS} med. sand, 5% fine sand, med. stiff, no odor, root-lets, mica flecks, cohesive, low plasticity.		4507
1.0			0.0	57			4894
			0.0	63			5212
2.0			0.0	68		SM	5168
			0.0	65			5122
3.0			0.0	95			5022
			0.0	85	33" Siltstone (10yr 4/6), dark yellowish brown, moist, med. stiff, no odor, trace mudstone beds; interbedded siltstone, top portion mechanically weathered to ML, rapid dilatancy, non-cohesive.		4739
4.0			0.0	70		BED ROCK	4712
			0.0	90			4892
5.0			0.0	75	5'0" Refusal at 5.0' bgs no GW encountered		4813
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 151			
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 6-2-11/1340	Date/Time Total Depth Reached 6-2-11/1350			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50300) (1350)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/27/11					
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 12	Silt with rock fragments, (10 YR, 5/4), light brown; 75% silt, 25% siltstone rock fragments, dry, stiff, very low plasticity and hardness, no odor (weathered bedrock). No groundwater reached.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDW 3	Location ID 151
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 1 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/29/11 0844	Date/Time Total Depth Reached 6/29/11 0850
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50301 50302 50303 none collected (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date LuDeart Robbins Feldman 8/29/11		

Radiological Background 49 / 3356	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5			0.0	67	IS Silt Siltw/Sand, Brown (5/3 104R) 90% silt, 10% fine sand, dry, loose, low high, low strength no ad- or staining	ML	1
1.0			0.0	74	Siltstone, Pale Brown (6/5 104R), 1	bedrock	1
1.0			0.0	69	TD= 1ft bgs Refusal on siltstone bedrock no gas encountered		
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 5DN, group 3	Location ID 152			
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 6-3-11 / 1139	Date/Time Total Depth Reached 6-3-11 / 1148			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50302) (1148)					
Geologist C. Carmichael		Checked by/Date L. Robbins-Heldman 7/27/11					
Radiological Background 0.033-14		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05				0.016	Silt, (10YR, 5/1), grey, 90% silt, 10% fine sand, mottled texture with grey sand silt and orange sand, dry, medium stiff, to very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SDR 3		Location ID 152	
Drilling Company Boart Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth 3.5 ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6/29/11 0911		Date/Time Total Depth Reached 6/29/11 0930	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected 50303 - 0920 (1) 1/2 gallon bags			
Geologist I. Stone				Checked by/Date Ludau Robbins Yeldman 8/29/11			
Radiological Background 30 / 3360		Radiological Equipment Used Pancake / downhole		PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches 0.5 = 3328 (CPM)
0.5			0.0	65	Silt. (A-horizon fill) Gray (6/1 2.5Y) 100% silt, dry, loose, low tough, low strength, no odor or staining	ML	3890
1.0				73	Sandy Silt (AF) Brown (4/3 10YR) 30% fine sand, 65% silt, 5% clay, dry, low strength, low toughness, low plasticity, no odor or staining	ML	5242
2.0				60	Silty Clay, Dark Brown (3/3 10YR) 55% clay, 35% silt, 40% silt, 5% fine sand, dry, med tough, med strength, med-high stiffness, med plasticity, no odor or staining	CL	5262
3.0				71			5258
4.0				66			5202
5.0				64			5147
6.0				83			5320
				85	SANDSTONE (SP) SAND (SANDSTONE), Pale Yellow (7/4 2.5Y) 95% fine sand, 5% silt, dry, high dens, no odor or stain	SP Bedrock	5403
TD = 3.5 ft bgs Refusal on sandstone no gw encountered no anomalies							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 153				
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 6-3-11/1200	Date/Time Total Depth Reached 6-3-11/1210				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50304) (1210)						
Geologist C. Carmichael		Checked by/Date J. Robbins Alderman 7/27/11						
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5			0.0	13	Sandy silt with clay, (10.YR, 3/4), dark brown, 55% silt, 30% fine to medium grained sand, 15% clay, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML		

Radiological Background 67,3508 cpm				Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 153	
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)
				76 Ⓢ			5487
7'			0.0	94	Gradational Contact. Silt with clay and rock fragments, (10YR, 6/6), light brown, 65% silt, 20% siltstone rock fragments, 15% clay, dry, stiff, very Ⓢ low plasticity, hardness order. ← Siltstone encountered.	ML	5753
			0.0	66			5848
8'			0.0	62			5869
					Refusal at 8' (at siltstone bedrock)		
9'					No GW reached.		
10'							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 154			
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 6-3-11/1116	Date/Time Total Depth Reached 6-3-11/1125			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50306) (1125.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Aldmen 7/27/11					
Radiological Background 13		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.013	Silt with sand and clay, (10 YR, 3/3), dark brown, 70% silt, 15% fine to medium grained sand, 15% clay, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN 3	Location ID 154
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/29/11 0725	Date/Time Total Depth Reached 6/29/11 0750
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50307 - 0750 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Julian Robbins Hedron 8/29/11		

Radiological Background 42 / 2782	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 = 2916 (CPM)
0.5			0.0	44	Sandy Silt, Dark Brown (3/3 10YR) 70% silt, 20% fine sand, 10% clay, dry, low strength, low toughness, low-med plasticity, no odor or staining, trace roots at surface.	ML	3939
				75			4911
1.0				67			5121
				60			5246
2.0				54			5309
				65	Clayey Silt, Brown (4/4 7.5YR) 65% silt, 30% clay, 5% fine sand, dry, low-med strength, low tough, med plasticity, no odor or staining, trace oxidation	ML	5196
3.0				68			5220
				85			5349
4.0				74			5215
				81			5296
5.0				76	Sandy silt is Clayey Silt w/ sand, Strong Brown (4/6 7.5YR) 55% silt, 35% clay, 10% fine sand, dry low-med tough, low-med strength, med plasticity, no odor or staining	ML	5262
				51			5216
6.0				46			5114

Radiological Background 42 / 2782				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location SDN 3, 154	
Depth	Interval	Recovery	FTD	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	46	Clayey silt w/ sand; same as above	ML	5114
				53			4955
7.0				55			5223
				57			5141
				66			5110
8.0				55	Silty Clay, Yellowish brown (5/4 10YR) 55% clay, 40% silt, 5% fine sand, dry, med tough, med strength, med plasticity, no odor or staining, slight mottling.	CL	5077
				58			5057
9.0				64			5215
				74			5241
10.0					TD = 10ft bgs. no refusal no gw encountered no anomalies		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 155			
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 6-3-11/1041	Date/Time Total Depth Reached 6-3-11/1051			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall. bag (#50308) (1050)					
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/27/11					
Radiological Background 13		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5			0.0	13	Silt, (10YR, 4/3), brown, 90% silt, 10% fine sand, dry, stiff, some rootlets, very low plasticity and hardness, no odor.	ML	
No groundwater reached.							

Radiological Background				Project Name	Project Number	Location	
59 / 2856				SSFL Area IV Radiological Study	EP9038.01.22.04.03	SDN, 3, 155	
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
							(CPM)
6.0			0.0	86	Silty Clay, continued, same as above	CL	4824
				109			4857
7.0				73	Sandy Silt, Brown (4/4 7.5YR)		4819
				63	35% fine sand, 60% silt, 5% clay, dry, low toughness, low strength, slow dilatancy, no odor or staining	ML	4811
8.0				56			4822
				59			4925
9.0				65	Silty Sand, Dark yellowish brown (4/4 10YR)	SM	4874
				74	55% fine sand, 40% silt, 5% clay, dry, med dense, no odor or staining		4954
10.0				73			4950
					TD = 108 ft logs, no refusal. no gw encountered no anomalies		
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 156			
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 6-3-11/0941	Date/Time Total Depth Reached 6-3-11/0950			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50310) (0950)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/27/11					
Radiological Background 13		Radiological Equipment Used w/ 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 Inches (CPM)
0.5'				0.013	Silt, (10YR, 3/3), dark brown, 90% silt, 10% fine sand, some rootlets, dry, soft, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDW 3	Location ID 156
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/8/11 1324	Date/Time Total Depth Reached 7/8/11 1345
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50311 - 1350 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Julian Pettins Aldman 8/29/11		

Radiological Background 34 / 2547	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches</small> +0.5 = 3517 (CPM)
0.0			0.0	60	Clayey Silt, Brown (4/3 10YR), 5% fine sand, 75% silt, 20% clay, dry, low toughness, low strength, med plasticity, no odor or staining, fract rootlets at surface	ML	4680
0.5			75	4783			
1.0			93	4786			
			87	4786			
2.0			74	4811			
			63	4727	Clayey Silt w/ sand, Dark yellowish brown (4/6 10YR) 10% fine sand, 60% silt, 30% clay, dry, low tough, low strength, med plasticity, med plasticity no odor or staining	ML	4733
3.0			46	4814			
			50	4965			
4.0			65	4878			
			64	4852			
5.0			63	4953	Sandy Silt, Brown (4/3 10YR) 20% fine sand, 75% silt, 5% clay, dry, low strength, low toughness, low plasticity, no odor or staining	ML	5041
			49				
6.0			65				

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 157
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 6-3-11/1002	Date/Time Total Depth Reached 6-3-11/1010
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50312) (1010)	Checked by/Date J. Robbins Mouldman 7/27/11	
Geologist C. Carmichael	PID Used Mini Rac 2000 (Background: 0.0 ppm)		

Radiological Background 12	Radiological Equipment Used up R meter
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	14	Silt, (10YR, 3/3), dark brown, 85% silt, 10% clay, 5% fine sand, dry, soft, trace rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN 3	Location ID 157
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/8/11 1053	Date/Time Total Depth Reached 7/8/11 1116
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50313 - 1115 (1) 1/2 gallon bags		D.P. - 50420 (1) 1/2 gallon bag
Geologist I. Stone	Checked by/Date John Dean Robbins Feldman 9/8/11		

Radiological Background 44 / 2629	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches +0.5' = 2994 (CPM)</small>		
0.0			0.0	48	Clayey Silt, Brown (4/3 10YR) 5% fine sand, 75% silt, 20% clay, dry, low toughness, low strength, med plasticity, no odor or staining, trace rootlets	ML	3866		
0.5				62			4658		
1.0				68			5022		
				61			5128		
2.0				51			5254		
				55			5102		
3.0				77			4907		
				64			4929		
4.0				59			Clayey silt, w/sand, Dark yellowish brown (4/6 10YR) 10% fine sand, 70% silt, 20% clay, dry, low toughness, low strength, med plasticity no odor or staining	ML	4766
				50					5010
5.0				47	4956				
				45	4939				
6.0				38			5134		

Radiological Background 44 / 2629				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 50W, 3, 157	
Depth	Interval	Recovery	PID	Radiological	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	38	Clayey silt, continued same as above		5134
				44			5121
7.0				56			5079
				57	Sandy silt, Dark yellowish Brown (4/4 10YR) 20% fine sand, 65% silt, 5% clay, dry low toughness; low strength; low plasticity, no odor or staining		5166
8.0				53			5328
				67			5178
9.0				66	Clayey Sand ⁷⁰ Silt w/ Sand, Brown (4/4 7.5YR) 10% fine sand, 65% silt, 20-25% clay, dry, low strength; low toughness, med plasticity, no odor or staining		5380
				61			5413
10.0				69			5360
					TD = 10 ft bgs, no refusal no ghw encountered no anomalies		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 158			
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 6-3-11/1020	Date/Time Total Depth Reached 6-3-11/1030			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50314) (1030.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/27/11					
Radiological Background 14		Radiological Equipment Used 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 Inches (CPM)
0.5'				0.014	Silt, ⁽²⁰⁾ with clay, (10 YR, 4/3), brown, 80% silt, 20% clay, dry, medium stiff, some rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50N 3	Location ID 158
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/8/11 0945	Date/Time Total Depth Reached 7/8/11 1006
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50315-1005 (1) 1/2 gallon bags		
Geologist E. Stone	Checked by/Date J. Dean Robbins Melman 8/29/11		

Radiological Background 54 / 2961	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches</small> 0.5' = 3073 (CPM)
0.5			6.0	48	Clayey silt, Brown (4/3 10YR) 5% fine sand, 75% silt, 20% clay, dry, low toughness, low strength, med plasticity, no odor or staining (F.H.) (S)	ML	3552
				51			4823
1.0				55			5070
				47			5068
2.0				65			5225
				49	5063		
3.0				42	Sandy silt, Brown (4/3 10YR) 35% fine sand, 60% silt, 5% clay, dry, low toughness, low strength, low plasticity, no odor or staining	ML	5233
				45			4931
4.0				69	Clayey silt w/ sand, Dark Yellowish Brown (4/6 10YR) 10% fine sand, 70% silt, 20% clay, dry, low tough, low strength, med plasticity no odor or staining	ML	4918
				74			4953
5.0				68			4929
				43			4971
6.0				47			5081

Radiological Background 54/2961				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 50N, 3, 158	
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	47	Clayey silt, continued, same as above		5081
				55		ML	4998
7.0				57	Sandy silt, Dark yellowish brown (4/4 10YR). 30% fine sand, 65% silt, 5% clay, dry, low strength, low toughness, low plasticity, no odor or staining		5192
				41			5149
8.0				59		ML	5077
				54			5062
9.0				70			5157
				41			5268
10.0				38			5269
					TD: 10ft logs, no refusal no gw encountered no anomalies		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 159				
Drilling Company HGL		Driller J. Morse	Ground Elevation NA	Total Drilled Depth 0.5'				
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a	Date/Time Drilling Started 6-3-11/0921	Date/Time Total Depth Reached 6-3-11/0930				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (# 50316) (0930)						
Geologist C. Carmichael		Checked by/Date J. Robbins Goldman 7/27/11						
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.0-12	Silt, (10 YR, 3/3), dark brown, 90% silt, 10% fine to medium grained sand, trace sandstone fragments, some rootlets, soft, dry, very low plasticity and hardness, no odor. No groundwater reached.	ML		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50N 3	Location ID 159
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/8/11 1440	Date/Time Total Depth Reached 7/8/11 1458
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50317-1500 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Andrew Robinson/Gedman 8/29/11		

Radiological Background 39 / 3048	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings
							Inches
							10.5' = 3573 (CPM)
			0.0	60	Clayey silt w/sand, Brown (5/3 104R) 10% fine sand, 70% silt, 20% clay dry, low toughness, low strength, low plasticity, no odor or staining, trace roots in first foot.	ML	4658
0.5				45			4743
1.0				33			5099
				59			5030
2.0				57			5090
				53			5196
3.0				70			5161
				66			5182
4.0				55			4965
				71			5030
5.0				83	Clayey Silt, Dark yellowish brown (4/4 104R) 5% fine sand, 65% silt, 30% clay, dry, low tough, low strength, med plasticity no odor or staining.	ML	4958
				52			4988
6.0				55			5108

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 160			
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 6-3-11/1454	Date/Time Total Depth Reached 6-3-11/1506			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50318) (1505.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Moldman 7/27/11					
Radiological Background 13		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0-14	Silt, (10YR, 5/4), light brown, 95% silt, 5% fine to medium grained sand, dry, medium stiff, trace rootlets, very low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 160
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 7'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-2-11/0815	Date/Time Total Depth Reached 8-2-11/0918
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50319) (0925)		
Geologist C. Carmichael	Checked by/Date Julian Robbins/Gedman 8/29/11		

Radiological Background 56, 3720 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
				80				0.5 - 3647
								0 - 4232
1'			0.074		Clayey silt, (10YR, 3/4), dark brown, 60% silt, 40% clay, dry, dry stiff, compact, medium plasticity, hardness, no odor.	ML	5554	
			0.074		Same as above, except with trace sand less compact and medium stiff		5824	
			0.082				6010	
2'			0.096		2' Clayey sand, (7.5YR, 4/3), reddish-brown, 55% fine to medium grained sand, 45% clay, dry, medium dense, semi-moist, low plasticity, hardness, no odor, speckles of orange and red.	SC	6151	
			0.065				6278	
3'			0.057		Same as above, except orangeish-brown (10YR, 4/6)		6233	
			0.079				6395	
4'			0.066				6535	
			0.074				6539	
5'			0.068				6638	
			0.093				6247	
6'			0.091				6170	

Radiological Background					Project Name	Project Number	Location
56, 3720 cpm					SSFE Area IV Radiological Study	EP9038.01.22.04.03	160
Depth	Interval	Recovery	PTD	Radiological	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)	Inches	
7'			0.097		Clayey silt with rock fragments, (2.5Y, 5/4) greenish-brown, 55% silt, 30% clay, 15% siltstone rock fragments, dry, dense stiff, medium plasticity, hardness, no odor.	ML	6102
			0.078		siltstone rock fragments.		6279
					Refusal at 7'- siltstone bedrock		
					No GW reached		
8'							
9'							
10'							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DNgroup3	Location ID 161			
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 6-3-11/1440	Date/Time Total Depth Reached 6-3-11/1447			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50320) (1445.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/27/11					
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5			0.0	14	Silt with sand, (10 yr, 4/4), brown, 85% silt, 15% fine sand, dry, medium stiff, trace rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Radiological Background 63,3645 cpm					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 161
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)
					(Same as above)	CL	
			0.0	58			5277
7'			0.0	67			5687
			0.0	76			5655
8'			0.0	40	Sand with clay, (10YR, 5/4), light orangeish-brown, 85% fine to coarse grained sand, 15% clay, semi-moist, dense, no plasticity, hardness or odor.	SC	5512
			0.0	62			5478
9'			0.0	67			5397
			0.0	76			5478
10'					Refusal at 9.5' - Sandstone bedrock No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN _{group3}	Location ID 162			
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 6-3-11/1418	Date/Time Total Depth Reached 6-3-11/1425			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50322) (1425)					
Geologist C. Carmichael		Checked by/Date J. Robbins Helman 7/27/11					
Radiological Background 12		Radiological Equipment Used w/ Rneter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.012	Silt, (10 VR, 3/3), dark brown, 90% silt, 10% fine sand, dry, soft, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 162
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-2-11/1334	Date/Time Total Depth Reached 8-2-11/1519
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50323) (1450)		
Geologist C. Carmichael	Checked by/Date John Robbins Feldman 8/29/11		

Radiological Background 68, 3360 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	Radiological CPM	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)
			70				0.5 - 333
			0.094	Silt with clay, (10YR, 4/3), pale brown, 85% silt, 15% clay, dry, medium stiff, low-medium plasticity, hardness, no odor.	ML		3493
1'			0.049	Sandy clay, (10YR, 5/4), brown with some speckles of beige sand, 70% clay, 30% fine sand, dry, stiff low-medium plasticity, hardness, medium @	CL		
			0.062				
2'			0.051				
			0.088				
3'			0.055	Red and orange speckles appear.			
			0.068				
4'			0.071				
			0.065				
5'			0.058	Same as above, except semi-moist			
			0.088				
6'			0.080				

Radiological Background					Project Name	Project Number	Location
68,3360 cpm					SSFE Area IV Radiological Study	EP9038.01.22.04.03	162
Depth	Interval	Recovery	PID	Radiological	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)	Inches	
					(Same as above)	CL	
			0.070				5240
7'			0.081				5271
			0.063				5318
8'			0.084				5369
			0.070				5382
9'			0.065				5287
			0.067				5171
10'			0.051				5279
					10' goal reached.		
					No GW reached.		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 163			
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 6-3-11/1403	Date/Time Total Depth Reached 6-3-11/1407			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50324) (1405.)					
Geologist C. Carmichael		Checked by/Date J. Robbins-Holdman 7/27/11					
Radiological Background 12		Radiological Equipment Used M R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5			0.0	12	Silt with clay and sand, (10 YR, 3/3), dark brown, 70% silt, 15% clay, 15% fine to medium grained sand, common rootlets, semi-moist, soft, low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 3	Location ID 163
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-3-11/0718	Date/Time Total Depth Reached 8-3-11/0843
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50325) (0840)		
Geologist C. Carmichael	Checked by/Date Julian Robbin Selman 8/3/11		

Radiological Background 57, 3349 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	PID	100 Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	2			0.5 - 3357
			0.075		Silt with clay, (10YR, 3/3), dark brown, 80% silt, 15% clay, 5% fine sand, semi-moist, medium stiff, low plasticity, hardness, no odor.	ML	4556
1'			0.045		Clayey sand, (10YR, 3/4), dark brown, 60% fine to medium grained sand, 30% clay, 10% silt, some speckles of beige, semi-moist, medium stiff, low-medium plasticity, hardness, no odor.	SC	4805
			0.079			5078	
2'			0.091				5076
			0.081				5127
3'			0.077				5115
			0.089				4999
4'			0.081		<u>Gradational Contact</u> Sandy clay, (10YR, 3/4), dark reddish-brown, 60% clay, 40% fine sand, semi-moist, dense compact, medium stiff, low-medium plasticity, hardness, no odor, trace charcoal.	CL	4999 5149
			0.057				5014
5'			0.059				5060
			0.071				5046
6'			0.072				5125

Radiological Background 57,3349 cpm					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 163
Depth	Interval	Recovery	PTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
					Same as above, except red, black and beige speckles.	CL	
			0.067				5044
7'			0.052				5124
			0.080				5133
8'			0.086				5020
			0.0100				5039
9'			0.053				5075
			0.080				5019
10'			0.0100				5026
					10' goal depth reached. No GW reached.		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 164				
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 5-26-11/1546	Date/Time Total Depth Reached 5-26-11/1555				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50326) (1555)						
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/27/11						
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'			0.0	13	Silt with sand and clay, (10 YR, 3/3), dark brown, 70% silt, 15% fine grained sand, 15% clay, some rootlets, dry, medium stiff, low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50W 2	Location ID 164
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/7/11 0753	Date/Time Total Depth Reached 7/7/11 0816
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50327-0820 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Julian Robbins-Meldman 8/29/11		

Radiological Background 45 / 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 <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5' = 2855 (CPM)
0.0			0.0	47	Clayey silt, Brown (4/3 10YR)		4041
0.5				62	5% fine sand, 65% silt, 30% clay, trace gravel, dry, low toughness, low strength, slow dilatancy, no odor or staining, trace rootlets, med plasticity (fill)	ML	4679
1.0			61	4673			
			77	4715			
2.0				79	Clayey silt w/ sand, Dark Brown (3/3 7.5YR)	ML	4726
				52	10% fine sand, 60% silt, 30% clay dry, low toughness, med strength, slow dilatancy, med plasticity, no odor or staining		4658
3.0				56	Clayey silt, Dark Brown (3/4 7.5YR)	ML	4837
				77	5% fine sand, 55% silt, 40% clay dry, med strength, low toughness, med plasticity, slow dilatancy, no odor or staining		4750
4.0				61			4946
				58			4908
5.0				55	Silty Clay, Brown (4/3 7.5YR)	CL	4921
				54	5% fine sand, 30% silt, 65% clay, dry, stiff, med strength, med plasticity, no dilatancy, no odor or staining		5032
6.0				68			4870

Radiological Background 45/2854				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 5DN, 2, 164	
Depth	Interval	Recovery	PID	Radiological	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			68		Silty Clay, same as above		4870
			74				4910
7.0			75			CL	4980
			96				5015
8.0			57				5159
			49			5071	
9.0			47			5120	
			56		Sandy Silt 40% 35% fine sand, 55% silt, 5% clay, dry, trace low-med toughness, low-med strength, Calcium carbonate stringers, low plasticity, slow dilatancy, no odor or staining	ML	5009
10.0			61				5123
					TO: = 10ft bgs, no refusal no gas encountered no anomalies		
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 165
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 5-26-11/1526	Date/Time Total Depth Reached 5-26-11/1535
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50328) (1535)		
Geologist C. Carmichael		Checked by/Date J. Robbins-Medman 7/27/11		
Radiological Background 13		Radiological Equipment Used up Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5				0.0 12	<p>Sandy silt, (10 YR, 4/4), brown, 70% silt, 30% fine to medium grained sand, trace gravel, dry, medium stiff, some rootlets, no plasticity or hardness, no odor.</p> <p style="text-align: center; font-size: 1.2em;">No groundwater reached.</p>	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDW 2	Location ID 165
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth - 10 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6/29/11 1436	Date/Time Total Depth Reached 6/29/11 1458
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50329 - 1560 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date		

Radiological Background 45 / 2386	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 = 2546 (CPM)
			0.0	45	Silty Sand, Pale Brown (6/3 10YR) (F.11)	SM	3493
0.5				61	70% fine sand, 30% silt, trace gravel, dry, low strength, low plasticity		4115
1.0				68	Concrete		4598
				86	Silty Clay, Dark Reddish brown (3/4 5YR)	CL	4687
2.0				66	5% fine sand, 30% silt, 65% clay, dry, stiff, med strength, med tough, med plasticity, no odor or staining		4675
3.0				53	Sandy Silt, Reddish Brown (4/4 5YR)	ML	4798
				60	30% 40% fine sand, 55% silt, 5% clay, dry, low tough, low strength, low plasticity, no odor or staining		4664
				53			4734
4.0				54	Sandy Silt, Reddish brown (4/4 5YR)	ML	4680
				65	40% fine sand, 55% silt, 5% clay, dry, low tough, low strength, low plasticity, no odor or staining		4757
5.0				77			4898
				69			4757
6.0				76			4809

Radiological Background 45 / 2386				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location SDN, 2, 165	
Depth	Interval	Recovery	FTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings (CPM)
6.0			0.0	76	Sandy silt, same as above	ML	4809
				55			4836
7.0				75			4659
				84			4638
				58			4669
8.0				62	Silty Sand, Yellowish Red (4/6 5YR) 70% fine sand, 30% silt, dry. low-med. dense, no odor or staining.	SM	4798
				65			4514
9.0				86			4553
				74			4536
10.0					TD: 10ft. bgs no refusal no gas encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN_group3	Location ID 166			
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 6-3-11/1521	Date/Time Total Depth Reached 6-3-11/1530			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50330) (1530)					
Geologist C. Carmichael		Checked by/Date J Robbins/Goldman 7/21/11					
Radiological Background		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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5					Silt with sand and clay, (10YR, 3/3), dark brown, dry, soft, 70% silt, 15% fine to medium grained sand, 15% clay, common rootlets, very low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN 3	Location ID 166
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/7/11 0914	Date/Time Total Depth Reached 7/7/11 0938
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50334 - 0935 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date: Lauren Robino Medman 8/31/11		

Radiological Background 62 / 2613	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5' = 2929 (CPM)
0.5			0.0	43	Clayey Silt, Brown (4/3 10YR) 5% fine sand, 65% silt, 30% clay, trace gravel, trace rootlets, dry, low toughness, low strength, med plasticity, no odor or staining, (Fill)	ML	4038
				53			4324
1.0				105			4576
				86			4618
2.0				72			4675
				62			4511
3.0				86			4517
				77			4603
4.0				80			4518
				75			4603
5.0				64	Clayey Silt, Dark Brown (3/4 7.5YR) 5% fine sand, 55% silt, 40% clay med strength, low toughness, slow d. latency, no odor or staining, trace calcium carbonate stringers	ML	4334
				55			4416
6.0				71	Silty Sand, Brown (4/4 7.5YR) 55% fine sand, 40% silt, 5% clay, dry, med dense, no odor or staining, trace Calcium carbonate stringers	SM	4367

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN 2	Location ID 167
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/7/11 1025	Date/Time Total Depth Reached 7/7/11 1047
Type of Sampling Device 1 3/4" Macrocure	Samples Collected 50332-1055 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date L. Robbins Malwan 8/31/11		

Radiological Background 50 / 2577	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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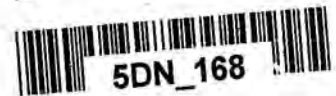
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches 0.5' = 3087 (CPM)
0.5			0.0	48	Clayey silt, Very dark grayish brown (3/2 10YR) 5% fine sand, 55% silt, 40% clay, dry, low tough, low strength, slow dilatency, no odor or staining, low plasticity	ML	4508
				64			4572
1.0				110			4614
				65			4695
				52			4774
2.0				74	Clayey silt w/ sand, Brown (4/4 7.5YR) 10% fine sand, 65% silt, 25% clay, dry, low tough, low strength, med plasticity, no odor or staining	ML	4795
				61			4579
				66			4742
4.0				84			4540
				68			4402
5.0				72	Silty clay, Brown (4/4 7.5YR) 5% fine sand, 30% silt, 65% clay, dry, stiff, med plasticity, no dilatency, no odor or staining.	CL	4564
				63			4197
6.0				54			4236

Radiological Background				Project Name	Project Number	Location	
50/2577				SSFL Area IV Radiological Study	EP9038.01.22.04.03	50N, 2, 167	
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings (CPM)
6.0			20	54	Clayey silt, Brown (4/14 7.59R)		4236
				52	5% fine sand, 60% silt, 30% clay, low tough, low strength, med plasticity, no odor or staining	ML	4026
7.0				74	Clayey silt w/ sand, Strong brown (4/16 7.59R)		4049
				63	10% fine sand, 60% silt, 30% clay, dry low tough, low strength, low plasticity, no odor or staining	ML	4170
8.0				65	Clayey silt, Strong Brown (4/16 7.59R)		4085
				61	5% fine sand, 70% silt, 25% clay, dry, low strength, low tough, med plasticity, no odor or staining	ML	4399
9.0				52			4366
				54			4624
10.0				45			4830
					TD = 10ft logs no gw no anomalies		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN 2	Location ID 168
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/7/11 1304	Date/Time Total Depth Reached 7/7/11 1327
Type of Sampling Device 1 3/4" Macrocoring	Samples Collected 50333 - 1330 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Lucretia Robbins-Jedman 8/31/11		

Radiological Background SS / 2465	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' = 2842 (CPM)
0.0			0.0	51	Clayey silt, Brown (4/3 10YR)		3776
0.5				71	5% fine sand, 65% silt, 30% clay, dry, low tough, low strength, slow dilatency, med plasticity, no odor or staining, trace gravel. (E. 11)	ML	4269
1.0				57			4509
				58	Silt w/ clay , Clayey silt, Brown (4/4 7.5YR)		4642
2.0				64	5% fine sand, 75% silt, 20% clay, dry, low tough, low strength, slow dilatency, med plasticity, no odor or staining	ML	4566
				61			4588 4558
3.0				64			4490
				57			4399
4.0				52			4456
				58			4661
5.0				58			4910
				64	Silt w/ clay Clayey silt, Reddish Brown (4/4 5YR) 5% fine sand, 75% silt, 20% clay. dry, low toughness, low strength, med plasticity, no odor or staining	ML	4723
6.0				72			4734



Radiological Background 55 / 2465				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location SDN, 2, 168	
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	72	Clayey silt, continued, same as above		4734
				71			4517
7.0				66			4412
				75			4256
8.0				70			4349
				61	Sandy silt w/clay, Brown (4/4 7.0 5 YR) 20% fine sand, 70% silt, 10% clay, dry, low tough, low strength, low med plasticity, no odor or staining, trace calcium carbonate stringers	ML	4517
9.0				69	Silty Sand, Strong Brown (4/6 7.5 YR) 55% fine sand, 40% silt, 5% clay, dry, med dense, no odor or staining, trace calcium carbonate		4338
				67		SM	4336
10.0				53	TD= 10ft bgs, no refusal no gw encountered no anomalies		4478
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SON 2	Location ID 169
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 8ft 8in ¹⁵ ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/7/11 1417	Date/Time Total Depth Reached 7/7/11 1437
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50334-1445 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Lubean Robbins Goldman 8/31/11		

Radiological Background 41 / 2537	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 40.5' = 2597 (CPM)
			0.0	45	Clayey silt, Brown (4/3 10YR)		2929
0.5				62	5% fine sand, 65% silt, 30% clay, dry, low strength, low tough, low plasticity, no odor or staining, trace asphalt	ML	3971
1.0				91	Silty Clay, Brown (4/3 7.5YR)		4217
				71	5% fine sand, 40% silt, 55% clay, dry, med stiff, med plasticity, med strength, no odor or staining	CL	4545
2.0				73			4435
				66			4471
3.0				50			4546
				67			4526
4.0				63			4524
				55			4588
5.0				57	Clayey silt w/sand, Strong brown (4/6 7.5YR)		4454
				76	10% fine sand, 65% silt, 25% clay low toughness, low strength, low plasticity, no odor or staining.	ML	4561
6.0				61			4353

Radiological Background 4/ 2537				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location SDW, 2, 169	
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 (CPM)
6.0			0.0	61	Silty sand, Dark yellowish Brown (5/6 10YR) 55% fine sand, 40% silt, 5% clay, dry, mud dense, no odor or staining	SM	4353
				64			4259
7.0				55			4342
				63			4244
8.0				70			4183
				67	Sand (weathered sandstone), Pale Brown (6/3 10YR) 80% fine sand, 15% medium sand, 5% Dense carbonate nodules	SP Bch	4176
9.0					TD = 8ft 8in bgs, refusal on weathered sandstone no gas 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 5DN group 2	Location ID 170			
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 5-26-11/0957	Date/Time Total Depth Reached 5-26-11/1005			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50335) (1005.)					
Geologist C. Carmichael		Checked by/Date J. Robbins/Goldman 7/27/11					
Radiological Background @ 13 12		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.5			0.0	12	Sand with silt, (10YR, 4/4), brown, 80% fine to medium grained sand, 20% silt, trace sandstone fragments, dry, medium dense, no plasticity or hardness, some rootlets, no odor. No groundwater reached	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 170
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-1-11/1102	Date/Time Total Depth Reached 8-1-11/1158
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50336) (1205)		
Geologist C. Carmichael	Checked by/Date J. Alan Robbins/8/31/11		

Radiological Background 96, 3282 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	D.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)
				69			0.5	3324
			0.0	59				4975
1'			0.0	104				5285
			0.0	78	1.5'			5314
2'			0.0	78	Silty sand with gravel (1.5 YR, 4/3), reddish-brown, medium dense, 60% fine to medium grained sand, 15% silt, 15% gravel fill rock and sandstone, 10% clay, dense, dry, no plasticity, hardness and odor.			5576
			0.0	82	2.5'			5350
3'			0.0	68	Same as above, except no sandstone and all gravel is fill rock: 50% sand, 25% gravel fill rock, 15% silt, 10% clay, semi-moist, dense, no plasticity, hardness or odor.			5169
			0.0	72	3.5'			5220
4'			0.0	106	Gradational contact Sand with clay and gravel, (10 YR, 3/4), dark brown, 65% fine to coarse grained sand, 20% clay, 15% gravel fill rock, semi-moist, medium dense, no plasticity, hardness or odor.	SW		5268
			0.0	77				5440
5'			0.0	62	Gradational Contact Sandy clay, (10 YR, 3/6), orangeish-brown, 55% clay, 45% fine to medium grained sand, calcium carbonate nodules (mm-sized) and stringers, semi-moist, medium stiff, low plasticity, low-medium hardness, no odor.	CL		5350
			0.0	67				5244
6'			0.0	78				5242

Radiological Background					Project Name	Project Number	Location
96, 3282 cpm					SSFE Area IV Radiological Study	EP9038.01.22.04.03	170
Depth	Interval	Recovery	P/D	Radiological	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)	inches	
					(Same as above)	CL	
				0.073			4948
7'				0.080	trace iron-oxide tinting throughout		4833
				0.057			4840
8'				0.073			4703
				0.070			4457
9'				0.069			4316
				0.075			4448
10'				0.089			5045
					10' goal depth reached. No GW reached.		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 171			
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 5-26-11/0935	Date/Time Total Depth Reached 5-26-11/0943			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50337) (0942)					
Geologist C. Carmichael		Checked by/Date J. Robbins-Holdman 7/27/11					
Radiological Background 3		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	3	Sand with silt and gravel, (10 VR, 3/4), reddish brown, 70% fine to medium grained sand, 15% silt, 15% gravel fill, sandstone fragments, asphalt, dry, common rootlets, medium dense, no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 172			
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 5-26-11/0920	Date/Time Total Depth Reached 5-26-11/0928			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50339) (0928)					
Geologist C. Carmichael		Checked by/Date J. Robbins-Heldman 7/27/11					
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 11	Sand with silt, (10 YR, 4/4), reddish-brown, 80% fine to coarse grained sand, 15% silt, 5% gravel fill and sandstone rock fragments, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached	SM	



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 172
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 7-28-11/1053	Date/Time Total Depth Reached 7-28-11/1204
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1-1/2 gall bag (#50340) (1355)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Melman 8/31/11		

Field DWP
50421

Radiological Background 51, 3130 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 2000. (0.0 ppm)	Background: 0.0 ppm
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Depth	Interval	Recovery	CPD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			0.0	29				0.5 - 3191
1'				0.068	Gravelly sand with silt, (10 YR, 5/4), light brown, 60% fine to coarse grained subrounded sand, 30% gravel fill rock and sandstone/siltstone fragments, 10% silt, dry, loose, no plasticity, hardness or odor.	SW		4119
				118	Same as above, except semi-moist and (10 YR, 4/4).			4593
				69	Large gravel cobbles appear at ~1 ft and below.			4848
2'				61				4931
				57				5292
3'				38	Sandy clay, (10 YR, 3/4), dark reddish-brown, 55% clay, 45% fine to medium grained sand, semi-moist, medium stiff, low plasticity, low-medium hardness, no odor.	CL		5483
				60				5353
4'				81	Same as above, except 65% clay, 35% fine to medium grained sand, semi-moist, low-medium plasticity, hardness, calcium carbonate stringers.			5199
				66				5119
5'				86	trace gravel/cobbles throughout.			5177 4896
				67				5058 5119
6'				47				5035 5174

Radiological Background					Project Name	Project Number	Location
51, 3130 cpm					SSFE Area IV Radiological Study	EP9038.01.22.04.03	172
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)		(CFM)
					Same sandy clay, except brick red (7.5YR, 4/4)	CL	5038
7'			0.0	79			5189 5035
				91			5107 5032
				72			4983 5189
8'				63			5107 5107
				97			4983
9'				49			4528
				63			4297
10'				75			
							10' goal depth reached. No GW reached.

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 173				
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 5-26-11/1017	Date/Time Total Depth Reached 5-26-11/1025				
Type of Sampling Device Stainless steel shovel		Samples Collected - Field Dup: 50413 1 1/2 gall bag (#50341) (1025)						
Geologist C. Carmichael		Checked by/Date J. Robbins/Geldman 7/27/11						
Radiological Background 14		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	14	Sand with silt, (10YR, 4/4), brown, 75% fine to medium grained sand, 20% silt, 5% gravel fill and sandstone fragments, dry, common rootlets, medium dense, no plasticity or hardness, no odor. No groundwater reached	SM		



Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 173			
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'				
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-1-11/0903	Date/Time Total Depth Reached 8-1-11/1003 50342				
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1-1/2 gall bag (#50432) (1015)					
Geologist C. Carmichael		Checked by/Date L. Clark Robbins/J. Edman 8/31/11					
Radiological Background 76, 3787 cpm		Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000: (0.0 ppm) 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)
			0.0	82			0.5 3833 0 5108
1'			0.0	108	Silty sand with gravel, (10 YR, 5/4), light brown, 70% fine to medium grained sand, 15% silt, 15% gravel fill, dry, loose, no plasticity, hardness or odor.	SM	5471
			0.0	79			5439
			0.0	55	Sand with clay, (7.5 YR, 4/4), reddish-brown, 75% fine to medium grained sand, 25% clay, calcium carbonate stringers and nodules, medium dense, no plasticity, low hardness, no odor.	SC	4396
2'			0.0	112			4041
			0.0	93			4214
3'			0.0	90	Same as above, except more clay: 65% sand, 35% clay		4595
			0.0	127			4597
4'			0.0	90			4750
			0.0	72			4812
5'			0.0	81			4716
			0.0	94			4870
6'			0.0	89			5114

Radiological Background				Project Name	Project Number	Location
76, 3787cpm				SSFE Area IV Radiological Study	EP9038.01.22.04.03	173
Depth	Interval	Recovery	PID	Description (include lithology, grain size, sorting, singularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		Borehole Gamma Readings (CPM)
			0.0104	Same as above, except more clay- Sandy clay, 55% clay, 45% fine to medium grained sand, low plasticity and hardness, no odor.		
7'			0.099			5142
			0.082			5023
8'			0.0115			5206
			0.088			5225
9'			0.081			5067
			0.086			5183
			0.092			5182
10'						5043
						10' goal depth reached. No GW reached

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 174	
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 5-26-11/1049		Date/Time Total Depth Reached 5-26-11/1055	
Type of Sampling Device Stainless steel shovel				Samples Collected 1-1/2 gall bag (#50343) (1055.)			
Geologist C. Carmichael				Checked by/Date J. Robbins Feldman 7/27/11			
Radiological Background 13		Radiological Equipment Used M/R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	13	Gravelly sand, (10 YR, 4/4), brown, 65% fine to coarse grained sand, 30% gravel fill and sandstone fragments, 5% silt, dry, medium dense, common rootlets, no plasticity or hardness, no odor. No groundwater reached.	SW	



Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 174				
Drilling Company HGL		Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'				
Drilling Equipment Hand auger		Borehole Diameter 2 3/4"	Date/Time Drilling Started 7-29-11/1332	Date/Time Total Depth Reached 7-29-11/1448				
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1 1/2 gall bag (#50344) (1455)						
Geologist C. Carmichael		Checked by/Date Jim Robbins/Geldman 9/8/11						
Radiological Background 61, 3411 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rae 2000. Background: (0.0 ppm)				
Depth	Interval	Recovery	RFD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
			20	70				0.5-3423
								0-3819
1'			0.0	95	Silty sand with gravel, (10YR, 4/4), brown, 55% fine to medium grained sand, 25% gravel fill rock, sandstone/siltstone, 20% silt, dry, loose, no plasticity, hardness or odor.	SM		4794
			0.0	95				4834
			0.0	75				5299
2'			0.0	75				5658
			0.0	77				5564
3'			0.0	69			5344	
			0.0	62			5491	
4'			0.0	93	Gradational Contact Silty sand with clay and gravel, (10YR, 3/4), dark brown, 50% fine to medium grained sand, 20% silt, 15% clay, 15% gravel fill rock, semi-moist, medium dense, no plasticity, hardness, or odor.	SM		5266
			0.0	74				5010
5'			0.0	60	Clayey sand, (7.5YR, 4/4), reddish-brown, 55% fine to medium grained sand, 45% clay, semi-moist, medium dense, low plasticity, low-medium hardness, no odor, calcium carbonate nodules and stringers.	SC		4764
			0.0	52				4744
6'			0.0	47				4629

Radiological Background 61,341 cpm					Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 174
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
					Same as above, except more clay: 55% clay, 45% fine to medium grained sand.	CL	4871
7'				0.092			4934
				0.083			4942
				0.085			5052
8'				0.083	trace sandstone fragments appear (~8ft)		5188
				0.065	Same as above, except more clay: 65% clay, 35% sand		5164
9'				0.098			5043
				0.078			5159
10'				0.060	10' goal depth reached. No GW reached.		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 175	
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 5-26-11/1114		Date/Time Total Depth Reached 5-26-11/1121	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50345) (1120)			
Geologist C. Carmichael				Checked by/Date L. Robbins Moldman 7/2-7/11			
Radiological Background 3		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 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'			0.0.12	Sand with silt, (10 YR, 3/4), brown, 75% fine to medium grained sand, 20% silt, 5% sandstone rock fragments and asphalt, dry, some rootlets, medium dense, no plasticity or hardness, no odor. No groundwater reached.		sm	



Radiological Background				Project Name	Project Number	Location	
62,338 cpm				SSFL Area IV Radiological Study	EP9038.01.22.04.03	175	
Depth	Interval	Recovery	PID	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>		USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
							Inches
			0.058	Same as above, except more clay. 55% clay, 45% fine to medium grained sand.		CL	5177
7'			0.071	gravel fill disappears.			5238
			0.074				4936
8'			0.077				5051
			0.095				5214
9'			0.095				5073
			0.085				5034
10'			0.0100				5062
				10' goal depth reached No GW reached			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 176	
Drilling Company HGL		Driller J. Morse		Ground Elevation NA		Total Drilled Depth 0.5'	
Drilling Equipment Stainless steel shovel		Borehole Diameter n/a		Date/Time Drilling Started 5-26-11/1135		Date/Time Total Depth Reached 5-26-11/1142	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50347) (1140.)			
Geologist C. Carmichael				Checked by/Date J. Robbins-J. Feldman 7/27/11			
Radiological Background @ 13 14		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>		USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			14 @ 13	Sand with silt, (10 YR, 5/4), light brown, 85% fine to medium grained sand, 15% silt, trace sandstone fragments, dry, some rootlets, loose, no plasticity, no hardness, no odor. No groundwater reached.		SM	



5DN_176

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 176
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-1-11/0737	Date/Time Total Depth Reached 8-1-11/0818
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50348) (0830)		
Geologist C. Carmichael	Checked by/Date Julie Ann Robbins Aldman 9/8/11		

Radiological Background 77, 3570 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 2000: (0.0 ppm)	Background: 0.0 ppm
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Depth	Interval	Recovery	D CPM	R CPM	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
1'	0.0	0.68	0.0	68	Sand with silt, (10 YR, 6/4), 90% fine to coarse grained subrounded sand, 10% silt, trace gravel, sandstone, concrete pieces dry, loose, no plasticity, hardness or odor.	SW	0.5	3702
							5402	5486
2'	0.0	0.83	0.0	83	Silty sand, (7.5 YR, 4/4), reddish-brown, 70% fine to medium grained sand, 20% silt, 10% gravel fill rock and asphalt, dry, loose, no plasticity, hardness or odor.	SM	5427	5425
							5551	5320
3'	0.0	0.75	0.0	75			5253	5199
							5199	4966
4'	0.0	0.62	0.0	62			4695	4890
							4890	5060
5'	0.0	0.85	0.0	85	Gradational Contact Sand with clay, (10 YR, 4/4), brown, 80% fine to medium grained sand, 20% clay, calcium carbonate stringers, dry, trace gravel, medium dense, no plasticity, very low hardness, no odor.	SC	4966	4695
							4695	4890
6'	0.0	0.60	0.0	60			5060	

Radiological Background 17,3570 cpm				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 176	
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)
					Same as above, except more clay and reddish-brown. 75% sand, 25% clay (7.5YR5/4)		5184
7'			0.0	72	Clayey sand, same as above, except more clay. 65% fine to medium grained sand, 35% clay.		5064
			0.0	80	Sandy clay, same as above, except more clay. 55% clay, 45% fine to medium grained sand.	CL	5184
8'			0.0	68			5064 5086
			0.0	78			5104
9'			0.0	69	8.5'-9' increased calcium carbonate nodules, crusts and stringers.		5110
			0.0	104			5189
10'			0.0	125 81 20			5072
10' goal depth reached No GW reached.							

Project Name: SSEL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 177
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 5-26-11/1154	Date/Time Total Depth Reached 5-26-11/1200
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50349) (1200)		
Geologist C. Carmichael	Checked by/Date J. Robbins Goldman 7/27/11		

Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 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)
05				20.13	Sand with silt, (10 YR, 5/3), light brown, 80% fine to medium grained sand, 20% silt, trace sandstone fragments, dry, few rootlets, loose, no plasticity or hardness, no odor. No groundwater reached.	SM		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 177
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 7-29-11/1006	Date/Time Total Depth Reached 7-29-11/1158
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50350) (1205)		
Geologist C. Carmichael	Checked by/Date		

Radiological Background 78, 3234 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 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)
			0.0	136				0.5-3518
1'			0.0	73	Silty sand with gravel, (2.5V, 6/3), light greyish-brown, 55% fine sand, 30% silt, 15% gravel fill rock, concrete pieces, dry, loose, trace rootlets, no plasticity, hardness or odor.	Sm	5045	
			0.0	105			5485	
			0.0	79	Same as above, except (10YR, 5/3) light brown.		5532	
			0.0	132			5294	
			0.0	66			5292	
3'			0.0	56			5480	
			0.0	54			5452	
4'			0.0	61	Gradational Contact 4'		5352	
			0.0	63	Silty sand, (10YR, 4/4), brown, 65% fine to medium grained sand, 20% silt, 10% gravel fill, concrete, sandstone, 5% silt, semi-moist, medium dense, no plasticity, hardness or odor.	SM	5436	
5'			0.0	75			5204	
			0.0	96	Silty sand with clay, (10YR, 3/3), dark brown, 50% fine sand, 35% silt, 15% clay, semi-moist, medium dense, no plasticity, very low hardness, no odor.	SM	5481	
6'			0.0	65			5526	

Radiological Background 78,3234 cpm				Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 177	
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)
					← piece of asphalt found. (Same as above)	SM	5299
7'				0.053			
				0.083	7'		5287
				0.061	Clayey sand, (10YR, 4/6), orangeish-brown, 65% fine to medium grained sand, ← broken glass found	SC	5202
8'				0.071	35% clay, semi-moist, medium dense, low plasticity, low medium hardness, no odor, calcium carbonate nodules and stringers.		5168
				0.045			5261
9'				0.062			5332
				0.060			5405
10'				0.055			5471
10' goal depth reached No GW reached							

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 178	
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 5-26-11/0905		Date/Time Total Depth Reached 5-26-11/0910	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50351) (0910)			
Geologist C. Carmichael				Checked by/Date J. Robbins Mld man 7/27/11			
Radiological Background 15		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	15	Sand with silt, (10YR, 4/3), brown, 85% fine to medium grained sand, 15% silt, trace sandstone fragments, dry, medium dense, some rootlets, no plasticity or hardness, no odor.	SM	
					No groundwater reached.		



5DN_178

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 178
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 7-28-11/0747	Date/Time Total Depth Reached 7-28-11/0828
Type of Sampling Device 2 3/4" hand auger		Samples Collected 1 1/2 gall bag (#50352) (0845)		
Geologist C. Carmichael		Checked by/Date John Phillips, Meldman 9/8/11		
Radiological Background 3917, 59 cpm		Radiological Equipment Used Downhole scanner, Pancake meter		PID Used Mini Rae 2000. (Background: 0.0 ppm)

Depth	Interval	Recovery	RPD 0.0	Radiological 65	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
							0.5	3991
							0	4519
			0.0	83	Sand with clay and silt, (10YR, 5/4), light brown, 70% fine sand, 15% clay, 10% silt, 5% sandstone, rock fragments, dry, loose, no plasticity, hardness or odor.	SC	4680	
1'			0.0	55	Clayey sand, (10YR, 3/4), dark reddish-brown, 70% fine to medium grained sand, 30% clay, trace gravel fill, semi-moist, very low hardness, no plasticity or odor, medium dense.	SC	4936	
			0.0	51			5053	
2'			0.0	58			4968	
			0.0	73			5021	
			0.0	97	Gradational Contact Sand with clay and gravel, (10YR, 3/4), dark reddish-brown, 70% fine to medium grained sand, 15% clay, 15% gravel fill rock, semi-moist, no plasticity, hardness or odor, medium dense.	SC	5220	
3'			0.0	78			5342	
4'			0.0	65			5115	
			0.0	82			5010	
5'					Refusal hit at 4.5'			
6'					No GW reached.			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 179	
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 5-26-11/0847		Date/Time Total Depth Reached 5-26-11/0855	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50353) (0855)			
Geologist C. Carmichael				Checked by/Date L Robbins Feldman 7/27/11			
Radiological Background 13		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000		Background: 0.0 ppm	
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	12	Silty sand, (10 YR, 5/3), light brown, 65% fine to medium grained sand, 35% silt, trace sandstone fragments, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 179
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 7-27-11/1302	Date/Time Total Depth Reached 7-27-11/1400
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50354) (1415)		
Geologist C. Carmichael	Checked by/Date Julian Robbins Feldman 9/8/11		

Radiological Background 3329, 71 cpm	Radiological Equipment Used HR meter , Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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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	
					Inches	(CPM)
0'-1'	0.0 74	58	Sand with silt, (2.5Y, 5/3), light greyish-brown, 90% fine to medium grained sand, 10% silt, trace sandstone fragments, dry, medium dense, no plasticity, hardness or odor. Same as above, except with trace reddish-brown clay inclusions.	SM	0.5	3425
	0.0 86				0	3848
	0.0 55					
1'-2'	0.0 60		Same as 0'-1', except 85% sand, 10% silt, 5% gravel fill.		5524	
	0.0 77				5389	
2'-3'	0.0 52		Sand with silt, (10YR, 4/4), reddish-brown, 90% fine sand, 10% silt, dense, semi-moist, no plasticity, hardness or odor.		5428	
	0.0 69				5455	
3'-4'	0.0 56		Silty sand, (10YR, 4/4), brown, 80% fine sand, 20% silt, trace gravel fill, dense, no plasticity, hardness or odor.		5403	
	0.0 77				5356	
4'-5'	0.0 42		Sand with clay, (7.5Y, 4/3), reddish-brown, 80% fine to medium grained sand, 20% clay, semi-moist, dense, trace gravel fill, no plasticity, hardness or odor.	SC	5234	
	0.0 66				5221	
5'-6'	0.0 86				4889	

Radiological Background 3329, 71 cpm				Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 179	
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'				0.077	← Clay layer Clayey sand, (10.YR, 4/6), reddish-brown, 65% fine to medium grained sand, 35% clay, semi-moist, dense, low plasticity, hardness, no odor.	SC	4371
				0.084	Same as above, except mottled texture with calcium carbonate in the reddish clay.		4216
				0.073			4304
8'				0.079	8' Same as above, except clayey		4384
				0.072	55% sand, 45% clay, low-medium plasticity and hardness		4704
9'				0.063			4761
				0.065	9.5' Same as 7'-8' depth		4996
10'				0.060	10' goal depth reached No GW encountered.		4935

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 180			
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 5-26-11/1338	Date/Time Total Depth Reached 5-26-11/1345			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50355) (1345.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Meldman 7/27/11					
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	12	Sand with silt, (10 YR, 5/2), light greyish-brown, 80% fine to medium grained sand, 20% silt, trace sandstone rock fragments, dry, loose, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 180
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 7-29-11/0753	Date/Time Total Depth Reached 7-29-11/0908
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50356) (0915)		
Geologist C. Carmichael	Checked by/Date [Signature] 8/31/11		

Radiological Background 59, 3350 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
1'	0.0 - 1.0	70	0.0	61	Silty sand with gravel, (10YR, 5/2), light grayish-brown, 70% fine to medium grained sand, 15% silt, 15% gravel fill rock, concrete and sandstone fragments, dry, loose, no plasticity, hardness or odor.	SM	4553	0.5 - 3250
					61	4661		
2'	1.0 - 2.0	48	0.0	69	Clayey sand with silt, (10YR, 4/6); reddish brown, 60% fine to medium grained sand, 30% clay, 10% silt, semi-moist medium dense, trace fine gravel, no plasticity, very low hardness and no odor.	SC	4688	
					69		4480	
					76		4384	
3'	2.0 - 3.0	65	0.0	76	Same as above, except the gravel disappears.		4201	
					65		3662	
					48		3481	
4'	3.0 - 4.0	105	0.0	77	Same as above, except calcium carbonate stringers and mm-sized nodules appear.		3495	
					105		3484	
					77		3456	
5'	4.0 - 5.0	65	0.0	65	Same as above, except clayey - or 55% sand, 40% clay, 5% silt and light orangeish-brown (10YR, 6/6)		3484	
					65		3491	
6'	5.0 - 6.0	76	0.0	76				

Radiological Background 59,3350 cpm				Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 180	
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'				0.060	Same as above, except reddish brown (7.5 YR, 5/4)	SC	3694
				0.065			3851
				0.069			3954
8'				0.059			4226
				0.077			4275
9'				0.055	5'-6' Same as above, except more clay	CL	4196
				0.063	55% sand, 45% clay stiff, semi-moist, low-medium plasticity, hardness, no odor.		4189
10'				0.057	10' goal depth reached. No. GW reached.		4130

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 181			
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 5-26-11/1359	Date/Time Total Depth Reached 5-26-11/1406			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall. bag (#50357) (1405.)					
Geologist C. Carmichael		Checked by/Date J. Robbin M. Aldman 7/27/11					
Radiological Background 12		Radiological Equipment Used w/ Rater		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, micrology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5'				O.D. 11	Silt with sand, (10 VR, 4/4), brown, 80% silt, 20% fine sand, trace sandstone rock fragments and gravel fill, dry, medium stiff, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID & Group SDN group 2		Location ID 181	
Drilling Company Boat Longyear		Driller D. Hansen		Ground Elevation NA		Total Drilled Depth -10 ft. bgs	
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"		Date/Time Drilling Started 6-30-11 0715		Date/Time Total Depth Reached 6-30-11 0835	
Type of Sampling Device 1 3/4" Macrocore				Samples Collected 50350 (0720) (1) 1/2 gallon bags			
Geologist C. Knight				Checked by/Date Audan Robbins Helman 8/31/11			
Radiological Background 51 / 2432		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		+0.5' 2734
			0.0	88			3025
0.5			0.0	94	Fill: Silty clay with Sand dark brown (10YR 3/3), moist, medium stiff, no odor, 30% silt, 5% medium sand, 15% fine sand, 50% clay, cohesive, low plasticity, medium toughness, very mottled	Af / CL	4092
1.0			0.0	65			4366
			0.0	54			4485
2.0			0.0	53			4474
			0.0	64			4705
3.0			0.0	68			4773
			0.0	58	3'5" Silty Sand: Brown (7.5YR 4/4), moist, medium stiff, no odor, 25% silt, 75% fine sand, trace Ca CO ₃ fine stringers	SM	4752
4.0			0.0	75			4615
			0.0	60			4464
5.0			0.0	56	No Recovery		4368
			0.0	55	Same as above	SM	3974
6.0			0.0	78			3883

Radiological Background 51/2432				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 181	
Depth	Interval	Recovery	PID	Radiological	Description (include lithology, grain size, sorting, angularity, Munsell color name & notation, micaceous, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings
						feet	(CPM)
6.0		0.0	78		Same as above	SM	3883
		0.0	60				3782
7.0		0.0	65		6' 11"		3784
		0.0	58		Sandy Silt; light olive brown (2.54 s/m), moist medium stiff, no odor, 35% fine sand, 65% silt, cohesive, low plasticity, low toughness	ML	3763
8.0		0.0	53				3718
		0.0	68				3433
9.0		0.0	59				3486
		0.0	53				3522
10.0		0.2	51		Same as above	ML	3502
					Total Depth: 10' bgs No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 182			
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 5-26-11/1422	Date/Time Total Depth Reached 5-26-11/1430			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50359) (1430)					
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/27/11					
Radiological Background 13		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 Inches (CPM)
0.5'			0.0	11	Silty sand with gravel, (10 YR, 4/4), brown, 55% fine to medium grained sand, 30% silt, 15% gravel fill and sandstone rock fragments, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	SM	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 182
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-30-11 0750	Date/Time Total Depth Reached 6-30-11 0820
Type of Sampling Device 1 3/4" Macrocure	Samples Collected (1) 1/2 gallon bags	50360 (0800)	
Geologist C. Knight	Checked by/Date Ludvan Robbins / Sedwan 8/30/11		

Radiological Background 43 / 2814 / 116R	Radiological Equipment Used Pancake / downhole / Micro R	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' 2814 (CPM)
			0.0	75	Surface: Soil and gravel		3079
0.5			0.0	64	Fill: Silty Sand with clay: light olive brown (2.5Y 5/1), moist, medium dense, no odor, 25% silt, 10% clay, 5% medium sand, 5% fine gravel (granitic), 55% fine sand, mottled	Af / SM	4142
1.0			0.0	76			4477
			0.0	66			6056
			0.0	61			5595
2.0			0.0	84	Same as above	Af / SM	5481
			0.0	50			5513
3.0			0.0	19			5586
			0.0	64			5458
4.0			0.0	56	Clay: Dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 5% silt, 95% clay, cohesive, medium plasticity, medium toughness	CL	5023
			0.0	52			4677
5.0			0.0	52			4742
			0.0	72			4721

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 183
Drilling Company HGL		Driller J. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel		Borehole Diameter N/A	Date/Time Drilling Started 5-26-11/1441	Date/Time Total Depth Reached 5-26-11/1448
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50361) (1448)		
Geologist C. Carmichael		Checked by/Date J. Rottino Feldman 7/27/11		
Radiological Background 13		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'	0.0-0.12				Sand, (10YR, 5/2), light greyish-brown, 90% fine to medium grained sand, 10% silt, trace sandstone fragments, dry, medium dense, some rootlets, no plasticity or hardness, no odor. <div style="font-size: 1.5em; text-align: center;">No groundwater reached.</div>	SP	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 183
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 7-28-11/0906	Date/Time Total Depth Reached 7-28-11/1002
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50362) (1010)		
Geologist C. Carmichael	Checked by/Date J. Robbins, J. Feldman 8/31/11		

Radiological Background 75, 3363 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rac 2000	Background: (0.0 ppm)
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Depth Interval	Recovery	RD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)
1'		0.0	87	Silty sand, (10YR, 6/2), grey, 70% fine sand, 25% silt, 5% sandstone rock fragments and black plastic (tras bag) found (0.5') trace gravel fill, dry, loose, no plasticity, hardness or odor.	SM	4644	0.5 - 3368
		0.0	107			5054	0 - 3508
2'		0.0	64	Sand with silt, (10YR, 4/4), reddish-brown, 80% fine to medium grained sand, 10% silt, 5% clay, 5% gravel fill rock and sandstone rock fragments, dry, medium dense, no plasticity, hardness or odor.	SM	5323	
		0.0	63			5525	
3'			64	Silty sand (10YR, 5/2), greyish-brown, same as 0'-1' otherwise	SM	5303	
			84			5486	
4'			51	3.5' Same as above, except (10YR, 5/3), light reddish-brown and clay layer appears, 75% fine sand, 25% 30% silt, 10% clay, dry, medium dense		5332	
			51	Clayey sand, (7.5YR, 4/4), reddish-brown, 55% fine to medium grained sand, 45% clay, stringers of calcium carbonate, medium dense, semi-moist, low plasticity and hardness, no odor.	SC	5240	
5'			68			5023	
			54	Same as above, except sandier 65% sand, 35% clay.		4907	
6'			68			4859	
			48			4604	

Radiological Background					Project Name	Project Number	Location
75, 3363 cpm					SSFE Area IV Radiological Study	EP9038.01.22.04.03	183
Depth	Interval	Recovery	PID	Radiological	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)
					Same as above, except (10YR, 5/6) orangeish brown.	SC	4125
7'			65				4801
			85				4145
8'			58		Clayey sand, same as 4'-5'		4716
			65				4690
9'			83				4890
			86				4882
10'			74				4943
					10' goal depth reached.		
					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 184				
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 5-26-11/1501	Date/Time Total Depth Reached 5-26-11/1510				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50363) (1510)						
Geologist C. Carmichael		Checked by/Date J. Robbins Feldman 7/27/11						
Radiological Background 12		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	13	Sand with silt and gravel, (10 YR, 4/4), brown, 70% fine to coarse grained sand, 15% silt, 15% gravel fill rock, and sandstone/siltstone rock fragments, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	SW		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 184
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -10.0 Ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-30-11 0835	Date/Time Total Depth Reached 6-30-11 0915
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50364 (0840) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date J. Robbins / J. Feldman 8/31/11		

Radiological Background N1 / 2683 / 11uR	Radiological Equipment Used Pancake / downhole / Macro R	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	58	Surface: Soil and gravel		2683
0.5			0.0	63	Fill: Silty clay with sand: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 15% silt, 5% medium sand, 5% fine sand, 75% clay, mottled, medium plasticity, medium toughness, cohesive, trace asphalt debris, trace granitic fine gravel	AF / CL	2854
1.0			0.0	59		4326	
			0.0	72		4579	
			0.0	65		4608	
2.0			0.0	59	1'10" to 2'3" Asphalt debris		
			0.0	67	Same as above	AF / CL	4629
			0.0	61		4591	
3.0			0.0	64	3'3"		
			0.0	58	Sandy Silt: Dark yellowish brown (10YR 4/4), moist, medium stiff, no odor, 15% fine sand, 85% silt, low plasticity, low toughness, cohesive, some CaCO ₃ fine stringers	ML	4486
4.0			0.0	46		4643	
			0.0	75		4625	
			0.0	34		4453	
5.0			0.0	60	Same as above		4403
			0.0	64		4399	
			0.0	45			
6.0			0.0	55			
			0.0	68			
			0.0	78			

Radiological Background 41/2683/11MR				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 184	
Depth	Interval	Recovery	PID	Radiological	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	78		Same as above: ML	ML	4359
		0.0	105		Clay with silt; strong brown (7.5YR 4/6), moist, medium stiff, no odor, 10% silt, 90% clay, cohesive, ^{medium} plasticity, medium toughness some CaCO ₃ stringers, trace CaCO ₃ nodules.	CL	4541
7.0		0.0	98			CL	4515
		0.0	75			CL	4460
8.0		0.0	63			CL	4519
		0.0	74			CL	4446
9.0		0.0	77			CL	4489
		0.0	53		Same as above	CL	4601
10.0		0.0	58			CL	4579
					Total Depth: 10.4R		
					No GW encountered		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 185			
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 5-24-11/1523	Date/Time Total Depth Reached 5-24-11/1530			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50365) (1530)					
Geologist C. Carmichael		Checked by/Date J Robbins Waldman 7/27/11					
Radiological Background 10		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	10	Sand with silt and clay, (10YR, 3/4), brown, 70% fine to coarse grained sand, 15% silt, 15% clay, dry, medium dense, some CaCO ₃ (mm-sized) nodules, no plasticity or hardness, no odor. No groundwater reached.	SM	

SDN

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / Group Subarea 1 / Group 2	Location ID 185
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 1525 @ 10'
Drilling Equipment hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8/4/11 / 1430	Date/Time Total Depth Reached 8/4/11 / 1525
Type of Sampling Device 2 3/4" hand auger	Samples Collected (1) 1/2 gal bag	Sample ID 50366	Time 1525
Geologist S. Lapeyre-Montrose	Checked by/Date Sheldon Robbins Gellman 8/31/11		

Radiological Background 87 / 14 / 924	Radiological Equipment Used Panache / R meter / downhole	PID Used Mini Rae 2000 (Bgd: 0.0 ppm)
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Depth - ft	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
0.0		68	0.0	68	0-2' SM silty sand dark yellowish brown (10YR 4/4)	SM	+0.5 = 3053	3040
0.0		73	0.0	73	10% clay, 20% silt, 70% fine-coarse grained sand			4074
1.0		78	0.0	78	trace gravel-subrounded, dense, low plasticity, soft, no HC odor, dry rootlets in 0-1'			4464
0.0		94	0.0	94				4667
2.0		76	0.0	76	2'-3' SC clayey sand with silt dark yellowish brown (10YR 3/4)	SC		4706
0.0		75	0.0	75	30% clay, 15% silt, 55% fine-medium grained sand, dense, firm, medium plasticity, firm, no HC odor, dry trace asphalt debris			4780
3.0		59	0.0	59	3'-10' CL sandy clay with silt brown (7.5 YR 4/4)	CL		4960
0.0		77	0.0	77	40% clay, 15% silt, 45% fine grained sand medium-high plasticity, hard, no HC odor, dry			5016
4.0		64	0.0	64				5154
0.0		82	0.0	82				5171
5.0		73	0.0	73	same as above slight increase in silt, decrease in sand (20% silt, 40% fine sand)			5258
0.0		63	0.0	63				5352
0.0		78	0.0	78				5294

Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea SDV group 2	Location ID 185
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment hand auger	Borehole Diameter 3" NA 2 3/4"	Date/Time Drilling Started 8/4/11 / 1430	Date/Time Total Depth Reached 8/4/11 / 1525
Type of Sampling Device 2 3/4" hand auger	Samples Collected 50366 (10) / 1525 (time)		
Geologist S. Lapeyre-Montrose	Checked by/Date		

Radiological Background 87/14/2924	Radiological Equipment Used Panache / up R meter / Downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth - ft	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0			0.0	78	same as above		5294	
6.5			0.0	61		5508		
7.0			0.0	89		5486		
			0.0	68	same as above		5746	
8.0			0.0	89		5546		
			0.0	65		5513		
9.0			0.0	65	same as above		5407	
			0.0	62		5324		
10.0			0.0	67		5537		
					TD = 10' bgs No GW encountered			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 186			
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 5-24-11/1439	Date/Time Total Depth Reached 5-24-11/1450			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50367) (1450)					
Geologist C. Carmichael		Checked by/Date J. Robbins Meldman 7/27/11					
Radiological Background 12		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0	11	Sand with clay, (10 YR, 3/3), dark brown, 75% fine sand, 25% clay, dry, medium dense, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	SC	



Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN 2	Location ID 186
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/5/11 0732	Date/Time Total Depth Reached 7/5/11 0803
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50368-0750 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date LuDean Robbins Feldman 8/31/11		

Radiological Background 59 / 2433	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches 0.5 = 2604 (CPM)
0.0				57	Clayey Silt, Very Dark Grayish Brown (3/2 10R2) 5% fine sand, 65% silt, 30% clay, dry, low strength, low tough, med. plasticity, no odor or staining, trace roots at surface. (Fill material)	ML	3883
0.5				66			4332
1.0				47			4380
				52			4459
2.0				67			4319
				57			4387
3.0				55	Silty Clay, Dark Brown (3/3 10YR) 5% fine sand, 35% silt, 60% clay, dry, med stiff, med toughness, med strength, low-med plasticity, no odor or staining	CL	4460
				54			4554
4.0				47			4671
				43			4861
5.0				58			4746
				41	color change: Brown (4/4 7.5YR)		4806
6.0				43			4844

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 187	
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 5-24-11/1502		Date/Time Total Depth Reached 5-24-11/1509	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50369) (1508)			
Geologist C. Carmichael				Checked by/Date J. Robbins M. Edman 7/27/11			
Radiological Background 10		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
05				0.0 11	Clay with sand, (10 YR, 3/2), dark brown, 80% clay, 20% fine sand, some rootlets, semi-moist, soft, low-medium plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 187
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-30-11 1415	Date/Time Total Depth Reached 6-30-11 1455
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags	50367 (1420) CIL 50370	
Geologist C. Knight	Checked by/Date Ludlow Robbins Hedman 8/31/11		

Radiological Background 50 / 2681 / 24R	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	63	Surface: grass and soil		70.5 2681 (CPM)
0.5			0.0	51	Fill: clayey silt; dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 20% clay, 80% silt, mottled, trace rootlets near surface, low plasticity, low toughness	AF/ML	3128
1.0			0.0	46			4121
			0.0	54	Fill: silty clay; dark brown (7.5YR 3/3), moist, medium stiff, no odor, 30% silt, 70% clay, medium plasticity, medium toughness, cohesive, some CaCO ₃ stringers	AF/CL	4495
2.0			0.0	61			4567
			0.0	65			4684
3.0			0.0	48			4634
			0.0	51			4517
4.0			0.0	76			4583
			0.0	78			4438
5.0			0.0	81	5' bgs, rusted metal strap		4454
			0.0	44	Silty clay; strong brown (2.5YR 4/6), moist, medium stiff, no odor, 25% silt, 75% clay, medium plasticity, medium toughness, cohesive, trace CaCO ₃ stringers	CL	4676
6.0			0.0	20			4676
			0.0	20			4699

Radiological Background 50/2681/12MR				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 187	
Depth	Interval	Recovery	RTD	Radiological	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	70		Same as above	CL	4699
		0.0	62				4751
7.0		0.0	55		8' bgs abundant CaCO ₃ stringers in vertical angle.		4709
		0.0	53				4828
8.0		0.0	56				4887
		0.0	48		Same as above		4886
9.0		0.0	88				4849
		0.0	59				4915
10.0		0.0	62				4862
					Total Depth 5.0' bgs No G.W. encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 188	
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 5-24-11/1418		Date/Time Total Depth Reached 5-24-11/1425	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50371) (1425)			
Geologist C. Carmichael				Checked by/Date J. Robby Moldman 7/27/11			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0.0 11	Sandy clay, (10YR, 3/3), dark brown, 65% clay, 35% fine to medium grained sand, common rootlets, semi-moist, soft, low plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 188
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-3-11/1034	Date/Time Total Depth Reached 8-3-11/1200
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (#50372) (1205)	Checked by/Date Lu Clark Robbins/Heldman 8/31/11	
Geologist C. Carmichael			

Radiological Background 72, 3503 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Ra2 2000	Background: (0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
							0.5 - 3534
							0 - 4049
1'			0.0	68	Silt with clay, (10YR, 3/4), dark brown, 80% silt, 15% clay, 5% fine sand, ^{medium} dry (top 3"), semi-moist trace rounded sandstone rock fragments, low plasticity, hardness, no odor	ML	.4676
			0.0	67	Clayey sand, ^{with silt} (10YR, 3/3), dark brown, 60% fine to medium grained sand, 30% clay, 10% silt, semi-moist, medium dense, very low plasticity, low hardness, no odor	SC	.4936
2'			0.0	54			.5055
			0.0	88			.4962
			0.0	61			5127 ^{CO} .5112
3'			0.0	63	Sandy clay, (7.5YR, 3/4), reddish-brown, 60% clay, 40% fine sand, semi-moist, medium-stiff, low-medium plasticity and hardness, no odor, beige speckles.	CL	.4922
			0.0	68			.5033
4'			0.0	64			.5176
			0.0	89			.5175
5'			0.0	81			.5427
			0.0	62	← 5.5' dark grey nodules of clay appear (mm and 1cm-sized)		.5323
6'			0.0	63			

Radiological Background				Project Name	Project Number	Location	
72,350.3 cpm				SSFE Area IV Radiological Study	EP9038.01.22.04.03	188	
Depth	Interval	Recovery	PTD	Radiological	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'			
					Spreckles of red, black and beige appear	CL	
		0.0		73			5313
7'		0.0		63			5646
		0.0		76			5752
8'		0.0		89	8'		5741
		0.0		76	Same as above, except mottled with light brown beige (see) sandy clay (10YR, 5/4) and reddish-brown sandy clay.		5733
9'		0.0		110			5688
		0.0		75			5645
10'		0.0		93			5543
					1.0' goal depth reached		5401
					No GW reached.		

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 189	
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 5-24-11/1125		Date/Time Total Depth Reached 5-24-11/1135	
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50373) (1135.)					
Geologist C. Carmichael		Checked by/Date J. Robbins Goldmann 7/27/11					
Radiological Background 11		Radiological Equipment Used M R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 11	Silt with sand and clay, (10 YR, 3/3), 65% silt, 20% fine sand, 15% clay, common rootlets, dry, soft, very low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / Group Subarea SDN group 2	Location ID 189
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8/4/11 / 1010	Date/Time Total Depth Reached 8/4/11 / 1142
Type of Sampling Device hand auger 2 3/4"	Samples Collected sample ID 50374 / time: 1145 (1) 1/2 gal bag		
Geologist S. Lapeyre-Montrose	Checked by/Date Julie Ann Robbins/Goldman 8/31/11		

Radiological Background 16/55/3117	Radiological Equipment Used up R meter / pancake / downhole	PID Used Mini Rae 2000 (Bkg: 0.0 ppm)
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Depth - ft	Interval	Recovery	PID	Radiological	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 = 3194 (CPM)
0-6'			81		ML sandy SILT with clay brown (10YR 5/3)	ML	3203
			78		30% silt, 25% clay, 45% fine grained sand dense, medium plasticity, firm, no odor, dry		4715
1.0			90				4749
			91				5059
2.0			63				5121
			50		Same as above	ML	5039
3.0			87				5117
			83				5352
4.0			61				5149
			85		Same as above	ML	5208
5.0			79				5057
			86				4961
			75				

Project Name: SSFL Area JV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 50N group 2	Location ID 189
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment hand auger	Borehole Diameter 3" 2 3/4"	Date/Time Drilling Started 8/4/11 / 1010	Date/Time Total Depth Reached 8/4/11 / 1142
Type of Sampling Device 2 3/4" hand auger	Samples Collected Sample ID 50374 / time 1145		
Geologist S. Lapeyre-Montrose	Checked by/Date		

Radiological Background 16 / 55 / 317	Radiological Equipment Used w/ R meter / Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth ft	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
							Inches	(CPM)
6.0			0.0	75	CL silty CLAY with sand reddish brown (54R/413)	CL	5077	
6.5			0.0	87	30% silty, 45% clay, 25% fine-grained sand, medium-high plasticity, hard, no HC odor, dry		5194	
7.0			0.0	93			5466	
			0.0	85			5346	
8.0			0.0	60			5404	
			0.0	77		Same as above	CL	5502
9.0			0.0	85	Same as above		5455	
			0.0	68			5505	
10.0			0.0	67			5416	
					TD = 10' bgs No GW encountered			

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 190
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 5-25-11/1442	Date/Time Total Depth Reached 5-25-11/1450
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50375) (1450)		
Geologist C. Carmichael		Checked by/Date J. Robbins Moldman 7/27/11		
Radiological Background 12		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)

Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'				0.0 12	Clay with silt and sand, (10 YR, 3/3), brown, 60% clay, 20% silt, 20% fine sand, dry, common rootlets, medium stiff, very low plasticity and hardness, no odor. <div style="text-align: center; font-size: 1.5em; margin-top: 20px;">No groundwater reached.</div>	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50/2 2	Location ID 190
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/6/11 1019	Date/Time Total Depth Reached 7/6/11 1037
Type of Sampling Device 1 3/4" Macrotube	Samples Collected 50376-1050 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Sharon Robbins Aldman 8/30/11		

Radiological Background 34 / 2502	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches *0.5 = 2659 (CPM)
0.5			0.0	52	Clayey Silt, Dark grayish brown (4/2 10YR) 5% fine sand, 70% silt, 25% clay, trace gravel dry, low strength, low toughness, slow dilatancy, low plasticity, no odor or skinning trace rootlets. (F=1)	ML	4108
			0.0	81			4128
1.0			0.0	73			4439
			0.0	108			4425
2.0			0.0	90			4558
			0.0	88		4513	
3.0			0.0	71	Clayey Silt, Dark Brown (3/3 7.5YR) 5% fine sand, 60% silt, 35% clay, dry low-med toughness, low-med strength, low-med plasticity, slow dilatancy, no odor or skinning, trace carbonate stringers	ML	4611
			0.0	63			4508
4.0			0.0	78			4540
			0.1	74			4648
5.0			0.1	87	Silty Clay, Brown (4/4 10YR) 5% fine sand, 35% silt, 60% clay, dry stiff, med plasticity, no dilatancy, no odor or skinning	CL	4597
			0.0	69			4581
6.0			0.0	58			4519

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 191	
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 5-24-11/1026		Date/Time Total Depth Reached 5-24-11/1032	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50377) (1032)			
Geologist C. Carmichael				Checked by/Date J. Robbins Melman 7/27/11			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5				0.0	<p>Silt with sand, (10 YR, 3/3), brown, 85% silt, 15% fine sand, common rootlets, dry, loose^{soft}, very low plasticity, hardness, no odor.</p> <p>No groundwater reached.</p>	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50/N 2	Location ID 191
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/6/11 0725	Date/Time Total Depth Reached 7/6/11 0756
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50378-0755 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date J. Robbins/Jedman 8/30/11		

Radiological Background SI / 2543	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches (CPM)</small>
0.0			0.0	63	Silt w/clay, Dark Grayish Brown (4/2 10YR), 5% fine sand, 80% silt, 15% clay, dry, low strength, low toughness, low plasticity, no odor or staining, trace rootlets. (Fill) trace gravel	ML	3217
0.5			64	4004			
1.0			63	4331			
			67	4261			
2.0			59	4271			
				46			4243
3.0				37			4283
				62	Clayey Silt, Dark Brown (3/5 7.5YR) 5% fine sand, 60% silt, 35% clay, dry, low toughness, low strength, ^{slow-} met ^(S) dilatancy, low-med plasticity, no odor or staining. trace carbonate stringers	ML	2293
4.0			76	4489			
			75	4530			
5.0				64	Silty Clay, Brown (4/4 10YR) 5% fine grained sand, 40% silt, ^(S) 55% clay, dry, med stiff, med plasticity, slow- dilatancy, no odor or staining	CL	4634
				72			4678
6.0				81			4611

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 192				
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 5-24-11/1059	Date/Time Total Depth Reached 5-24-11/1106				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50379) (1105)						
Geologist C. Carmichael		Checked by/Date J. Rotkin/Heldman 7/27/11						
Radiological Background 11		Radiological Equipment Used up Reiter	PID Used Mini Rae 2000 (Background: 0.0 ppm)					
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5				20 11	Silt with sand and clay, (10 YR, 3/3), dark brown, 70% silt, 15% fine sand, 15% clay, dry, common rootlets, soft, low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50N 2	Location ID 192
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/5/11 1158	Date/Time Total Depth Reached 7/5/11 1234
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50380 - 1225 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date LuAnn Robbins Gudman 10/7/11		

Radiological Background 45 / 2871	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches 0.5 = 2673 (CPM)
0.0			0.0	54	Clayey silt w/ sand, ^{Dark yellowish} Brown (3/4 10YR) 10% fine sand, 60% silt, 30% clay, dry, low toughness, low strength, low-med plasticity, no odor or staining.	ML	2771
0.5			75	3692			
1.0			76	4364			
			93	4386			
				(fill)			
2.0				67	color change: Brown (4/3 10YR) trace construction debris in one of the cores.		4728
				61			4551
3.0				72	Clayey silt, Dark brown (3/3 10YR) 5% fine sand, 55% silt, 40% clay, dry, low toughness, low strength, med plasticity, no odor or staining	ML	4504
				79			4550
4.0				88			4673
				71			4834
5.0				63	Silty clay, Brown (4/4 7.5YR) 5% fine sand, 55% silt, 40% clay dry, med stiff, med toughness ^{stiff} , med plasticity, no odor or staining med toughness.	CL	4646
				44			4759
6.0				49			4850

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 193	
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 5-24-11/1340		Date/Time Total Depth Reached 5-24-11/1348	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50381) (1348.)			
Geologist C. Carmichael				Checked by/Date J. Rokim Aldman 7/27/11			
Radiological Background 11		Radiological Equipment Used w/ Rater		PID Used Mini Rae 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches (CPM)
0.5				0.0-12	Sandy silt, (10 YR, 3/4), dark brown, 60% silt, 40% fine to medium grained sand, trace sandstone rock fragments, dry, soft, some rootlets, no plasticity or hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN, group ^{2/1} 3/2	Location ID 193
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 2 3/4"	Date/Time Drilling Started 8-3-11/1338	Date/Time Total Depth Reached 8-3-11/1458
Type of Sampling Device 2 3/4" hand auger	Samples Collected 1 1/2 gall bag (# 50382) (1420)		
Geologist C. Carmichael	Checked by/Date J. Robbins Hedman 8/30/11		

Radiological Background 63, 3443 cpm	Radiological Equipment Used Downhole scanner, Pancake meter	PID Used Mini Rae 2000	Background: (0.0 ppm)
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Depth Interval	Recovery	Radiological DTPD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings	
						Inches	(CPM)
1'	[Diagram]	0.0	105	Silt with clay, (10YR, 3/4), dark brown, 75% silt, 15% clay, 10% sand (fine), dry, medium stiff, low plasticity, hardness, no odor.	ML	3381	0.5
			86			4528	0
			76			4882	
			63			5109	
			83			5112	
3'	[Diagram]	0.0	53	Gradational Contact Sand with clay, (10YR, 3/6), reddish-brown, 75% fine to medium grained sand, 25% clay, dry, low plasticity, hardness, no odor.	SC	4249	
			52			5181	
4'	[Diagram]	0.0	86	Clayey sand (7.5 YR, 3/4), red-brown, 55% fine to medium grained sand, 45% clay, semi-moist, low-medium plasticity, hardness, no odor.	FC	5296	
			65			5140	
5'	[Diagram]	0.0	62	Gradational Contact Sandy clay (7.5 YR, 3/4), reddish-brown, 60% clay, 40% fine to medium grained sand, semi-moist, low-medium plasticity, medium hardness, no odor.	CL	5084	
			69			5041	
6'	[Diagram]	0.0	73				

Radiological Background 63,344 cpm					Project Name SSFE Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 193
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)
7'			0.084		Same as above.	CL	5092
			0.058				4979
			0.098				5038
8'			0.075				4994
			0.0106				5115
9'			0.095				5063
			0.076		5119		
10'			0.075		5146		
					5201		
					10' goal depth reached No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 194
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 5-24-11/1359	Date/Time Total Depth Reached 5-24-11/1406
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50383) (1405.)		
Geologist C. Carmichael	Checked by/Date J Robbins Goldman 7/27/11		

Radiological Background 11	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5				0.0 11	Sandy clay, (10 YR, 2/2), dark brown, 70% clay, 30% fine to medium grained sand, common rootlets, semi-moist, soft, low-medium plasticity and hardness, no odor. No groundwater reached.	CL		



Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50N 2	Location ID 194
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/5/11 0859	Date/Time Total Depth Reached 7/5/11 0923
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50384 - 0920 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date J. Robbins/Goldman 8/29/11		

Radiological Background 44 / 2494	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>Inches #0.5 = 2628 (CPM)</small>
			20	36	Clayey Silt, Brown (4/3 10YR) (Fill)		2904
0.5				62	5% fine sand, 65% silt, 30% clay, dry, low strength, low toughness, med plasticity, no odor or staining, trace rootlets	ML	4072
1.0				70	Silty Clay, Dark Brown (3/3 10YR)		4443
				52	5% fine sand, 55% clay, 40% silt, dry, medium stiff, low toughness, med plasticity, no odor or staining	CL	4497
2.0				46			4522
				44			4694
3.0				55			4675
				51			4726
4.0				67			4704
				73			4748
5.0				51			4869
				29			4874
6.0				32			4750

Radiological Background			Project Name	Project Number	Location		
44	2494		SSFL Area IV Radiological Study	EP9034.01.22.04.03	SON. 2, 194		
Depth	Interval	Recovery	FTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings (CPM)
6.0			0.0	32	Silty Clay, continued same as above		4750
				26			4859
7.0				53	color change: Brown (4/4 7.5YR)	CL	4795
				69			4741
8.0				72			4760
				52	Silty clay w/ sand, Brown (4/4 7.5YR) 10% fine sand, 50% clay, 40% silt, dry, medium stiff, med plasticity, med toughness, no odor or staining	CL	4901
9.0				54			4998
				51			4855
10.0				65			4701
					TD = 10 ft. bgs; no refusal no gas encountered no anomalies		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 195
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 5-24-11/0943	Date/Time Total Depth Reached 5-24-11/0950
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50385) (0950)		
Geologist C. Carmichael	Checked by/Date J. Robbins-Holdman 7/27/11		

Radiological Background 12	Radiological Equipment Used RP R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'				0013	Silt with sand and clay, (10 YR, 3/2), dark brown, 60% silt, 20% fine sand, 20% clay, common rootlets, semi-moist, soft, low plasticity and hardness, no odor. No groundwater reached	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 50N 2	Location ID 195
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation MA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/5/11 1025	Date/Time Total Depth Reached 7/5/11 1050
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50386 - 1045 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date J. Robbins Goldman 8/30/11		

Radiological Background 55 / 2565	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 = 2560 (CPM)
			0.0	31	Sandy silt w/ clay, Dark Grayish Brown (4/2 10YR)		3997
0.5				28	20% fine sand, 70% silt, 10% clay, dry low strength, low toughness, no odor or staining?	ML	4250
1.0				39	-----		4372
				44	Sandy Clayey Silt w/ sand, Dark Brown (3/3 10YR)		4474
2.0				45	10% fine sand, 70% silt, 20% clay, dry, low strength, low toughness, no odor or staining	ML	4411
				53	(Fill)		4391
3.0				43			4498
				63			4363
4.0				48			4346
				35	-----		4484
5.0				27	Clayey Silt, Dark Brown (3/3 10YR)		4489
				52	5% fine sand, 55% silt, 40% clay, dry, low-med stiff, low toughness, low dilatancy, no odor or staining, trace carbonate stringers.	ML	4544
6.0				60	Silty Clay, Brown (4/4 7.5YR)	CL	4561
					5% fine sand, 55% clay, 40% silt, dry, med stiff low-med plasticity, low dilatancy, no odor or staining.		

Radiological Background 55 / 2565				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 50N, 2, 195	
Depth feet	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings
							Inches (CPM)
60			60		Silty Clay, same as above		4561
			66				4498
70			74				4626
			92				4567
80			78				4578
			67				4658
90			70				4717
			77				4742
100			66		TD = 10ft. bgs, no refusal no gw encountered no anomalies		4766
110							
120							
130							

Project Name: SSFL Area JV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 196				
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 5-24-11/0901	Date/Time Total Depth Reached 5-24-11/0906				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (# 50387) (0905)						
Geologist C. Carmichael		Checked by/Date J. Robbins & Aldman 7/27/11						
Radiological Background 11		Radiological Equipment Used M/R meter		PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
05				0.0 12	Silt with sand and clay, (10YR, 3/4), dark brown, 70% silt, 15% fine sand, 15% clay, dry, loose, common rootlets, plastic wire found, low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 196
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -10.0 ft. bgs
Drilling Equipment Geo probe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-30-11 1135	Date/Time Total Depth Reached 6-30-11 1220
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50388 (1140)
Geologist C. Knight	Checked by/Date J. Robbins/Goldman 8/30/11		

Radiological Background 36 / 270 / 104R	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: grass and soil		10.5 2770
0.5			60	62	Fill: Clayey silt: dark yellowish brown (10YR 4/4), dry, medium stiff, no odor, 20% clay, 5% fine sand, 25% silt, low toughness, low plasticity, cohesive, trace green plastic shreds, brass metal debris	AF	3397
			60	75		ML	4226
1.0			60	70			4773
			60	62			4874
2.0			0.0	66			4910
			0.0	77		4670	
3.0			0.2	92	2'11" silty clay: Brown (7.5 YR 4/4), moist, medium stiff, no odor, 25% silt, 75% clay, cohesive, medium plasticity, medium plasticity, trace CaCO ₃ nodules	CL	4675
			0.2	80			4747
4.0			0.0	62			4722
			0.0	71			4751
5.0			0.2	67			4774
			0.0	35		4863	
6.0			0.0	51		4712	

Radiological Background 36 / 2770 / 10 μR					Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 196
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 (CPM)
6.0		0.0		51	Same as above; abundant CaCO ₃ nodules	CL	4712
		0.0		60		CL	4756
7.0		0.0		57	6'10" Clayey silt; yellowish brown (10YR 5/6), moist, medium stiff, no odor, 20% clay, 80% silt, ^{CL} medium low plasticity, low toughness, trace mottling, cohesive	ML	4761
		0.0		61			4741
8.0		0.0		58	7'9" Silty Clay; Dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 40% silt, 60% clay, medium plasticity, medium toughness, cohesive, trace stringers	CL	4720
		0.0		84			4432
9.0		0.0		53			4138
		0.0		58			4333
10.0		0.0		72	Same as above	CL	4266
<p>Total Depth: 10.0' bgs No GW encountered</p>							
11.0							
12.0							
13.0							

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 197
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 5-24-11/0919	Date/Time Total Depth Reached 5-24-11/0925
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50389) (0925)		
Geologist C. Carmichael	Checked by/Date J. Robbins M. Holman 7/27/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PTD	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5				0.0 12	Silt with sand, (10 YR, 3/3), dark brown, 75% silt, 20% fine to medium grained sand, 5% clay, trace sandstone fragments, dry, some rootlets, loose, very low hardness and plasticity, no odor. No groundwater reached	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 197
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth -1010 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 8-30-11 1040	Date/Time Total Depth Reached 6-30-11 1120
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags 50390 (1050) 50419 (NT) Field DDP		
Geologist C. Knight	Checked by/Date J. Robbins-Yeldman 8/29/11		

Radiological Background 57 / 2732	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.2 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5' 2847 (CPM)
			0.0	93	Surface: grass and soil		
0.5			0.0	62	Silt with sand: dark brown (10YR 3/3), moist, medium stiff, no odor, 10% fine sand, 5% clay, 85% silt, cohesive, low plasticity, low toughness, trace rootlets near surface	ML	3346 4024
1.0			0.0	53	"		4379
			0.0	50	Silty clay: dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 35% silt, 65% clay, medium plasticity, low toughness, cohesive, medium dry strength	CL	4618
2.0			0.0	60			4570
			0.0	72			4679
3.0			0.0	75			4653
			0.0	70			4655
4.0			0.0	76			4552
			0.0	66			4627
5.0			0.0	61	Same as above	CL	4560
			0.0	57			4644
6.0			0.0	55	contact 6.0'		4588

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 198
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 0.5'
Drilling Equipment Stainless steel shovel	Borehole Diameter 1/4	Date/Time Drilling Started 5-24-11/0833	Date/Time Total Depth Reached 5-24-11/0841
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50391) (0840)		
Geologist C. Carmichael	Checked by/Date J. Robbins M. Leiman 7/27/11		

Radiological Background 13	Radiological Equipment Used up R meter	PID Used Mini Rae 2000	Background: 0.0 ppm
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.013		<p>Silty sand, (10 YR, 4/3), brown, 65% fine to medium grained sand, 30% silt, 5% rock fragments (sandstone and asphalt), dry, loose, no hardness or plasticity, no odor.</p> <p>No groundwater reached.</p>	SM		

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / group Subarea 5 SW group 2	Location ID 198
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth
Drilling Equipment Hand auger	Borehole Diameter @ NA 2 3/4"	Date/Time Drilling Started 8/5/11 / 0758	Date/Time Total Depth Reached 8/5/11 / 0930
Type of Sampling Device 2 3/4" hand auger	Samples Collected sample ID: 50392 / NA: 0935 1/2 gal bag (1)		
Geologist S. Lapeyre-Montrose	Checked by/Date J. Robbins-Geldman 8/30/11		

Radiological Background 80 / 3216	Radiological Equipment Used @ off Paracake / Downhole	PID Used Mini Rae 2000 (Bkgd: 0.10 ppm)
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Depth - ft	Interval	Recovery	PID	Radiological	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 = 3238 (CPM)
0.0			72		Surface: top soil and vegetation (weeds)		
0.0			64		0-1.6' SP sand yellowish brown (10YR 5/4)	SP	3633
1.0			57		15% clay, 10% silt, 75% fine-coarse grained sand (rootlets in top 1') trace gravel - subangular (volcanic, some quartz) low plasticity, soft, dry, no HC odor		4646
2.0			60		Empty space - animal burrow		5003
2.5			77				5252
3.0			73		2.5'-8' SC clayey sand dark brown (10YR 3/3)	SC	5326
4.0			69		35% clay, 10% silt, 55% fine-coarse grained sand (trace coarse grained sand) medium plasticity, firm-hard, dry, no HC odor		5057
4.0			65		3 1/4" @ piece of plastic		4882
5.0			76		Same as above	SC	4900
5.0			74				4792
5.0			57		Same as above	SC	4916
5.0			74				4948
5.0			74				4970
5.0			74				4970

Radiological Background			Project Name	Project Number	Location		
SO	3216		SSPL Area IV Radiological Study	EP9034.01.22.04.03	198		
Depth	Interval	Recovery	RTD	Radiological	Description	USCS Symbol	Boothole Gamma Readings (CPM)
6.0			0.0	74		SC	4920
			0.0	65		"	5021
7.0			0.0	74	Same as above	SC	4953
			0.0	68			4793
8.0			0.0	77	8' - SC sand with clay yellowish brown (10% clay 5%)	SC	4878
			0.0	89	9' 6" sand, dense, low-medium plasticity, soft, CaCO ₃ nodule, no MC odor, dry		4832
9.0			0.0	70			4939
			0.0	62	Same as above	SC	4736
10.0			0.0	S3	10' trace asphalt debris		4779
					TD = 10' bgs		
					No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 199
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 5-25-11/1130	Date/Time Total Depth Reached 5-25-11/1138
Type of Sampling Device Stainless steel shovel	Samples Collected 1-1/2 gall bag (#50393) (1138)		
Geologist C. Carmichael	Checked by/Date J. Robbins Mclaren 7/27/11		

Radiological Background 12	Radiological Equipment Used up R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'				0.012	Sandy silt, (10 YR, 3/4), dark brown, 70% silt, 30% fine sand, dry, soft, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 199
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 Ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7-11-11 0945	Date/Time Total Depth Reached 7-11-11 1045
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (0950) 50394 (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Julian Robbins Medman 11/1/11		

Radiological Background UB / 2678	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches
					surface: soil and grass		+0.5' 2777 (CPM)
0.5			0.0	63	clayey silt: Brown (10YR 5/3), dry, medium stiff, no odor, 15% clay, 5% fine sand, 80% silt, cohesive, low plasticity, low toughness, trace rootlets	ML	3634
			0.0	59			4515
1.0			0.0	70			4755
			0.0	63			4584
2.0			0.0	56	clay with silt: Dark yellowish brown (10YR 3/4), moist, medium stiff, no odor, 10% silt, 90% clay, cohesive, medium plasticity, medium toughness, trace CaCO ₃ stringers; trace pinhole pores	CL	4550
			0.0	59			4542
3.0			0.0	65			4478
			0.0	74			4540
4.0			0.0	68			4409
			0.0	65			449
5.0			0.0	68	Some as above	CL	4550
			0.0	58			4473
6.0			0.0	56			4471

Radiological Background 48/2678					Project Name SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Location 799
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)
6.0		0.0	56		Same as above: Clay	CL	4471
		0.0	65				4460
7.0		0.0	60		7' abundant CaCO_3 stringers		4556
		0.0	62		7.5"		4425
8.0		0.0	75		Silt with sand: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 15% fine sand, 85% silt, cohesive, medium ^{ck} toughness, ^{ck} low plasticity, abundant ^{low} CaCO_3 stringers	ML	4256
		0.0	56				4100
9.0		0.0	59				3979
		0.0	60				3939
10.0		0.0	54				4354
Total Depth 10.0' bgs 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 5DN group 2	Location ID 200				
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 5-25-11/1405	Date/Time Total Depth Reached 5-25-11/1412				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50395) (1412)						
Geologist C. Carmichael		Checked by/Date J. Robbins Aldman 7/27/11						
Radiological Background 12		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	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	10	Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 35% fine sand, dry, common rootlets, medium stiff, low plasticity and hardness, no odor. No groundwater reached.	CL		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN 2	Location ID 200
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/6/11 0858	Date/Time Total Depth Reached 7/6/11 0927
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50396-0930 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date J. Robbins-Goldman 8/30/11		

Radiological Background 55 / 2281	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches 6.5 - 2744 (CPM)
0.5			0.1	40	Clayey Silt, Dark grayish brown (4/2 10YR) 5% fine sand, 70% ^(ES) 60% silt, 35% clay, dry, low tough, low strength, low- med plasticity, trace rootlets, no odor.	ML	3833
				31			4365
1.0				42			4385
				48			4513
2.0				87			4501
				84	4280		
3.0				94	Clayey Silt, Dark Brown (3/3 7.5 YR) 5% fine sand, 50% ^(ES) 55% silt, 40% clay dry, low strength, low toughness, med plasticity, slow dilatency, no odor or staining, trace carbonate stringers	ML	4571
				98			4458
4.0				105			4350
				88			4475
5.0				63	Silty Clay, Brown (4/4 10YR) 5% fine sand, 35% silt, 60% clay, dry, med toughness, med strength, stiff, no dilatency	CL	4645
				82			4643
6.0				97			4675

no odor or staining

Radiological Background				Project Name	Project Number	Location	
55 / 2281				SSPL Area IV Radiological Study	EP9038.01.22.04.03	SDN 2, 200	
Depth	Interval	Recovery	PI	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole
							Gamma Readings
							(CPM)
6.0			0.1	97	Silty Clay, carbonized, same as above		4675
				92			4656
7.0				85			4818
				74			4775
8.0				68			4804
				51			4759
9.0				67			4691
				62			4946
10.0				56			4929
						TD: 10 ft. logs, no (refuse) no gw encountered no anomalies	
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 201
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 5-25-11/1337	Date/Time Total Depth Reached 5-25-11/1345
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50397) (1345)		
Geologist C. Carmichael	Checked by/Date J. Robbins M. Edman 7/27/11		

Radiological Background 	Radiological Equipment Used M/R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0		Sandy clay, (10 YR, 3/3), dark brown, 65% clay, 35% fine sand, dry medium stiff, some rootlets, low plasticity and hardness, no odor. No groundwater reached	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group JDN 2	Location ID 201
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/6/11 1420	Date/Time Total Depth Reached 7/6/11 1445
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50398-1440 (1) 1/2 gallon bags		
Geologist I. Stone	Checked by/Date Lui Van Robbins Gleason 8/30/11		

Radiological Background 54 / 2354	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.1 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5' = 2652 (CPM)
0.5			61	60	Clayey Silt, Dark Grayish Brown (4/2 10YR) 5% fine sand, 75% silt, 20% clay. trace asphalt dry, low tough, low strength, slow dilatancy, no odor or staining. (Fill)	ML	2964
				47			4013
1.0			67				4188
				68			4360
2.0			59				4428
				66			4552
3.0			65				4596
				57			4557
4.0			63		Clayey Silt, Dark Brown (3/3 7.5YR) 5% fine sand, 55% silt, 40% clay. dry, low toughness, low strength, slow dilatancy, med plasticity, no odor or staining	ML	4536
				52			4614
5.0			49		Silty Clay, Brown (4/4 10YR) 5% fine sand, 35% silt, 60% clay. dry, stiff, med plasticity, no dilatancy, no odor or staining.	CL	4575
				45			4457
6.0			62				4536

Radiological Background 54/2354			Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 50N, 2, 201		
Depth	Interval	Recovery	PTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
6.0			0.1	62	Silty sand, ^② continued, same as above Clay		4536
				84			4660
7.0				109			4607
				98			4615
8.0				69			4668
				54			4850
9.0				56			4725
				55			4753
10.0				46			4848
						TD = 10ft logs, no refusal no gw encountered no anomalies	

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 202				
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 5-18-11/1300	Date/Time Total Depth Reached 5-18-11/1311				
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50399) (1310.)						
Geologist C. Carmichael		Checked by/Date J. Robbins Moldman 7/27/11						
Radiological Background 10		Radiological Equipment Used up R meter		PID Used Mini Rae 2000 (0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Sandy clay with gravel, (10YR, 3/3), 50% clay, 35% sand (fine to medium grained sand), 15% gravel fill, common rootlets, semi-moist, medium stiff, traces of charcoal in top 1" of soil, no odor, low plasticity and hardness. No groundwater reached.	CL		

Project Name: SSEL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN group 2	Location ID 202
Drilling Company Boart Longyear		Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600		Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-13-11 - 1409	Date/Time Total Depth Reached 6-13-11 1420
Type of Sampling Device 1 3/4" Macrocore		Samples Collected (1) 1/2 gallon bags 50400 (1420)		
Geologist L. Robbins Goldman		Checked by/Date J. Robbins Goldman 7/27/11		
Radiological Background 40 / 2604 / NR		Radiological Equipment Used Pancake / downhole / NR	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)	

Depth	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	49	Surface: grass + soil		+0.5' = 2661
			0.0	45	AF = artificial fill		
0.5			0.0	45	silty clay: very dark grayish brown (2.5Y 3/2), dry, med. stiff, no odor, 65% clay, 20% silt, 5% gravel, (fill rock), 5% fine sand, 5% med. sand, med plasticity, med. toughness, cohesive, trace rootlets, trace CaCO3 nodules > 5mm Same as above: 65% clay, 25% silt, 5% med sand, 5% fine sand	AF	3176
1.0			0.0	49		CL	4036
			0.0	47			4393
			0.0	47			4457
2.0			0.0	49		AF / CL	4490
			0.0	47			4533
3.0			0.0	72			4585
			0.0	77			4533
4.0			0.0	67			4601
			0.0	57			4424
5.0			0.0	55			4442
			0.0	53			
			0.0	53	5' 5" silty clay: dark yellowish brown (10YR 4/4), moist,	AF / CL	4468
6.0			0.0	53	Continue next page		4554

Pancake/downhole/UR

Radiological Background 40/2664/10				Project Name SSFL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location SDN-202		
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	53		<p>med. ^{LEG} stiff, no odor, 60% clay, 25% silt, 10% fine sand, 5% med. sand, med. to low plasticity, med toughness, cohesive, pin hole pores, mica flecks.</p> <p>6'8" —————</p> <p>Same as above: color change dark yellowish brown (10 yr 4/4)</p> <p>CaCO₃ nodules < 5mm, size increase to < 10mm</p>	AF CL		4554
		0.0	72				4424	
7.0		0.0	61				4415	
		0.0	45				4401	
8.0		0.0	74				4347	
		0.0	51				4354	
9.0		0.0	50				4333	
		0.0	47				4102	
10.0		0.0	61	10'0"			4300	
11.0								
12.0								
13.0								

total depth = 10' bgs
no GW encountered

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 203
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 5-24-11/0846	Date/Time Total Depth Reached 5-24-11/0852
Type of Sampling Device Stainless steel shovel	Samples Collected 1 1/2 gall bag (#50401) (0852)		
Geologist C. Carmichael	Checked by/Date J. Robbins Moldman 7/27/11		

Radiological Background 12	Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Inches	Borehole Gamma Readings (CPM)
0.5'			0.0	11	Silt with sand and clay, (10 YR, 3/3), dark brown, 70% silt, 15% fine sand, 15% clay, loose, dry, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML		

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group SDN group 2	Location ID 203
Drilling Company Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 6-30 -11 1335	Date/Time Total Depth Reached 6-30 -11 1405
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50402 (1340) (1) 1/2 gallon bags		
Geologist C. Knight	Checked by/Date Lee Ann Robbins Sedman 8/30/11		

Radiological Background 44 / 267 / 1111R	Radiological Equipment Used Pancake / downhole / Micro R	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	68			70.5' 2697
0.5		0.0	0.0	72	Fill: Silty Clay: Dark brown (10YR 3/3), moist, medium stiff, no odor, 30% silt, 70% clay, cohesive, medium plasticity, medium toughness, slightly mottled	AF / CL	3605
1.0		0.0	0.0	63			4271
		0.0	0.0	54			4552
		0.0	0.0	64			4434
2.0		0.0	0.0	64	2'2" _____		4447
		0.0	0.0	64	Clay with silt: Dark brown (7.5YR 3/4), moist, medium stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive	CL	4423
3.0		0.0	0.0	57			4455
		0.0	0.0	52			4640
4.0		0.0	0.0	53			4659
		0.0	0.0	52			4498
5.0		0.0	0.0	52			4605
		0.0	0.0	62	Clayey Silt: Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 25% clay, 75% silt, cohesive, low plasticity, low toughness, trace CaCO ₃ stringers	ML	4559
6.0		0.0	0.0	52			4619

Radiological Background 44/2697/11AR				Project Name SSPL Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location 203	
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)
6.0		0.0	52		Same as above	ML	4619
		0.6	43			4600	
7.0		0.0	48			4428	
		0.0	51			4245	
		0.0	54			4355	
8.0		0.0	49		7' 9" Clay with silt and sand: Brown (7.5YR 5/4) moist, medium stiff, no odor, 10% silt, 10% fine sand, 80% clay, cohesive, medium plasticity, medium toughness, abundant CaCO ₃ nodules	CL	4376
		1	48			4416	
9.0		0.0	52			4545	
		0.0	53			4462	
10.0							
					Total Depth: 10.0' bgs		
					No GW encountered		
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 204			
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 5-24-11/1003	Date/Time Total Depth Reached 5-24-11/1010			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50403) (1010)					
Geologist C. Carmichael		Checked by/Date J. Pettins M. Aldman 7/27/11					
Radiological Background 11		Radiological Equipment Used w/ R meter	PID Used Mini Rae 2000 (Background: 0.0 ppm)				
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'			0.0 11		7.5 Silt with sand and clay, (4AYR, 3/3), dark reddish-brown, 60% silt, 20% fine sand, 20% clay, soft, semi-moist, common rootlets, low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / Group Subarea SDN, group 2	Location ID 204
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment Hand auger	Borehole Diameter 5" A/A 2 3/4"	Date/Time Drilling Started 8/4/11 / 0800	Date/Time Total Depth Reached 8/4/11 / 0910
Type of Sampling Device Hand auger	Samples Collected sample ID: 50404 / time: 0915 (1) 1/2 gal bag		
Geologist S. Lapeyre-Montrose	Checked by/Date Dan Robbins/Meldman 8/30/11		

Radiological Background 16 / 56 / 3132	Radiological Equipment Used w/ R meter / Parake / Down hole	PID Used Mini Rac 2000 (Bkgd: 0.0 ppm)
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Depth - ft	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Borehole Gamma Readings Inches (CPM)
			0.0	65			+0.5 = 3160
0.5			2.7	61	SC clayey sand with silt dark yellowish brown (104R 4H) 25% clay, 15% silt, 60% fine grained sand, dense, medium plasticity, soft, dry, no odor rootlets from 0-1' (MC)	SC	3196
1.0			1.4	72		4063	
1.5			0.6	97		4751	
2.0			0.7	58		4992	
2.5			1.4	75		4985	
3.0			1.4	101		4948	
3.5			1.6	73		5088	
4.0			0.6	69		5042	
4.5			1.2	77		5122	
5.0			0.3	61		5137	
			0.2	69	5226		
					5129		

Same as above

Same as above

Project Name: SSEL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID / Group Subarea SDN, group 2	Location ID 204
Drilling Company HGL	Driller T. Morse	Ground Elevation NA	Total Drilled Depth 10'
Drilling Equipment hand auger	Borehole Diameter NA	Date/Time Drilling Started 8/4/11 / 0800	Date/Time Total Depth Reached 8/4/11 / 0910
Type of Sampling Device 2 3/4" hand auger	Samples Collected ID 50404 / time 0915		
Geologist S. Lapeyre-Montrose	Checked by/Date JPH (see page 1) 8/30/11		

Radiological Background 16 / 56 / 312	Radiological Equipment Used AP R meter / Pancake / Downhole	PID Used Mini Rae 2000 (Bgd: 0.10 ppm)
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Depth ft	Interval	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			0.1	71	same as above	SC		5343
6.5		0.7	76		6.5'-8' ML clayey silt with sand dark yellowish brown (10YR 4/4) 35% clay, 40% silt, 25% fine grained sand	ML		5172
7.0		0.0	82		medium-high plasticity, hard, very dense, no odor, dry HC			5062
		0.4	89					4996
8.0		0.2	78		8'-10' CL silty clay with sand dark yellowish brown (10YR 3/4) 45% clay, 30% silt, 25% fine grained sand, medium-high plasticity, hard, no odor, dry HC	CL		4953
		0.7	65					4956
9.0		1.4	68					4999
		1.7	92		same as above			5008
10.0		1.2	83		TD = 10' bgs NO GW encountered			5117

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03		Subarea ID 5DN group 2		Location ID 205	
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 5-25-11/1424		Date/Time Total Depth Reached 5-25-11/1430	
Type of Sampling Device Stainless steel shovel				Samples Collected 1 1/2 gall bag (#50405) (1430)			
Geologist C. Carmichael				Checked by/Date J. Robbins/Goldman			
Radiological Background 12		Radiological Equipment Used w/ R meter		PID Used Mini Rac 2000 (Background: 0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
0.5'			0.0	12	Clay sand Sand with clay and silt, (10YR, 3/3), brown, 60% clay, 20% fine sand, 20% silt, dry, medium stiff, common rootlets, very low plasticity and hardness, no odor. No groundwater reached.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DA 2	Location ID 205
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 10 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 7/6/11 1305	Date/Time Total Depth Reached 7/6/11 1328
Type of Sampling Device 1 3/4" Macrocore	Samples Collected (1) 1/2 gallon bags		50406 - 1325
Geologist I. Stone	Checked By/Date J. Robbins Moldovan 8/30/11		

Radiological Background 54 / 2524	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgd: 0.0 ppm)
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Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings Inches +0.5 = 2644 (CPM)	
0.5			0.1	42	Clayey Silt, Dark grayish brown (4/2 10YR) 5% fine sand, 70% silt, 25% clay, trace gravel dry, low strength, low toughness, slow dilatancy, low plasticity, no odor or staining, trace rootlets. (Fill)		3763	
				53			4104	
1.0				46			4270	
				60			ML	4362
2.0				55				4436
				67			4421	
3.0				58	Clayey Silt, Dark Brown (3/3 7.5YR) 5% fine sand, 55% silt, 40% clay, trace calcium carbonate stringers dry, low-med strength, low med toughness, med plasticity, slow dilatancy, no odor or staining		4499	
				45			ML	4498
4.0				74				4483
				52				4637
5.0				43	Silty Clay, Brown (4/4 10YR) 5% fine sand, 35% silt, 60% clay, dry, stiff, med plasticity, no dilatancy, no odor or staining		4517	
				45			CL	4488
6.0				38				4660

Radiological Background 54 / 2524			Project Name SSPE Area IV Radiological Study	Project Number EP9034.01.22.04.03	Location SDN, 2, 205		
Depth	Interval	Recovery	PTD	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, micrology, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.1	38	Silty Clay .. continued same as above	CL	4660
				70			4644
7.0				61			4596
				72			4649
8.0				59			4720
				94			4794
9.0				93			4760
				64	4753		
10.0				74	TD = 10 ft. bgs, no refusal no gw encountered no anomalies		4708
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN group 2	Location ID 206			
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 5-17-11/1448	Date/Time Total Depth Reached 5-17-11/1500			
Type of Sampling Device Stainless steel shovel		Samples Collected 1 1/2 gall bag (#50407) (1455)					
Geologist C. Carmichael		Checked by/Date J. Robbins Moldman 7/27/11					
Radiological Background 11		Radiological Equipment Used w/ R meter		PID Used Mini Rae 2000 (0.0 ppm)			
Depth	Interval	Recovery	PID	Radiological	Description <small>(Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)</small>	USCS Symbol	Borehole Gamma Readings <small>(CPM)</small>
0.5'					Sandy clay, (10 VR, 3/3), dark brown, 60% clay, 40% cl 35% fine grained sand, 5% gravel, some rootlets, semi-moist, stiff, low-medium hardness & plasticity, no odor. No groundwater.	CL	

Project Name: SSFL Area IV Radiological Study	Project Number EP9038.01.22.04.03	Subarea ID & Group 5DN - group 2	Location ID 206
Drilling Company: Boart Longyear	Driller D. Hansen	Ground Elevation NA	Total Drilled Depth 5.0 ft. bgs
Drilling Equipment Geoprobe 6600	Borehole Diameter 1 3/4"	Date/Time Drilling Started 5-19-11 1320	Date/Time Total Depth Reached 5-19-11 1400
Type of Sampling Device 1 3/4" Macrocore	Samples Collected 50408 (1330) (1) 1/2 gallon bags		
Geologist C. Knight		Checked by/Date J. Robbins-Meldman 7/27/11	

Radiological Background 341 / 1244	Radiological Equipment Used Pancake / downhole	PID Used Mini Rae 2000 (Bkgsd: 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	42	Surface grass and soil		105 2597
0.5			0.0	50	Fill: Silt with clay and sand: Yellowish brown (10YR 5/4), dry, medium dense, no odor, 10% clay, 10% fine sand, 80% silt, trace angular medium gravel (fill rock), cohesive, low plasticity, low toughness	Af	3186
1.0			0.0	50			4473
			0.0	58	17" Silty clay: Brown (10YR 4/3), dry, medium stiff, no odor, 20% silt, 52% fine sand, 75% clay, cohesive, low plasticity, medium toughness, trace CaCO ₃ stringers and nodules	CL	4786
2.0			0.0	64			4770
			0.0	60			4786
3.0			0.0	63			4692
			0.0	64	3'6" Sandy silt with clay: Strong brown (7.5YR 5/6), moist, medium stiff, no odor, 57% medium sand, 25% fine sand, 15% clay, 55% silt, low plasticity, low toughness, cohesive	ML	4922
4.0			0.0	63			4738
			0.0	60	4'10" Weathered sandstone: Brownish yellow (10YR 6/6), hard, moist, no odor, mechanically weathered to SP, fine grained sandstone		4855
5.0			0.0	61			4863
					Refusal on sandstone at 5.0' bgs No GW encountered		5007
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number EP9038.01.22.04.03	Subarea ID 5DN, group 2	Location ID 207			
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 6-3-11/0828	Date/Time Total Depth Reached 6-3-11/0835			
Type of Sampling Device Stainless steel shovel			Samples Collected 1 1/2 gall bag (#50409) (0835)				
Geologist C. Carmichael			Checked by/Date J. Robbins Milderman 7/27/11				
Radiological Background 12		Radiological Equipment Used w/ Rater		PID Used Mini Rax 2000 (Background: 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'			0.012		Silt with sand, (10 YR, 4/4), brown, 85% silt, 15% fine sand, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor. No groundwater reached.	ML	

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DN	Group: 2	Location ID: 207	
Radiological Background: 62, 3209 cpm			Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm		
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0					Same as above	SM	6031
7.0			0.0	74	Some siltstone/sandstone fragments appear.		
8.0					Refusal at 6'10" - sandstone bedrock		
9.0					No GW reached.		
10.0							
11.0							
12.0							
13.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 505	Group: 4	Location ID: 1
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 9 in 8 bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/10/11 1334	Date/Time Total Depth Reached: 11/10/11 1349	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.);		50441 - no sample	
Geologist: Ian Stone	Checked By / Date: <i>Ad</i> 1-4-12			

Radiological Background: 22 / 5801 / 123	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	162	Silty Sand, Dark Yellowish Brown (5/6 10R) 80% fine subrounded sand, 20% silt, sandstone cobbles, moist, med dense, no odor or staining	SM		
			0.0	98				
1.0					TD = 9.12 bgs no gw encountered refusal on sandstone		1	
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

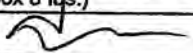
SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 4	Location ID: 2
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2'10" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/14/11 0905	Date/Time Total Depth Reached: 11/14/11 0925	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50443 (0930)	
Geologist: Jan Stone - <i>Timothy Morse</i>		Checked By / Date: <i>[Signature]</i> 1-3-12		

Radiological Background: 18 / 4317 / 88	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft. bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	56	Surface: soil + veg.		+0.5' 4272
0.5			0.0	65	Sandy silt: Dark Brown (10YR 3/3) 20% fine grained sand, 80% silt, trace roots and rootlets, no odor, slightly moist, loose, low plasticity, non-cohesive	ML	4926
1.0		0.0	75	7626			
		0.0	103	7963			
2.0		0.0	105	8203			
			0.0	76	2'6" to 2'10" same as above: ↳ presence of mechanically broken pieces of sandstone bedrock gravel		8032
3.0					2'10"		
					Refusal on sandstone at 2'10" bgs. NO GW encountered	bedrock	
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 505	Group: 4	Location ID: 3
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 1ft 2in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/10/11 1003	Date/Time Total Depth Reached: 11/10/11 1019	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50445 - no sample	
Geologist: Ian Stone	Checked By / Date:  1-4-12			

Radiological Background: 22 / 5737 / 114	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 0.5' = N/M (CPM)
0.5			0.0	151	Silty Sand, Yellowish Brown (5/6 10YR), 65% fine subrounded sand, 35% silt, trace gravel (sandstone, max size = 1.5"), moist, low dense, no odor or staining	SM		N/M
1.0		0.0	121					N/M
1.0		0.0	97					1
2.0					TD = 1ft 2in bgs No gw encountered refusal on sandstone			
3.0							2	
4.0							3	
5.0							4	
6.0							5	
7.0							6	

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 4
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-27-11/1409	Date/Time Total Depth Reached: 9-27-11/1418	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (#50446) (1418)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>ds</i> 11-31-11			

Radiological Background: 34, 113	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	36 104	Silt with rock fragments, (10YR, 4/4), brown, 85% silt, 15% siltstone/ sandstone rock fragments, dry, soft, some rootlets, no plasticity, very low hardness, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 505	Group: 4	Location ID: 4
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 10 in bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/10/11 0843	Date/Time Total Depth Reached: 11/10/11 0854	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50447 - no sample	
Geologist: Ian Stone	Checked By / Date: 1-4-12			

Radiological Background: 25 / 5932 / 141	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 6.5' Amm (CPM)
0.0			0.0	132	Sandy silt, Dark Brown (3/3 10YR), 40% fine subrounded sand, 60% silt, sandstone cobbles (max size = 4"), moist, low toughness, low strength, slow dilatancy, no odor or staining	ML		
0.5			0.0	156				
1.0					<p>TD = 10 in bgs</p> <p>no gw encountered</p> <p>refusal on sandstone</p>			
2.0								
3.0								
4.0								
5.0								
6.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 5
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-27-11/1345	Date/Time Total Depth Reached: 9-27-11/1355	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50448) (1355)			
Geologist: Chelsea Carmichael		Checked By./ Date: <i>[Signature]</i> 11-21-11		

Radiological Background: 32, 108	Radiological Equipment Used: Micro R/ Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	32 130	Silt with rock fragments, (10YR, 4/4), brown, 85% silt, 15% siltstone/ sandstone rock fragments, dry, medium stiff, some rootlets, very low hardness, no plasticity or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 4	Location ID: 5
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 2 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/9/11 1432	Date/Time Total Depth Reached: 11/9/11 1443	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50449-1450	
Geologist: Ian Stone	Checked By / Date: 1-4-12			

Radiological Background: 21 / 5889 / 136	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	94	Sandy Silt, Dark Brown (3/3 10YR), 40% fine subrounded sand, 60% silt, trace gravel (sandstone max size = 1"), moist, low tough, low strength, slow dilatancy, no odor or staining	ML	5841
1.0			0.0	101			8836
1.5			0.0	97	Silty Sand, Dark Yellowish Brown (4/4 10YR), 70% fine subrounded sand, 30% silt, trace gravel (sandstone, max size = 1"), moist, low-med dense, no odor or staining	SM	10962
2.0			0.0	83			11979
2.5			0.0	79			11993
TD = 2 ft bgs no gw encountered							
3.0							
4.0							
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 505	Group: 4	Location ID: 6
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/9/11 1336	Date/Time Total Depth Reached: 11/9/11 1348	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50450 - 1340	
Geologist: Ian Stone	Checked By / Date: <i>[Signature]</i> 1-4-12			

Radiological Background: 18 / 4395 / 106	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)	
							Feet bgs.	
0.0			0.0	113	Sandy Silt, Dark Brown (3/3) (10 ⁰), 40% fine subrounded sand, 60% silt, trace gravel (sandstone, max size 1"); moist, low toughness, low strength, slow dilatancy, no cohesion	ML		
0.5			0.0	93				
1.0					TD: 0.5 ft bgs			
2.0								
3.0								
4.0								
5.0								
6.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 7
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-28-11/075L	Date/Time Total Depth Reached: 9-28-11/0806	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50452) (0805)			
Geologist: Chelsea Carmichael		Checked By / Date: [Signature] 11-11-11		

Radiological Background: 30, 100	Radiological Equipment Used: Micro R Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	26 115	Silt, (10YR, 4/4), brown, 100% silt, dry, medium stiff, some rootlets, very low plasticity and hardness, no odor.	ML		
1.0					No GW reached.			
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: 505	Group: 4	Location ID: 7
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 1ft. 8. in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/8/11 1013	Date/Time Total Depth Reached: 11/8/11 1035	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50453 - no sample	
Geologist: Ian Stone		Checked By / Date:  1-4-12		

Radiological Background: 17 / 4168 / 108	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings 0.5' = NM (CPM)
0.5			0.0	95	Silty Sand, Dark Brown (3/3 104R) 60% fine subrounded sand, 40% silt, trace gravel (sandstone, max size = 1/8"), moist, low dense, no odor or staining	SM		NM
1.0			0.0	90	Silty Sand, Brownish Yellow (6/6 104R) 70% fine subrounded sand, 30% silt, trace gravel (sandstone, max size = 1/8"), moist, low dense, no odor or staining	SM		NM
1.0			0.0	65				NM
5.7			5.7	103				NM
<p>TD = 1ft 8. in bgs No gw encountered Refusal on sandstone</p>								

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS	Group: 1	Location ID: 8	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-28-11/0726		Date/Time Total Depth Reached: 9-28-11/0735	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50454) (0735)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>AS</i> 11-21-11			
Radiological Background: 30 100		Radiological Equipment Used: (Micro RY Downhole / Pancake Meters)		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	30 108 cpm	Silt, (10 YR, 4/6), reddish-brown, 95% silt, 5% siltstone/sandstone rock fragments, dry, trace rootlets, medium stiff, very low plasticity, hardness, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS		Group: 1		Location ID: 9	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-28-11/0946		Date/Time Total Depth Reached: 9-28-11/0955			
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50456) (0955)					
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-21-11					
Radiological Background: 28, 91			Radiological Equipment Used: (Micro R) / Downhole (Pancake Meters)			PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)	
0.5			0.0	26 138	Silt, (104R, 4/4), brown, 95% silt, 5% sandstone/siltstone, dry, some rootlets, medium stiff, very low hardness, no plasticity, no odor.	ML			
1.0					No GW reached				
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: 5DS		Group: 1		Location ID: 11	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-28-11/ 0855		Date/Time Total Depth Reached: 9-28-11/ 0901			
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: Field DUP: 50515 (NT) One 1/2 Gallon Bag (Approx 8 lbs.) (#50460) (0900)							
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-11-11					
Radiological Background: 26, 103			Radiological Equipment Used: Micro B / Downhole (Pancake Meters)			PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)	
0.5			0.0	26 117	Silt, (10YR, 4/4), brown, 100% silt, trace siltstone rock fragments, dry, some plasticity, rootlets, soft, very low plasticity, hardness, no odor.	ML			
1.0									
2.0									
3.0									
4.0									
5.0									
6.0									
					No GW reached.				

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 1	Location ID: ck No 11
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/18/11 1405	Date/Time Total Depth Reached: 10/18/11 1510	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) ck 50477 (1430)			
Geologist: C. Knight	Checked By / Date: 1-3-12			

Radiological Background: 22pR/4153/63	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					Surface: Soil and grass		0.5'	4555
			0.0	69	Sandy silt: Dark yellowish brown (10YR 4/6), dry, soft to medium stiff, no odor, 5% medium sand, 10% fine sand, 85% silt, cohesive, low plasticity, low toughness, trace rootlets	ML		5269
			0.6	72				7581
			0.6	76				8157
			0.0	79				8261
			0.0	78				8456
			0.0	82			8403 8456	
			0.0	46			3	8402
			0.0	99	3'4" Silt with clay: Strong brown (7.5 YR 4/6), moist, medium stiff, no odor, 10% clay, 5% fine sand, 85% silt, cohesive, low plasticity, low toughness	ML		8429
			0.0	48			4	8203
			0.0	93	4'4" Sandstone Bedrock: Light yellowish brown (2.5 Y 6/4), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	Bedrock Sandstone		8226
			0.0	88			5	8051
					Refusal on Sandstone at 5.0' bgs No GW encountered		6	

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 12
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-28-11/1025	Date/Time Total Depth Reached: 9-28-11/1031	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50462) (1030)		Checked By / Date: <i>[Signature]</i> 11-11-11	
Geologist: Chelsea Carmichael				

Radiological Background: 30, 97	Radiological Equipment Used: Micro R Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	30 139	Silt, (10 VR, 4/4), 95% silt, 5% siltstone rock fragments, dry, some rootlets, medium stiff, very low hardness, no plasticity or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 13
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-28-11/1057	Date/Time Total Depth Reached: 9-28-11/1106	
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: One 1/2 Gallon Bag (Approx:8 lbs.) (#50464) (1105)		
Geologist: Chelsea Carmichael		Checked By / Date: [Signature] 11-21-11		

Radiological Background: 24 109	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5	[Wavy lines]	[Wavy lines]	0.0	26 148	Silt, (10YR, 4/4), brown, 100% silt, common rootlets, dry, semi-cemented, medium stiff, very low hardness and plasticity, no odor.	ML	[Scale 0-6]	
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS	Group: 1	Location ID: 14	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-28-11/1005		Date/Time Total Depth Reached: 9-28-11/1013	
Type of Sampling Device: stainless steel shovel/trowel				Samples Collected: One 1/2 Gallon Bag (Approx. 8 lbs.) (#50466) (1012)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-28-11			
Radiological Background: 24, 99		Radiological Equipment Used: Micro R / Downhole Pancake Meters		PID Used: Mini Rae 2000 - Background:		0.0 ppm	
Depth (ft. bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	26 154	Silt, (10 YR, 4/4), brown, 90% silt, 5% fine to medium grained sand, 5% sandstone/siltstone rock fragments, dry, medium stiff, common rootlets, very low hardness, no plasticity, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 1	Location ID: 141
Drilling Company: Beart	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/18/11 1125	Date/Time Total Depth Reached: 10/18/11 1145	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		50467 (SAMPLE)	
Geologist: C. Knight	Checked By / Date: [Signature] 1-3-12			

Radiological Background: 234R/4223/65	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0	ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 10.5 CL (CPM)
0.0			0.0	68	Surface: soil and grass		
0.5			0.0	83	Silt with sand: Dark yellowish brown (10YR 3/4), dry, soft, no odor, 10% fine sand, 90% silt, cohesive, low plasticity, low toughness	ML	No down-hole gamma collected
1.0			0.0	92	Weathered Sandstone Bedrock: yellow (2.5Y 8/6), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	Sandstone Bedrock	
2.0			0.0	90	Refused on sandstone at 1.5' bgs No GW encountered No sample collected for laboratory		
3.0							
4.0							
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS	Group: 1	Location ID: 15	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-28-11/1045		Date/Time Total Depth Reached: 9-28-11/1053	
Type of Sampling Device: stainless steel shovel/ trowel		Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50468) (1053)					
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-22-11			
Radiological Background: 30, 107			Radiological Equipment Used: Micro R/Downhole Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm	
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	28 129	Silt, (10YR, 4/4), brown, 95% silt, 5% siltstone/sandstone rock fragments, dry, medium stiff, some rootlets, very low hardness, no plasticity or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 1	Location ID: 15
Drilling Company: <i>Beart</i> <i>Beart Longyear</i>	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: <i>4.5</i> ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: <i>10/18/11 1005</i>	Date/Time Total Depth Reached: <i>10/18/11 1055</i>	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) <i>50469 (1010)</i>			
Geologist: <i>C. Knight</i>	Checked By / Date: <i>[Signature] 1-3-12</i>			

Radiological Background: <i>27MR/4695/69</i>	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: <i>0.0</i> ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					<i>Surface: Soil and grass</i>			<i>70.5' 4545 (CPM)</i>
0.0			66		<i>Sandy Silt with clay: Dark yellowish brown (10YR 4/4), moist, soft to medium stiff, no odor, 10% clay, 15% fine sand, 75% silt, cohesive, low plasticity, low toughness, pin hole pores, trace rootlets</i>	ML		<i>5911</i>
0.5		67						<i>8019</i>
1.0		67						<i>8447</i>
		70						<i>8773</i>
2.0		71						<i>8630</i>
		75			<i>Same as above: Sandy Silt with clay</i>	ML		<i>8498</i>
3.0		86						<i>8492</i>
		83						<i>8148</i>
		85			<i>3'5" Clayey Silt: Dark yellowish brown (10YR 4/6), moist, medium stiff, no odor, 15% clay, 85% silt, low plasticity, low toughness, cohesive, trace rootlets</i>	ML		<i>7034</i>
4.0		82			<i>Weathered Sandstone Bedrock: Pale yellow (2.5Y 7/4), moist, dense, no odor, fine grained sandstone</i>		CK ML Weathered Sandstone	
5.0					<i>Refusal on Sandstone at 4.5' bgs</i>			
6.0					<i>NO GW encountered</i>			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 1	Location ID: 16
Drilling Company: Bart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 5.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/19/11 0920	Date/Time Total Depth Reached: 10/19/11 1040	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 50471 (0925)			
Geologist: C. Knight	Checked By / Date: [Signature] 1-3-12			

Radiological Background: 104R/4261/48	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs	(cpm) Borehole Gamma Readings +0.5' 4449 (CPM)
			0.0	68	Surface: Soil and wood chips			5821
0.5			0.0	66	Sandy silt: Dark yellowish brown (10YR 4/4), moist, soft to medium dense, no odor, 15% fine sand, 5% clay, 80% silt, cohesive, low plasticity, low toughness, trace roots and rootlets	ML		7453
1.0		0.0	67					8148
2.0		0.0	71					8668
2.5		0.0	76					8336
3.0		0.0	73				8573	
3.5		0.0	82		3.5" trace roots			8566
4.0		0.0	79		4" silt with clay: Brown (7.5YR 5/4), moist, medium stiff, no odor, 10% clay, 5% fine sand, 85% silt, cohesive, low plasticity, low toughness	ML		8891
4.5		0.0	70					9396
5.0		0.0	71		4" weathered sandstone bedrock: Brownish yellow (10YR 6/8), dry, dense, no odor, mechanically weathered to SP, fine grained sandstone	5' sandstone bedrock		10181
5.5		0.0	74		Refusal on sandstone at 5.5' bgs (5.5' recovery) No GW encountered, down hole logging to 5.0' bgs			NM

Sample interval 4-5' bgs, analysis @ 5'

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 17
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-28-11/0829	Date/Time Total Depth Reached: 9-28-11/0837	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50472) (0836)			
Geologist: Chelsea Carmichael	Checked By / Date: [Signature] 11-22-11			

Radiological Background: 32, 127	Radiological Equipment Used: Micro Rx Downhole (Pancake Meters)	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	34 140	Silt with rock fragments, (10 YR, 4/4), brown, 85% silt, 15% sandstone/siltstone rock fragments, dry, soft, some rootlets, very low hardness, no plasticity or odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 4	Location ID: 17
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/8/11 0945	Date/Time Total Depth Reached: 11/8/11 0953	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 50473 - no sample			
Geologist: Ian Stone	Checked By / Date: <i>[Signature]</i> 1-4-12			

Radiological Background: 22 / 5198 / 105	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings 0.5 = NM (CPM)
0.0 - 0.5			0.0	106	Silty Sand, Dark Brown (3/3 1042) 60% fine subrounded sand, 40% silt, trace gravel (sandstone, max size = 1.5"), moist, low dense no odor or staining	SM	NM
0.5 - 1.0					TD = 0.5 ft no gw encountered refusal on sandstone/bedrock		NM

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 18
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-28-11 / 0740	Date/Time Total Depth Reached: 9-28-11 / 0746	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50474) (0745)			
Geologist: Chelsea Carmichael	Checked By / Date: [Signature] 11-11-11			

Radiological Background: 30, 133	Radiological Equipment Used: Micro R, Downhole, Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	32 187	Silt, (10 YR, 4/6), reddish-brown, 100% silt, dry, some rootlets, medium stiff, semi-cemented, very low plasticity and hardness, no odor.	ML		
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								

No GW reached.

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 19
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-27-11/1038	Date/Time Total Depth Reached: 9-27-11/1049	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: Field DUP: 50514 (NT) One 1/2 Gallon Bag (Approx 8 lbs.) (#50476) (1048)			
Geologist: Chelsea Carmichael	Checked By / Date: [Signature] 11-22-11			

Radiological Background: 28, 107	Radiological Equipment Used: Micro R _V Downhole (Pancake Meters)	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	28 133	Silt, (10YA, 4/4), brown, 95% silt, 5% sandstone & siltstone rock fragments, dry, soft, some rootlets, very low plasticity and hardness, no odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 4	Location ID: 19
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 3ft 2in ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/8/11 1404	Date/Time Total Depth Reached: 11/8/11 1433	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 50477 - 1508			
Geologist: Ian Stone	Checked By / Date: <i>[Signature]</i> 1-4-12			

Radiological Background: 20 / 4572 / 111	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	110	Silty Sand, Yellowish Brown (5/6 10YR) 70% fine subrounded sand, 30% silt, trace gravel (sandstone, max size = 1/4"), moist, low dense, no odor or staining	SM		4807
			0.0	101				7111
1.0			0.0	110				8629
			0.0	104				9994
2.0			0.0	111	Silty Sand, Yellowish Brown (5/6 10YR) 80% fine subrounded sand, 20% silt, moist, ② formed dense, no odor or staining	SM		11133
			0.0	108				11602
3.0			0.0	126				11567
4.0					TD = 3ft 2in bgs no gw encountered refusal on sandstone			
5.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS	Group: 1	Location ID: 20	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-27-11/1101		Date/Time Total Depth Reached: 9-27-11/1112	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50478) (111)			
Geologist: Chelsea Carmichael				Checked By / Date: 11-22-11			
Radiological Background: 32, 117		Radiological Equipment Used: Micro R Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	32 143 cpm	Silt, (10 YR, 4/4), @ brown, 90% silt, 10% siltstone/sandstone rock fragments, dry, soft, some rootlets, very low hardness, no plasticity, no odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 21
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-27-11/1144	Date/Time Total Depth Reached: 9-27-11/1153	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 50480) (1152)			
Geologist: Chelsea Carmichael	Checked By./ Date: [Signature] 11-2-11			

Radiological Background: 28, 119	Radiological Equipment Used: Micro R _v Downhole Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	26 102 cpm	Silt, (10 YR, 4/4), brown, 95% silt, 5% sandstone/siltstone rock fragments, dry, soft, common rootlets, very low plasticity and hardness, no odor.	ML	1	
1.0								
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

No GW reached.

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 22
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-27-11/ 1434	Date/Time Total Depth Reached: 9-27-11/1443	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (# 50482) (1442)			
Geologist: Chelsea Carmichael	Checked By./ Date: <i>[Signature]</i> 11-22-11			

Radiological Background: 28, 103	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	28	Silt, (10 YR, 4/4), brown, 95% silt, 5% siltstone rock fragments, dry, some rootlets, medium stiff, very low plasticity and hardness, no odor.	ML	1	
1.0				152			2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 4	Location ID: 22
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 5.25 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/9/11 1104	Date/Time Total Depth Reached: 11/9/11 1132	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.) 50483 - 1150			
Geologist: Ian Stone	Checked By / Date:			

Radiological Background: 17 / 5051 / 145	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	127	Sandy silt, Dark Brown (3/3 104R)			0.5' = 4804
1.0			0.0	93	40% fine subrounded sand, 60% silt, moist, low toughness, low strength; slow dilatancy, no odor or staining	ML		5337
1.5			0.0	80	Silty Sand, Dark Yellowish Brown (4/4 104R)		1	8044
2.0			0.0	119	60% fine subrounded sand, 40% silt, trace roots, moist, low dense, no odor or staining	SM		8642
2.5			0.0	88	trace gravel (sandstone, max size = 1.5")		2	8698
3.0			0.0	92				8547
3.5			0.0	71			3	8739
4.0			0.0	107				8773
4.5			0.0	114			4	8528
5.0			0.0	81				8333
5.25			0.0	86	Same as above	SM	5	8187
TP = SPT 3in bgs no gw encountered refusal on sandstone								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS		Group: 1		Location ID: 25	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs			
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-27-11 / 0726		Date/Time Total Depth Reached: 9-27-11 / 0734			
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50488) (0732)					
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-21-11					
Radiological Background: 34, 100		Radiological Equipment Used: Micro B Downhole Pancake Meters			PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)	
0.5	0.0 - 0.5	100%	0.0	34 / 100	Silt with rock fragments, (10YR, 4/4), brown, 80% silt, 20% siltstone rock fragments; dry, medium stiff, trace rootlets, very low hardness, no plasticity, no odor.	ML	0.5		
1.0							1.0		
2.0							2.0		
3.0							3.0		
4.0							4.0		
5.0							5.0		
6.0					No GW reached.		6.0		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS Group: 1	Location ID: 26
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs 1.2
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-26-11/0945	Date/Time Total Depth Reached: 9-26-11/1023
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (#56490) (1020)		
Geologist: Chelsea Carmichael		Checked By / Date: 11-22-11	

Radiological Background: 15	Radiological Equipment Used: Micro R Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5					9" of asphalt on top			
1.0			57.0 at peak at 1' (8.7 average)	21	Silt with sand and rock fragments, 60% silt, 20% fine sand, 20% Sandstone rock fragments, asphalt fragments, semi-moist, medium stiff, compact, strong tar odor, no plasticity or hardness.	ML	1	
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0					No GW reached.		6	

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 1	Location ID: 26
Drilling Company: Dart Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/20/11 1130	Date/Time Total Depth Reached: 10/20/11 1240	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs) 50491 (1145)			
Geologist: C. Knight	Checked By / Date: [Signature] 1-3-12			

Radiological Background: 10AR/2043/42	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	46	Surface: Asphalt 8" Asphalt thick		+0.5'	2362 (CPM)
0.5			0.0	47				3000
1.0			0.0	48	Fill: Silty Sand: light yellowish brown (10YR 6/4), moist, medium dense, no odor, 20% silt, 10% medium sand, 5% angular sandstone gravel (fine), 65% fine sand, mottled	AF / SM	1	4481
2.0			0.0	59				5252
			0.0	46			2	5437
3.0			0.0	44				5341
			0.0	54			3	5556
4.0			0.0	52	3'6" Weathered siltstone Bedrock: light yellowish brown (2.5Y 6/4), moist, medium dense, no odor, some layers mechanically weathered to ML or SP, inter bedded siltstone beds with occasional sandstone beds	Weathered siltstone Bedrock	4	5574
			0.0	62	3'10" to 4'0" sandstone bed - 2" thick fine grained sandstone			5238
5.0			0.0	66	4'7" sandstone bed w/ 1" thick fine grained sandstone		5	5293
			0.0	63				5519
6.0			0.0	52	Same as above		6	5577

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 5D3 Group: 1	Location ID: 29				
Drilling Company: HGL		Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs				
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a	Date/Time Drilling Started: 9-26-11/1104	Date/Time Total Depth Reached: 9-26-11/1112				
Type of Sampling Device: stainless steel shovel/trowel			Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50496) (1110)					
Geologist: Chelsea Carmichael			Checked By / Date: <i>ad</i> 11-22-11					
Radiological Background: 16		Radiological Equipment Used: Micro R _h Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Silt with rock fragments, (10YR, 5/4), light brown, 80% silt, 20% siltstone rock fragments, dry, medium stiff, trace rootlets, very low hardness, no plasticity, no odor.	ML		
1.0								
2.0					No GW reached.			
3.0								
4.0								
5.0								
6.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 4	Location ID: 29
Drilling Company: HGL	Driller: C. Knight/J. Harris	Ground Elevation: NA	Total Depth Drilled: 4.5 ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/11/11 0835	Date/Time Total Depth Reached: 11/11/11 0959	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50497-1020	
Geologist: Ian Stone	Checked By / Date: <i>[Signature]</i> 1-3-12			

Radiological Background: 11 / 2753 / 87	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings 0.5' - 2836 (CPM)
0.0			0.0	78	Silty Sand, Yellowish Brown (5/6 104R) 70% fine subrounded sand, 20% silt, 10% gravel (sandstone, max size = 1/8"), dry, low dense, no odor or staining	SM	4202
0.5			0.0	67			4925
1.0			0.0	88			5032
1.5			0.0	78			5082
2.0			0.0	94	Gravelly Silty Sand, Yellowish Brown (5/6 104R) 65% fine subrounded sand, 20% silt, 15% gravel (sandstone, max size = 1"), dry, med dense, no odor or staining	SM	5100
2.5			0.0	103			5157
3.0			0.0	98	Silty Sand w/gravel, Yellowish Brown (5/6 104R) 65% fine subrounded sand, 25% silt, 10% gravel (siltstone, max size = 0.5"), dry	SM	5337
3.5			0.0	93			5241
4.0			0.0	83			5170
4.5			0.0	88	TD = 4.5 ft bgs no gw encountered refusal on siltstone		5206
5.0							
6.0							

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS Group: 1		Location ID: 30	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-26-11/1119		Date/Time Total Depth Reached: 9-26-11/1129	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Appox 8 lbs.) (#50498) (1128)			
Geologist: Chelsea Carmichael				Checked By / Date: 11-22-11			
Radiological Background: 22		Radiological Equipment Used: Micro R _y Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	20	Gravelly silt, (10YR, 5/3), light brown, 50% silt, 45% siltstone rock fragments, 5% fine sand, dry, medium stiff, no plasticity, hardness or odor.	ML	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 31
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-26-11/1142	Date/Time Total Depth Reached: 9-26-11/1149	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50499) (1148)			
Geologist: Chelsea Carmichael	Checked By / Date: <i>[Signature]</i> 11-23-11			

Radiological Background: 18	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	16	Silt with rock fragments, (10 YR, 4/4), 80% silt, 20% siltstone rock fragments dry, soft, some rootlets, very low hardness, no plasticity or odor.	ML	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 4	Location ID: 31
Drilling Company: HGL	Driller: Tim Morse/James Harris	Ground Elevation: NA	Total Depth Drilled: 10' 0" ft bgs.	
Drilling Equipment: Hand Auger	Borehole Diameter: 2.75 inches	Date/Time Drilling Started: 11/14/11 1019	Date/Time Total Depth Reached: 11/14/11 10' 0" (1125)	
Type of Sampling Device: 2.75" Hand Auger	Samples Collected: (1) 1/2 Gallon Bag (Approx 8 lbs.)		50500 (1200)	
Geologist: Ian Stone TM Timothy Morse		Checked By / Date: <i>[Signature]</i> 1-3-12		

Radiological Background: 11 / 2974 / 67	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background:	0.0ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)
			0.0	58	Surface: soil + Veg.		10.5 3084
0.5			0.0	61	Clayey TM silt w/ sand: Sandy silt w/ clay: Dark Yellowish Brown (10YR 4/4), 20% fine grained sand, 5% med. grained sand, 60% silt, 15% clay, slightly moist, no odor, cohesive, low plasticity, trace rootlets	ML	3901 4966
1.0			0.0	95	1' 0" - - - - -		5013
2.0			0.0	70	Clayey silt w/ sand: Dark Yellowish Brown (10YR 4/4) 20% clay, 65% silt, 10% fine grained sand, 5% med. grained sand, slightly moist, no odor, cohesive, low plasticity, trace rootlets	ML	5185
			0.0	77			5261
			0.0	67	2' 6" - - - - -		5451
3.0			0.0	79	Silty sand: Dark Yellowish Brown (10YR 3/6) 30% silt, 60% fine grained sand, 10% clay, dry, no odor, slightly cohesive, low plasticity, trace rootlets, medium dense	SM	5315
			0.0	78			5303
4.0			0.0	62	4' 0" - - - - -		5363
			0.0	64	Silty sand w/ clay ↳ same as above except 15% clay		5152
5.0			0.0	56		SM	5371
			0.0	71			5153
6.0			0.0	67			5220

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS Group: 1	Location ID: 32
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-26-11/1203	Date/Time Total Depth Reached: 9-26-11/1215
Type of Sampling Device: stainless steel shovel/trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 50501) (1215)		
Geologist: Chelsea Carmichael	Checked By / Date: <i>[Signature]</i> 11-2-11		

Radiological Background: 20	Radiological Equipment Used: (Micro R) Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Silt with rock fragments, (10YR, 5/3) 80% silt, 20% siltstone rock fragments, dry, medium stiff, some rootlets, very low hardness, no plasticity, no odor.	ML	0.5	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0							5.0	
6.0							6.0	

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 33
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA	Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-28-11/1325	Date/Time Total Depth Reached: 9-28-11/1335	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50502) (1335)		Checked By / Date: <i>[Signature]</i> 11-22-11	
Geologist: Chelsea Carmichael				

Radiological Background: 20	Radiological Equipment Used: (Micro R) Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	18	Clay, (10 YR, 5/4), light brown, 95% clay, 5% fine sand, some rootlets, CaCO ₃ stringers, dry, semi-cemented, medium stiff, low-medium plasticity, medium hardness, no odor.	CL	1	
1.0							2	
2.0							3	
3.0							4	
4.0							5	
5.0							6	
6.0								

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 33
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 3.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/17/11 1130	Date/Time Total Depth Reached: 10/17/11 1205	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		50503 (1140)	
Geologist: C. Knight	Checked By / Date: 1-3-12			

Radiological Background: 14MR/2747/57	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. 3000 (CPM)
			0.0	66	Surface: soil and grass		3049
0.5			0.0	70	Silt with clay and sand: Yellowish brown (10YR 5/6), dry, medium stiff, no odor, 10% fine sand, 10% clay, 80% silt, cohesive, low plasticity, low toughness, blocky texture, abundant CaCO ₃ stringers, some rootlets	ML	4004
1.0			0.0	81	1" Clay with silt: Dark yellowish brown (10YR 4/4), moist, stiff, no odor, 10% silt, 90% clay, medium plasticity, medium toughness, cohesive, blocky texture, CaCO ₃ stringers abundant	CL	4571
			0.0	80			4686
2.0			0.0	72	2" Weathered siltstone: Light yellowish-brown (10YR 6/4), moist, hard, no odor, mechanically weathered to ML, blocky texture, abundant CaCO ₃ stringers		4825
			0.0	70			4842
3.0			0.0	65			5055
4.0					Refusal on siltstone at 3.0' bgs		
5.0							
6.0							

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03		Subarea: 5DS Group: 1		Location ID: 34	
Drilling Company: HGL		Driller: L. Speranza		Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs	
Drilling Equipment: stainless steel shovel		Borehole Diameter: n/a		Date/Time Drilling Started: 9-28-11/1341		Date/Time Total Depth Reached: 9-28-11/1351	
Type of Sampling Device: stainless steel shovel/ trowel				Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (# 50504) (1350)			
Geologist: Chelsea Carmichael				Checked By / Date: <i>[Signature]</i> 11-22-11			
Radiological Background: 17		Radiological Equipment Used: Micro B / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.5			0.0	18	Clay, (10 YR, 5/4), light brown, 95% clay, 5% fine sand, dry, semi-cemented, medium stiff, some rootlets, CaCO ₃ stringers, low-medium plasticity, medium hardness, no odor.	CL	
1.0							
2.0							
3.0							
4.0							
5.0							
6.0							
					No GW reached.		

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 34
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/17/11 0945	Date/Time Total Depth Reached: 10/17/11 1110	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 50505 (0950)			
Geologist: C. Knight	Checked By / Date: <i>[Signature]</i> 1-3-12			

Radiological Background: BMB/2553/50cpm	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	7590	Surface: Soil and grass		70.5'	2663 cK (CPM) 2742
0.5			0.0	52 53	Sandy Silt with clay; Yellowish brown (10YR 5/4), dry, medium stiff, no odor, 15% clay, 20% fine sand, 65% silt, cohesive, low plasticity, low toughness	ML		3756 cK 3739 3801 cK 4507
1.0			0.0	51 52	Silty Clay; Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 30% silt, 70% clay, cohesive, medium plasticity, medium toughness, pin hole pores, CaCO ₃ stringers	CL		4284 cK 4754 4403 cK 4911
2.0			0.0	51 50				4747 cK 4814 4737 cK 4850
3.0			0.0	72 54				4893 cK 4903
4.0			0.0	60 66				4945 cK 4768
5.0			0.0	63 65				5009 cK 5010
6.0			0.0	61 68	Same as above: Silty Clay	CL		4898 cK 4906 5135 cK 5044
			0.0	82				5056 cK 4975 5011 cK

66

5078

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: 505	Group: 1	Location ID: 34			
Radiological Background: 13m ² /2553/50		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
6.0			0.0	75 62 61	constant 6'0" Clay with silt; yellowish brown (10YR 5/6), moist, stiff, no odor, 10% silt, 90% clay, trace rootlets, cohesive, medium plasticity, medium toughness, blocky texture	CL	6	5044 ckc 5078
7.0			0.0	60 69 76 64	7'1" Weathered siltstone Bedrock: light olive brown (2.5Y 5/4), moist, stiff to hard, no odor, mechanically weathered to ML, interbedded siltstone layers, some blocky texture	6'0" weathered siltstone	7	5260 ckc 5174
8.0			0.0	72 60 78 60			8	5222 ckc 5284
9.0			0.0	76 63 ckc			9	5382 ckc 5115
10.0			0.0	72 64 ckc	increase density of siltstone with depth		10	5560 ckc 5045
11.0			0.0	69 67 ckc			11	5777 ckc 5046
12.0							12	5805 ckc 5124
13.0					Total Depth: 10,0' bgs No GW encountered		13	5777 ckc 5214

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 35
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 1.5 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/17/11 0915	Date/Time Total Depth Reached: 10/17/11 1030	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.), 50506		No SAMPLE (6920) OK	
Geologist: C. Knight	Checked By / Date: 1-3-12			

Radiological Background: 132A/2596/58	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
0.0			0.0	47	Surface: soil and grout		40.5'
0.5			0.0	57	Sandy silt: yellowish brown (10YR 5/4), dry, medium grained, no odor, 15% fine sand, 85% silt, cohesive, low plasticity, low toughness	ML	No down hole gamma collected
1.0			0.0	59	Weathered siltstone Bedrock: Pale yellow (2.5Y 7/4) clay, hard, no odor, interbedded siltstone layers ~1-2mm thick, mechanically weathered to ML	Siltstone Bedrock	
2.0			0.0	68			
3.0					Refusal on siltstone at 1.5' bgs		
4.0					No GW encountered		
5.0					No downhole gamma logging collected due to refusal at 1.5' bgs		
6.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 36
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/14/11 11:25	Date/Time Total Depth Reached: 10/14/11 12:15	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		50507 (130)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 11-17-11			

Radiological Background: 104R/2574/50	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	75	Surface: Soil and grass			+0.5' 2663 (CPM)
0.5			0.0	80	Clayey silt Silt with clay: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 25% clay, 5% fine sand, 70% silt, cohesive, low plasticity, low toughness	ML		3756
1.0			0.0	81				4284
			0.0	77				4403
2.0			0.0	78				4740
			0.0	76	Silty Clay: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 15% silt, 5% fine sand, 80% clay, cohesive, medium plasticity, medium toughness, trace pinhole pores, some stringers (CaCO ₃)	CL		4731
3.0			0.0	72				4893
			0.0	80				4945
4.0			0.0	75				5009
			0.0	63				4898
5.0			0.10	61				5135
			0.0	84				5056
6.0			0.0	82	6'0" — — — contact — — —			5011

Project Name:		Project Number:	Subarea:	Group:	Location ID:		
SSFL Area IV Radiological Study		EP038.01.22.04.03	SDS	1	36		
Radiological Background:		Radiological Equipment Used:		PID Used:			
UMR/LS74/50		Micro R / Downhole / Pancake Meters		Mini Rac 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	82	Same as above: Silty Clay	CL	5011
			0.0	75			5202
7.0			0.0	69			5260
			0.0	64			5222
8.0			0.0	58	Silty Clay: Pale yellow (2.5Y 7/3), moist, stiff, no odor, 30% silt, 70% clay, cohesive, medium plasticity, low toughness, CaCO ₃ nodules and stringers, blocky texture	CL	5382
			0.0	60			5560
9.0			0.0	83			5671
			0.0	64			5805
10.0			0.0	67	Total Depth: 10.0' bgs No GW encountered		5777
11.0							
12.0							
13.0							

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 37
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/14/11 0855	Date/Time Total Depth Reached: 10/14/11 1000	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		50516 (NT) 50508 (2900)	
Geologist: C. Knight	Checked By / Date: Chelsea Carmichael / 11-17-11			

Radiological Background: 13MR/222A/46	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
					Surface soil and grass		40.5'	2528 (CPM)
0.5			0.0	62	Clayey Silt: Light yellowish brown (10YR 6/4), moist, medium stiff, no odor, 30% clay, 57% fine sand, 65% silt, cohesive, low toughness, low plasticity, trace pinhole pores	ML		3021
			0.0	60				3808
1.0			0.0	62				4177
			0.0	64				41356
2.0			0.0	60	2' some CaCO ₃ stringers			4520
			0.0	58	2' 6"			4697
3.0			0.0	51	Silty Clay: Yellowish brown (10YR 5/6), moist, medium stiff, no odor, 35% silt, 65% clay, cohesive, medium toughness, medium plasticity, some CaCO ₃ stringers, trace pinhole pores	CL		4758
			0.0	47				4834
4.0			0.0	46	Clay: Dark yellowish brown (10YR 4/4), moist, stiff, no odor, 52% silt, 95% clay, cohesive, medium plasticity, medium toughness, some CaCO ₃ stringers			4845
			0.0	40				4988
5.0			0.0	42				4905
			0.0	38				5173
6.0			0.0	45	----- contact 6'0" ----- dashed -----			5128

Project Name:		Project Number:	Subarea:	Group:	Location ID:			
SSFL Area IV Radiological Study		EP038.01.22.04.03	5DS	i	37			
Radiological Background:		Radiological Equipment Used:		PID Used:				
BGR / 2225 / 46		Micro R / Downhole / Pancake Meters		Mini Rae 2000 - Background: 0-0 ppm				
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)	
6.0			0.0	45	Clay: Yellowish brown (10YR: 5/4), moist, stiff, no odor, 5% silt, 95% clay, cohesive, medium plasticity, medium toughness, some CaCO ₃ nodules	CL	6 5128	
			0.0	44			7 4962	
7.0			0.0	48			7 5096	
			0.0	46			8 5077	
8.0			0.0	50			8 5123	
			0.0	47			9 4871	
9.0			0.0	45			9 4865	
			0.0	48			5009	
10.0			0.0	45			CL	10 41874
							Total Depth: 10.0' bgs No GW encountered	11
11.0					12			
12.0					13			

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 38
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-27-11 / 1454	Date/Time Total Depth Reached: 9-27-11 / 1504	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Appox 8,lbs.) (#50509) (1502)			
Geologist: Chelsea Carmichael	Checked By./ Date: <i>AL</i> 11-11-11			

Radiological Background: 20	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	20	Silt, (10 YR, 4/3), pale brown, 100% silt, dry, medium stiff, semi-cemented, common rootlets, very low plasticity, low hardness, no odor.	ML	1	
1.0								
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 38
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/14/11 1020	Date/Time Total Depth Reached: 10/14/11 1110	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 50510 (1030)			
Geologist: C. Knight	Checked By / Date: [Signature] 11-22-11			

Radiological Background: 19 mR / 3000 cpm / 65	Radiological Equipment Used: Micro R / Downhole / Pancake Meters (cpm)	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings +0.5' 3342 (CPM)
					Surface: Soil and gravel			
0.5			0.0	64	Silt with Sand: Dark yellowish brown (10YR 4/4), dry, soft, no odor, 10% fine sand, 5% clay, 85% silt, cohesive, low plasticity, low toughness, trace rootlets	ML		4070
1.0			0.0	62				5129
			0.0	65			1	5184
			0.0	67				5418
2.0			0.0	69	1'9" —————			
			0.0	70	Silt with Clay: Yellowish brown (10YR 5/4), moist, medium stiff, no odor, 10% clay, 5% fine sand, 85% silt, cohesive, low plasticity, low toughness, some CaCO ₃ stringers, some pinhole pores	ML	2	5518
			0.0	71				5662
3.0			0.0	70			3	5097
			0.0	68				5269
			0.0	75				5517
4.0			0.0	73			4	
			0.0	74				5622
			0.0	75				6100
5.0			0.0	74			5	
			0.0	65	Silt with clay: Strong brown (7.5YR 4/6), moist, medium stiff, no odor, 10% clay, 5% fine sand, 85% silt, cohesive, low plasticity, low toughness, trace CaCO ₃ nodules, some pinhole pores, some CaCO ₃ stringers	ML		6068
			0.0	65				628
6.0			0.0	63			6	
			0.0	55				

(C10)

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 39
Drilling Company: Bort Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 4.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/17/11 1425	Date/Time Total Depth Reached: 10/17/11 1450	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.)		50511 (1430)	
Geologist: C. Knight	Checked By / Date: 1-3-12			

Radiological Background: 13MB/2342/45	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings Feet bgs. (CPM)	
			0.0	86	Surface: Soil and grass		10.5' 2412 (CPM)	
0.5			0.0	88	Sandy ^{cl} silt; Yellowish brown (10YR 5/6), dry, medium stiff, no odor, 20% fine sand, 5% angular siltstone gravel (fine), 75% silt, cohesive, low plasticity, low toughness, trace scatter	ML	2636	
1.0			0.0	91	Weathered siltstone: Pale yellow (2.5Y 7/4), dry, hard, no odor, mechanically weathered to ML, interbedded siltstone layers, blocky texture, CaCO ₃ stringers between some beds	ML siltstone	3424	
2.0			0.0	78			1	3910
			0.0	88			2	4019
3.0			0.0	78			3	3964
			0.0	70			4	4159
4.0			0.0	68			4310	
			0.0	79	Same as above		4346	
			0.0	89			4314	
5.0					Refusal on siltstone at 4.0' bgs			
6.0								

SSFL BORING LOG

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 5DS	Group: 1	Location ID: 40
Drilling Company: HGL	Driller: L. Speranza	Ground Elevation: NA		Total Depth Drilled: 0.5 ft bgs
Drilling Equipment: stainless steel shovel	Borehole Diameter: n/a	Date/Time Drilling Started: 9-28-11/1459	Date/Time Total Depth Reached: 9-28-11/1510	
Type of Sampling Device: stainless steel shovel/ trowel	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) (#50512) (1510)			
Geologist: Chelsea Carmichael	Checked By / Date: A 11-22-11			

Radiological Background: 24	Radiological Equipment Used: (Micro R) Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, minerology, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
0.5			0.0	23	Clayey silt, (10YR, 4/4), brown, 70% silt, 30% clay, trace fine sand, dry, medium stiff, some rootlets, low hardness, low plasticity, no odor.	ML	1	
1.0								
2.0							2	
3.0							3	
4.0							4	
5.0							5	
6.0							6	

No GW reached.

Project Name: SSFL Area IV Radiological Study	Project Number: EP038.01.22.04.03	Subarea: 505	Group: 1	Location ID: 40
Drilling Company: Becht Longyear	Driller: Don Hansen	Ground Elevation: NA	Total Depth Drilled: 10.0 ft bgs.	
Drilling Equipment: Geoprobe 6600	Borehole Diameter: 1.75 inches	Date/Time Drilling Started: 10/29/11 0905	Date/Time Total Depth Reached: 10/20/11 1005	
Type of Sampling Device: 1.75 inch Macrocore	Samples Collected: One 1/2 Gallon Bag (Approx 8 lbs.) 50513 (0910)			
Geologist: C. Knight	Checked By / Date: [Signature] 1-3-12			

Radiological Background: 15mR / 3621 / 63	Radiological Equipment Used: Micro R / Downhole / Pancake Meters	PID Used: Mini Rae 2000 - Background: 0.0 ppm
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Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Feet bgs.	Borehole Gamma Readings (CPM)
			0.0	60	Surface: soil and gravel on slope		+0.5'	3830
0.5			0.0	70	Silt with clay and sand. Dark yellowish brown (10YR 4/6), dry, soft, no odor, 10% clay, 10% fine sand, 80% silt, cohesive, low plasticity, low toughness, trace rootlets, some pin hole pores	ML		4838
1.0			0.0	61			1	6387
			0.0	54				6003
2.0			0.0	52	1'10" Silt clay: Brown (7.5YR 4/4), moist, medium stiff, no odor, 35% silt, 5% fine sand, 60% clay, cohesive, medium plasticity, medium toughness, some pin hole pores, trace rootlets	CL	2	5890
			0.0	57				5866
3.0			0.0	62	3'0" Clayey silt: Strong brown (7.5YR 4/0), moist, stiff, no odor, 35% clay, 5% fine sand, 60% silt, cohesive, low plasticity, low toughness, trace coarse sand, trace pin hole pores, trace rootlets	ML	3	5964
			0.0	65				5973
4.0			0.0	85			4	6160
			0.0	75				6227
5.0			0.0	73			5	6114
			0.0	80	Clayey silt with gravel: Brownish yellow (10YR 6/6), moist, medium stiff, no odor, 20% clay, 5% fine sand, 10% fine angular sandstone gravel up to 1/4" diameter, 65% silt, low plasticity, low toughness, cohesive, abundant pin hole pores, blocky texture	ML		6154
6.0			0.0	88			6	6335

Project Name: SSFL Area IV Radiological Study		Project Number: EP038.01.22.04.03	Subarea: SDS	Group: 1	Location ID: 40		
Radiological Background: 15mR/3621/63		Radiological Equipment Used: Micro R / Downhole / Pancake Meters		PID Used: Mini Rae 2000 - Background: 0.0 ppm			
Depth (ft bgs)	Interval	Recovery	PID	Radiological	Description (Include lithology, grain size, sorting, angularity, Munsell color name & notation, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)	USCS Symbol	Borehole Gamma Readings (CPM)
6.0			0.0	88	Same as above: Clayey silt with gravel	ML	6 6337
			0.0	92			6173
			0.0	90			7 6288
7.0			0.0	100			6289
			0.0	99			8 6336
			0.0	82			6246
			0.0	75			9 6353
8.0			0.0	69			6378
			0.0	66			10 6422
10.0							
					Total Depth: 10.0' bgs No GW encountered		
11.0							
12.0							
13.0							